# Key and Data Field Reference
# Volume 1: Symbols, Numerics, A-H

## Agilent Technologies
## E4428C/38C ESG Signal Generators

This guide applies to the following signal generator models:

**E4428C ESG Analog Signal Generator**

**E4438C ESG Vector Signal Generator**

Due to our continuing efforts to improve our products through firmware and hardware revisions, signal generator design and operation may vary from descriptions in this guide. We recommend that you use the latest revision of this guide to ensure you have up-to-date product information. Compare the print date of this guide (see bottom of page) with the latest revision, which can be downloaded from the following website:

*www.agilent.com/find/esg*

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# Volume 1: Symbols, Numerics, A−H

# Symbols

## # of Blocks

**Supported**          E4438C with Option 400

This field sets the number of data blocks for the downlink dedicated channel (DCH). the transport channel position (**Transp Position Flexible Fixed** softkey) affects the behavior of this field as described in the following table.

| DownlinkTransport Channel Mode | Signal Generator Behavior |
|---|---|
| Flexible | Changing the number of blocks causes the signal generator to recalculate the block set size (`Blk Set Size` field); *block size* (`Blk Size` field) remains constant. The equation is as follows:<br><br>  `# of Blocks ≤ Blk Set Size ÷ Blk Size` |
| Fixed | Changing the number of blocks causes the signal generator to recalculate the block size; *block set size* remains constant. Changing the number of blocks also causes the ESG to generate a settings conflict error that is corrected when the signal generator recalculates the block size. You may have to scroll the cursor (arrow hardkey) to the `Blk Set` field for the update to occur. The equation is as follows:<br><br>  number of blocks ≤ block set size ÷ block size |

**Range**          1–64

## # of Carriers

**Supported**          E4438C with Option 001/601or 002/602

This softkey accesses a menu from which you can set the number of carriers for initialization of the multicarrier table.

## # Points

**Supported**    All Models

This softkey enables you to define the number of points in a step sweep. When you press this key, the current value is shown in the active entry area.

**Preset**        2

**Range**        2–65535

**Remarks**      A step sweep must have a minimum of 2 points.

## # Skipped Points

**Supported**    E4438C with Option 001/601or 002/602

This softkey enables you to set the number of points to skip in the range that you are defining. The first point in a range always has a marker set; the skipped points are after that marker. This enables you to set repetitively spaced markers. For example, a skip of 2 produces two points between each marker across the defined range. You can use either the knob or the numeric keys to set the value. The maximum number of skipped points for a selected file is 1 less than the number of points set in the file.

**Preset**        0

**Range**        0–65535

## ΦM Dev

**Supported**    All Models

This softkey enables you to set the deviation of the phase modulation for the currently selected modulation path.

**Preset**        0.000 rad

| **Range**s | *Frequency* | *Normal Bandwidth* | *High Bandwidth* |
|---|---|---|---|
| | 100 kHz–250 MHz | 0–10 RAD | 0–1 RAD |
| | > 250–500 MHz | 0–5 RAD | 0–0.5 RAD |
| | > 500 MHz–1 GHz | 0–10 RAD | 0–1 RAD |
| | > 1–2 GHz | 0–20 RAD | 0–2 RAD |
| | > 2–3.2 GHz | 0–40 RAD | 0–4 RAD |
| | > 3.2–4.0 GHz | 0–80 RAD | 0–8 RAD |

**Remarks**      The deviation limits are dependent upon the carrier frequency. This limiting occurs only when the modulation is turned on.

### ΦM Dev Couple Off On

**Supported**    All Models

This softkey toggles the operating state of the coupled deviation for phase modulation.

Off              The ΦM Path 1 and ΦM Path deviation values are independent of each other.

On               The ΦM Path 1 and ΦM Path deviation values are linked. Any change you make
                 to one ΦM deviation value is applied to both.

**Preset**       Off

### ΦM Off On

**Supported**    All Models

This softkey toggles the operating state of the currently selected phase modulation.

Off              Use this setting to turn off the currently selected phase modulation.

On               Use this setting to turn on the currently selected phase modulation.

When phase modulation is on, the Φ annunciator is displayed.

**Preset**       Off

### ΦM Path 1 2

**Supported**    All Models

This softkey toggles the selection between ΦM Path 1 and ΦM Path 2.

ΦM Path 1        This selection enables you to configure the modulation characteristics for ΦM
                 Path 1, using the remaining softkeys in the ΦM menu.

ΦM Path 2        This selection enables you to configure the modulation characteristics for ΦM
                 Path 2, using the remaining softkeys in the ΦM menu.

ΦM Path 1 and ΦM Path 2 define two standard phase modulation configurations which can be used
together.

ΦM Path 1 and ΦM Path 2 are summed internally for composite modulation. Either path can be
switched to any one of the modulation sources: Internal, Ext1, or Ext2.

**Preset**       ΦM Path 1

**Remarks**      ΦM Path 2 must be set to a deviation less than ΦM Path 1.

## ΦM Rate

**Supported**        All Models

This softkey enables you to change the frequency of the currently selected phase modulation.

**Preset**           400.0 Hz

**Range**            100.0 mHz−100.0 kHz

## ΦM Source

**Supported**        All Models

Use this softkey to access a menu of choices that enables you to select either an internally generated or an externally applied modulation input for the phase modulation source. The internal modulation is always ac-coupled. For externally applied signals, you can choose between ac- and dc-coupled modulation.

**Remarks**          A 1.0 volt peak voltage input is required for calibrated ΦM deviation settings. The EXT 1 LO/HI and EXT 2 LO/HI display annunciators will turn on if the peak input voltage differs from 1.0 by more than 3%. (The LO/HI annunciators function only for ac-coupled external inputs.)

## ΦM Start Rate

**Supported**        All Models

This softkey enables you to change the starting frequency of the internally generated modulation source for swept-sine phase modulation.

**Preset**           400.0 Hz

**Range**            0.5 Hz−1 MHz (minimum increment allowed is 0.5 Hz)

**Remarks**          This softkey is coupled to the **FM Rate** softkey in the initial FM menu and the **FM Tone 1 Rate** softkey in the FM Dual-Sine menu. Any value set for FM Start Rate is reflected in the **FM Rate** and **FM Tone 1 Rate** softkeys.

## ΦM Stop Rate

**Supported**        All Models

This softkey enables you to change the ending frequency of the internally generated modulation source for swept-sine phase modulation.

**Preset**           400.0 Hz

**Range**            1 Hz−1 MHz (minimum increment allowed is 1 Hz)

| | |
|---|---|
| **Remarks** | This softkey is coupled to the **FM Tone 2 Rate** softkey in the FM Dual-Sine menu. Any value set for FM Stop Rate is reflected in the **FM Tone 2 Rate** softkey. |

## ΦM Sweep Time

| | |
|---|---|
| **Supported** | All Models |

This softkey enables you to set the sweep time for swept-sine phase modulation.

| | |
|---|---|
| **Preset** | 400.0 Hz |
| **Range** | 1 Hz–100.0 kHz |

## ΦM Sweep Trigger

| | |
|---|---|
| **Supported** | All Models |

Use this softkey to access a menu of choices that enables you to select the triggering mode for the swept-sine phase modulation.

| | |
|---|---|
| **Preset** | Free Run |
| **Range** | 1 Hz–100.0 kHz |
| **Remarks** | You can also configure the polarity of the TTL signal output at the TRIGGER IN connector using the **Trigger In Polarity Neg Pos** softkey on this menu. |

## ΦM Tone 1 Rate

| | |
|---|---|
| **Supported** | All Models |

This softkey enables you to set the internal modulation frequency for the phase modulation tone 1 rate of the dual-sine waveform.

| | |
|---|---|
| **Preset** | 400.0 Hz |
| **Range** | 0.5 Hz–1.0 MHz (minimum increment is 0.5 Hz) |
| **Remarks** | This key is coupled to the **ΦM Rate** softkey in the initial ΦM menu and the **ΦM Start Rate** softkey in the ΦM swept-sine menu. Any value set for **ΦM Tone 1 Rate** is reflected in the **ΦM Rate** and **ΦM Start Rate** softkeys. |

## ΦM Tone 2 Ampl Percent Of Peak

| | |
|---|---|
| **Supported** | All Models |

This softkey enables you to adjust the amplitude of the alternate frequency as a percentage of the peak LF analog modulation amplitude. For example, if the tone 2 amplitude is set to 30.0% of the total amplitude, then the primary frequency is 70.0% of the total amplitude.

| Preset | 50.0% |
|---|---|
| **Range** | 0.1%−99.9% |
| **Remarks** | This is applicable for the dual-sine function only. |

## ΦM Tone 2 Rate

| Supported | All Models |
|---|---|

This softkey enables you to set the internal modulation frequency for the phase modulation tone 2 rate of the dual-sine waveform.

| Preset | 400.0 Hz |
|---|---|
| **Range** | 0.5 Hz−1.0 MHz (minimum increment is 0.5 Hz) |
| **Remarks** | This key is coupled to the **ΦM Stop Rate** softkey in the ΦM swept-sine menu. Any value set for **ΦM Tone 2 Rate** is reflected in the **ΦM Stop Rate** softkey. |

## ΦM Waveform

| Supported | All Models |
|---|---|

Use this softkey to access a menu of choices that enables you to select the phase modulation waveform that can be produced by the internal modulation source.

| Remarks | This softkey is only enabled when Internal is selected in the FM Source menu. |
|---|---|

## $\pi/4$ DQPSK

| Supported | E4438C with Option 001/601or 002/602 |
|---|---|

This softkey appears in two different locations, enabling you to either select a modulation or load an I/Q map into the I/Q table editor.

### Selecting a $\pi/4$ DQPSK Modulation

Use this softkey to select $\pi/4$ differential quadrature phase shift keying ($\pi/4$ DQPSK) to modulate a continuous stream of the selected data pattern. $\pi/4$ DQPSK modulation transmits data at the rate of 2 bits per symbol.

### Loading a $\pi/4$ DQPSK I/Q Map into the Table Editor

Use this softkey to load a $\pi/4$ differential quadrature phase shift keying ($\pi/4$ DQPSK) I/Q map into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *User's Guide*.

# Numerics

## 0

**Supported**          E4438C with Option 400

This softkey selects 0 chips as the frame timing for the uplink physical random access channel (PRACH). The Tp-a is the difference between the uplink PRACH's frame timing relative to the AICH and the downlink's AICH framing timing. This timing difference is part of the propagation delay. See 3GPP Standard TS25.211 and TS25.214 specifications for more information.

**Remarks**          The actual timing offset is defined as:
(Timeslot Offset + Timing Offset $\times$ 2560) – (Tp–a) [chips]

## 0 deg

**Supported**          E4438C with Option 003 or 004

This softkey, for the N5102A module, aligns the transition edge of the clock with the beginning of each sample for a parallel or parallel interleaved data transmission and with each bit for a serial data transmission. This is the factory preset phase selection.

### Clock Relative to the Data at 0 Degrees



## 1
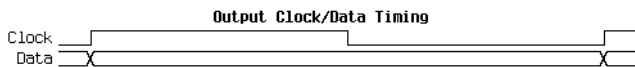
**Supported**          E4438C with Option 003 or 004

For a parallel or parallel interleaved port configuration, this softkey, for the N5102A module, selects one clock per sample. This is the factory preset selection. With either a serial port configuration or an IF signal type, or when in input mode, this softkey is not accessible.

## 1 kHz

**Supported**          All Models

This softkey selects a 1 kHz bandwidth for the automatic leveling control (ALC) circuit. The 1 kHz bandwidth is the auto selection for pulse modulation. In pulse modulation, the level accuracy degrades as the pulse repetition interval (PRI) lengthens. For signals with long PRI's, use a 100 Hz ALC bandwidth.

## 1.5V CMOS

**Supported**          E4438C with Option 003 or 004

This softkey sets the N5102A module logic type to a 1.5 volt CMOS signal.

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**CAUTION**     Changing the logic type changes the voltage levels. To avoid potential damage to your device or the N5102A module, first verify that the new logic type and voltage are appropriate.

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## 0.7V

**Supported**          E4438C with Option UN7

This softkey selects 0.7 volts (normal TTL) as the input threshold level of the BER CLK IN, BER DATA IN, and BER GATE IN rear panel connectors.

**Remarks**          None

## 1/2 Conv

**Supported**          E4438C with Option 400

Use this softkey to select a one-half rate Viterbi convolutional encoder to be used for transport channel error protection coding.

**Remarks**          None

## 1/3 Conv

**Supported**          E4438C with Option 400

Use this softkey to select a one-third rate Viterbi convolutional encoder to be used for transport channel error protection coding.

**Remarks**          None

## 1 DPCH

**Supported**          E4438C with Option 400

This softkey selects a single dedicated physical channel (DPCH) for the downlink W-CDMA setup. The one DPCH selection can also be inserted as a row in the Multicarrier WCDMA 3GPP Setup menu after the **Multicarrier Off On** softkey has been set to On.

**Remarks**          When multicarrier is active, you can press the Multicarrier Define softkey to adjust parameters in the Multicarrier WCDMA 3GPP Setup editor. The Edit Channel Setup table editor allows editing of the 1 DCPH parameters when multicarrier off is selected.

## 1.23 MHz

**Supported**          E4438C with Option 401

This softkey sets the carrier frequency spacing to 1.23 MHz when a spread rate 3 signal is generated with a multicarrier spreading type (as opposed to direct spreading). The Cellular band uses a CDMA-standard spacing of 1.23 MHz.

**Remarks**          None

## 1.25 MHz

**Supported**          E4438C with Option 401

This softkey sets the carrier frequency spacing to 1.25 MHz when a spread rate 3 signal is generated with a multicarrier spreading type (as opposed to direct spreading). The PCS band uses a CDMA-standard spacing of 1.25 Mhz.

**Remarks**          None

## 1.4V

**Supported**          E4438C with Option UN7

This softkey selects 1.4 volts (Schmit TTL) as the input threshold level of the BER CLK IN, BER DATA IN, and BER GATE IN rear panel connectors.

**Remarks**          None

## 1.65V

**Supported**          E4438C with Option UN7

This softkey selects 1.65 volts (CMOS 3.3 V) as the input threshold level of the BER CLK IN, BER DATA IN, and BER GATE IN rear panel connectors.

**2**

**Supported**            E4438C with Option 003 or 004

This softkey, for the N5102A module, selects two clocks per sample and is used in the parallel or parallel interleaved port configuration in the output mode. With either a serial port configuration, or an IF signal type, this softkey is not accessible. If this command is executed with a serial port configuration or an IF signal type, the parameter value is changed, but it is not used by the interface module until the port configuration is changed to parallel or parallel interleaved, *and* the signal type is changed to IQ.

The query returns the currently set value, regardless of the port configuration, you must query all four states (clocks per sample, port configuration, data direction, and signal type) to know the interface module's current setup

## 2's Complement

**Supported**            E4438C with Option 003 or 004

This softkey sets the N5102A module data format to a two's complement representation of the data values. This is the factory preset selection.

## 2–Lvl FSK

**Supported**            E4438C with Option 001/601or 002/602

This softkey appears in two different locations, enabling you to either select a modulation or load a default pattern into the FSK table editor.

### Selecting a 2–Level FSK Modulation

Use this softkey to select 2–level frequency shift keying (FSK) for modulating a continuous stream of the selected data pattern. Two–level FSK modulation transmits data at the rate of 1 bit per symbol.

The selected modulation is displayed under the **Modulation Type** softkey in the Modulation Type menu.

### Loading a 2–Level FSK Pattern into the FSK Table Editor

Use this softkey to load a 2–level frequency shift keying (FSK) modulation pattern into the FSK table editor. Two–level FSK modulation transmits data at the rate of 1 bit per symbol. For more information on using the FSK table editor, see the *User's Guide*.

## 2nd Scr Offset

**Supported**            E4438C with Option 400

This field displays the secondary scrambling code offset.

**Range**            0–15

Remarks           This field is displayed for the downlink orthogonal channel noise simulator
                  (OCNS) channel and dedicated physical channel (DPCH).

## 2 Carriers

**Supported**        E4438C with Option 400

Use this softkey to select a 2-carrier wideband CDMA setup with the settings listed below.

*Carrier 1:* PCCPCH + SCH; −7.5 MHz frequency offset; 0 dB power

*Carrier 2:* PCCPCH + SCH; −7.5 MHz frequency offset; 0 dB power

## 2 SR3 Carriers

**Supported**        E4438C with Option 401

Use this softkey to select a 2-carrier CDMA2000 setup with the settings listed below.

| | |
|---|---|
| Carrier 1: | spread rate 3, direct spread, 9 channel; −2.5 MHz frequency offset; 0 dB power |
| Carrier 2: | spread rate 3, direct spread, 9 channel; 2.5 MHz frequency offset; 0 dB power |

## 2.100 MHz

**Supported**        E4438C

Use this softkey to apply a 2.100 MHz filter to signals that are routed to the I/Q modulator. This filter eliminates spurs (and reduces distortion) above 2.100 MHz. Primarily used tor W-CDMA ACLR measurements.

## 2.5V

**Supported**        E4438C with Option UN7

This softkey selects 2.5 volts (CMOS 5 V) as the input threshold level of the BER CLK IN, BER DATA IN, and BER GATE IN rear panel connectors.

## 3 Carriers

**Supported**        E4438C with Option 400/401

This softkey selects a 3-carrier IS-95A, CDMA2000, or W-CDMA setup with the settings listed below.

**IS-95A or CDMA2000**

*Carrier 1:* spread rate 1, 9 channel; −1.25 MHz frequency offset; 0 dB power

*Carrier 2:* spread rate 1, 9 channel; 0 kHz frequency offset; 0 dB power

*Carrier 3:* spread rate 1, 9 channel; 1.25 MHz frequency offset; 0 dB power

**W-CDMA**

*Carrier 1:* perch channel; −5 MHz frequency offset; 0 dB power

*Carrier 2:* perch channel; 0 kHz frequency offset; 0 dB power

*Carrier 3:* perch channel; 5 MHz frequency offset; 0 dB power

## 3 DPCH

**Supported**          E4438C with Option 400

This softkey selects three Dedicated Physical Channels (DPCH) for the downlink
Arb W-CDMA setup. The 3 DPCH selection can also be inserted as rows in the Multicarrier WCDMA
3GPP Setup menu after the **Multicarrier Off On** softkey has been set to On.

**Remarks**          Parameters can be adjusted from the Multicarrier WCDMA 3GPP Setup menu
                     editor when multicarrier is active. The Edit Channel Setup table editor allows
                     editing of the 3 DPCH parameters when multicarrier off is selected.

## 3GPP STD

**Supported**          E4438C with Option 400

This softkey sets the dedicated physical control channel (DPCCH) framing structure as defined in the
3GPP TS25.211 specification. This data selection is displayed in the PhyCH Setup menu.

**Remarks**          This softkey is available for uplink DPCCH and PRACH.

## 3.84 MHz chip-clk (DRPS4)

**Supported**          E4438C with Option 400

This softkey assigns a 3.84 MHz chip clock to the selected rear panel output port. You can assign a
signal to an output port by highlighting the desired row in the table editor and selecting the desired
signal from the softkey menu.

**Remarks**          The **(DRPS4)** designator refers to the remote SCPI command parameter that
                     corresponds to this softkey.

**4**

**Supported**          E4438C with Option 003 or 004

This softkey, for the N5102A module, selects four clocks per sample and is used in the parallel or parallel interleaved port configuration in the output mode.With either a serial port configuration, or an IF signal type, this softkey is not accessible. If this command is executed with a serial port configuration or an IF signal type, the parameter value is changed, but it is not used by the interface module until the port configuration is changed to parallel or parallel interleaved, *and* the signal type is changed to IQ.

The query returns the currently set value, regardless of the port configuration; you must query all four states (clocks per sample, port configuration, data direction, and signal type) to know the interface module's current setup.

## 4 1's & 4 0's

**Supported**          E4438C with Option 001/601or 002/602

Use this softkey to select a binary data pattern that consists of four ones followed by four zeroes. Use this selection to generate unframed data patterns or for use with framed data transmissions.

When you select **4 1's & 4 0's**, both the **Data** and the **Other Patterns** softkeys show this selection. In addition, P4 (where "P" refers to Pattern and "4" refers to four ones and four zeroes) appears in the Data field of the table.

A single output of a framed P4 data pattern consists of enough repetitions of four ones followed by four zeroes to fill the data fields in TDMA timeslots.

## 40.000 MHz

**Supported**          E4438C

Use this softkey to apply a 40.000 MHz filter to signals that are routed to the I/Q modulator. This filter eliminates spurs above 40 MHz.

## 4 Carriers

**Supported**          E4438C with Option 400/401

This softkey selects a 4-carrier IS-95A, CDMA2000, or W-CDMA setup with the settings listed below.

### IS-95A or CDMA2000

*Carrier 1:* spread rate 1, 9 channel; −1.875 MHz frequency offset; 0 dB power

*Carrier 2:* spread rate 1, 9 channel; −625 kHz frequency offset; 0 dB power

*Carrier 3:* spread rate 1, 9 channel; 625 kHz frequency offset; 0 dB power

*Carrier 4:* spread rate 1, 9 channel; 1.875 MHz frequency offset; 0 dB power

**W-CDMA**

*Carrier 1:* perch channel; −7.5 MHz frequency offset; 0 dB power

*Carrier 2:* perch channel; −2.5 kHz frequency offset; 0 dB power

*Carrier 3:* perch channel; 2.5 kHz frequency offset; 0 dB power

*Carrier 4:* perch channel; 7.5 MHz frequency offset; 0 dB power

## 4 Carriers TM1 64 DPCH

**Supported**         E4438C with 400

Use this softkey to select a 4-carrier W-CDMA setup. Each carrier will be a TM1 (Test Model 1) with 64 DPCH. Scramble codes and timing offsets are automatically incremented.

## 4-Lvl FSK

**Supported**         E4438C with Option 001/601or 002/602

This softkey appears in two different locations, enabling you to either select a modulation or load a default pattern into the FSK table editor.

### Selecting a 4-Level FSK Modulation

Press this softkey to select 4–level frequency shift keying (FSK) for modulating a continuous stream of the selected data pattern. Four–level FSK modulation transmits data at the rate of 2 bits per symbol, and conforms with FLEX variants of paging standards.

The selected modulation is displayed under the **Modulation Type** softkey in the Modulation Type menu.

### Loading a 4–Level FSK Pattern into the FSK Table Editor

Press this softkey to load a 4–level frequency shift keying (FSK) modulation pattern into the FSK table editor. Four–level FSK modulation transmits data at the rate of 2 bits per symbol. For more information on using the FSK table editor, see the *User's Guide*.

## 4QAM

**Supported**       E4438C with Option 001/601or 002/602

This softkey appears in two different locations, enabling you to either select a modulation or load a default I/Q map into the I/Q table editor.

### Selecting a 4QAM Modulation

Press this softkey to select 4-state quadrature amplitude modulation (4QAM) to modulate a continuous stream of the selected data pattern. 4QAM transmits data at the rate of 2 bits per symbol.

The selected modulation is displayed under the **Select** and **QAM** softkeys in the Modulation Type menu.

### Loading a 4QAM I/Q Map into the I/Q Table Editor

Press this softkey to load a 4-state quadrature amplitude modulation (4QAM) I/Q map into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *User's Guide*.

## 5 Channel

**Supported**       E4438C with Option 401

This softkey selects a reverse link setup to transmit a 5-channel CDMA2000 signal. Channel 1 is a pilot channel, channel 2 is a dedicated control channel, channel 3 is a fundamental traffic channel, channel 4 is a supplemental 1 traffic channel, and channel 5 is a supplemental 2 traffic channel.

## 7.5 ksps

**Supported**       E4438C with Option 400

Use this softkey to select 7.5 kilo symbols per second as the data rate for the selected channel type to be inserted into the table editor.

## 8 1's & 8 0's

**Supported**       E4438C with Option 001/601or 002/602

Use this softkey to select a binary data pattern that consists of eight ones followed by eight zeroes. Use this selection to generate unframed data patterns or for use with framed data transmissions.

When you select **8 1's & 8 0's**, both the **Data** and the **Other Patterns** softkeys show this selection. In addition, P8 (where "P" refers to Pattern and "8" refers to eight ones and eight zeroes) appears in the Data field of the table.

A single output of a framed P8 data pattern consists of enough repetitions of eight ones followed by eight zeroes to fill the data fields in TDMA timeslots.

## 8 Bit Pattern

**Supported**          E4438C with Option 406

This softkey enables you to enter an eight-bit pattern for a Bluetooth setup. The 8-bit pattern is repeated 27 times within the payload of each packet. A change in the payload data type resets the eight-bit pattern to the default value.

**Preset**          0000 0000

## 8 Channel

**Supported**          E4438C with Option 401

This softkey selects a reverse link setup to transmit an 8-channel CDMA2000 signal. Channel 1 is a traffic channel, and channels 2 through 8 are supplemental 1 traffic channels. This setup is used for radio configurations 1 and 2.

## 8-Lvl FSK

**Supported**          E4438C with Option 001/601or 002/602

This softkey appears in two different locations, enabling you to either select a modulation or load a default pattern into the FSK table editor.

### Selecting an 8-Level FSK Modulation

Press this softkey to select 8–level frequency shift keying (FSK) for modulating a continuous stream of the selected data pattern. Eight–level FSK modulation transmits data at the rate of 3 bits per symbol.

The selected modulation is displayed under the **Modulation Type** softkey in the Modulation Type menu.

### Loading an 8–Level FSK Pattern into the FSK Table Editor

Press this softkey to load an 8–level frequency shift keying (FSK) modulation pattern into the FSK table editor. Eight–level FSK modulation transmits data at the rate of 3 bits per symbol. For more information on using the FSK table editor, see the *User's Guide*.

## 8PSK

**Supported**          E4438C with Option 001/601or 002/602

This softkey appears in two different locations, enabling you to either select a modulation or load an I/Q map into the I/Q table editor.

### Selecting an 8PSK Modulation

Use this softkey to select 8-state phase shift keying (8PSK) to modulate a continuous stream of the

selected data pattern. 8PSK modulation transmits data at the rate of 3 bits per symbol.

The modulation selection appears under the **Select** and **PSK** softkeys in the Modulation Type menus.

### Loading an 8PSK I/Q Map into the Table Editor

Use this softkey to load an 8-state phase shift keying (8PSK) I/Q map into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *User's Guide*.

## 9 Ch Fwd

**Supported**        E4438C with Option 401

This softkey selects a standard, forward 9-channel IS-95A setup.

Using this setup, the signal generator will transmit a 9-channel IS-95A signal for forward link (base-to-mobile) at IS-97-defined power levels. Channel 1 is a pilot channel, channel 2 is a paging channel, channels 3 through 8 are traffic channels, and channel 9 is a synchronization channel.

## 9 Channel

**Supported**        E4438C with Option 401

This softkey selects a forward link setup to transmit a 9-channel CDMA2000 signal. Channel 1 is a pilot channel, channel 2 is a paging channel, channels 3 and 6 are traffic channels, channels 4, 5, 7, and 8 are supplemental 1 traffic channels, and channel 9 is a synchronization channel.

## 10 kHz

**Supported**        All Models

This softkey selects a 10 kHz bandwidth for the automatic leveling control (ALC) circuit. This bandwidth is the auto selection for AM modulation when the CW carrier frequency is above 500 kHz.

The 10 kHz bandwidth has the fastest ALC settling time, but the most signal degradation and highest error vector magnitude (EVM) of the ALC bandwidths (100 Hz, 1 kHz, 10 kHz).

## 10ms Frame Pulse (RPS6, DRPS11)

**Supported**        E4438C with Option 400

This softkey assigns the 10 millisecond frame pulse to the selected rear panel output port. You can assign a signal to an output port by highlighting the desired row in the table editor and selecting the desired signal from the softkey menu.

**Remarks**        The **(RPS6)** designator refers to the remote SCPI command parameter that corresponds to this softkey for the uplink. The **(DRPS11)** designator refers to the remote SCPI command parameter that corresponds to this softkey for the downlink.

## 10 msec

**Supported**   E4438C with Option 400

This softkey selects a 10 millisecond time period for the uplink frame clock.

**Remarks**   When using the frame clock, use a frame clock period equal to or longer than the longest transport channel transmission time interval (TTI). The TTI period can be set in the transport channel setup menu. Refer to for more information.

## 12.2 kbps (34.121)

**Supported**   E4438C with Option 400

This softkey selects 12.2 kbps for the downlink DPCH reference measurement channel as described in the 3GPP Technical Specification (TS) 34.121.

**Remarks**   This selection affects the channel slot format.

With this softkey selection, the Data Type field in the highlighted row changes to Ref 12.

## 15 ksps

**Supported**   E4438C with Option 400

Use this softkey to select 15 kilosymbols per second as the data rate for the selected channel type to be inserted into the table editor.

## 16 1's & 16 0's

**Supported**   E4438C with Option 001/601or 002/602

Use this softkey to select a binary data pattern that consists of 16 ones followed by 16 zeroes. Use this selection to generate unframed data patterns or for use with framed data transmissions.

When you select **16 1's & 16 0's**, both the **Data** and the **Other Patterns** softkeys show this selection. In addition, P16 (where "P" refers to Pattern and "16" refers to 16 ones and 16 zeroes) appears in the Data field of the table.

A single output of a framed P16 data pattern consists of enough repetitions of 16 ones followed by 16 zeroes to fill the data fields in TDMA timeslots.

## 16-Lvl FSK

**Supported**       E4438C with Option 001/601or 002/602

This softkey appears in two different locations, enabling you to either select a modulation or load a default pattern into the FSK table editor.

### Selecting a 16-Level FSK Modulation

Press this softkey to select 16–level frequency shift keying (FSK) for modulating a continuous stream of the selected data pattern. 16–level FSK modulation transmits data at the rate of 4 bits per symbol.

The selected modulation is displayed under the **Modulation Type** softkey in the Modulation Type menu.

### Loading a 16–Level FSK Pattern into the FSK Table Editor

Press this softkey to load a 16–level frequency shift keying (FSK) modulation pattern into the FSK table editor. 16–level FSK modulation transmits data at the rate of 4 bits per symbol. For more information on using the FSK table editor, see the *User's Guide*.

## 16PSK

**Supported**       E4438C with Option 001/601or 002/602

This softkey appears in two different locations, enabling you to either select a modulation or load an I/Q map into the I/Q table editor.

### Selecting a 16PSK Modulation

Use this softkey to select 16-state phase shift keying (16PSK) to modulate a continuous stream of the selected data pattern. 16PSK modulation transmits data at the rate of 4 bits per symbol.

The modulation selection appears under the **Select** and **PSK** softkeys in the Modulation Type menus.

### Loading a 16PSK I/Q Map into the Table Editor

Use this softkey to load a 16-state phase shift keying (16PSK) I/Q map into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *User's Guide*.

## 16QAM

**Supported**       E4438C with Option 001/601or 002/602

This softkey appears in two different locations, enabling you to either select a modulation or load a default I/Q map into the I/Q table editor.

### Selecting a 16QAM Modulation

Press this softkey to select 16-state quadrature amplitude modulation (16QAM) to modulate a continuous stream of the selected data pattern. 16QAM transmits data at the rate of 4 bits per symbol.

The selected modulation is displayed under the **Select** and **QAM** softkeys in the Modulation Type menu.

### Loading a 16QAM I/Q Map into the I/Q Table Editor

Press this softkey to load a 16-state quadrature amplitude modulation (16QAM) I/Q map into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *User's Guide*.

## 20 msec

**Supported**        E4438C with Option 400

This softkey selects a 20 millisecond time period for the uplink frame clock.

**Remarks**        When using the frame clock, use a frame clock period equal to or longer than the longest transport channel transmission time interval (TTI). The TTI period can be set in the transport channel setup menu. Refer to for more information.

## 30 ksps

**Supported**        E4438C with Option 400

Use this softkey to select 30 kilosymbols per second as the data rate for the selected channel type to be inserted into the table editor.

## 32 1's & 32 0's

**Supported**        E4438C with Option 001/601or 002/602

Use this softkey to select a binary data pattern that consists of 32 ones followed by 32 zeroes. Use this selection to generate unframed data patterns or for use with framed data transmissions.

When you select **32 1's & 32 0's**, both the **Data** and the **Other Patterns** softkeys show this selection. In addition, P32 (where "P" refers to Pattern and "32" refers to 32 ones and 32 zeroes) appears in the Data field of the table.

A single output of a framed P32 data pattern consists of enough repetitions of 32 ones followed by 32 zeroes to fill the data fields in TDMA timeslots.

## 32 Ch Fwd

**Supported**　　　E4438C with Option 401

This softkey selects a standard, forward 32-channel IS-95A setup. Using this setup, the signal generator will transmit a 32-channel IS-95A signal for forward link (base-to-mobile) at IS-97-defined power levels. Channel 1 is a pilot channel, channel 2 is a paging channel, channels 3 through 26 and channels 28 through 32 are traffic channels, and channel 27 is a synchronization channel.

## 32QAM

**Supported**　　　E4438C with Option 001/601or 002/602

This softkey appears in two different locations, enabling you to either select a modulation or load a default I/Q map into the I/Q table editor.

### Selecting a 32QAM Modulation

Press this softkey to select 32-state quadrature amplitude modulation (32QAM) to modulate a continuous stream of the selected data pattern. 32QAM transmits data at the rate of 5 bits per symbol.

The selected modulation is displayed under the **Select** and **QAM** softkeys in the Modulation Type menu.

### Loading a 32QAM I/Q Map into the I/Q Table Editor

Press this softkey to load a 32-state quadrature amplitude modulation (32QAM) I/Q map into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *User's Guide*.

## 40.000 MHz

**Supported**　　　E4438C with Option 001/601or 002/602

Use this softkey to apply a 40.000 MHz filter to signals that are routed to the I/Q modulator or the I/Q signal out the rear panel of the instrument. This filter eliminates spurs above 40.000 MHz.

## 40 msec

**Supported**　　　E4438C with Option 400

This softkey selects a 40 millisecond time period for the uplink frame clock.

**Remarks**　　　When using the frame clock, use a frame clock period equal to or longer than the longest transport channel transmission time interval (TTI). The TTI period can be set in the transport channel setup menu. Refer to "TTI" on page 488 for more information.

### 60 ksps

**Supported**          E4438C with Option 400

Use this softkey to select 60 kilosymbols per second as the data rate for the selected channel type to be inserted into the table editor.

### 64 1's & 64 0's

**Supported**          E4438C with Option 001/601or 002/602

Use this softkey to select a binary data pattern that consists of 64 ones followed by 64 zeroes. Use this selection to generate unframed data patterns or for use with framed data transmissions.

When you select **64 1's & 64 0's**, both the **Data** and the **Other Patterns** softkeys show this selection. In addition, P64 (where "P" refers to Pattern and "64" refers to 64 ones and 64 zeroes) appears in the Data field of the table.

A single output of a framed P64 data pattern consists of enough repetitions of 64 ones followed by 64 zeroes to fill the data fields in TDMA timeslots.

### 64 Ch Fwd

**Supported**          E4438C with Option 401

This softkey selects a standard, forward 64-channel IS-95A setup.

Using this setup, the signal generator will transmit a 64-channel IS-95A signal set independently for forward link (base-to-mobile) at IS-97-defined power levels. Channel 1 is a pilot channel, channels 2 through 8 are paging channels, channels 9 through 32 and channels 34 through 64 are traffic channels, and channel 33 is a synchronization channel.

### 64 kbps (34.121)

**Supported**          E4438C with Option 400

This softkey selects 64 kbps for the downlink DPCH reference measurement channel as described in the 3GPP Technical Specifications (TS) 34.121.

**Remarks**          This selection affects the channel slot format.

With this softkey selection, the Data Type field in the highlighted row changes to Ref 64.

### 64QAM

**Supported**          E4438C with Option 001/601or 002/602

This softkey appears in two different locations, enabling you to either select a modulation or load a default I/Q map into the I/Q table editor.

### Selecting a 64QAM Modulation

Press this softkey to select 64-state quadrature amplitude modulation (64QAM) to modulate a continuous stream of the selected data pattern. 64QAM transmits data at the rate of 6 bits per symbol.

The selected modulation is displayed under the **Select** and **QAM** softkeys in the Modulation Type menu.

### Loading a 64QAM I/Q Map into the I/Q Table Editor

Press this softkey to load a 64QAM (64-state quadrature amplitude modulation) I/Q map into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *User's Guide*.

## 80ms Frame Pulse (RPS20, DRPS13)

| | |
|---|---|
| **Supported** | E4438C with Option 400 |

This softkey assigns the 80 millisecond frame pulse to the selected rear panel output port. You can assign a signal to an output port by highlighting the desired row in the table editor and selecting the desired signal from the softkey menu.

| | |
|---|---|
| **Remarks** | The **(RPS20)** designator refers to the remote SCPI command parameter that corresponds to this softkey for the uplink. The **(DRPS13)** designator refers to the remote SCPI command parameter that corresponds to this softkey for the downlink. |

## 80 msec

| | |
|---|---|
| **Supported** | E4438C with Option 400 |

This softkey selects a 80 millisecond time period for the uplink frame clock.

| | |
|---|---|
| **Remarks** | When using the frame clock, use a frame clock period equal to or longer than the longest transport channel transmission time interval (TTI). The TTI period can be set in the transport channel setup menu. Refer to "TTI" on page 488 for more information. |

## 90 deg

| | |
|---|---|
| **Supported** | E4438C with Option 003 or 004 |

This softkey, for the N5102A module, provides a 90 degree phase adjustment for the clock signal. The phase adjustment moves the clock transition edge relative to the beginning of each sample for parallel or parallel interleaved data transmission and to each bit during a serial data transmission.

This softkey is grayed out (unavailable) when the clock rate is less than 10 MHz or greater than 200 MHz. If 90 degrees is the phase setting when the clock rate is changed to a value that is less than 10 MHz or greater than 200 MHz, the phase setting becomes zero degrees.

**Clock Relative to the Data at 90 Degrees**
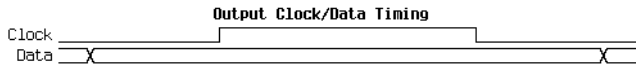


## 100 Hz

**Supported**      All Models

This softkey selects a 100 Hz bandwidth for the automatic leveling control (ALC) circuit. This bandwidth is the auto selection for the signal generator's digital modulation modes.

The 100 Hz bandwidth requires more ALC settling time, but has the least signal degradation and lowest error vector magnitude (EVM) of the ALC bandwidths (100 Hz, 1 kHz, 10 kHz).

## 120 ksps

**Supported**      E4438C with Option 400

Use this softkey to select 120 kilosymbols per second as the data rate for the selected channel type to be inserted into the table editor.

## 128QAM

**Supported**      E4438C with Option 001/601or 002/602

This softkey appears in two different softkey locations, enabling you to either select the modulation or load a default I/Q map into the I/Q table editor.

### Selecting a 128QAM Modulation

Press this softkey to select 128-state quadrature amplitude modulation (128QAM) to modulate a continuous stream of the selected data pattern. 128QAM transmits data at the rate of 7-bits per symbol.

The selected modulation is displayed under the **Select** and **QAM** softkeys in the Modulation Type menu.

### Loading a 128QAM I/Q Map into the I/Q Table Editor

Press this softkey to load a 128-state quadrature amplitude modulation (128QAM) I/Q map into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *User's Guide*.

## 144 kbps (34.121)

**Supported**        E4438C with Option 400

This softkey selects 144 kbps for the downlink DPCH reference measurement channel as described in the 3GPP Technical Specification (TS) 34.121.

**Remarks**        This selection affects the channel slot format.

With this softkey selection, the `Data Type` field in the highlighted row changes to `Ref144`.

## 240 ksps

**Supported**        E4438C with Option 400

Use this softkey to select 240 kilosymbols per second as the symbol rate for the selected channel type to be inserted into the table editor.

## 180 deg

**Supported**         E4438C with Option 003 or 004

This softkey, for the N5102A module, provides a 180 degree phase adjustment for the clock signal. The phase adjustment is relative to the beginning of each sample for a parallel or parallel interleaved data transmission and to each bit during a serial data transmission. This functions the same as selecting the negative clock polarity using the **Clock Polarity Neg Pos** softkey.

### Clock Relative to the Data at 180 Degrees
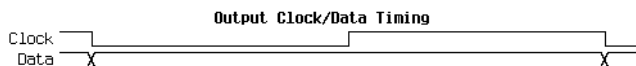


## 256QAM

**Supported**        E4438C with Option 001/601or 002/602

This softkey appears in two different locations, enabling you to either select a modulation or load a default I/Q map into the I/Q table editor.

### Selecting a 256QAM Modulation

Press this softkey to select 256-state quadrature amplitude modulation (256QAM) to modulate a continuous stream of the selected data pattern. 256QAM transmits data at the rate of 8 bits per symbol.

The selected modulation is displayed under the **Select** and **QAM** softkeys in the Modulation Type menu.

### Loading a 256QAM I/Q Map into the I/Q Table Editor

Press this softkey to load a 256-state quadrature amplitude modulation (256QAM) I/Q map into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *User's Guide*.

## 270 deg

**Supported**          E4438C with Option 003 or 004

This softkey, for the N5102A module, provides a 270 degree phase adjustment for the clock signal. The phase adjustment moves the clock transition edge relative to the beginning of each sample for parallel or parallel interleaved data transmission and to each bit during a serial data transmission.

This softkey is grayed out (unavailable) when the clock rate is less than 10 MHz or greater than 200 MHz. If 270 degrees is the phase setting when the clock rate is changed to a value that is less than 10 MHz or greater than 200 MHz, the phase becomes 180 degrees.

### Clock Relative to the Data at 270 Degrees
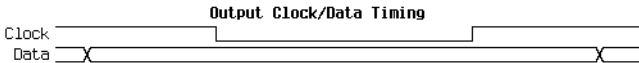


## 300

**Supported**          All Models

This softkey selects 300 as the baud rate for RS-232 data communication.

**Remarks**          The baud rate is not affected by a preset or by a power cycle.

## 384 kbps (34.121)

**Supported**          E4438C with Option 400

This softkey selects 384 kbps as the downlink DPCH reference measurement channel as described in the 3GPP Technical Specification (TS) 34.121.

**Remarks**          This selection affects the channel slot format.

With this softkey selection, the `Data Type` field in the highlighted row will change to `Ref384`.

## 480 ksps

**Supported**       E4438C with Option 400

Use this softkey to select 480 kilosymbols per second as the data rate for the selected channel type to be inserted into the table editor.

## 800MHz Base

**Supported**       All Models

This softkey selects 800 MHz Base as the frequency band for Personal Digital Cellular (PDC). The output frequency depends on both the channel band and channel number selections.

**Preset**          *Channel*: 1

                    *Frequency*: 810.025 MHz

**Range**           *Channels*: 1–320

                    *Frequency*: 810.025–818.000 MHz

## 800MHz Mobile

**Supported**       All Models

This softkey selects 800 MHz Mobile as the frequency band for Personal Digital Cellular (PDC). The output frequency depends on both the channel band and channel number selections.

**Preset**          *Channel*: 1

                    *Frequency*: 940.025 MHz

**Range**           *Channels*: 1–320

                    *Frequency*: 940.025–948.000 MHz

## 960 ksps

**Supported**       E4438C with Option 400

Use this softkey to select 960 kilosymbols per second as the data rate for the selected channel type to be inserted into the table editor.

## 1200

**Supported**       All Models

This softkey selects 1200 as the baud rate for RS-232 data communication.

**Remarks**         The baud rate is not affected by a preset or by a power cycle.

## 1500 Bps

| | |
|---|---|
| **Supported** | E4438C with Option 401 |

This softkey selects 1500 bits per second as the data rate for the selected CDMA traffic channel.

## 1500MHz Base

| | |
|---|---|
| **Supported** | All Models |

This softkey selects 1500 MHz Base as the frequency band for Personal Digital Cellular (PDC). The output frequency depends on both the channel band and channel number selections.

| | |
|---|---|
| **Preset** | *Channel*: 1 |
| | *Frequency*: 1.477 GHz |
| **Range** | *Channels*: 1–480 |
| | *Frequency*: 1.477–1.489 GHz |

## 1500MHz Mobile

| | |
|---|---|
| **Supported** | All Models |

This softkey selects 1500 MHz Mobile as the frequency band for Personal Digital Cellular (PDC. The output frequency depends on both the channel band and channel number selections.

| | |
|---|---|
| **Preset** | *Channel*: 1 |
| | *Frequency*: 1.429 GHz |
| **Range** | *Channels*: 1–480 |
| | *Frequency*: 1.429–1.441 GHz |

## 2400

| | |
|---|---|
| **Supported** | All Models |

This softkey selects 2400 as the baud rate for RS-232 data communication.

| | |
|---|---|
| **Remarks** | The baud rate is not affected by a preset or by a power cycle. |

## 2560 msec

**Supported**　　　　E4438C with Option 400

This softkey selects a 2560 millisecond time period for the uplink frame clock.

**Remarks**　　　　When using the frame clock, use a frame clock period equal to or longer than the longest transport channel transmission time interval (TTI). The TTI period can be set in the transport channel setup menu. Refer to "TTI" on page 488 for more information.

## 2700 Bps

**Supported**　　　　E4438C with Option 401

This softkey selects 2700 bits per second as the data rate for the CDMA traffic channel.

## 4800

**Supported**　　　　All Models

This softkey selects 4800 as the baud rate for RS-232 data communication

**Remarks**　　　　The baud rate is not affected by a preset or by a power cycle.

## 4800 Bps

**Supported**　　　　E4438C with Option 401

This softkey selects 4800 bits per second as the data rate for the selected CDMA traffic channel.

## 7680

**Supported**　　　　E4438C with Option 400

This softkey selects 7680 chips as the frame timing for the uplink physical random access channel (PRACH). The Tp-a is the difference between the uplink PRACH's frame timing relative to the AICH and the downlink's AICH framing timing. This timing difference is part of the propagation delay. See 3GPP Standard TS25.211 and TS25.214 specifications for more information.

**Remarks**　　　　The actual timing offset is defined as:
(Timeslot Offset + Timing Offset $\times$ 2560) – (Tp–a) [chips]

## 9600

**Supported**          All Models

This softkey selects 9600 as the baud rate for RS-232 data communication.

**Remarks**          The baud rate is not affected by a preset or by a power cycle.

## 9600 Bps

**Supported**          E4438C with Option 401

This softkey selects 9600 bits per second as the data rate for the selected CDMA traffic channel.

## 12800

**Supported**          E4438C with Option 401

This softkey selects 12800 chips as the frame timing for the uplink physical random access channel (PRACH). The Tp-a is the difference between the uplink PRACH's frame timing relative to the AICH and the downlink's AICH framing timing. This timing difference is part of the propagation delay. See 3GPP Standard TS25.211 and TS25.214 specifications for more information.

**Remarks**          The actual timing offset is defined as:
(Timeslot Offset + Timing Offset × 2560) – (Tp−a) [chips]

## 16384

**Supported**          E4438C with Option 403

This softkey sets the length of the additive white Gaussian noise (AWGN) waveform to 16384 points.

## 19200

**Supported**          All Models

This softkey selects 19200 as the baud rate for RS-232 data communication.

**Remarks**          The baud rate is not affected by a preset or by a power cycle.

## 19200 Bps

**Supported**          E4438C with Option 401

This softkey selects 19200 bits per second as the data rate for the selected CDMA traffic channel.

## 32768

**Supported**      E4438C with Option 403

This softkey sets the length of the additive white Gaussian noise (AWGN) waveform to 32768 points.

## 38400

**Supported**      All Models

This softkey selects 38400 as the baud rate for RS-232 data communication.

**Remarks**      The baud rate is not affected by a preset or by a power cycle.

## 38400 Bps

**Supported**      E4438C with Option 401

This softkey selects 38400 bits per second as the data rate for the selected CDMA traffic channel.

## 57600

**Supported**      All Models

This softkey selects 57600 as the baud rate for RS-232 data communication.

**Remarks**      The baud rate is not affected by a preset or by a power cycle.

## 65536

**Supported**      E4438C with Option 403

This softkey sets the length of the additive white Gaussian noise (AWGN) waveform to 65536 points.

## 76800 Bps

**Supported**      E4438C with Option 401

This softkey selects 76800 bits per second as the data rate for the selected CDMA traffic channel.

## 8648A/B/C/D

**Supported**      All Models

This softkey selects 8648A/B/C/D compatible commands for remote operation of the signal generator. The selection appears in the Preset Language softkey menu and the Remote Language softkey menu.

The **8648A/B/C/D** softkey is a language choice for the signal generator and is compatible with the remote language commands used by the 8648A/B/C/D. Choosing **8648A/B/C/D** in the Preset

Language menu allows you to select this remote language as the default after you preset the signal generator. Choosing **8648A/B/C/D** in the Remote Language menu allows you to immediately use 8648A/B/C/D commands for remote operation of the signal generator.

**Remarks**     The 8648A/B/C/D compatible commands are only supported over the GPIB interface.

## 8656B,8657A/B

**Supported**   All Models

This softkey selects 8656B or 8657A/B compatible commands for remote operation of the signal generator. The selection appears in the Preset Language softkey menu and the Remote Language softkey menu.

The **8656B,8657A/B** softkey is a language choice for the signal generator and is compatible with the remote language commands used by the 8656B and the 8657A/B. See the Functional E4438C SC PI Commands While in a Compatible Language Mode chapter of the Programming Compatibility Guide. Choosing **8656B,8657A/B** in the Preset Language menu allows you to select this remote language as the default after you preset the signal generator. Choosing **8656B,8657A/B** in the Remote Language menu allows you to immediately use 8656B,8657A/B commands for remote operation of the signal generator.

**Remarks**     The 8656B, 8657A/B compatible commands are only supported over the GPIB interface.

## 8657D NADC

**Supported**   E4438C

This softkey selects 8657D NADC compatible commands for remote operation of the signal generator. The selection appears in the Preset Language softkey menu and the Remote Language softkey menu.

The **8657D NADC** softkey is a language choice for the signal generator and is compatible with the remote language commands used by the 8657D with NADC digital modulation capabilities. Choosing **8656D NADC** in the Preset Language menu allows you to select this remote language as the default after you preset the signal generator.
Choosing **8657D NADC** in the Remote Language menu allows you to immediately use 8648A/B/C/D commands for remote operation of the signal generator.

**Remarks**     The 8657D NADC compatible commands are only supported over the GPIB interface.

## 8657D PDC

**Supported**   E4438C

This softkey selects 8657D PDC compatible commands for remote operation of the signal generator. The selection appears in the Preset Language softkey menu and the Remote Language softkey menu.

The **8657D PDC** softkey is a language choice for the signal generator and is compatible with the remote language commands used by the 8656D with PDC digital modulation capabilities. Choosing **8657D PDC** in the Preset Language menu allows you to select this remote language as the default language after you preset the signal generator. Choosing **8657D PDC** in the Remote Language menu allows you to immediately use 8648A/B/C/D commands for remote operation of the signal generator.

**Remarks**   The 8657D PDC compatible commands are only supported over the GPIB interface.

## 8657J PHS

**Supported**   E4438C

This softkey selects 8657J PHS compatible commands for remote operation of the signal generator. The selection appears in the Preset Language softkey menu and the Remote Language softkey menu.

The **8657J PHS** softkey is a language choice for the signal generator and is compatible with the remote language commands used by the 8657J with PHS digital modulation capabilities. Choosing **8657J PHS** in the Preset Language menu allows you to select this remote language as the default language after you preset the signal generator. Choosing **8657J PHS** softkey in the Remote Language menu allows you to immediately use 8648A/B/C/D commands for remote operation of the signal generator.

**Remarks**   The 8657D NADC compatible commands are only supported over the GPIB interface.

## 131072

**Supported**   E4438C with Option 403

This softkey sets the length of the additive white Gaussian noise (AWGN) waveform to 131072 points.

## 153600 Bps

**Supported**   E4438C with Option 401

This softkey selects 153600 bits per second as the data rate for the selected CDMA traffic channel.

**Remarks**   This softkey is available only for a supplemental traffic channel.

## 262144

**Supported**      E4438C with Option 403

This softkey sets the length of the additive white Gaussian noise (AWGN) waveform to 262144 points.

## 307200 Bps

**Supported**      E4438C with Option 401

This softkey selects 307200 bits per second as the data rate for the selected CDMA traffic channel.

**Remarks**      This softkey is available only for a supplemental traffic channel.

## 524288

**Supported**      E4438C with Option 403

This softkey sets the length of the additive white Gaussian noise (AWGN) waveform to 524288 points.

## 1048576

**Supported**      E4438C with Option 403

This softkey sets the length of the additive white Gaussian noise (AWGN) waveform to 1048576 points.

# A

## A

**Supported**          E4438C with Option 400

This softkey selects the frame structure used for the downlink compressed mode. The **A** softkey maximizes the transmission gap length in a compressed frame.

## A field

**Supported**          E4438C with Option 402

Use this softkey to make the hexadecimal value of the 64-bit A field the active function. The current value appears in the A field near the bottom of the text area of the display. The preset value (when normal preset is selected) reflects the Digital European Cordless Telecommunications (DECT) format, but you can enter a new hexadecimal value.

The A field comprises 48 bits of signalling data and 16 bits of error correction.

**Preset**              0000FFFF0000FFFF

**Range**               0–FFFFFFFFFFFFFFFF

## Abort Cal

**Supported**          E4438C with Option 001/601or 002/602

Use this softkey to abort a calibration in process. If you abort the calibration, the previous calibration data is restored.

## Access

**Supported**          E4438C with Option 402

Use this softkey to select access as the timeslot type for the active timeslot. Access is a short uplink burst for the mobile to access service from a base station.

When you select **Access** for a timeslot, the visual representation of the timeslot pattern updates.

## ACS

**Supported**  E4438C with Option 400

Adjacent channel selectivity (ACS) is a measure of a receiver's ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the center frequency of the assigned channel. ACS is the ratio of the receiver filter attenuation on the assigned channel frequency to the receiver filter attenuation on the adjacent channel(s).

This is a single button setup that configures the instrument to generate an in-channel signal for ACS testing. It automatically sets the transport channel group A to the 12.2 reference measurement channel and sets the RF amplitude in accordance with the specification.

**Remarks**  This softkey is available for downlink DPCH.

## Activate Secure Display

**Supported**  All Models

This softkey blanks the display, except for the message `*** SECURE DISPLAY ACTIVATED ***`, and disables the front panel keys. The **Confirm Secure Display** softkey must be selected in order to activate the secure display mode. Once this function is activated, the power must be cycled to re-enable the display and front panel keys. For more information about security functions, refer to the *User's Guide*.

## Actual BER

**Supported**  E4438C with Option 400

This field displays the actual bit error rate (BER) value being generated. This value may be different from the desired BER value as set in the `BER` field. It is calculated after the **Apply Channel Setup** softkey is pressed and the error bits are inserted into the data of the transport channel. To insert the error bits, the `Err Insert` field must be set to `BER`. This data field is on the second page of the table editor.

**Remarks**  This field is displayed for the uplink DPDCH Transport setup.

## Actual BLER

**Supported**  E4438C with Option 400

This field displays the actual block error rate (BLER) value being generated. This value may be different from the desired BLER value as set in the `BLER` field. It is calculated after the **Apply Channel Setup** softkey is pressed and the error blocks are inserted into the data of the transport channel. To insert the error blocks, the `Err Insert` field must be set to `BLER`.

**Range**  0–5000

## Add Comment To Seq[*n*] Reg[*nn*]

**Supported**        All Models

This softkey enables you to add a comment that is associated with a register in use. The register number is listed in the text area of the display and the comment is shown immediately following the register.

**Remarks**        The comment line is limited to 55 alpha-numeric and special characters.

## Adjust Code Domain Power

**Supported**        E4438C with Option 400/401

Use this softkey to access a menu that enables you to adjust the code domain power (the relative power in each of the channels) to either IS-97 levels, equal energy per symbol, equal powers, or scale to 0 dB.

| | |
|---|---|
| IS-97 Levels | This menu selection sets the channel power to IS-97 levels. This selection is available only for IS-95A. |
| Equal Powers | This menu selection sets all channels to equal power, and the total power to 0 dB. This selection is available only for IS-95A and CDMA2000. |
| Equal Energy per Symbol | This menu selection sets the channel powers so that all channels have equal energy per symbol referenced to 7.5ksps, and increasing by 3 dB for each doubling of the symbol rate. This selection is available only for W-CDMA. |
| Scale to 0dB | This menu selection scales all of the current channel powers so that the total power equals 0 dB while maintaining the power ratios between the individual channels. This selection is available for all CDMA formats. |
| **Remarks** | After making adjustments, you can view a graphical representation of the code domain power by pressing **Display Code Domain Power**. |

## Adjust Gain

**Supported**        E4438C with Option 300

This softkey enables you to make the adjustment necessary to start the synchronization with the PDCH channel for the EDGE format. This key must be used when switching the synchronization source from the broadcast channel (BCH), GMSK modulation, to a packet data channel (PDCH), EDGE modulation.

**Remarks**        This key is only enabled when **EDGE BERT Off On** is set to On.

## Adjust Phase

**Supported**        All Models

This softkey enables you to change the phase of the RF output signal. The change is relative to whatever phase the signal generator locked to the last time a frequency change was performed. For this reason, the phase adjustment does not survive changes in frequency and must be readjusted. If you first press **Phase Ref Set**, the current output phase is set as a zero reference and any subsequent phase adjustment is displayed as relative to the zero reference.

**Preset**           0.000 radians

**Range**            ±3.142 radians or ±180.0 degrees

**Remarks**          Phase adjustment cannot be used with frequency or phase modulation. Adjustments to phase can be made in 0.1 degree increments.

## AICH

**Supported**        E4438C with Option 400

This softkey, acquisition indicator channel (AICH), is one of the selections available for the Uplink Physical Type: PRACH Timing menu. The softkey appears when the Message Part field in this menu is selected and the **Edit Item** softkey pressed. This selection causes the message part of the PRACH signal to be generated when an AICH trigger is received and after the specified number of preambles have played. When selected, AICH will be displayed in the Uplink Input Signal Setup menu. The AICH trigger works only when AICH is selected for the message part generation parameter.

**Remarks**          The AICH trigger is accepted during the preamble to message (Tp-m) or preamble to preamble (Tp-p) time period, whichever is shorter. The AICH trigger is ignored at other time periods.

## AICH Trigger Polarity Neg Pos

**Supported**        E4438C with Option 400

This softkey selects the acquisition indicator channel (AICH) trigger polarity to be either positive or negative. The AICH trigger indicates that the base station (BTS) has received the preamble and is ready for the message part of the physical random access channel (PRACH) signal.

Neg                  The signal generator responds to a high to low trigger transition

Pos                  The signal generator responds to a low to high trigger transition.

**Remarks**          The AICH trigger is accepted during the preamble to message (Tp-m) or preamble to preamble (Tp-p time period, whichever is the shorter. The AICH trigger is ignored at other time periods.

## ALC BW

**Supported**        All Models

This softkey accesses a menu from which you can select a bandwidth for the automatic leveling control (ALC) loop. In Auto mode, the signal generator automatically selects a bandwidth optimized for the current settings. Manually selecting a bandwidth overrides the Auto setting.

For waveforms with varying amplitudes and/or a high crest factor, it is recommended that the ALC loop bandwidth be set to 100 Hz, which is the default bandwidth set when an ARB format is turned on. Limiting the loop bandwidth of the ALC circuit will prevent the ALC from sampling the fast rising edges of high-crest pulsed waveforms that are present in formats such as 802.11a and CDMA.

**Preset**        Auto

## ALC Hold

**Supported**        E4438C with Option 001/601or 002/602

Use this softkey to access a menu from which you select one of four markers to enable the automatic leveling control (ALC) hold function for the output signal, or select None to disable the hold feature. The hold selection remains until you reconfigure it, preset the signal generator, or cycle the ESG power. When enabled (ALC On), the ALC levels the RF output signal while the marker is high and holds the ALC (does not respond to RF output signal amplitude changes) while the marker signal is low. For more detailed information on the ALC hold function, see the *User's Guide*.

A high marker signal enables the ALC hold when the marker polarity is positive; a low marker signal disables the ALC Hold. The ALC Hold marker function holds the I/Q modulator at the amplitude of the sample point(s) where the marker signal occurs. Primarily used for bursted signals to maintain power accuracy.

---

**CAUTION**        Incorrect ALC sampling (response) can create a sudden unleveled condition that may create a spike in the RF output potentially damaging a DUT or connected instrument. Ensure that you set markers to let the ALC sample over an amplitude that accounts for the high power levels within the signal.

---

**NOTE**        Do not use the ALC hold for more than 100 ms, because it can affect the waveform's output amplitude.

---

The ALC hold setting is part of the file header information, so saving the setting to the file header saves the current marker routing for the waveform file. For more information on file headers, see the *User's Guide*.

| NOTE | A waveform file that has unspecified settings in the file header uses the previously played or configured waveform's routing settings. |
|---|---|
| Remarks | If the Pulse Routing function has been selected, it will automatically incorporate ALC Hold. The current ALC Hold mode is shown in parenthesis below the softkey. For more information on file headers |

## ALC Off On

**Supported**     All Models

This softkey toggles the operating state of the automatic leveling control (ALC) circuit. The RF output power of the signal generator is constantly monitored and controlled by the ALC circuit. Its purpose is to maintain output power at a desired level by eliminating power drift due to temperature and time.

There are some modulation conditions which the ALC circuit cannot handle properly which lead to output level errors. In these conditions, better power level accuracy can be obtained by turning the ALC off and using power search. ALC Off is useful with pulse modulation if the pulse width is narrower than 2 μs and with certain external I/Q modulation formats. Refer to "Power Search" on page 355 for more information on the power search function.

Pulse modulation is accomplished using a modulator that precedes the ALC detector. The ALC must therefore measure a pulsed signal, and it can do this if the pulse width exceeds 2 μs. For narrower pulses, set the **ALC Off On** softkey to Off. Refer to the *User's Guide* for more information on using the ALC.

With external I/Q modulation, the ALC loop acts to hold the signal generator's average output power constant, even though variations in the I/Q input power $(I^2 + Q^2)$ occur. Rapid variations of $(I^2 + Q^2)$ propagate to the output, while slow variations are removed by the ALC loop, with a high-pass corner of 1 kHz. If you do not want this high-pass filtering, set the **ALC Off On** softkey to Off. With ALC off, the I/Q modulation will be DC-coupled. Using power search, power level accuracy is preserved if $\sqrt{I^2 + Q^2} = 0.5$ V$_{rms}$.

When ALC is off, the ALC OFF display annunciator will turn on. An alternative to setting the ALC off is to set the ALC to a narrow bandwidth

| Off | The output power level is not controlled. |
|---|---|
| On | The output power level is constantly monitored and controlled. |
| **Preset** | On |

## All Models

### In the Standard Menu

**Supported**　　　　All Models

This softkey enables you to specify that all signal generator file types in the user file system are to be listed.

### In the CDMA Menu

**Supported**　　　　E4438C with Option 401

Use this softkey to turn on all channels in the current reverse link configuration.

## All Models (Except FQPCH)

**Supported**　　　　E4438C with Option 401

Use this softkey to turn on all channels in the current forward link configuration, except for the forward link quick paging channel (FQPCH).

## All Models Down

**Supported**　　　　E4438C with Option 400

This softkey sets the transmit power control (TPC) pattern to send consecutive down commands on a slot-by-slot basis.

**Remarks**　　　　This softkey is available for downlink DPCH and the uplink DPCCH.

## All Models Timeslots

**Supported**　　　　E4438C with Option 402

Use this softkey to output a 1-bit pulse at the EVENT 1 rear panel connector that is synchronized to the first bit of each timeslot. If you have entered a value for Sync Out Offset, the synchronizing pulse is offset by the number of bits specified.

**Remarks**　　　　The **Data Format Pattern Framed** softkey must be set to Framed to enable this softkey. This softkey is grayed out (not accessible) in Custom.

## All Models Up

**Supported**　　　　E4438C with Option 400

This softkey sets the transmit power control (TPC) pattern to send consecutive up commands on a slot-by-slot basis.

**Remarks**　　　　This softkey is available for downlink DPCH and the uplink DPCCH.

## Alt Ampl Delta

**Supported**    All Models except with Options UNB or 506

Press this softkey to set the delta value for the alternate amplitude function.

**Preset**    0.00 dB

**Range**    0.00-161.00 dB

## Alt Ampl Off On

**Supported**    All Models except with Options UNB or 506

This softkey toggles the operating state of the alternate amplitude function.

Off    Main RF output power amplitude is used when this mode is turned off.

On    RF output power is switched from main to alternate amplitude in this mode.

**Preset**    Off

## Alt Ampl Trigger

**Supported**    All Models except with Options UNB or 506

Use this softkey to access a menu of choices for the alternate amplitude trigger source. These choices include Int (internal from the baseband generator), Ext (external source provided at the rear panel TRIG IN connector), and Manual (hardkey-driven) triggering.

Internal triggering is used during framed-data generation. Each timeslot is allowed to output power with a user-selected main or alternate amplitude. For instruments without baseband generators, the Int softkey will be nonfunctional.

For instruments containing baseband generators, internal triggering is automatically selected during framed data transmission with at least one activated timeslot with alternate amplitude.

**Preset**    Manual

## Alternate Amplitude

### In the Standard Menu

**Supported**    All Models except with Options UNB or 506

Use this softkey to reveal a menu for configuring the alternate amplitude function. The menu includes softkeys for configuring the alternate amplitude state, delta, triggering, and subsequently, manual triggering between the main and alternate amplitudes.

| | |
|---|---|
| **Range** | −156 to 156 |
| **Remarks** | The actual RF output amplitude is equal to the Alternate Amplitude Delta value plus the RF output amplitude; this sum cannot exceed the minimum and maximum amplitude limits of the signal generator. For example, if the Alternate Amplitude Delta is set to −156 dB and the RF output amplitude is set to 20 dB, the sum is equal to −136 dB. |

### In Marker Routings Menu

| | |
|---|---|
| **Supported** | E4438C with Option 001/601or 002/602 except with Option UNB or 506 |

This softkey enables you to select a marker that enables and disables the Alternate Amplitude function. A low marker signal enables Alternate Amplitude; a high marker signal disables Alternate Amplitude. The Alternate Amplitude parameters located in the **Amplitude** hardkey menu still need to be configured. Primarily used for TDMA formats requiring more than one timeslot power level.

## AM

| | |
|---|---|
| **Supported** | All Models |

Use this hardkey to access a menu of choices that enables you to configure the amplitude modulation type, path, depth and depth coupling, rate, source, mode, and waveform.

## AM_ADDR

| | |
|---|---|
| **Supported** | E4438C with Option 406 |

This softkey enables you to assign a 3-bit slave address for Bluetooth. The active member address is used to distinguish between the active members participating on the piconet.

| | |
|---|---|
| **Preset** | 1 |
| **Range** | 0–7 |

## AM Depth

| | |
|---|---|
| **Supported** | All Models |

This softkey enables you to set the amplitude modulation depth, as a percent, for the selected modulation path. The AM depth for both AM Path 1 and 2 can be user-defined. If AM Path WB is available, the depth is set at 100% and is not user-defined.

| | |
|---|---|
| **Preset** | 0.1% |
| **Range** | 0.0–100.0% (minimum increment allowed is 0.1%) |
| **Remarks** | The new value of AM depth applies only to the AM path selected. |

### AM Depth Couple Off On

**Supported**      All Models

This softkey toggles the operating state for AM depth coupling. AM depth coupling links the depth values of AM Path 1 and AM Path 2.

On                  AM depth is coupled and applied to both AM Path 1 and AM Path 2.

Off               AM depth coupling is disabled.

**Preset**         Off

**Remarks**      When the values are coupled, any change you make to one AM depth value is applied to both.

### AM Off On

**Supported**      All Models

This softkey turns amplitude modulation either off or on for the AM path selected.

Two paths for amplitude modulation can be simultaneously enabled provided that different sources (for example, Internal, Ext1, or Ext2) are used. When amplitude modulation is on, the front panel AM annunciator is displayed.

On                  AM is turned on with this key. If two or more paths are enabled then the modulation signals from the paths are summed internally for composite modulation.

Off               AM for a path(s) is turned off with this key.

**Preset**         Off

**Remarks**      Although you can enable amplitude modulation with this key, the RF carrier is modulated only when you set **Mod On/Off** to on and is available at the RF Output connector only after **RF On/Off** is set to on.

### AM Path 1 2 WB

**Supported**      All Models

This softkey enables you to select an amplitude modulation path. AM Path 1, 2, and WB define standard amplitude modulation configurations which can be used together.

AM Path 1, AM Path 2, and AM Path WB can be summed internally for composite modulation. Either path can be switched to any of the modulation sources: Internal, Ext1, Ext2, for example. All Models modulation types can be simultaneously enabled, except FM with ΦM. The AM, FM, and ΦM can sum inputs from any two sources. Any source can be routed to one modulation type.

| AM Path 1 | This selection enables you to configure the modulation characteristics for AM Path 1, using the remaining softkeys in the AM menu. |
| --- | --- |
| AM Path 2 | This selection enables you to configure the modulation characteristics for AM Path 2, using the remaining softkeys in the AM menu. |
| AM WB | This selection enables you to configure the modulation characteristics for AM WB, using the remaining softkeys in the AM menu. |
| **Preset** | AM Path 1 |
| **Remarks** | The RF carrier is available at the RF OUTPUT connector when you set **RF On/Off** to on. Set **Mod On/Off** to enable the modulation that you have selected. |

## AM Rate

**Supported**        All Models

This softkey enables you to change the frequency of the internal modulation source.

| **Preset** | 400.0 Hz |
| --- | --- |
| **Range** | 0.1 Hz–20.0 kHz (minimum increment allowed is 0.5 Hz)<br>0.1 Hz–100.0 kHz if a sine wave is selected as the internal waveform |
| **Remarks** | The new value for the AM rate applies only to the AM path selected. |

## AM Source

**Supported**        All Models

Use this softkey to access a menu of available sources for modulation inputs. Internal modulation is always ac-coupled.

| **Preset** | Internal |
| --- | --- |
| **Remarks** | A 1.0 volt peak voltage input is required for calibrated AM depth settings. The EXT 1 LO/HI and EXT 2 LO/HI display annunciators will turn on if the peak input voltage differs from 1.0 by more than 3%. (The LO/HI annunciators function only for ac-coupled external inputs.) |

## AM Start Rate

**Supported**        All Models

This softkey enables you to change the start frequency of the swept-sine modulation.

| **Preset** | 400.0 Hz |
| --- | --- |
| **Range** | 0.1 Hz–100.0 kHz (minimum increment allowed is 1.0 Hz) |

| Remarks | This softkey is coupled to the **AM Rate** softkey in the AM menu and the **AM Tone 1 Rate** softkey in the AM Dual-Sine menu. Any value set for the AM start rate is reflected in the **AM Rate** and **AM Tone 1 Rate** softkeys. |
|---|---|

## AM Stop Rate

| Supported | All Models |
|---|---|

This softkey enables you to change the stop frequency of the swept-sine modulation.

| Preset | 400.0 Hz |
|---|---|
| Range | 0.1 Hz−100.0 kHz (minimum increment allowed is 0.1 Hz) |
| Remarks | This softkey is coupled to the **AM Tone 2 Rate** softkey in the AM Dual-Sine menu. Any value set for the AM stop rate is coupled to the **AM Tone 2 Rate** softkey. |

## AM Sweep Time

| Supported | All Models |
|---|---|

This softkey enables you to set the sweep time for the swept-sine modulation.

| Preset | 100 ms |
|---|---|
| Range | 1 ms−65.535 s |

## AM Sweep Trigger

| Supported | All Models |
|---|---|

Use this softkey to access a menu of choices enabling you to select a triggering mode for the swept-sine modulation.

| Preset | Free Run |
|---|---|

## AM Tone 1 Rate

| Supported | All Models |
|---|---|

This softkey enables you to set the frequency for AM tone 1 of the dual-sine modulation.

| Preset | 400.0 Hz |
|---|---|
| Range | 0.5 Hz−1.0 MHz (minimum increment allowed is 0.5 Hz) |
| Remarks | This softkey is coupled to the **AM Rate** softkey in the AM menu and the **AM Start Rate** softkey in the AM Dual-Sine menu. Any value set for the AM tone 1 rate is reflected in the **AM Rate** and **AM Start Rate** softkeys. |

## AM Tone 2 Ampl Percent of Peak

**Supported**        All Models

This softkey enables you to adjust the tone 2 amplitude of the dual-sine modulation, as a percentage of the total amplitude. For example, if the tone 2 amplitude is set to 30% of the total amplitude, then the tone 1 amplitude is 70% of the total amplitude.

**Preset**        50.0%

**Range**        0.1%–99.9%

**Remarks**        This key is available for the dual-sine mode only.

## AM Tone 2 Rate

**Supported**        All Models

This softkey enables you to set the internal modulation frequency for tone 2 of the dual-sine modulation.

**Preset**        400.0 Hz

**Range**        0.5 Hz–1.0 MHz (minimum increment allowed is 0.5 Hz)

**Remarks**        This key is available for the dual-sine mode only.

## AM Waveform

**Supported**        All Models

Use this softkey to access a menu of choices enabling you to select an amplitude modulation waveform that can be produced by the internal modulation source. This softkey is available after selecting internal as the AM Source or after pre-setting the signal generator.

**Preset**        Sine

**Remarks**        The waveform selection applies only to the AM path selected and the AM Waveform softkey is available for the internal source only.

## Ampl

**Supported**        All Models

This softkey enables you to set the signal generator to sweep amplitude data only. The frequency is set at a constant value determined by the **Frequency** hardkey.

**Remarks**        You can define a sweep containing both amplitude and frequency information and still choose to sweep only amplitude.

## Ampl Offset

| | |
|---|---|
| **Supported** | All Models |

This softkey enables you to change the value for amplitude offset. An amplitude offset changes the value shown in the amplitude area of the display but does not affect the output power. For example, if the current output power is 0.0 dBm and you enter an amplitude offset of −3.0 dBm, the output power will remain at 0.0 dBm but the display will show an amplitude of −3.0 dBm. This feature lets you simulate the power level at a test point beyond the RF OUTPUT connector.

An amplitude offset can be entered at any time during normal operation and also when you are operating in amplitude reference mode.

| | |
|---|---|
| **Preset** | 0.00 dB |
| **Range** | −200 dB to 200 dB |
| **Remarks** | Changes to this value affect the displayed amplitude value only, the actual RF output power amplitude is not changed. |

## Ampl Ref Off On

| | |
|---|---|
| **Supported** | All Models |

This softkey toggles the operating state of the amplitude reference mode.

| | |
|---|---|
| Off | When this mode is turned off, the amplitude value displayed is equal to the current hardware output power plus the amplitude offset, if any. |
| On | When this mode is turned on, the amplitude value displayed is equal to the current hardware output power minus the reference value set by the **Ampl Ref Set** softkey. All Models subsequent amplitude parameters are then relative to the reference value. |

Amplitude offsets can be used with amplitude reference mode. In this situation, the display will show the amplitude calculated as the current hardware output power minus the reference value plus the amplitude offset.

| | |
|---|---|
| **Preset** | Off |
| **Remarks** | Amplitude reference mode changes the display only, it does not change the RF output power. |

## Ampl Ref Set

**Supported**     All Models

This softkey enables you to set the current output power as an amplitude reference value. It also causes the **Ampl Ref Off On** key to toggle to the On position, turning on amplitude reference mode. All Models subsequent output power settings are then relative to the reference value.

**Preset**     0.00 dB

**Range**     −136 to 20 dBm

**Remarks**     This key sets the reference value equal to the current output power. If you have not yet set the reference value, the normal preset value for amplitude reference is 0.0 dBm.

## Ampl Start

**Supported**     All Models

This softkey enables you to set the amplitude of the first point in the sweep.

**Preset**     Στανδαρδ ινστρυμεντσ: −20.00 dBm
Ινστρυμεντσ ωιτη Οπτιον YNB: −135.00 dBm

**Range**     You can set the value anywhere in the range of the signal generator's specified output power.

## Ampl Stop

**Supported**     All Models

This softkey enables you to set the amplitude of the last point in the sweep.

**Preset**     Στανδαρδ ινστρυμεντσ: −20.00 dBm
Ινστρυμεντσ ωιτη Οπτιον YNB: −135.00 dBm

**Range**     You can set the value anywhere in the range of the signal generator's specified output power.

## Amplitude

### For the Front-Panel Hardkey

**Supported**        All Models

This hardkey enables you to change the RF output power. In addition, the key accesses a menu of choices that enables you to configure the automatic leveling control (ALC), power search, user flatness, and amplitude options. The current RF output power level is always shown in the amplitude area of the display except under the following conditions:

- amplitude reference mode is turned on
- an offset is applied
- a step or list amplitude sweep is in process

The amplitude area of the display is blanked whenever an amplitude sweep is selected.

**Preset**           Standard instruments: –20.00 dBm

                     Instruments with Option UNB: –136.00 dBm

**Range**            The output power range depends on your signal generator options. For more information, refer to the data sheet.

### For the Baseband BERT Modulation Menu

**Supported**        E4438C with Option UN7

This softkey enables you to change the RF output power. The current RF output power level is always shown in the amplitude area of the display except under the following conditions:

- amplitude reference mode is turned on
- an offset is applied
- a step or list amplitude sweep is in process

**Preset**           Standard instruments: –20.00 dBm

                     Instruments with Option UNB: –136.00 dBm

**Range**            The output power range depends on your signal generator options. For more information, refer to the data sheet.

## AMR 12.2 (25.944)

**Supported**        E4438C with Option 400

This softkey configures the downlink dedicated physical channel (DPCH) to the adaptive multiple rate (AMR) 12.2 kbps reference as described in the 3GPP Technical Specification (TS) 25.944.

**Remarks**        This selection affects the symbol rate and channel slot format on the current DPCH channel. It also sets up the DCH channels in accordance with the specification as follows:

DPCH1 sets up TrCh group A
DPCH2 sets up TrCh group B

With this softkey selection, the value for the `Data Type` field in the highlighted row changes to `AMR 12`.

## AMR 12.2 kbps

**Supported**        E4438C with Option 400

This softkey configures the uplink dedicated physical data channel (DPDCH) to the adaptive multiple rate (AMR) 12.2 kbps reference measurement as described in the 3GPP Technical Specification (TS) 25.944.

**Remarks**        This selection affects the symbol rate and channel slot format.

## APCO 25 C4FM

Supported        E4438C with Option 001/601or 002/602

Use this softkey to select an APCO 25-specified C4FM filter in the Select filter menu. This is a Nyquist filter with an alpha of 0.200 which is combined with a shaping filter.

## APCO 25 w/C4FM

**Supported**        E4438C with Option 001/601or 002/602

Use this softkey to set up a predefined APCO 25-compliant personality with compatible 4-level frequency modulation (C4FM) as the modulation type to modulate a continuous stream of the selected data pattern. The maximum deviation is 1.8 kHz. C4FM uses frequency shift keying (FSK) modulation, which transmits data at the rate of 2 bits per symbol (4.8 ksps).

## APCO 25 w/CQPSK

**Supported**    E4438C with Option 001/601or 002/602

Use this softkey to set up a predefined APCO 25-compliant personality with compatible quadrature phase shift keying (CQPSK) as the modulation type to modulate a continuous stream of the selected data pattern. CQPSK uses π/4 differential quadrature phase shift keying (π/4 DQPSK) modulation, which transmits data at the rate of 2 bits per symbol (4.8 ksps).

## Apply Bit Errors

**Supported**    E4438C with Option 001/601or 002/602

This softkey has two uses and appears in multiple locations.

### In the Create File/Edit File Menu

In this menu, use the **Apply Bit Errors** softkey to access a menu that enables you to enter a specific number of bit errors or a percentage of bit errors for the current file.

### In the Apply Bit Errors Menu

In this menu, use the **Apply Bit Errors** softkey to apply the currently selected bit-error percentage or number of bit errors to the current file.

## Apply Channel Setup

**Supported**    E4438C with Option 401

Use this softkey to apply the changes made in the Edit Channel Setup Table Editor.

**Remarks**    If the modulation format is turned on, then the new channel data is used to generate a new modulation waveform in memory.

## Apply Multicarrier

**Supported**    E4438C with Option 001/601or 002/602

Use this softkey to apply the current settings in the IS-95A, CDMA2000, W-CDMA or Custom ARB multicarrier table editor.

## Apply Multitone

**Supported**         E4438C with Option 001/601or 002/602

Use this softkey to apply, to the active signal, any changes you have made in the frequency offset, power, phase, or state parameters. Signal parameters are also applied when Multitone is turned on.

## Apply To Waveform

**Supported**         E4438C with Option 001/601or 002/602

Use this softkey to apply the current clipping, scaling, and marker settings you have selected to the waveform. The waveform automatically regenerates every time you change a setting and press the **Apply to Waveform** softkey.

Repeated presses of the softkey is cumulative. For example, if scaling is 75 percent, a second press of the softkey will make scaling 75 percent of the original 75 percent.

**Remarks**         Press **Return** if you do not want to apply the new settings at this time.

## Arb AWGN Off On

**Supported**         E4438C with Option 403

This softkey sets the operating state of the additive white Gaussian noise (AWGN) function for the arbitrary waveform generator.

Off         When you choose Off, AWGN is disabled.

On         When you choose On, AWGN is enabled.

**Preset**         Off

## ARB Catalog Types

**Supported**         E4438C with Option 001/601or 002/602

This softkey selects a menu of ARB type files that can be listed in the user file system.

## Arb CDMA2000

**Supported**         E4438C with Option 401

Use this softkey to access a menu from which you can operate the CDMA2000 waveform generator.

### Arb IS-95A

**Supported**      E4438C with Option 401

Use this softkey to access a menu from which you can operate the CDMA IS-95A waveform generator.

### ARB Off On

**Supported**      E4438C with Option 001/601or 002/602

This softkey selects the operating state of the dual arbitrary waveform generator.

| | |
|---|---|
| Off | If you select Off, the dual arbitrary waveform generator is turned off. |
| On | If you select On, the dual arbitrary waveform generator is turned on and the currently selected waveform is played. This waveform resides in volatile memory. |
| **Preset** | Off |

### ARB Reference Ext Int

**Supported**      E4438C with Option 400 or 401

This softkey selects the reference for the waveform clock.

| | |
|---|---|
| Ext | If you select Ext, you must enter the reference frequency (as described under the **Reference Freq** softkey) and the signal must be applied to the BASEBAND GEN REF IN rear panel connector. |
| Int | If you select Int, the internal clock is used for the arbitrary waveform (ARB) frequency reference. |
| **Preset** | Int |

### ARB Sample Clock

**Supported**      E4438C with Option 001/601or 002/602

This softkey enables you to adjust the sample clock rate. After entering the desired clock rate, terminate the entry with **GHz**, **MHz**, **kHz**, or **Hz**.

**Preset**      100 MHz

**Range**      1.0 Hz–100.0 MHz

### ARB Setup

**Supported**          E4438C with Option 001/601or 002/602

This softkey displays the Arb setup menu. From this menu you can access the ARB reference setup menu, and the header and waveform settings.

### Arb Waveform Generator

Supported          E4438C with Option 001/601or 002/602

Use this softkey to access a menu from which you can operate the custom digital modulation waveform generator.

### Arb Waveform Generator AWGN

**Supported**          E4438C with Option 403

This softkey accesses a menu that enables you to set the parameters of the additive white Gaussian noise (AWGN) modulation which uses the internal arbitrary waveform generator.

### Arb W-CDMA

**Supported**          E4438C with Option 400

Use this softkey to access a menu from which you can operate the wideband CDMA waveform generator.

### Arm Sensitivity Search

**Supported**          E4438C with Option 300

Use this softkey to arm the sensitivity search function. Once sensitivity search is armed, the sensitivity search operation will run upon receiving the selected trigger. (If **Trigger Key** is selected, press the **Trigger** hardkey to start the search.)

**Remarks**          During search, no other softkey operation is available.

### Atten/ALC Control

**Supported**          All Models

Use this softkey to access a menu from which you can set the output attenuation and configure the ALC level.

## Atten Hold Off On

| **Supported** | All Models |
|---|---|

This softkey toggles the operating state of the output attenuator hold function.

| Off | In this state, the automatic level control (ALC) controls the attenuator level setting and switches the attenuator as needed to maintain RF power levels. |
|---|---|
| On | In this state, the attenuator level setting is static: it remains at its current setting. You can use this function at any time to insure that no power discontinuity occurs during power adjustments. |
| **Preset** | Off |
| **Remarks** | There will be no attenuator switching during power adjustments when the attenuator hold is enabled (On). The maximum power adjustment range will vary. However, you will have a minimum range of +4 dB to −13 dB. |
| | During an amplitude sweep, signal generators with Option UNB protect the step attenuator by automatically switching to attenuator hold (On) mode. The attenuator is locked at its current setting and the amplitude sweep range is limited to 40 dB. |

## Auto

### In the I/Q Output Filter Manual Auto

| **Supported** | E4438C |
|---|---|

Use this softkey to enable the ESG to automatically choose a filter based on the active digital modulation settings.

### In the `PwrOff` menu (Edit Menu)

| **Supported** | E4438C with Option 400 |
|---|---|

This softkey, when selected, automatically adjusts the power of the compressed frame to compensate for the code gain loss.

When AUTO is selected, the signal generator calculates the power offset values following the power calculation method described in 3GPP Standard TS25.101 and TS25.214. The calculated value is expressed in decibels (dB).

### In the ALC BW

| **Supported** | All Models |
|---|---|

Use this softkey to allow the signal generator to automatically select the automatic leveling control (ALC) bandwidth. In auto mode, the signal generator selects one of three ALC bandwidths depending

on the current modulation type. The following table shows the auto ALC bandwidth selections for different modulation types.

| Modulation Type | Auto ALC Bandwidth Selection |
|---|---|
| Digital Modulation | 100 Hz |
| Pulse Modulation | 1 kHz |
| AM Modulation | 10 kHz[1] or 1 kHz |
| FM/ΦM Modulation | 10 kHz |

1. 10 kHz ALC bandwidth used with CW frequencies above 500 kHz

**Preset**          Auto

## Aux Fctn

**Supported**          All Models

This hardkey accesses a menu of auxiliary functions. If no auxiliary functions are installed, the softkey will display **Option(s) Not Installed**.

## Auxiliary Software Options

**Supported**          E4438C with Option 001/601or 002/602

This softkey, returns a list of licenses for software applications associated with the signal generator that have the software license file installed on the PC, as opposed to a license key installed on the signal generator. However this softkey does not return demo licenses for Arb-based applications.

**Remarks**          If you use the signal generator with a PC that has a copy of a software application for which a license shows with this softkey, the software automatically accesses and installs the license on the PC.

To view option numbers and license keys on the ESG for use with PC software applications that require license keys, see "Software Options" on page 430.

## Aux I/O

**Supported**          E4438C with Option UN7

This softkey enables you to trigger an event on pin 22 of the AUX I/O connector.

## Aux I/O Out

**Supported**        E4438C with Option UN7

Use this softkey to access a menu of choices for the bit error rate output configuration using the AUX I/O rear panel connector.

## Aux I/O Trigger Polarity Neg Pos

**Supported**        E4438C with Option UN7

Use this softkey to select the auxiliary I/O triggering mode.

Neg                    This choice initiates triggering on the falling edge of the trigger signal.

Pos                    This choice initiates triggering on the rising edge of the trigger signal.

**Remarks**          This softkey is enabled when the AUX I/O triggering mode is selected.

## AWGN

### For an AWGN Waveform

**Supported**        E4438C with Option 403

This softkey accesses a menu of softkeys for configuring and generating an additive white Gaussian noise waveform.

### For Bluetooth Impairments

**Supported**        E4438C with Option 406

This softkey accesses a menu for configuring additive white gaussian noise as an impairment in a Bluetooth waveform.

**Remarks**          The parameters set in the AWGN setup menu will not be implemented until both **AWGN Off On** and **Impairments Off On** are in the On state.

### In the W-CDMA Menu

**Supported**        E4438C with Options 400, 403

This softkey selects the additive white gaussian noise (AWGN) signal for the physical random access channel (PRACH) transmission, the uplink (AWGN) is selected by pressing the **PRACH AWGN Setup** softkey, or the downlink physical channel number eight (AWGN).

## AWGN Off On

This softkey appears in two different locations.

### For an AWGN Waveform

**Supported**        E4438C with Option 403

This softkey sets the operating state of the additive white Gaussian noise (AWGN) waveform generator.

Off                  When you choose Off, the AWGN waveform generator is disabled.

On                   When you choose On, the AWGN waveform generator is enabled.

**Preset**           Off

### For Bluetooth Impairments

**Supported**        E4438C with Option 406

This softkey sets the operating state of the additive white Gaussian noise (AWGN) as a Bluetooth impairment.

Off                  When you choose Off, the AWGN impairment is disabled.

On                   When you choose On, the AWGN is added as a Bluetooth impairment.

**Preset**           Off

**Remarks**          The parameters set in the AWGN setup menu will not be implemented until both **AWGN Off On** and **Impairments Off On** are in the On state.

## AWGN State Off On

**Supported**        E4438C with Options 400, 403

This softkey enables or disables the additive white gaussian noise (AWGN) for the PRACH channel.

Off                  The AWGN is not used.

On                   The AWGN is on and used for PRACH transmission.

# B

## B

**Supported**        E4438C with Option 400

This softkey selects the frame structure used for the downlink compressed mode. The **B** softkey optimizes power control during a compressed frame.

## Baseband Setup

**Supported**        E4428C with Option 601or 602 and Option 004

This softkey, for the N5102A module, accesses a menu that enables you to adjust the scaling of the IQ data, and select filtering when the data type is Pre-FIR Samples.

This menu is only available in the input mode with Real-Time Custom turned on. For more information on scaling and filtering, refer to the *User's Guide*.

## B field

**Supported**        E4438C with Option 402

This softkey accesses a menu of softkeys from which you can choose either internal data generation (PN9, PN11, PN15, PN20, PN23, fixed 4-bit repeating sequences, set patterns of ones and zeroes), your own data (download a binary file or input data using the DATA INPUT connector), or Digital European Cordless Telecommunications (DECT) data for configuring the timeslot data bit fields (B field).

**Preset**        PN9

## Backup System Files

**Supported**        All Models

Use this softkey to copy all system configuration and calibration files from the signal generator's CPU flash memory to motherboard flash memory.

| NOTE | This function should be performed by trained personnel or under direction from the Agilent Service Center. Refer to the *User's Guide* for information on contacting the Agilent Service Center. |
|------|---|

## Bandwidth

**Supported**        E4438C with Option 403

This softkey enables you to adjust the bandwidth of the additive white Gaussian noise (AWGN) waveform.

**Preset**        1.000000 MHz

**Range**        50.000kHz–15.000 MHz

## Baseband BERT

**Supported**        E4438C with Option 300

This softkey accesses a menu of softkeys that enable you to set or specify all of the parameters required to configure a bit error rate test (BERT) for baseband bit error rate measurements.

## Baseband Signal Polarity Setup

**Supported**        E4438C with Option 001/601or 002/602

This softkey accesses a menu of softkeys that enable you to select the polarity for the TTL signal at the DATA, DATA CLOCK, SYMBOL SYNC, and GURST GATE IN input connectors. Positive (Pos) refers to normal TTL logic (+5 volts) while negative (Neg) refers to inverted logic (0 volts).

## Base Delay Tp–a

**Supported**        E4438C with Option 400

This softkey accesses a menu for setting the uplink physical random access channel (PRACH) frame timing. The Tp-a is the difference between the uplink PRACH's frame timing relative to the AICH and the downlink's AICH framing timing. This timing difference is part of the propagation delay. See 3GPP Standard TS25.211 and TS25.214 specifications for more information.

**Preset**        7680 chip

**Remarks**        The actual timing offset is defined as:
(Timeslot Offset + Timing Offset $\times$ 2560) – (Tp–a) [chips]

## BaseStation Setup

**Supported**        E4438C with Option 401

Use this softkey to activate the table editor for selecting and modifying the base station transceiver parameters. Highlight the field you want to change and press the
**Edit Item** softkey.

**Remarks**        This softkey is available for the forward link only.

## BBG 1

**Supported**      E4438C with Option 001/601or 002/602

This softkey appears in the Source 1 and I/Q Out menus.

### In the Source 1 and Source 2 menus

Use this softkey to route the internal baseband generator I and Q signals to the internal I/Q modulator.

**Remarks**      The **Source 1** or **Source 2** selection is independent of the **I/Q Out** selection.

### In the I/Q Out menu

Use this softkey to route the internal baseband generator I and Q signals to the rear panel I and Q output connectors.

**Remarks**      The **I/Q Out** selection is independent of the **Source 1** or **Source 2** selection.

## BBG Chip Clock Ext Int

**Supported**      E4438C with Option 400

This softkey selects an external clock reference or an internal clock reference for the baseband generator (BBG) chip clock source.

Ext      The signal generator's BBG uses an externally provided clock reference. For the downlink configuration, a chip clock must be supplied through the DATA CLOCK input connector. For the uplink configuration, a chip clock must be supplied through the BASEBAND GEN REF IN rear panel connector.

Int      The signal generator uses an internally generated clock reference for the BBG.

## BBG Chip Clock Setup

**Supported**      E4438C with Option 400

This softkey displays a menu from which you can select the baseband generator (BBG) chip clock source, or a multiplier for the external clock.

## BBG Data Clock

**Supported**          E4438C with Option 401

This field displays the active source for the baseband generator data clock. To change the field selection, highlight the BBG Data Clock field, press the **Edit Item** softkey and make a choice from the menu that appears.

| | |
|---|---|
| Ext | This choice sets the instrument to use an external data clock as its data clock input. A data clock must be supplied through the DATA CLOCK input connector when external mode is selected. |
| Int | This choice sets the instrument to use the internal data clock as its data clock input. |
| **Preset** | Internal |
| **Remarks** | If external is selected, the BBG Reference field selection will automatically be set to internal. |

## BBG Data Clock Ext Int

**Supported**          E4438C with Option 001/601or 002/602

Use this softkey to select the internal data clock for the baseband generator or to select an externally supplied data clock. For more information on input and output signals, see the *User's Guide*.

| | |
|---|---|
| Ext | In external mode, the baseband generator will use an external data clock as its data clock input, unless the external BBG reference is selected. A data clock or symbol sync input must be supplied through the DATA CLOCK or SYMBOL SYNC input connector when external mode is selected. |
| Int | In internal mode, the baseband generator will use the internal data clock as its data clock input. |
| **Preset** | Int |
| **Range** | In the EDGE modulation format, this softkey greys out when a GMSK timeslot is part of the signal. |

## BBG Reference

**Supported**     E4438C with Option 401

This field selects the reference clock source for the cdma2000 reverse link setup. To change the field selection, highlight the `BBG Reference` field, press the **Edit Item** softkey and make a choice from the menu that appears.

Ext         This choice sets the instrument to use an external reference signal. The expected external reference frequency must be entered using the `EXT BBG Ref Freq` field and the signal must be applied to the BASEBAND GEN REF IN rear panel connector.

Int          This choice sets the instrument to use the internal reference.

**Preset**     Int

**Remarks**     If external is selected, the `BBG Data Clock` field selection will automatically be set to internal.

## BBG Ref Ext Int

**Supported**     E4438C with Option 001/601or 002/602

Use this softkey to select the internal baseband generator reference or to select an externally supplied reference.

Ext         In external mode, an external signal will be used as the reference frequency for the baseband I/Q signal. A signal must be supplied through the rear panel BASEBAND GEN REF IN connector, and the frequency of the signal must be entered using the **Ext BBG Ref Freq** softkey.

Int          In internal mode, an internally generated 10 MHz signal will be used as the reference source, unless the **BBG Data Clock Ext Int** softkey is set to Ext. In this case, the external data clock signal is used as the reference.

**Preset**     Int

## BCH Data

**Supported**     E4438C with Option 400

This field displays the data type used for the broadcast transport channel (BCH). The data type can be PN9, PN15, FIX4 or a user file. The BCH is transmitted on the primary common control physical channel (P-CCPCH).

**Preset**     0000

**Remarks**     Each slot of P-CCPCH data contains 18 bits of BCH information at a rate of 15 kbps. The BCH information spans two frames.

## BD_ADDR

**Supported**        E4438C with Option 406

This softkey enables you to allocate a unique 48-bit Bluetooth device address (BD_ADDR) for the device under test. This address is derived from the IEEE802 standard.

**Preset**              000000 00 0008

**Range**               000000000000–FFFFFFFFFFFF

## Begin Frame

**Supported**        E4438C with Option 402

Use this softkey to output a 1-bit pulse to the EVENT 1 rear panel connector that is synchronized to the first bit of the first frame. If you have entered a value for Sync Out Offset, the synchronizing pulse is offset by the number of bits specified. The number of trigger pulses generated depends on the framed data pattern selected.

**Remarks**        When using any of the TDMA digital modulation formats, the
**Data Format Pattern Framed** softkey must be set to Framed for the
Begin Frame softkey to appear.

## Begin Pattern

**Supported**        E4438C with Option 001/601or 002/602

Use this softkey to output a 1-bit pulse to the EVENT 1 rear panel connector that is synchronized to the first bit of an unframed data pattern. The synchronizing pulse occurs with each repetition of the pattern.

If you enter a value for Sync Out Offset, the synchronizing pulse is offset by the number of bits specified.

**Remarks**        When using any of the TDMA digital modulation formats, the
**Data Format Pattern Framed** softkey must be set to Pattern for the **Begin Pattern**
softkey to appear.

## Begin Timeslot

**Supported**      E4438C with Option 001/601or 002/602

Use this softkey to specify which timeslot triggers the rear-panel external trigger EVENT 1 output (a 1-bit signal synchronized to the first bit of the selected timeslot).

If you enter a value for Sync Out Offset, the synchronizing pulse is offset by the number of bits specified.

**Range**      *EDGE, GSM:* 0-7
*NADC:* 1-6 Half-Rate, 1-3 Full-Rate
*PDC:* 0-5 Half-Rate, 0-2 Full-Rate
*PHS:* 1-4 Downlink, 1-4 Uplink
*DECT:* 0-12 RFP, 1-11 PP
*TETRA:* 1-4

**Remarks**      The **Data Format Pattern Framed** softkey must be set to Pattern to enable this softkey.

This softkey is grayed out (not accessible) in Custom.

## BER

**Supported**      E4438C with Option 400

This field displays the bit error rate (BER) to be inserted into the selected transport channel data. The errors are applied to transport channel data when the
**Apply Channel Setup** softkey is pressed. The actual numbers of the Error Bits, the Total Bits, and the Actual BER are displayed below this field and after the errors are applied to the transport channel data. This data field is on the second page of the table editor.

**Preset**      0.0000

**Range**:      0.0000–1.0000

## BER/BLER% Configure

**Supported**      E4438C with Option 300

This softkey accesses a menu that enables you to select the configuration for block or bit error measurements.

## BER% TCH/FS Configure

**Supported**        E4438C with Option 300

Use this softkey to access a menu that enables you to set the full-rate-speech traffic channel (TCH/FS) bit error rate configuration functions such as the frame count, pass/fail limits, and the stop-on-event thresholds.

## BER% Uncoded Configure

**Supported**        E4438C with Option 300

Use this softkey to access a menu that enables you to set uncoded bit error rate configuration functions such as the bit count, pass/fail limits, and the stop-on-event thresholds.

## BER Display % Exp

**Supported**        E4438C with Option UN7

Use this softkey to select the display mode for bit error rate measurement results.

%                    With this choice the BER measurement results are displayed in percent values.

Exp                  With this choice the BER measurement results are displayed in exponential units.

## BER Mode Off On

**Supported**        E4438C with Option 300

Use this softkey to set the operating state of the bit error rate (BER) mode.

Off                  This choice disables the BER mode and only BLER is measured.

On                   This choice enables a new BER mode and both BER and BLER are measured.

**Preset**           On

## BERT

**Supported**        E4438C with Option UN7

This softkey accesses a menu of softkeys that enable you to select the type of bit error rate test (BERT).

### BERT Off On

**Supported**          E4438C with Option UN7

This softkey toggles the operating state of the bit error rate (BER) measurement function.

Off               This choice disables the bit error rate measurement function.

On               This choice enables the bit error rate measurement function.

**Preset**          Off

### BERT Resync Off On

**Supported**          E4438C with Option UN7

Use this softkey to set the operating state of the resynchronizing function.

Off               This choice disables the resynchronizing function.

On               With this choice, a new BER measurement will immediately be restarted whenever the previous BER measurement result exceeds the value specified for the resynchronizing limits.

**Preset**          On

### BERT Trigger

**Supported**          E4438C with Option UN7

This softkey accesses a menu of choices for triggering BER measurements.

**Preset**          Trigger Key

### BERT Trigger Source

**Supported**          E4438C with Option 300

This softkey accesses a menu of choices for selecting the BERT trigger source. You can choose triggering that occurs immediately (**Immediate**), triggering by the **Trigger** hardkey (**Trigger Key**), triggering that is supplied remotely via GPIB, RS-232, or LAN (**Bus**), or triggering on an external signal supplied to the TRIGGER IN connector (**Ext**).

**Preset**          Trigger Key

## Beta

**Supported**        E4438C with Option 001/601or 002/602

This softkey is activated automatically when you select the Kaiser windowing function. The default Beta factor provides a good solution for optimizing out-of-band performance (ACP), without seriously compromising passband performance (EVM).

Changing the Beta factor adjusts the trade-off between ACP and EVM:

• Decreasing the value improves EVM.

• Increasing the value improves ACP.

**Preset**        4.000

**Range**        1.000–10.000

## Beta

**Supported**        E4438C with Option 400

This field displays the signal value for the amplitude ratio. The value of the Power field is re-calculated when a Beta value is set in this field. If the value of the Power field is directly set, the value of this field becomes invalid and a "–" is displayed.

**Preset**:        *DPCCH*: 11
                   *DPDCH*: 15

**Range**        0–15

**Remarks**        Access this field by pressing the **DPCH Power Setup** softkey.

## Binary

**Supported**        All Models

This softkey enables you to specify that only signal generator binary files be listed in the catalog of files. These binary files are typically associated with baseband I/Q signals.

While the **Binary** softkey is available on all models, you can only create binary files with a baseboard generator option installed on your E4438C (that is Option 001/601or 002/602).

## Bit

**Supported**        All Models

This softkey enables you to specify that only signal generator bit files be listed in the catalog of files.

While the **Bit** softkey is available on all models, you can only create bit files with a baseboard generator option installed on your E4438C (that is Option 001/601or 002/602).

## Bit Count

**Supported**        E4438C with Option 300

This softkey enables you to specify the total number of bits to be measured for the uncoded EDGE channel.

**Preset**        139200

**Range**        1392–600000000

## Bit Delay Off On

**Supported**        E4438C with Option UN7

Use this softkey to set the operating state of the trigger delay for BER measurements.

Off        This choice disables the trigger delay for BER measurements.

On        This choice enables the trigger delay for BER measurements.

**Preset**:        Off

## Bit Errors
## (numeric value)

**Supported**        E4438C with Option 001/601or 002/602

This softkey enables you to specify the number of bit errors applied to the current file when you press the **Apply Bit Errors** terminator softkey. The percent **Bit Errors** softkey also updates to reflect the percentage of bit errors you have chosen.

## Bit Errors
## (percent value)

**Supported**        E4438C with Option 001/601or 002/602

This softkey enables you to specify the percentage of bit errors applied to the current file when you press the **Apply Bit Errors** terminator softkey. The numeric value **Bit Errors** softkey also updates to reflect the number of bit errors you have chosen.

## Bit Order MSB LSB

**Supported**       E4438C with Option 003 or 004

This softkey, selects the bit ordering of the data transmitted through the N5102A module.

MSB                This selection transmits the most significant bit (MSB) on data line zero for both I and Q for a parallel or parallel interleaved port configuration, and transmits the MSB as the first bit in a sample for a serial port configuration.

LSB                This selection transmits the least significant bit (LSB) on data line zero for both I and Q for a parallel or parallel interleaved port configuration, and transmits the LSB as the first bit in a sample for a serial port configuration.

For information on selecting the port configuration, see "Port Config" on page 351.

**Preset**        LSB

## Bit Rate

### In the W-CDMA Menu

**Supported**      E4438C with Option 400

The bit rate value is automatically updated from calculated transport channel parameters and the reference measurement setup test rate selection.

**Preset:**        *Downlink*: 2 kbps

                   *Uplink*: 12.2 kbps

**Range**          None

**Remarks**        This field is not user-defined. The value cannot be changed and the field is grayed-out.

### In the CDMA Menu

**Supported**      E4438C with Option 401

This field displays the current bit rate for the selected CDMA2000 channel. To change the bit rate, highlight the Bit Rate field, press the **Edit Item** softkey and enter a new value. If the field is grayed out, you cannot change the value.

**Preset**         Depends on channel type, radio configuration, and frame length.

**Range**          Depends on channel type, radio configuration, and frame length.

## Bits/Frame

**Supported**      E4438C with Option 400

The field displays the bits per frame for the fully coded transport channel and is automatically updated from calculated transport channel parameters and the selected slot format for the channel.

**Preset**:           *Uplink*: 490

                      *Downlink*: 60

**Range**          Varies depending on the channel setup.

**Remarks**        This field is not user-defined. The value cannot be changed and the field is grayed-out.

# Black Pixels Screen Test

**Supported**      All Models

This softkey enables you to set all the pixels on the display to black. Pressing the **Local** hardkey returns the display to normal operation.

**Remarks**        This key is provided for factory use in testing the display.

## BLER

**Supported**      E4438C with Option 400

This field displays the block error rate (BLER) in bits, selected for the transport channel data. The value entered into this field is valid only when the `Err Insert` field is set to `BLER`. The errors are applied to the transport channel data when the **Apply Channel Setup** softkey is pressed. The numbers of the `Error Blocks`, the `Total Blocks`, and the `Actual BLER` data fields are displayed below this field and after the errors are applied to the transport channel data.

**Preset**          0.000

**Range**          0.000–1.000

**Remarks**        This field appears in uplink only.

# BLER% CS1 Configure

**Supported**      E4438C with Option 300

This softkey accesses a menu that enables you to set the CS1 block error rate configuration functions such as block count, pass or fail limits, threshold number of events to stop, and the state of the BER mode.

### BLER% CS4 Configure

**Supported**        E4438C with Option 300

This softkey accesses a menu from which you can set CS4 block error rate configuration functions such as block count, pass or fail limits, threshold number of events to stop, and the state of the BER mode.

### BLER% E-TCH/F43.2 Configure

**Supported**        E4438C with Option 300

This softkey accesses a menu from which you can select E-TCH/F43.2 block error rate configuration functions such as block count, pass or fail limits, threshold number of events to stop, and the state of the BER mode.

### BLER% MCS1 Configure

**Supported**        E4438C with Option 300

This softkey accesses a menu from which you can select MCS1 block error rate configuration functions such as block count, pass or fail limits, threshold number of events to stop, and the state of the BER mode.

### BLER% MCS5 Configure

**Supported**        E4438C with Option 300

This softkey accesses a menu from which you can select MCS5 block error rate configuration functions such as block count, pass or fail limits, threshold number of events to stop, and the state of the BER mode.

### BLER% MCS9 Configure

**Supported**        E4438C with Option 300

This softkey accesses a menu from which you can select MCS9 block error rate configuration functions such as block count, pass or fail limits, threshold number of events to stop, and the state of the BER mode.

## Blk Set Size

**Supported**        E4438C with Option 400

This field sets the block set size for the selected downlink dedicated physical channel (DPCH). The transport channel position (**Transp Position Flexible Fixed** softkey) affects the behavior of this field as described in the following table.

| Transport Channel Mode | Signal Generator Behavior |
|---|---|
| Flexible | The field grays out, which means that you cannot enter a value. The block set size value changes only when there is a value change in the number of blocks (# of Blocks field) or the block size (Blk Size field) according to the following formula: <br><br> Blk Set Size ≥ Blk Size × # of Blocks |
| Fixed | Changing the block set size value automatically changes the block size (Blk Size field), so that the block set size approximates or is the product of the block size and number of blocks (# of Blocks field) values: <br><br> Blk Set Size ≥ Blk Size × # of Blocks <br><br> The change in the block set size value generates a settings conflict error, which the signal generator corrects when it recalculates the block size value. The settings conflict message clears after you use the arrow hardkeys to scroll to the Blk Size field |

**Preset**:        20

**Range**:        0–200000

**Remarks**        To enable the Blk Set Size field, use the **Transp Position Flexible Fixed** softkey to select Fixed.

## `Blk Size`

**Supported**        E4438C with Option 400

This field sets the coding block size for the selected downlink or uplink transport channel.

For *downlink*, the transport channel position (**Transp Position Flexible Fixed** softkey) affects the behavior of this field as described in the following table.

| Downlink Transport Channel Mode | Signal Generator Behavior |
|---|---|
| Flexible | Changing the block size causes the signal generator to recalculate the block set size (`Blk Set Size` field). The block size, number of blocks (`# of Blocks` field) and the block set size values are interdependent as shown in the following formula: <br><br> `Blk Size = Blk Set Size ÷ # of Blocks` |
| Fixed | There are two signal generator behaviors in this mode: <br><br> • change the block size to zero, and it remains zero regardless of the block set size and number of blocks values <br><br> • change the block size to a value other than zero, and the signal generator recalculates the block size as a quotient of the block set size and the number of blocks (`Blk Set Size ÷ # of Blocks`), ignoring the entered value |

**Preset**:        *Downlink*: 20 for all transport channels.
*Uplink DPDCH*: 244 for transport channel #1, 100 for transport channel #2, 20 for transport channels #3, #4, #5, and #6.
*Uplink PRACH*: 168

**Range**:        0–5000

## Block Count

**Supported**        E4438C with Option 300

This softkey enables you to specify the number of data blocks to be measured at each measurement on the MCS5 or MCS9 channels.

**Preset**        600

**Range**        *MCS5*: 1–1500000

                    MCS9: 2–1500000

**Remarks**        For MCS-9, only even values are valid. If odd numbers are entered, the value increments by one to make it an even value.

## Block Erasure

**Supported**   E4438C with Option 300

This softkey enables you to set the block erasure threshold. If the number of erased blocks exceeds this value, the measurement will end.

Range: 0 to 1,000,000 frames

**Preset**    60

**Range**    0–1500000

## Blocking

**Supported**   E4438C with Option 400

The blocking characteristic is a measure of the receiver's ability to receive a signal at its assigned channel frequency in the presence of an unwanted interferer. For more information refer to 3G TS 25.101

This is a single button setup that configures the signal generator to measure blocking characteristics.

## Bluetooth

This softkey appears in two different locations, enabling you to either access the Bluetooth menu, or select a predefined Bluetooth setup for Custom.

### In the Wireless Networking Menu

**Supported**   E4438C with Option 406

This softkey accesses a menu of softkeys for generating data patterns using the Bluetooth waveform generator.

### Selecting a Bluetooth Setup for Custom

**Supported**   E4438C with Option 001/601or 002/602

Press this softkey to set up a predefined Bluetooth digital modulation format to modulate a continuous stream of the selected data pattern with the default maximum deviation set to 157.5 kHz. Bluetooth uses 2-level frequency shift keying (FSK) modulation that transmits data at the rate of 1 bit per symbol (1 Msps).

## Bluetooth Off On

**Supported**         E4438C with Option 406

This softkey sets the operating state of Bluetooth waveform generator.

Off                          When you choose Off, the Bluetooth waveform generator is disabled.

On                           When you choose On, the Bluetooth waveform generator is enabled.

**Preset**              Off

## BPSK

**Supported**         E4438C with Option 001/601or 002/602

This softkey appears in two different locations, enabling you to either select a modulation, or load an I/Q map into the I/Q table editor.

### Selecting a BPSK Modulation

Use this softkey to select binary phase shift keying (BPSK) to modulate a continuous stream of the selected data pattern. BPSK modulation transmits data at the rate of 1 bit per symbol.

The modulation selection appears under the **Select** and **PSK** softkeys in the Modulation Type menus.

### Loading a BPSK I/Q Map into the Table Editor

Use this softkey to load a binary phase shift keying (BPSK) I/Q map into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *User's Guide*.

## Brightness

**Supported**         All Models

Use this softkey to adjust the display brightness (intensity). The value shown in the active entry area is a relative value for brightness. Increasing the number increases the brightness; decreasing the number decreases the brightness.

**Range**               1–50

**Remarks**           The brightness intensity is not affected by a preset or power cycle.

## BS Setup

**Supported**         E4438C with Option 400

This softkey accesses a table editor from which you can select and modify the parameters for the base station (BS). Highlight the data field you want to change and press the **Edit Item** softkey. Press a

softkey, use the numeric keypad or front panel knob to change values contained in the table and press the appropriate softkey to terminate the entry.

## BTS BERT EDGE Loopback

**Supported**        E4438C with Option 300

This softkey accesses a menu of softkeys that enable you to select or specify all of the parameters required to configure the EDGE base transceiver station bit error rate test (BTS BERT).

## BTS BERT GSM Loopback

**Supported**        E4438C with Option 300

This softkey accesses the menu of softkeys that enable you to select or specify all of the parameters required to configure the GSM base transceiver station bit error rate tests (BTS BERT).

## Build New Waveform Sequence

**Supported**        E4438C with Option 001/601or 002/602

This softkey accesses a menu that enables you to create a new waveform sequence file.

## Burst Envelope Int Ext Off

**Supported**        E4438C

Use this softkey to select the operating state of the burst envelope modulator and the source for burst modulation.

Off                 When you toggle this softkey to Off, RF bursting is disabled.

Ext                 When you toggle this softkey to Ext, the bursted output signal will have the same shape as the analog input signal that is supplied to the EXT 1 input connector.

Int                 When you toggle this softkey to Int, the internal baseband generator bursts the RF carrier. The Internal bursting toggle selection is available only when Option 001/601or 002/602 is installed and a digital modulation format is turned on.

When the burst envelope modulator is set to external or internal, the ENVLP annunciator will be displayed.

**Preset**           Off

## Burst Gate In Polarity Neg Pos

**Supported**   E4438C with Option 001/601or 002/602

Use this softkey to select the polarity for the TTL signal at the BURST GATE IN connector.

Neg     Selecting Neg configures the TTL logic high at 0 volts.

Pos     Selecting Pos configures the TTL logic high as +5 volts.

## Burst Off On

**Supported**   E4438C with Option 406

This softkey sets the operating state of the burst function. Refer to Figure 0-1.

Off     When burst is off, transmitted packets are linked in a series with no power ramping. This causes the **Burst Power Ramp** softkey to be grayed out.

On     When burst is on, the signal power will ramp up prior to transmitting the packet and then ramp down at the end of the packet transmission.
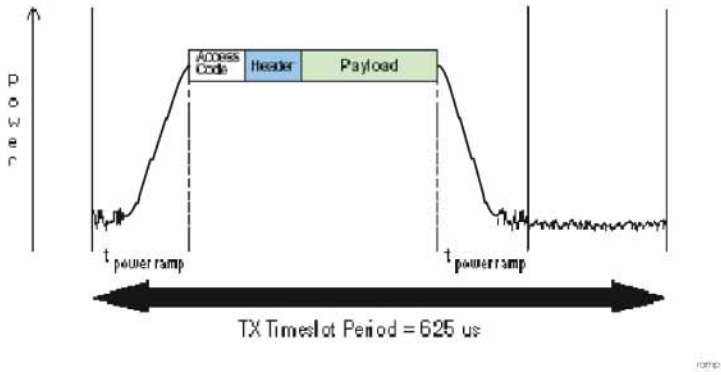
**Figure 0-1**
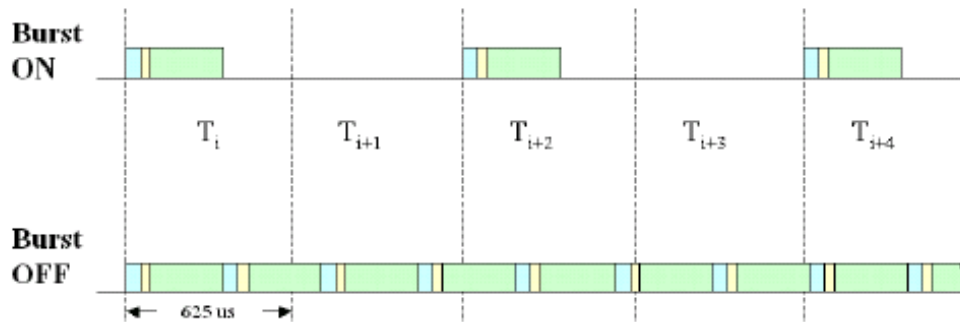


**Preset**    On

## Burst Power Ramp

**Supported**   E4438C with Option 406

This key enables you to set the duration of the power ramp. The signal power ramps up prior to transmitting the packet and then ramps down at the end of the packet transmission.

**Figure 0-2**



| Preset | 6.0 symbols |
| Range | 1–10 symbols |

## Burst Shape

**Supported**     E4438C with Option 001/601or 002/602

Use this softkey to access a menu from which you can modify the rise and fall time and delay of the burst shape. In addition, you can select the shape and type of the burst or restore the default burst shape values.

## Burst Shape Type

**Supported**     E4438C with Option 001/601or 002/602

Use this softkey to access a menu from which you can select the burst shape type. You can choose Sine or a user-defined burst shape that is stored in the signal generator's catalog of burst shapes.

**Preset**     Sine

## Bus

**Supported**     All Models

This softkey sets the trigger source to bus. When the trigger source is set to bus, the signal generator will trigger an event when it receives the appropriate command from the GPIB, RS-232, or LAN.

### In the Sweep Trigger Menu

In the Sweep Trigger menu, choosing **Bus** enables you to trigger a full sweep by sending a *TRG

command (GPIB, RS-232, or LAN) or by asserting the GPIB group execute trigger (GET) line.

### In the Point Trigger Menu

In the Point Trigger menu, choosing **Bus** enables you to trigger a point-by-point sweep by sending a *TRG command (GPIB, RS-232, or LAN) or by asserting the GPIB group execute trigger (GET) line.

### In the Trigger Source Menu

In this menu, choosing **Bus** enables you to trigger the internal digital modulation pattern generator by sending a *TRG command (GPIB, RS-232, or LAN) or by asserting the GPIB group execute trigger (GET) line.

In secondary frame mode, selecting **Bus** allows the next frame type to be toggled by the commands *TRG or GET. This frame type is used once the current frame type has been completely transmitted.

**Remarks**         Pattern Trigger functions are not available if you use either a PN data sequence or an external data source.

### In the AM, FM, and FM Sweep Trigger Menus

In the AM, FM, and ΦM sweep trigger menus, choosing **Bus** enables you to trigger a swept-sine amplitude, frequency, or phase modulation by sending a *TRG command (GPIB, RS-232, or LAN) or by asserting the GPIB group execute trigger (GET) line.

### In the BERT Menu

**Supported**         E4438C with Option UN7

This softkey enables a measurement to run when the appropriate GPIB command is received, provided synchronization has already been achieved. If not already synchronized, the trigger is ignored.

# C

## C4FM

**Supported**      E4438C with Option 001/601or 002/602

This softkey appears in two different locations, to either select a modulation or load a default pattern into the FSK table editor.

### Selecting a C4FM FSK Modulation

Use this softkey to select C4FM to modulate a continuous stream of the selected data pattern. C4FM is an APCO 25-compliant, 4-level frequency shift keying (FSK) modulation that transmits data at the rate of 2 bits per symbol.

The modulation selection is displayed under the **Select** softkey in the Modulation Type menu.

### Loading a C4FM FSK Pattern into the FSK Table Editor

Use this softkey to load a C4FM frequency shift keying (FSK) modulation pattern into the FSK table editor. C4FM FSK modulation transmits data at the rate of 2 bits per symbol. For more information on using the FSK table editor, see the *User's Guide*.

## Calibration Type DC User Full

**Supported**      E4438C

This softkey selects an I/Q calibration type.

| | |
|---|---|
| DC | In this mode the signal generator will calibrate I/Q offset errors for a single frequency at the current signal generator settings. The DC calibration is volatile and must be repeated with each signal generator setting change. A DC calibration can be done while the RF On/Off is set to off; the calibration will still be valid when the RF is enabled. This calibration will take less than two seconds. |
| User | In this mode the signal generator will calibrate I/Q offset, gain, and quadrature error for all signal generator settings over a user defined set of frequencies. This calibration is valid only for the frequencies defined by the user. |
| Full | In this mode the signal generator will calibrate I/Q offset, gain, and quadrature error for all settings over the full frequency range of the signal generator. |
| **Remarks** | The User and Full I/Q calibration settings are not affected by an instrument preset or power cycle. |

## Capture current HW configuration

**Supported**　　　All Models

This softkey saves the signal generator's current hardware configuration to the hardware configuration file. This file lists circuit boards and other hardware installed in the signal generator.

---

**NOTE**　　　This function should be performed by trained personnel or under direction from the Agilent Service Center. Refer to the *User's Guide* for information on contacting the Agilent Service Center.

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## Carrier

**Supported**　　　E4438C with Option 401

This field is used to display and access the IS-95A CDMA carrier type for each single-carrier setup within the selected multicarrier setup.

## Carrier Phases Fixed Random

**Supported**　　　E4438C with Option 001/601or 002/602

This softkey selects the carrier phase operating mode.

Fixed　　　　　This selection sets the phase of all carriers to 0.

Random　　　　This selection sets random phase values for all carriers.

## Carrier Setup

**Supported**　　　E4438C with Option 001/601or 002/602

This softkey accesses a menu from which you can select a setup for initalization of the multicarrier table.

## Carrier Bandwidth

**Supported**　　　E4438C with Option 403

Use this softkey to set the bandwidth over which noise power is integrated for the purposes of calculating the carrier to noise ratio. The carrier bandwidth is limited to the ARB sample clock rate or 80 MHz.

**Preset**　　　1.0 Hz

**Range**　　　1 Hz – 80 MHz

## Carrier to Noise Ratio

**Supported**          E4438C with Option 403

This softkey allows you to select the noise power to be applied to a waveform. Noise can be applied in real time while the waveform is being played by the dual ARB player. The noise power is set as a ratio of carrier power to noise power (C/N). Carrier power is defined as the total modulated signal power before noise is added. When noise is added, the power output from the signal generator will not change; the output power level is the sum of carrier power and the added noise power. Noise bandwidth can be specified using the **Carrier Bandwidth** softkey.

**Preset**          0.00 dB

**Range**          –100.00 through 100.00 dB

## Catalog Type

This softkey appears in two different locations.

### Selecting Catalog Type from the Memory Catalog.

**Supported**          All Models

Use this softkey to access a menu of choices enabling you to select the catalog type for displaying files. When you have made your selection, the display is updated and your choice appears below the **Catalog Type** softkey.

**Remarks**          Catalog type selection is not affected by a preset or by a power cycle.

### Selecting Catalog Type from the Dual ARB waveform generator menu.

**Supported**          E4438C with Option 001/601or 002/602

Use this softkey to select a file type to be displayed in the header Table Editor window. Only file types that contain headers are selectable under this menu. The file types include: NVWFM, Seq, and WFM1).

## CC

**Supported**          E4438C with Option 402

Use this softkey to select the 8-bit color code (CC) as the active function. These 8-bit color codes are codes assigned to each burst in individual clusters to distinguish the signals from the interfering station. The preset hexadecimal value (when normal preset is selected) for CC reflects the Personal Digital Cellular (PDC) format; the current value for CC is displayed in the CC field near the bottom line of the text area of the display.

**Preset**:           00

**Range**          00–FF

## CDMA

This softkey appears in two different locations, enabling you to either select a CDMA personality, or set the current catalog type to CDMA.

### Selecting the CDMA Mode

**Supported**          E4438C with Option 401

Use this softkey to select a menu of CDMA personalities.

### Setting the Catalog Type to CDMA

**Supported**          E4438C with Option 401

Use this softkey to set the current catalog type to CDMA and display the catalog of CDMA files.

**Remarks**         Catalog type selection is not affected by a preset or by a power cycle.

## CDMA2000 Define

**Supported**          E4438C with Option 401

Use this softkey to access a menu for defining CDMA2000 signal parameters, such as channel setup, filter adjustments, multicarrier spacing, I/Q mapping, and clipping.

**Remarks**         When the **Multicarrier Off On** softkey is set to On, the **CDMA2000 Define** softkey is replaced with the **Multicarrier Define** softkey.

## CDMA2000 Off On

**Supported**          E4438C with Option 401

This softkey toggles the operating state of the CDMA2000 waveform playback personality.

Off              Turning this softkey off disables the CDMA2000 waveform playback personality.

On                      Turning this softkey on sets up the internal hardware to generate the currently selected CDMA2000 signal.

When CDMA2000 is On, the CDMA2K and I/Q annunciators appear on the display.

**Preset**              Off

**Remarks**             At least one channel must be on before switching on CDMA2000.

The CDMA2000 signal modulates the RF carrier only after you have set the front panel **Mod On/Off** hardkey to On.

## CDMA2000 Select

**Supported**           E4438C with Option 401

The function of this softkey changes, depending on whether the multicarrier mode is off (default) or on.

### With Multicarrier Off

Use this softkey to access the CDMA2000 Select menu for the current link, where you can select a predefined channel setup or a stored custom state.

**Preset**              9 Channel

**Remarks**             The **Multicarrier Off On** softkey and related functions are accessed only when the **Link Forward Reverse** softkey is set to Forward.

### With Multicarrier On

Use this softkey to access the multicarrier CDMA2000 Select menu, where you can select a predefined multicarrier setup or a stored custom multicarrier setup.

**Preset**              2 SR3 Carriers

**Remarks**             The **Multicarrier Off On** softkey and related functions are accessed only when the **Link Forward Reverse** softkey is set to Forward.

## CDMA Define

**Supported**           E4438C with Option 401

Use this softkey to access a menu for defining IS-95A CDMA signal parameters such as channel setup, filter adjustments, chip rate, waveform length, oversample ratio, I/Q mapping, and clipping.

## CDMA Freq

**Supported**      E4438C with Option 401

This field is used to direct the mobile station to a CDMA channel having a primary paging channel. To change the CDMA channel, use the down arrow key to move the cursor to the second page of data fields and highlight the CDMA Freq field. Press the **Edit Item** softkey and enter a new value.

| | |
|---|---|
| **Preset** | 50 |
| **Range** | 0–2047 |
| **Remarks** | This field is grayed out (not editable) until the F-SYNCH Type field is set to JSTD8 or IS2000. |

## CDMA Off On

**Supported**      E4438C with Option 401

This softkey toggles the operating state of the IS-95A CDMA waveform generator.

| | |
|---|---|
| Off | Turning CDMA off disables the IS-95A CDMA waveform generator. |
| On | Turning CDMA on sets up the internal hardware to generate the currently selected IS-95A CDMA signal. |

When CDMA is on, the CDMA and I/Q annunciators appear on the display.

| | |
|---|---|
| **Preset** | Off |
| **Remarks** | The CDMA signal modulates the RF carrier only after you have set the front panel **Mod On/Off** hardkey to On. |

## CDPD

**Supported**      E4438C with Option 001/601or 002/602

Press this softkey to set up a predefined Cellular Digital Packet Data (CDPD) digital modulation format to modulate a continuous stream of the selected data pattern. CDPD uses minimum shift keying (MSK) modulation that transmits data at the rate of 1 bit per symbol (19.2 ksps).

## CDVCC

**Supported**      E4438C with Option 402

Use this softkey to select the hexadecimal 12-bit coded digital verification color code (CDVCC) as the active function. In the 12-bit code, 8 bits are used for the code and 4 bits are used for the code of the cyclic redundancy check (CRC). The same CDVCC code is used for all base and mobile transmission in the same cell.

The current value for CDVCC appears in the CDVCC field near the bottom of the text area of the display.

**Preset**:          000

**Range**          000–FFF

### CFN #0 Frame Pulse (RPS10)

**Supported**          E4438C with Option 400

This softkey, in the DPCH Rear Panel Output Setup menu, selects a connection frame number (CFN) zero frame pulse as the signal for the selected rear panel connector. The CFN #0 aligns with the signal generator's connection frame number (CFN) count.

**Remarks**          The **(RPS10)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

### Chan Code

**Supported**          E4438C with Option 400

This field displays the channel code number for the downlink orthogonal channel noise stimulator (OCNS) and the dedicated physical channel (DPCH).

**Range**          0–255

**Remarks**          The OCNS and DPCH channel codes are coupled with the slot format and symbol rate.

### Channel Band

**Supported**          All Models

Use this softkey to display a menu of softkeys where you can assign channel bands based on the current device settings. The output frequency depends on both the channel band and channel number selections.

**Preset**          P-GSM Base

### Channel Code

**Supported**          E4438C with Option 400

This field displays the value of the channel code. This code is an orthogonal variable spreading factor code (OVSF). The range of code numbers is dependent on and coupled to the slot format and symbol rate.

**Preset**         *Downlink: ChipARB*: 6, *DPCCH*: 0, *DPDCH*: 16, *P-CCPCH*: 1, *PICH*: 3
*Uplink*: *DPCCH: 0*, *DPDCH*: 16

**Range**         *Downlink*: 0 to 511 depending on the physical channel. Refer to
Table 0-1.
*Uplink*: 0 to 255 depending on the physical channel. Refer to Table 0-2.

**Table 0-1**          **Downlink**

| Slot Format | 0-1 | 2-7 | 8-11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|
| Symbol Rate (ksps) | 7.5 | 15 | 30 | 60 | 120 | 240 | 480 | 960 |
| Max Ch Code | 511 | 255 | 127 | 63 | 31 | 15 | 7 | 3 |

**Table 0-2**          **Uplink**

| Slot Format | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Symbol Rate (ksps) | 15 | 30 | 60 | 120 | 240 | 480 | 960 |
| Max Ch Code | 255 | 127 | 63 | 31 | 15 | 7 | 3 |

**Remarks**         The signal generator indicates slot format and channel code conflicts using the
error messages area of the display. If the slot format is not compatible with the
channel code, the "error -221 Settings Conflict" message is displayed. If the
channel code number is incompatible with the slot format, the "value clipped to
upper limit" is displayed.

## Channel Number

This softkey appears in two different locations.

### In the Frequency Menu

**Supported**          All Models

This softkey selects channel numbers (the frame carrier frequency) as the active function based on frequency channels defined in the selected format. The output frequency depends on both the channel band and channel number selections.

**Preset**          1

**Range**          Depends on selected band

### In the CDMA Menu

**Supported**          E4438C with Option 401

Use this softkey to select the channel to be configured. There are eight forward channels and up to five reverse channels available for selection. The channel number advances each time this key is pressed. It can also be changed using the arrow keys or the RPG knob.

**Preset**          1

**Range**          *Forward link:* 1–8
                    *Reverse link:* depends on the selection made in the **Operating Mode** softkey menu

## Channel Setup

**Supported**          E4438C with Option 401

Use this softkey to activate the table editor for viewing and modifying the selected channel parameters.

**Remarks**          Available data fields within the table editor depend on the currently selected channel.

## Channel State Off On

**Supported**          E4438C with Options 400 and 401

This softkey selects the operating state of the selected channel.

Off          When you select Off, the display will show the channel selected with white lettering.

| On | When you select On, the display will show the channel selected with black lettering |
|---|---|
| **Preset** | Off |
| **Remarks** | For Option 400, Real-Time W-CDMA, if you turn off all physical channels, the W-CDMA signal also turns off. To restart the signal, turn on a physical channel and set the **W-CDMA Off On** softkey to On. |

## Channel State

| **Supported** | E4438C with Option 400 |
|---|---|

This field displays the operating state for the uplink dedicated physical control channel (DPCCH).

| **Preset** | On |
|---|---|
| **Remarks** | The **Apply Channel Setup** softkey must be pressed if the channel to turn on is either the uplink DPCCH or the DPDCH |
| | For Real-Time W-CDMA, if you turn off all physical channels, the W-CDMA signal also turns off. To restart the signal, turn on a physical channel and set the **W-CDMA Off On** softkey to On. |

## Channel State Quick Presets

| **Supported** | E4438C with Option 401 |
|---|---|

Use this softkey to access a menu from which you can activate a group of channels within the selected channel configuration with a single key press.

| **Remarks** | This menu is available only for the forward link and the RadioConfig 3/4 Traffic reverse link channel configuration (operating mode). |
|---|---|

## Channels

| **Supported** | E4438C with Option 400 |
|---|---|

Use this softkey to enter the number of duplicate channels that you want to set up and insert into the Edit Channel Setup table editor. Press the softkey **Enter** to terminate the entry.

After you have set the channel parameters, and the number of times you want the channel duplicated, press **Done** to insert the information into the table editor.

| **Preset** | 1 |
|---|---|
| **Range** | 1 – 511 |

## ChCode Clt

**Supported**        E4438C with Option 400

This field displays the channel code of the message control part of the physical random access channel (PRACH) on the multiple PRACH mode. The value of this field is calculated by the formula: 16 * `Pre Sig` + 15.

**Preset**

| UE | ChCode Ctl |
|----|-----------|
| 1 | 15 |
| 2 | 31 |
| 3 | 47 |
| 4 | 63 |
| 5 | 79 |
| 6 | 95 |
| 7 | 111 |
| 8 | 127 |

**Range**        0–255

**Remarks**        This command affects the PRACH setting on the multiple PRACH mode only.

## ChCode Dat

**Supported**        E4438C with Option 400

This field displays the channel code of the message data part of the physical random access channel (PRACH) on the multiple PRACH mode.

The value of this field is calculated by the formula: SF * `signature` / 16. SF=spreading factor (32–256) and depends on the slot format. Possible spreading factor and slot format combinations are (slot format:spreading factor, 0:256, 1:128, 2:64, 3:32).

**Preset**

| UE | ChCode Dat |
|----|-----------|
| 1 | 0 |
| 2 | 16 |
| 3 | 32 |
| 4 | 48 |
| 5 | 64 |
| 6 | 80 |
| 7 | 96 |
| 8 | 112 |

**Range**        0–255

**Remarks**        This command affects the PRACH setting on the multiple PRACH mode only.

## Chip Clock (RPS1)

**Supported**    E4438C with Option 400

This softkey, in the DPCH and PRACH Rear Panel Setup menus, assigns the chip clock to the selected rear panel AUX I/O output connector.

**Remarks**    The chip clock can be assigned to several different output connectors. The **(RPS1)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

## Chip Rate

### In the CDMA Menu

**Supported**    E4438C with Option 401

Use this softkey to adjust the current chip rate. To enter a value, use the front panel knob, up/down arrows, or numeric keypad. After entering the value using the numeric keypad, press **Mcps**, **kcps**, or **cps** to terminate the entry

**Preset**    1.228800 Mcps

**Range**    10 cps to 8 Mcps

### In the W-CDMA Menu

**Supported**    E4438C with Option 400

This softkey enables you to set a new chip rate value. Use the front panel knob, up/down arrows, or numeric keypad to enter in a chip rate.

**Preset**    3.84 Mcps

**Range**    3.456 Mcps to 4.224 Mcps.

## `Chip Rate`

This softkey appears in two different locations.

### In the CDMA Menu

**Supported**    E4438C with Option 401

This field displays the current chip rate. The chip rate is equivalent to the spreading rate of the channel. Spreading rate 1 (SR1) is 1.2288 Mcps. The default value is in accordance with the IS-2000 specification. To change the chip rate, highlight the `Chip Rate` field, press the **Edit Item** softkey and enter a new value.

| Preset | 1.2288 Mcps |
|---|---|
| Range | 1.000 kcps to 1.300 Mcps. |
| Remarks | The chip rate is equivalent to the spreading rate. |

**In the W-CDMA Menu**

| Supported | E4438C with Option 400 |
|---|---|

This field displays the chip rate used in the downlink or uplink setup table editor. The Preset chip rate of 3.84 Mcps is in accordance with the 3GPP W-CDMA specifications.

| Preset | 3.840000 Mcps |
|---|---|
| Range | 1.000 kcps–4.25000000 Mcps |

## Class Ib Bit Error

| Supported | E4438C with Option 300 |
|---|---|

This softkey enables you to set the number of Class Ib bit errors as the threshold for the number of events to stop function. The measurement ends when the detected number of Class Ib errors exceeds the set threshold.

| Preset | 300 |
|---|---|
| Range | 0–1000000 |

## Class Ib RBER

| Supported | E4438C with Option 300 |
|---|---|

This softkey enables you to set the pass/fail Class Ib residual bit error rate (RBER) limit. Class Ib RBER is the ratio of the number of Class Ib bits that contain errors (after de-convolution in the non-erased speech frames) to the total number of Class Ib bits in the non-erased frames. The measurement fails if the Class Ib RBER exceeds the limit.

| Preset | 0.4000% RBER |
|---|---|
| Range | 0–100% |

## Class II Bit Error

| Supported | E4438C with Option 300 |
|---|---|

This softkey enables you to set the number of Class II bit error events as the threshold for the number of events stop function. The measurement ends when the detected number of Class II errors exceeds the set threshold.

| Preset | 300 |
|---|---|

**Range** 0–1000000

## Clear All Models Pos of Selected UE

**Supported** E4438C with Option 400

This softkey, when pressed, will clear the start access slots of the selected UE for the active physical random access channel (PRACH).

## Class II RBER

**Supported** E4438C with Option 300

This softkey enables you to set the pass/fail Class II residual bit error rate (RBER) limit. Class II RBER is the ratio of the number of Class II bits that contain errors (after de-convolution in the non-erased speech frames) to the total number of Class II bits in the non-erased frames. The measurement fails if the Class II RBER exceeds the limit.

**Preset** 2.0000% RBER

**Range** 0–100%

## Clear Error Queue(s)

**Supported** All Models

This softkey enables you to delete all messages that are stored in the error message queues. When the error message queues are empty, the ERR annunciator is turned off.

**Remarks** You cannot undo this action; once the messages are deleted, they cannot be recalled. There are two error message queues: one for front panel operation and one for remote operation.

## Clear Header

**Supported** E4438C with Option 001/601or 002/602

This softkey enables you to clear the information stored in the currently displayed header. When this softkey is pressed the settings in the Saved Header Settings fields are set to Unspecified. The actual settings used when the header field is Unspecified are the settings listed in the Current Inst. Settings column.

To activate this softkey, the modulation format must be enabled and the waveform file being displayed must be the active file.

## Clear Text

**Supported**       All Models

Use this softkey to delete all characters and digits in the active entry area. This key is especially useful when you want to clear the current entry so you can create a new entry.

## Clipping

**Supported**       E4438C with Option 001/601or 002/602

This softkey accesses a menu of clipping options for the waveform modulation level. Once clipping has been applied to a waveform, it can not be undone. Repeated clipping applications are cumulative.

**Remarks**       This softkey in not available for all modulation formats.

## Clip |I| To

**Supported**       E4438C with Option 001/601or 002/602

Use this softkey to make the modulation level of the I component the active function. You can then clip (limit) the level to a percentage of full scale. A level of 100.0% equates to no clipping.

**Preset**       100.0%

**Range**       10.0 through 100.0%, in 0.1% increments

**Remarks**       Clipping type must be set to |I|,|Q| for this softkey to be active.

## Clip |I+jQ| To

**Supported**       E4438C with Option 001/601or 002/602

Use this softkey to make the modulation level of the combined I and Q waveform the active function. You can then clip (limit) the level to a percentage of full scale. A level of 100.0% equates to no clipping.

**Preset**       100.0%

**Range**       10.0 through 100.0%, in 0.1% increments

**Remarks**       Clipping type must be set to |I+jQ| for this key to be active.

## Clip |Q| To

**Supported**       E4438C with Option 001/601or 002/602

Use this softkey to make the modulation level of the Q component the active function. You can then clip (limit) the level to a percentage of full scale. A level of 100.0% equates to no clipping.

| | |
|---|---|
| **Preset** | 100.0% |
| **Range** | 10.0 through 100.0% in 0.1% increments |
| **Remarks** | Clipping type must be set to |I|,|Q| for this softkey to be active. |

## Clip At PRE POST FIR Filter

| | |
|---|---|
| **Supported** | E4438C with Option 400/401 |

This softkey selects whether you want the IS-95A, CDMA2000, or W-CDMA waveform clipped before or after FIR filtering.

| | |
|---|---|
| PRE | When you choose PRE, the waveform is clipped before FIR filtering. |
| POST | When you choose POST, the waveform is clipped after FIR filtering. |
| **Preset** | PRE |
| **Remarks** | This softkey is inactive (grayed out) and automatically sets to POST FIR filter clipping when using forward link CDMA2000 with the spreading type set to multicarrier. |

## Clipping Type |I+jQ| |I|,|Q|

| | |
|---|---|
| **Supported** | E4438C with Option 001/601or 002/602 |

Use this softkey to select either |I+jQ| or |I|,|Q| as the clipping type.

| | |
|---|---|
| |I+jQ| | If you select |I+jQ|, the combined I and Q waveform is clipped (circular clipping). |
| |I|,|Q| | If you select |I|,|Q|, the I and Q components of the waveform are clipped independently (rectangular clipping). In this case, you can clip I and Q to different levels. |
| **Preset** | |I+jQ| |

## Clock Delay Off On

| | |
|---|---|
| **Supported** | E4438C with Option UN7 |

Use this softkey to toggle the state of the clock delay adjustment.

| | |
|---|---|
| Off | When you select Off, the clock delay adjustment function is inactive. |
| On | When you select On, the clock delay adjustment function is active and the **Clock Time Delay** and **Resolution** softkeys are enabled. |
| **Preset**: | Off |

## Clock/Gate Delay

**Supported**        E4438C with Options 400, 403, 406

This softkey enables you to specify the number of symbols to shift the symbol clock and gate output signals relative to the Bluetooth signal. The packet timing is delayed, relative to the clock/gate timing, as it passes through a device under test. Use this softkey to restore the timing relationship by delaying the clock/gate the same amount as the packet.

Output symbol clock signals are emitted from the EVENT 1 rear panel connector while the gate signals are emitted from the EVENT 2 rear panel connector. When Clock/Gate Delay is set to 0, the rising edge of the clock lines up with the middle of each symbol, and the gate is high during the payload bits portion of the packet.

**Preset**        0

**Range**        0–24999.9 symbols

**Remarks**        This option is available only when the payload data is continuous PN9 and is intended to be used during bit error rate (BERT Option UN7) testing.

This softkey also appears under the BERT (Option UN7) menu when the Bluetooth modulation is activated and the payload data is set to continuous PN9.

## Clock Polarity Neg Pos

This softkey appears in two locations.

**Supported**        E4438C with Option UN7

### In the Baseband Bert menu

Use this softkey to select the polarity of the clock signal supplied to the rear panel BER GATE IN connector.

Neg        With this choice, the falling edge of the signal is used for the input.

Pos        With this choice, the rising edge of the signal is used for the input.

**Preset**        Pos

### In the N5102A Off On menu

**Supported**        E4438C with Option 003 or 004

This softkey, for the N5102A module, selects which clock edge (rising or falling) is aligned with the start of a sample for a parallel or parallel interleaved data transmission, and with the start of each bit

for a serial data transmission. The Neg selection functions the same as selecting the 180 degree phase adjustment using the 180 deg softkey.

**Preset**          Pos

## Clock Phase

**Supported**          E4438C with Option 003 or 004

This softkey, for the N5102A module, accesses a menu that enables you to select the phase adjustment (in 90 degree increments) of the clock edge relative to the start of each sample for a parallel or parallel interleaved data transmission, and to each data bit for a serial data transmission.

In addition to making coarse adjustments, a fine-skew adjustment is available. See "Clock Skew" on page 101 for more information.

**Preset**          0 deg

## Clock Rate

**Supported**          E4438C with Option 003 or 004

This softkey, for the N5102A module, enables you to adjust the clock rate (frequency) when the internal clock is used, or to enter the clock rate of an external clock source (connected at the Ext Clock In connector or supplied through the Device Interface connector). The value set with this softkey is also the rate for the output clock signal at the Clock Out connector and the Device Interface connector. See "Clock Source" on page 101 for information on selecting the clock source.

The clock rate range is dependent on the port configuration, logic type, signal type, and clocks per sample. Signal type and clocks per sample apply to parallel and parallel interleaved transmissions.

**Preset**          100.000000000 MHz

## Clock Setup

**Supported**          E4438C with Option 003 or 004

This softkey, for the N5102A module, accesses a menu that enables you to select the clock and external frequency reference parameters that are used to synchronize the transmitted data.

## Clock Skew

**Supported**        E4438C with Option 003 or 004

This softkey, for the N5102A module, provides a fine-adjustment for aligning the clock to the valid portion of the data relative to the coarse adjustment associated with the **Clock Phase** softkey. Because this is a fine adjustment, it provides greater benefit at higher clock rates. When the clock rate is less than 25 MHz, this softkey is grayed out (inactive). Skew is displayed in nanoseconds with a maximum range and a maximum number of discrete steps. Both the range and the number of steps are variable, and depend on the clock rate. The skew range decreases as the clock rate increases, and increases as the clock rate decreases. The maximum skew range is reached at a clock rate of approximately 99 MHz and is maintained down to a clock rate of 25 MHz.

**Preset**        0.000 ns

## Clock Source

**Supported**        E4438C with Option 003 or 004

This softkey, for the N5102A module, accesses a menu where the clock source is selected. The selected clock source also provides the output clock signal at the Clock Out and Device Interface connectors.

---

**CAUTION**        It is important that the signal generator, the interface module, and the DUT are locked to a common frequency reference. Failure to have a common frequency reference may result in a loss of data. For more information on using the N5102A to lock to a common frequency reference, see the *User's Guide*.

---

**Preset**        Internal

## Clocks Per Sample

**Supported**        E4438C with Option 003 or 004

For a digital I/Q signal, this softkey, for the N5102A module, accesses a menu that enables you to select the number of clock cycles per sample and is active for a parallel or parallel interleaved port configuration (see "Port Config" on page 351). For a serial port configuration, an IF signal, or while in input mode, this softkey is grayed out (inactive).

Some devices require multiple clocks per sample. The N5102A module provides multiple clocks per sample choices (1x, 2x, or 4x). When you select a clocks per sample that is greater than one, the sample is held for the selected number of clock cycles. This reduces the sample rate relative to the clock rate by a factor equal to the clocks per sample value.

**Example**
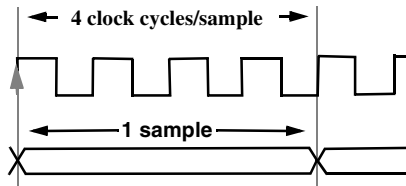


For more information on clock rates, see "Clock Rate" on page 100.

**Preset**         1

## Clock Time Delay

**Supported**        E4438C with Option UN7

This softkey enables you to specify the delay time of the clock. The clock delay time must be a multiple of the minimum resolution value and if not, the clock delay time is automatically rounded to a value that is the multiple value closest to the entered value. Enter the value using the numeric keypad and terminate it by pressing the appropriate unit softkey.

**Preset**         26.7 nsec

**Range**         26.7 nsec–1 sec

**Remarks**         This key is enabled when the clock delay is on.

## CM Method

**Supported**        E4438C with Option 400

This field, in the DPCH, DPCCH and DPDCH Compressed Mode Setup menus, displays the compressed mode (CM) method used. There are two choices for the CM method:

SF/2          This choice selects the compressed mode method that reduces the spread factor (SF) by one half. This method doubles the data rate and halves the SF. When the dedicated physical data channel's (DPDCH) symbol rate is 960 kbps, the frame is not compressed because the lowest SF value is used and cannot be reduced further.

Higher Layer      This choice selects the higher layer scheduling method used to make room for the discontinuous transmission (DTX) slots in the compressed frames. The emulated

higher layer scheduling method mode keeps the same physical layer data rate even when a transmission gap is created. The maximum number of bits for the physical layer, for the compressed frame, is known and a transmission gap can be generated.

| | |
|---|---|
| **Preset** | SF/2 |
| **Remarks** | Refer to 3GPP Standard TS25.212 for more information on compressed mode operation. |

## C/N

| | |
|---|---|
| **Supported** | E4438C with Option 401 |

Use this softkey to set the carrier to noise power ratio for the current CDMA2000 channel setup.

| | |
|---|---|
| **Preset** | 0.00 dB |
| **Range** | –30.0 to 30.0 dB |
| **Remarks** | The Flat Noise Bandwidth for noise equals 1.6 times the chip rate. |

## C/N [1 MHz]

| | |
|---|---|
| **Supported** | E4438C with Option 403/406 |

This softkey enables you to set the carrier-to-noise ratio for a 1 MHz bandwidth when the AWGN impairment is turned on.

| | |
|---|---|
| **Preset** | 21.0 dB |
| **Range** | 10.0–40.0 dB |

## C/N Value

| | |
|---|---|
| **Supported** | E4438C with Options 400, 403 |

This field displays the carrier to noise (C/N) ratio for the RF signal. The sum of the carrier (C) power and the noise (N) power equals the total RF power. The ratio between C and N equals the C/N value. If a valid number ÿ is entered for the C/N value, the C power and N power will be adjusted so that the delta between them is the number ÿ. In multiple PRACH mode, the sum of the carrier (C) power and the noise (N) power is less than 18 dB from the RF power. Refer to see "C Power" on page 121 and "N Power" on page 308 for more information on the C/N value.

| | |
|---|---|
| **Preset** | *Downlink*: 0 dB |
| | *Uplink (DPCH)*: –18.00 dB |
| | *Uplink (PRACH)*: –22.5005194 dB |
| **Range** | –30 to 30 dB |

## Coding

**Supported**            E4438C with Option 400

This field displays the encoder type used for the transport/physical channel selected. For uplink, this field is displayed for the DPDCH. For downlink, this field is displayed for the DPCH. To change the field selection, highlight the Coding field, press the **Edit Item** softkey and make a choice from the menu that appears.

Changing the field selection, will change the Bits/Frame field values.

**Preset**            *Downlink*: 1/2 Conv
                      *Uplink*: 1/3 Conv

## Common Mode I/Q Offset

**Supported**            E4438C

Use this softkey to enter an origin offset voltage for in-phase and quadrature-phase signals that are routed to the external output ports. This offset adjusts the I, I-bar, Q, and Q-bar output signal levels equally, relative to ground.

**Preset**            0.000 V

**Range**            −3.000 to 3.000 V

## Composite Waveform Clip

**Supported**            E4438C with Option 001/601or 002/602

Use this softkey to access a menu of options for limiting the modulation level.

The current clipping type is displayed under the **Composite Waveform Clip** softkey.

## Comp Parameter Setup

**Supported**            E4438C with Option 400

This softkey accesses the dedicated physical channel (DPCH) compressed mode configuration screen.

## Comp Mode Start Trigger Polarity Neg Pos

**Supported**            E4438C with Option 400

This softkey allows you to select the polarity of the compressed mode start trigger. The compressed pattern transmission begins when this trigger is received and the specified TGCFN number or TTI period occurs. Refer to ”Compressed Mode Start Trigger” softkey description for more information. There are two choices for trigger polarity.

Neg                     The signal generator responds to a high–to–low trigger transition.

Pos                     The signal generator responds to a low–to–high trigger transition.

## Comp Mode Stop Trigger Polarity Neg Pos

**Supported**          E4438C with Option 400

This softkey allows you to select the polarity of the compressed mode stop trigger. The compressed pattern transmission stops when this trigger is received and the stop CFN# or the TGPRC number is reached. Refer to the "Compressed Mode Stop Trigger" softkey description for more information. There are two choices for trigger polarity.

Neg                     The signal generator responds to a high-to-low trigger transition.

Pos                     The signal generator responds to a low-to-high trigger transition.

## Compressed Frame (RPS8)

**Supported**          E4438C with Option 400

This softkey in the DPCH Rear Panel Output Setup menu selects a compressed frame as the signal for the selected rear panel connector AUX I/O output connector/pin.

**Remarks**            The **(RPS8)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

                       This softkey is available in uplink only.

## Compressed Mode Off On

**Supported**          E4438C with Option 400/401

This softkey selects the operating state of the W-CDMA compressed mode.

Off                     Turning this softkey off disables the compressed mode.

On                      Turning this softkey off enables the compressed mode.

**Preset**             *Downlink*: Off
                       *Uplink*: On

## Compressed Mode Setup

**Supported**       E4438C with Option 400

This softkey accesses a menu for configuring the selected channel for compressed mode operation. When in compressed mode, the information normally transmitted during a 10 ms frame is compressed in time. This can be accomplished using puncturing, by reducing the spreading factor by half, and by higher layer scheduling. Refer to "CM Method" on page 102 for more information on the compressed mode operation.

## Compressed Mode Start Trigger

**Supported**       E4438C with Option 400

This softkey will begin the signal generator's compressed pattern transmission. Compressed pattern transmission begins with the specified transmission gap connection frame number (TGCFN). There are two different start timings for uplink, based on frame synchronization signal choices.

SFN or 2560 msec Frame Clock Interval:

> If the synchronization source selection is either system frame number (SFN) or 2560 msec frame clock interval, a compressed pattern starts at the specified transmission gap connection frame number (TGCFN) after the start trigger is received.

80, 40, 20, or 10 msec Frame Clock Interval:

> If the synchronization source selection is 80 msec (or less) frame clock interval, a compressed pattern transmission begins at the following transmission time interval (TTI) of the next TTI period after the start trigger is received.

**Remarks**       The frame synchronization signal applies to uplink only. For downlink, the DUT must synchronize with the ESG's RF output signal.

## Compressed Mode Stop Trigger

**Supported**       E4438C with Option 400

This softkey will stop signal generator compressed pattern transmission. Compressed pattern transmission begins with the specified transmission gap connection frame number (TGCFN). There are two different stop timings for uplink, based on frame synchronization signal choices.

Transmission Gap Repetition Count (TGPRC):

> Compressed pattern transmission stops after a specified TGPRC count of patterns.

Stop CFN#:

> Compressed pattern transmission stops when the stop trigger is received and at the next stop connection frame number (CFN). The synchronization source selection must be either SFN or 2560 msec frame clock.

Remarks        The frame synchronization signal applies to uplink only. For downlink, the DUT must synchronize with the ESG's RF output signal.

## Confirm

**Supported**        All Models

Press this softkey to activate the selected security level. This softkey appears after pressing the **Enter Secure Mode** softkey.

---

CAUTION        Once the secure mode is entered, the security level can only be increased. After this function is activated, the power must be cycled to return to normal operation mode.

---

## Config Change

**Supported**        E4438C with Option 401

This field displays the status of the configuration change bits in the quick paging channel (QPCH). These bits are used by the base station to notify the mobile that a configuration change is required.

The 80 ms QPCH slot is divided into 4 equal portions. The last 2 bits of the second and fourth portions are the configuration change bits. These bits can be enabled or disabled by setting a value in the Config Change field. To change the value, highlight the Config Change field, press the **Edit Item** softkey and enter a new value.

The following table shows which bits are enabled for the values allowed:

**Table 0-3**

| Config Change Value | Bits Enabled |
|---|---|
| 0 | All Models bits off |
| 1 | Last 2 bits of 2nd portion on |
| 2 | Last 2 bits of 4th portion on |
| 3 | Last 2 bits of 2nd and 4th portions on |

**Preset**        3

**Range**        0–3

### Configure BERT

**Supported**        E4438C with Option UN7

Use this softkey to access a menu of softkeys that enable you to select and configure test parameters for BER measurements.

### Configure Cal Array

**Supported**        All Models

Use this softkey to access a menu of softkeys for defining a user flatness list sweep. Each point in this sweep will contain a frequency and amplitude correction pair.

### Configure Differential Encoding

**Supported**        E4438C with Option 001/601or 002/602

Press this softkey to display a menu and editor (a differential state map) where you can create user-defined differential encoding for the current user-defined modulation table. Use this table to enter the symbol table offset for each binary data bit. For more information on differential encoding and the Differential State Map editor, see the *User's Guide*.

### Configure Frame

**Supported**        E4438C with Option 402

This softkey accesses a menu of softkeys from which you can control the entire selected frame. These frame-wide functions include scramble operating state, scramble seed data, secondary frame operating state, recalling and saving secondary frame states, and secondary frame state triggering options.

### Configure Hardware

**Supported**        E4438C with Option 001/601or 002/602

Use this softkey to access a menu from which you can set a particular latch or hardware configuration to meet user-specific needs.

### Configure List Sweep

**Supported**        All Models

Use this softkey to access a menu of softkeys for defining a list sweep. In this menu you can insert and delete points in a sweep. Each point can contain frequency, amplitude, and dwell time information.

## Configure Measurement

**Supported**        E4438C with Option 300

This softkey accesses a menu that enables you to configure the test parameters for bit error rate measurements.

## Configure Normal

**Supported**        E4438C with Option 402

This softkey accesses a menu of softkeys from which you can configure a normal timeslot.

### In the EDGE Format

The following figure shows an example of display graphics for a normal timeslot. The visual representation of the timeslot shows each field of the timeslot as it is defined by the Enhanced Data Rates for GSM Evolution (EDGE) format.
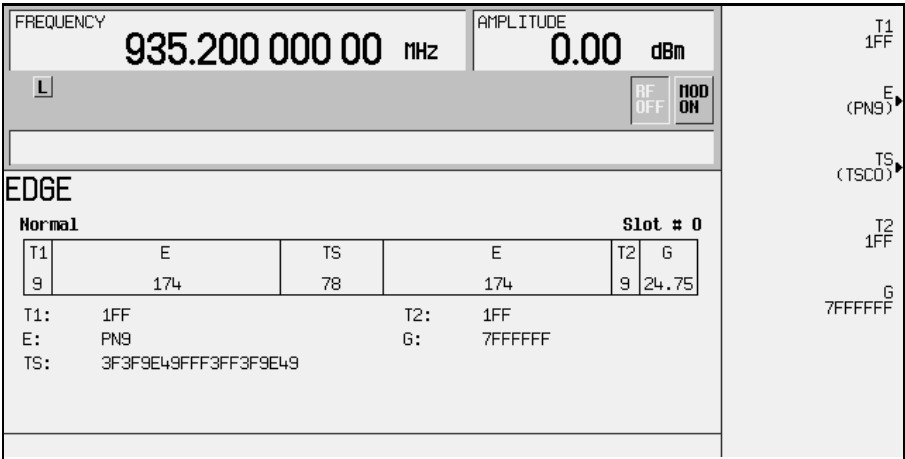


In this example:

- `T1:` shows the value (hexadecimal 1FF) for the 9-bit tail field. You can edit this value by pressing the **T1** softkey. However, if the guard time symbols of the previous timeslot do not match the T1 symbols of the current timeslot, the burst shape may not be smooth (even if the previous timeslot is turned off).

- `E:` shows the current data selection (PN9). Press the **E** softkey to change the data selection. Other selections allowed include PN15, fixed 4-bit patterns, fixed patterns of ones and zeroes, user files, or external data.

- TS: shows the value (hexadecimal 3F3F9E49FFF3FF3F9E49) for the 78-bit training sequence. You can edit this value by pressing the **TS** softkey.

- T2: shows the value (hexadecimal 1FF) for the 9-bit tail field. You can edit this value by pressing the **T2** softkey. However, if the guard time and T2 symbols of the current timeslot do not match, the burst shape may not be smooth.

- G: shows the value (hexadecimal 7FFFFFF) for the guard time field. Guard time appears in the visual representation of the timeslot as a 24.75-bit field. In the actual implementation, the guard time field in timeslots 0 and 4 are 27 bits long and the remaining timeslots contain 24-bit fields. You can edit the guard time value by pressing the **G** softkey. However, If the guard time and T2 symbols of the current timeslot and the T1 symbols of the next timeslot do not match, the burst shape may not be smooth (even if the current timeslot is turned off).

### In the GSM Format

The following figure shows an example of a normal timeslot as it is defined by the Global System for Mobile Communications (GSM) format.
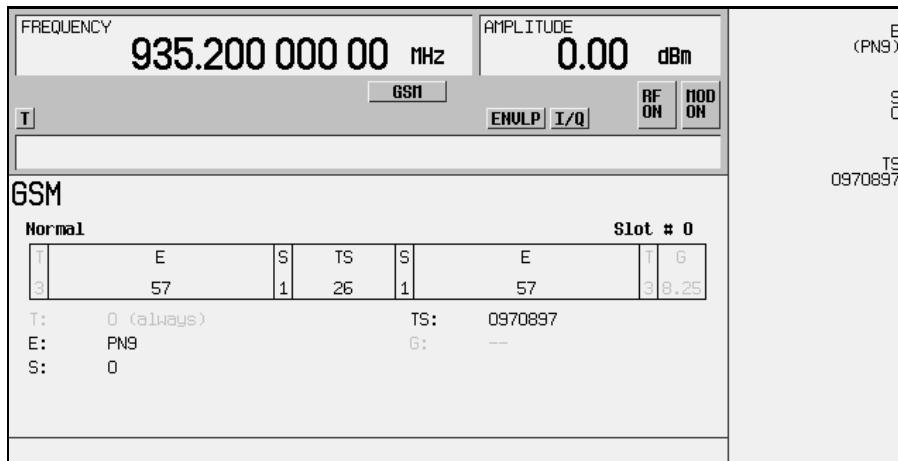


- T: shows the contents (hexadecimal zero) of the 3-bit tail field. The text in this field is grey, indicating that you cannot change the value for the tail bit field.

- E: shows the contents (PN9) of the data selection (encryption bits) for this timeslot. The **E** softkey makes this the active function. Other selections include PN15, fixed 4-bit patterns, fixed patterns of ones and zeroes, user files, and external data.

- S: shows the value (0) of both stealing bits for this timeslot. The **S** softkey makes both stealing bits the active function.

- `TS:` shows the contents (hexadecimal 0970897) of the 26-bit training sequence for this timeslot. The **TS** softkey makes this the active function.

- `G:` guard time appears in the visual representation of the timeslot as an 8.25-bit field. In the actual implementation, the guard time field in timeslots 0 and 4 are 9 bits long and the remaining timeslots contain 8 bit fields. The text in this field is grey, indicating that you cannot change the contents of the guard time field.

## Configure Sensitivity Search

**Supported**      E4438C with Option 300

This softkey accesses a menu that enables you to configure the parameters for the bit error rate sensitivity search function.

## Configure Step Array

**Supported**      All Models

Use this softkey to access a menu of softkeys that enables you to define a step sweep with a user flatness connection. In this menu you can set the start frequency, stop frequency, and the number of points for the sweep.

## Configure Step Sweep

**Supported**      All Models

Use this softkey to access a menu of softkeys for defining a step sweep. In this menu you can set the start and stop frequencies for a sweep, set the start and stop power levels, and you can set the number of points in the sweep with the dwell time at each point.

## Configure TCH

**Supported**       E4438C with Option 402

Use this softkey to access a menu of softkeys from which you can configure a timeslot as a traffic channel.

The following figure shows a downlink traffic channel timeslot as it is defined by the PHS format.



- R: ramp time is a 4-bit field. The grey text indicates that you can not change the contents of this field.

- SS: the start symbol is a 2-bit field. The grey text indicates that you cannot change the contents of this field.

- PR: the preamble is a 6-bit field. The grey text indicates that you cannot change the contents of the this field.

- UW: shows the contents (hexadecimal 3D4C) of the unique word. The **UW** softkey makes this the active function.

- CI: the channel identifier is a 4-bit field. The grey text indicates that you cannot change the contents of this field.

- SA: shows the contents (hexadecimal 8000) of the slow associated control channel. The **SA** softkey makes this the active function.

- TCH: shows the data selection (PN9) for this traffic channel. Other selections include PN15, fixed 4-bit patterns, fixed patterns of ones and zeroes, user files, and external data.

- CRC: shows that a cyclic redundancy check is performed on the channel identifier (CI), the slow associated control channel (SA), and the data fields (TCH). The grey text indicates that you cannot change the contents of this field.

- G: guard time is a 16-bit field. The grey text indicates that you cannot change the contents of this field.

**Remarks**      The uplink traffic channel timeslot is *not* identical (see Configure Up TCH).

## Configure Timeslots

**Supported**      E4438C with Option 402

This softkey accesses a menu of softkey from which you can configure the timeslots.

**Remarks**      This softkey is inactive with unframed data.

## Configure Traffic Bearer

**Supported**      E4438C with Option 402

This softkey accesses a menu of softkeys from which you can configure a timeslot as a traffic bearer. The following figure shows an example of a radio fixed part traffic bearer timeslot. The portable part traffic bearer timeslot is identical except for the preset values.



- G: there are two guard time fields. The grey text indicates that you cannot change the contents of these fields.

- P: the preamble is a 16-bit field.

- `S:` shows the contents (hexadecimal E98A) of the 16-bit synchronization word. The **S** softkey makes this the active function.

- `A:` shows the contents (hexadecimal 0000FFFF0000FFFF) of the A field. The **A field** softkey makes this the active function.

- `B:` shows the B field data selection (PN9). The **B field** softkey makes this the active function. Other selections include, PN11, PN15, PN20, PN23, fixed 4-bit patterns, fixed patterns of ones and zeroes, DECT-specific patterns, user files and external data.

- `Z:` the Z field is a 4-bit error detection field. The Z field repeats the last 4 bits of the B field. The grey text indicates that you cannot change the contents of this field.

## Configure Triggers

**Supported**        E4438C with Option UN7

This softkey accesses the menu of softkeys that enable you to select the BERT trigger source and triggering parameters.

## Configure Up Normal

**Supported**        E4438C with Option 402

Use this softkey to display a menu of softkeys where you can configure a timeslot as an uplink normal timeslot. The following figure shows an uplink normal timeslot as it is defined by the TETRA format.
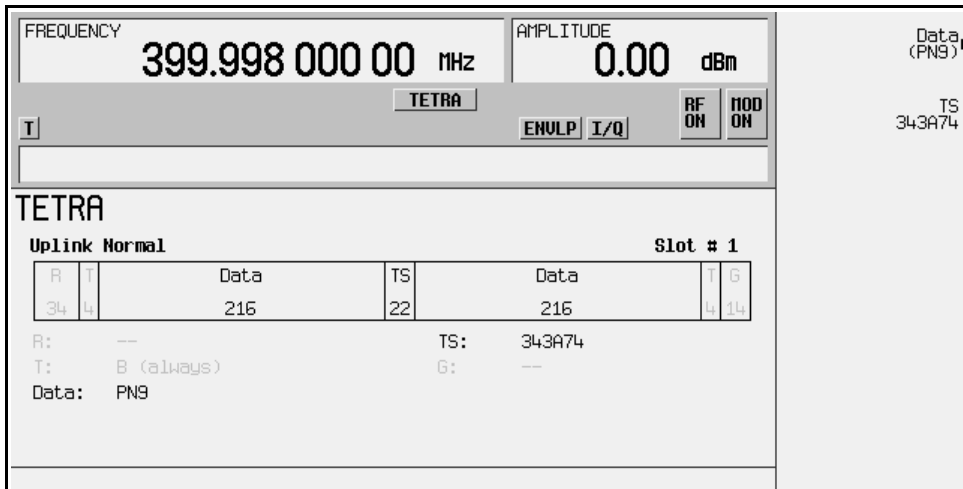


- `R:` ramp time is a 34-bit field. The grey text indicates that you cannot change the content of this field.

- `T:` shows the content (hexadecimal B) of both of the 4-bit tail fields. The grey text indicates that you cannot change the content of these fields.

- `Data:` shows the data selection (PN9) for both 216-bit data fields. Other selections include PN15, fixed 4-bit patterns, fixed patterns of ones and zeroes, user files, or external data.

- `TS:` shows the contents (hexadecimal 343A74) of the training sequence field. The **TS** softkey makes this the active function.

- `G:` guard time is a 14-bit field. The grey text indicates that you cannot change the content of this field.

## Configure Up TCH

**Supported**        E4438C with Option 402

In either the North American Digital Cellular (NADC) or the Personal Digital Cellular (PDC) format, use this softkey to access a menu of softkeys from which you can configure a timeslot as an uplink traffic channel.

The following figure shows an uplink traffic channel timeslot as defined by the NADC format.



- `G:` guard time is a 6-bit field. The grey text indicates that you cannot change the content of this field.

- `R:` ramp time is a 6-bit field. The grey text indicates that you cannot change the content of this field.

- `Data:` shows the data selection (PN9) for this up traffic channel. The **Data** softkey makes this the active function. Other selections include PN15, fixed 4-bit patterns, fixed patterns of ones and zeroes, user files, or external data.

- SYNC: shows the value (hexadecimal A91DE4A) of the synchronization word. The **SYNC** softkey makes this the active function.

- SACCH: shows the value (hexadecimal 000) of the slow associated control channel. The **SACCH** softkey makes this the active function.

- CDVCC: shows the value (hexadecimal 000) of the coded digital verification color code. The **CDVCC** softkey makes this the active function.

The following figure shows an uplink traffic channel timeslot as defined by the PDC format.



- R: ramp time is a 4-bit field. The grey text indicates that you cannot change the content of this field.

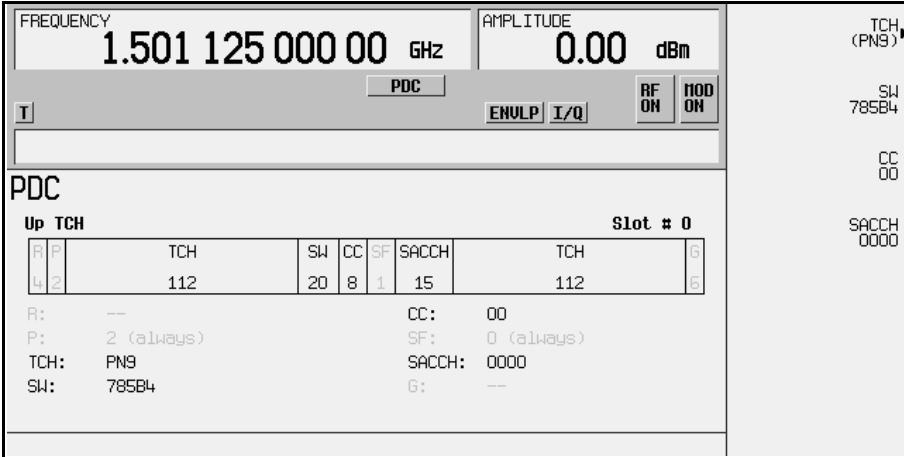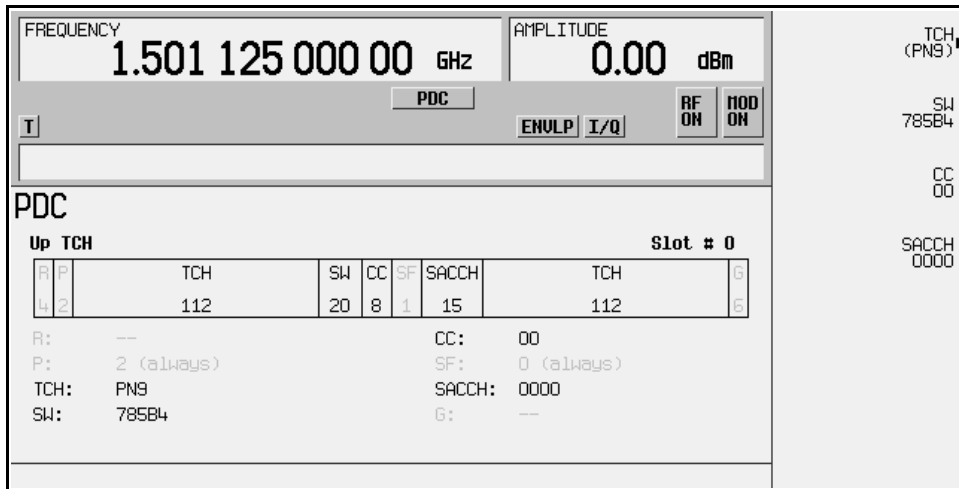- P: the preamble is a 2-bit field. The grey text indicates that you cannot change the content of this field.

- TCH: shows the data selection (PN9) for this uplink traffic channel. The **Data** softkey makes this the active function. Other selections include PN15, fixed 4-bit patterns, fixed patterns of ones and zeroes, user files, and external data.

- SW: shows the value (hexadecimal 785B4) of the frame synchronization word. The **SW** softkey makes this the active function.

- CC: shows the value (00) of the color code. The **CC** softkey makes this the active function.

- SF: shows the value (0) of the stealing flag. The grey text indicates that you cannot change the content of this field.

- SACCH: shows that the slow associated control channel is set to 0000. The **SACCH** softkey makes this the active function.

- G：guard time is a 6-bit field. The grey text indicates that you cannot change the content of this field.

## Confirm

**Supported**     All Models

Press the softkey to activate the selected security level. This key appears after pressing the **Enter Secure Mode** softkey.

---

| | |
|---|---|
| **CAUTION** | Once the secure mode is entered, the security level can only be increased. After, this function is activated, the power must be cycled to return to normal operation mode. |

---

## Confirm Change

**Supported**     All Models

Use this softkey to confirm reconfiguration of a selected signal generator option. After modifying the license key and proceeding with a reconfiguration, pressing this key will implement the change.

**Remarks**     Pressing this key reboots the signal generator.

## Confirm Delete

**Supported**     All Models

Use this softkey to continue to delete the selected file.

## Confirm Delete Of All Models Rows

**Supported**     E4438C with Option 001/601or 002/602

Use this softkey to continue to delete all rows in the current table.

## Confirm Load From File

**Supported**     E4438C with Option 001/601or 002/602

Use this softkey to continue to load the highlighted file into the current table.

## Confirm Load Mirror Image of Fall Shape

**Supported**     E4438C with Option 001/601or 002/602

Use this softkey to continue to load the Rise Shape Editor with a mirror image of the Fall Shape Editor when editing a burst shape.

## Confirm Load Mirror Image of Rise Shape

**Supported**        E4438C with Option 001/601or 002/602

Use this softkey to continue to load the Fall Shape Editor with a mirror image of the Rise Shape Editor when editing a burst shape.

**Remarks**        None

## Confirm Restore Sys Defaults

**Supported**        All Models

Use this softkey to restore the signal generator to preset system conditions.

**Remarks**        Pressing this key reboots the signal generator.

## Confirm Secure Display

**Supported**        All Models

This softkey blanks the display, except for the message: `*** SECURE DISPLAY ACTIVATED ***`, and disables the front panel keys. Once, this function is activated, the power must be cycled to re-enable the display and front panel keys. For more information about security functions, refer to the *User's Guide*.

## Continuous

**Supported**        E4438C with Option 001/601or 002/602

This softkey enables the continuous transmission of a waveform after the ESG receives a trigger. This softkey appears in multiple menus with some differences in behavior as described in the following subsections. For more information on triggering, see the *User's Guide*.

### In the Trigger Menus and Pattern Trigger Menu

This softkey selects the continuous triggering mode, which enables the signal generator to repeat the modulating signal indefinitely until you turn off the modulation format, change triggers, or select another waveform for an ARB format or another data pattern for the Real Time I/Q Baseband format. To configure the modulating signal's response to triggers, use the softkeys in the Continuous Mode menu.

### In the Seg Advance Menu

This softkey selects the waveform's response to triggers when segment advance is the dual ARB trigger mode. On the initial trigger, the first segment begins playing indefinitely. A subsequent trigger causes the segment's playback to complete to the end of the segment file. Then the sequence advances

to the next segment, and that segment begins playing indefinitely. This behavior continues to the last segment. When the last segment in the sequence receives a trigger during its playback, the segment completes playing, the sequence resets to the first segment, and the first segment begins playing indefinitely.

## Continuous Mode

**Supported**      E4438C with Options 001/601 or 002/602

This softkey accesses a menu from which you select the waveform's response to triggers when Continuous is the triggering mode (continuous waveform transmission.). The menu offers two to three choices depending on whether you are in an ARB format or real-time custom.

| Format | Waveform Response Selection |
|---|---|
| ARB | **Free Run**, page 221—A sequence or segment plays immediately and continuously without a trigger when you turn the format on |
| | **Trigger & Run**, page 482— A sequence or segment waits for a trigger and then runs continuously and does not respond to subsequent triggers |
| | **Reset & Run**, page 388—A sequence or segment waits for a trigger and then runs continuously and responds to subsequent triggers by restarting back at the start of the sequence or segment |
| Real-Time | **Free Run**, page 221—immediately triggers when you turn the format on |
| | **Trigger & Run**, page 482—waits for and starts on the first trigger; ignores subsequent triggers |

For more information on triggering, see the *User's Guide*.

## Continuous PN9

**Supported**      E4438C with Option 406

This softkey selects a continuous PN9 pattern to be used in a Bluetooth setup. The PN9 payload data will place 8 continuous PN9 sequences into payloads of 19 packets. These packets are followed by one packet with no payload. The packet with no payload is included to ensure the SEQN bit is inverted with each packet transmission when the waveform is repeatedly played back.

## Control Channel Dnlink Uplink

| **Supported** | E4438C with Option 402 |
|---|---|

Use this softkey to select either the downlink or the uplink channel.

| Dnlink | When you select Dnlink, the timeslot number, type and configuration settings apply to the downlink channel. |
|---|---|
| Uplink | When you select Uplink, the timeslot number, type and configuration settings apply to the uplink channel. |
| **Preset** | Dnlink |
| **Remarks** | The downlink and uplink timeslots can be active concurrently. |

## Copy File

| **Supported** | All Models |
|---|---|

This softkey enables you to copy and rename a file in the displayed catalog of files. The maximum file name length is 23 characters (alphanumeric and special characters).

When you have entered the new file name, press the **Enter** terminator softkey. If you have changed your mind, press the **Return** hardkey. Once you press **Enter**, the new file is stored and displayed immediately in the catalog list.

## Correction

| **Supported** | All Models |
|---|---|

This field enables you to set a power correction value in the table editor.

| **Remarks** | None |
|---|---|

## CPICH

| **Supported** | E4438C with Option 400 |
|---|---|

### In ARB W-CDMA

Use this softkey to insert a Common Pilot Channel (CPICH) into the downlink Edit Channel Setup table editor.

### In the Real Time W-CDMA Menu

This softkey selects the common pilot channel (CPICH) to be the Ec reference in the downlink additive white gaussian noise (AWGN) configuration menu.

## C Power

**Supported**　　　　E4438C with Options 400, 403

This field displays the carrier power of the RF signal. This value is calculated from the RF power level. For example, if the signal generator RF power = –20 dBm and C/N is set to 3.0 dB then the displayed C power will be –22.97 dBm. The C power is calculated as $10(-22.97/10) = 0.00505$ milliwatts. In this example the N power displayed on the signal generator is –25.97 dBm. The power calculation, shown previously, results in a 0.00253 milliwatt power level. Note that N means in-channel noise power and total noise power is 1.96 times larger than N. The sum of the C power and N powers, $2.53 \times 1.96 + 5.05$ is 0.010 milliwatts (approximately) and $10 \log_{10} .0100 = -20$ dBm; the signal generator's RF power.

**Preset**　　　　　　*Downlink*: –140.712917 dBm

　　　　　　　　　　　*Uplink*: –159.957537 dBm

　　　　　　　　　　　*Uplink (PRACH)*: –161.435521 dBm

**Range**　　　　　　0.00 to –INF dBm

## CRC Size

**Supported**　　　　E4438C with Option 400

This field displays the number of cyclic redundancy code (CRC) bits to be added to the transport channel data. The CRC choices are 0, 8, 12, 16, and 24.

**Preset**:　　　　　　*Downlink*: 8
　　　　　　　　　　　*Uplink*: 16

## Create File

**Supported**　　　　E4438C with Option 001/601or 002/602

Use this softkey to create a new bit file. After the new file is automatically opened by the Bit File Editor, you can edit bits individually, or select from a menu of editing tools.

The Bit File Editor automatically assigns a generic file name, which you can change using the **Rename** softkey.

## CS-1

**Supported**      E4438C with Option 402

Use this softkey to access a selection of PN sequences that you can use as the data for a packet data traffic channel that uses the packet data block type 1 coding scheme in accordance with the 3GPP standard GSM 05.03.

This packet data traffic channel is part of a multiframe structure with the following attributes:

- 52 frames
- frames 12 and 38 contain tail and control bits with the payload bits set to zero
- frames 25 and 51 are idle, and incorporate RF blanking

## CS-4

**Supported**      E4438C with Option 402

Use this softkey to access a selection of PN sequences that you can use as the data for a packet data traffic channel that uses the packet data block type 4 coding scheme in accordance with the 3GPP standard GSM 05.03.

This packet data traffic channel is part of a multiframe structure with the following attributes:

- 52 frames
- frames 12 and 38 contain tail and control bits with the payload bits set to zero
- frames 25 and 51 are idle, and incorporate RF blanking

## Ctrl Beta

**Supported**      E4438C with Option 400

This field displays the beta ratio (amplitude ratio) for the message control part of the physical random access channel (PRACH). The beta value can be used to set the power level for the PRACH message control part.

Control beta is an integer value. Changing the `Ctrl Pwr` field changes the beta ratio, and the signal generator may not be able to compute a proper beta value. If this occurs, the beta value changes to "–".

**Preset**:      11

**Range**      0–15

**Remarks**      An entry of 0 in the `Ctrl Beta` field sets the message control power to –40.00 dB.

### Ctrl Pwr

**Supported**      E4438C with Option 400

This field displays the power level for the physical random access channel (PRACH) message control part relative to the data power level. The power can be adjusted using the **Edit Item** softkey or by entering a control beta value.

**Preset**:          –2.69 dB

**Range**          –40.00 to 0.00 dB

**Remarks**      Changing this field changes the `Ctrl Beta` value. Refer to "Ctrl Beta" for more information.

## Custom

**Supported**      E4438C with Option 001/601or 002/602

This softkey appears in two different locations, enabling you to either create a custom digital modulation, or create a custom timeslot type.

### Creating a Custom Digital Modulation

Use this softkey to access a menu from which you can select the real time I/Q baseband generator or the arbitrary waveform generator to create a custom digital modulation.

### Creating a Custom Timeslot Type

Use this softkey to select a custom timeslot type for the active timeslot. A custom timeslot is configured using an internally generated data pattern, a downloaded sequence of bits stored in a user file, or by supplying external data. The custom timeslot is provided for flexibility; it is not a standard timeslot type.

## Custom CDMA2000 Carrier

**Supported**      E4438C with Option 401

Use this softkey to display the forward link CDMA2000 (FCDMA) memory catalog. From this catalog listing, you can select a custom FCDMA single-carrier setup to insert into a custom multicarrier forward link CDMA2000 (MFCDMA) setup.

## Custom CDMA2000 Multicarrier

**Supported**      E4438C with Option 401

Use this softkey to display the multicarrier forward link CDMA2000 (MFCDMA) memory catalog. From this catalog listing, you can select a previously stored custom multicarrier setup.

### Custom CDMA2000 State

**Supported**        E4438C with Option 401

Use this softkey to display either the forward link CDMA2000 (FCDMA) memory catalog or the reverse link CDMA2000 (RCDMA) memory catalog, depending on the selected link direction. From this catalog listing, you can choose a previously stored custom CDMA2000 setup.

### Custom CDMA Carrier

**Supported**        E4438C with Option 401

Use this softkey to display the CDMA memory catalog. From this catalog listing, you can select a custom single-carrier setup to insert into a custom CDMA multicarrier setup.

### Custom CDMA Multicarrier

**Supported**        E4438C with Option 401

This key displays the multicarrier CDMA memory catalog. From this catalog listing, you can choose a previously stored custom multicarrier setup.

### Custom CDMA State

**Supported**        E4438C with Option 401

Use this softkey to access a menu from which you can choose a custom CDMA setup that has previously been defined and stored in the signal generator's memory. Use the front-panel knob, or the arrow keys to highlight the desired CDMA state file, then press **Select File** to activate the custom CDMA state.

### Custom Digital Mod State

**Supported**        E4438C with Option 001/601or 002/602

This softkey displays the Digital Modulation Setup Select File menu. From this menu, you can choose a custom digital modulation setup that has previously been defined and stored in the signal generator's memory. Use the front-panel knob, arrow keys, or the data entry keypad to highlight the desired file, then press **Select File** to activate the custom digital modulation state.

### Custom Off On

**Supported**        E4438C with Option 001/601or 002/602

This softkey toggles the operating state of the real time custom modulator.

Off                 When the **Custom Off On** softkey is set to Off, the real time custom modulator is disabled.

| On | When the **Custom Off On** softkey is set to On, the real time custom modulator builds a modulation that is specified by the user. You can create custom modulation formats for transmitting continuous streams of unframed data patterns. |
|---|---|
| **Preset** | Off |

## Custom TS

| **Supported** | E4438C with Option 402 |
|---|---|

Use this softkey to access a menu of softkeys for setting a customized training sequence (TS). After selecting this softkey, the active entry area displays the TS hexadecimal value. To edit the TS value, use the displayed softkeys and the numeric keypad.

### In the EDGE (Enhanced Data Rates for GSM Evolution) Format

The normal timeslot TS is a 78-bit field and the GMSK timeslot TS is a 26-bit field.

| **Preset** | *Normal Timeslot*: 3F3F9E49FFF3FF3F9E49 |
|---|---|
| | *GMSK Timeslot*: 0970897 |
| **Range** | *Normal Timeslot*: 0–3FFFFFFFFFFFFFFFFFFF |
| | *GMSK Timeslot*: 0–3FFFFFF |

### In the GSM (Global System for Mobile Communications) Format

The normal and dummy timeslot TS is a 26-bit field, and the synchronization (sync) timeslot TS is a 64-bit field.

| **Preset** | *Normal & Dummy Timeslots*: 0970897 |
|---|---|
| | Sync Timeslot: B962040F2045761B |
| **Range** | *Normal & Dummy Timeslots*: 0–3FFFFFF |
| | Sync Timeslot: 0–FFFFFFFFFFFFFFFF |

## Custom W-CDMA Carrier

| **Supported** | E4438C with Option 400 |
|---|---|

Use this softkey to display the downlink W-CDMA (DWCDMA) memory catalog. From this catalog listing, you can select a custom DWCDMA single-carrier setup to insert into a custom multicarrier downlink W-CDMA (MDWCDMA) setup.

## Custom W-CDMA Multicarrier

**Supported**       E4438C with Option 400

Use this softkey to display the multicarrier downlink W-CDMA (MDWCDMA) memory catalog. From this catalog listing, you can select a previously stored custom multicarrier setup.

## Custom W-CDMA State

**Supported**       E4438C with Option 400

In downlink, this softkey displays the catalog of downlink W-CDMA (DWCDMA) files. In uplink, this softkey displays the catalog of UWCDMA (Uplink WCDMA) files. You can choose a previously stored custom W-CDMA setup from the displayed catalog.

## Cycle Count

**Supported**       E4438C with Option UN7

This softkey enables you to specify the number of repetitions of BER measurements. Enter the value using the numeric keypad and terminate it by pressing the **Enter** key.

**Preset**          1

**Range**           0–65,535

## Cycle End

**Supported**       E4438C with Option UN7

Use this softkey to select a pass or fail judgement at the end of the next BER measurement result.

**Remarks**         This key is one of the choices in the Pass/Fail Update menu and is enabled when the **Pass/Fail Off On** softkey is set to On.

# D

## D8PSK

**Supported**     E4438C with Option 001/601or 002/602

This softkey appears in two different locations, enabling you to either select a modulation, or load an I/Q map into the I/Q table editor.

### Selecting a D8PSK Modulation

Use this softkey to select differential 8-state phase shift keying (D8PSK) to modulate a continuous stream of the selected data pattern. D8PSK modulation transmits data at the rate of 3 bits per symbol.

The modulation selection appears under the **Select** and **PSK** softkeys in the Modulation Type menus.

### Loading a D8PSK I/Q Map into the Table Editor

Use this softkey to load a differential 8-state phase shift keying (D8PSK) I/Q map into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *User's Guide*.

## Data

This softkey appears in four different locations.

Use this softkey to access a menu of choices from which you can select pseudorandom bit patterns, fixed 4-bit repeating sequences, alternating bit patterns, user files or external data.

The current selection is displayed under the **Data** softkey.

### In the BERT Menu

**Supported**      E4438C with Option UN7

Use this softkey to access a menu that enables you to select a specific pseudo-random noise sequence.

**Preset**      PN9

### In the Real Time GPS Menu

**Supported**      E4438C with Option 409

Use this softkey to access a menu of choices from which you can select pseudorandom bit patterns, fixed 4-bit repeating sequences, or user files as the data source for the GPS navigation message.

**Preset**      PN9

**Remarks**      This softkey is grayed out when **Ranging Code** is set to **P** or when **Data Mode** is set to **TLM**.

### In the Real Time TDMA Menu

**Supported**      E4438C with Option 402

**For Unframed Data Transmission**  This softkey accesses a menu of choices for internal data generation (pseudorandom bit patterns, fixed 4-bit repeating sequences, set patterns of ones and zeroes, standard-specific patterns) for unframed transmission. You can choose to supply your own data (download a binary file or input data using the DATA INPUT connector).

**Preset**      *Custom*: PN23

                 *EDGE*: PN9

                 *Other Formats*: PN23

**Remarks**      Pattern Repeat and Pattern Trigger functions are *not* available if you use either a PN data sequence, or an external data source.

### For NADC and TETRA Framed Data Transmission

**Supported**      E4438C with Option 402

This softkey accesses a menu of choices for internal data generation (pseudorandom bit patterns, fixed 4-bit repeating sequences, set patterns of ones and zeroes, standard-specific patterns) for framed transmission. You can choose to supply your own data (download a binary file or input data using the DATA input connector).

**Preset**      PN9

## Data

This field appears in two different locations.

### In the CDMA2000 Menu

**Supported**      E4438C with Option 401

This field displays the data selection for the current channel. To change the field selection, highlight the Data field, press the **Edit Item** softkey and make a choice from the menu that appears.

**Preset**      PN9

### In the Real Time W-CDMA Menu

**Supported**      E4438C with Option 400

This field displays the data type used for the downlink setup. To change the field selection, highlight the `Data` field, press the **Edit Item** softkey and make a choice from the menu that appears.

| | |
|---|---|
| **Preset** | *OCNS*: PN9 |
| | *DPCH*: PN9 |
| | *DPCCH*: 3 GPP STD |
| | *DPDCH*: TrCH |
| | *PICH*: PN9 |
| | *ChipARB*: PN9 |
| **Remarks** | The 3 GPP STD data is defined in 3 GPP Standard TS25.211. This standard defines fields and slot formats. |

## Data Beta

**Supported**      E4438C with Option 400

This field displays the beta ratio (amplitude ratio) for the message data part of the physical random access channel (PRACH). The beta value can be used to set the power level for the PRACH message data part.

Data beta is an integer value. Changing the `Data Pwr` field changes the beta ratio, and the signal generator may not be able to compute a proper beta value. If this occurs, the beta value changes to "–".

| | |
|---|---|
| **Preset**: | 15 |
| **Range** | 0–15 |
| **Remarks** | An entry of 0 in the `Data Beta` field sets the message `Data Pwr` field to –40.00 dB. |

## Data clock out

**Supported**      E4438C with Option 400

This field, displayed in the PRACH and DPCH Rear Panel Output Setup menu, indicates data clock out, rear panel connector settings. For example, signal type and connection locations are shown.

| | |
|---|---|
| **Remarks** | For information on the rear panel AUX I/O connector configuration, refer to chapter 1 of the *User's Guide*. |

## Data Clock Out Polarity Neg Pos

**Supported**          E4438C with Option 001/601or 002/602

This softkey is used to configure the polarity of the TTL signal for the data clock out signal. The data clock out signal is available from the AUX I/O connector on the rear panel of the signal generator.

Neg                Selecting Neg uses the falling edge of the TTL signal.

Pos                Selecting Pos uses the rising edge of the TTL signal.

## Data Clock Polarity Neg Pos

**Supported**          E4438C with Option 001/601or 002/602

This softkey is used to configure the polarity of the TTL signal at the DATA CLOCK connector.

Neg                Selecting Neg uses the falling edge of the TTL signal.

Pos                Selecting Pos uses the rising edge of the TTL signal.

**Preset**             Pos

**Remarks**         This softkey is disabled during external data pattern input and external clock input.

### Data Format Pattern Framed

**Supported**          E4438C with Option 402

Use this softkey to select the data format.

Pattern           When you select Pattern, a continuous stream of the selected data pattern is transmitted.

Framed           When you select Framed, a framed data pattern in the current format is transmitted. The **Data Format Pattern Framed** softkey is coupled to the **Burst Envelope Int Ext Off** softkey in the I/Q menu. When the data format is on, and Framed is selected, Int becomes active and the ENVLP annunciator appears in the display.

The following figure shows the display graphics for one of the formats. The timeslot pattern is displayed only when **Data Format Pattern Framed** is set to **Framed**.

- `DECT On` (or other active format) this field shows whether the selected format is enabled (on) or not (off). In this example, the format is DECT.

- `Data Format:` displays the selected type of transmission (framed or pattern).

- `Mod Type:` displays the currently selected (2-Lvl FSK) type of internally generated modulation.

- `DECT:` indicates whether the current structure of the DECT transmission follows DECT protocol (STANDARD) or not (MODIFIED).

- `Nxt Frame:` indicates the next triggered frame.

  When secondary frame is on, after the primary frame triggers, this field changes to `Nxt Frame: Secondary`. In this example this field is grey, indicating that the secondary frame state is off.

- `Bits/Symbol:` indicates the number of bits per symbol required according to the selected format.

- `SymRate:` displays the current symbol rate. In this example, the symbol rate is set according to the DECT format (1.152000000 Msps). This value can be changed in the Symbol Rate menu. An asterisk (*) next to the value indicates that it differs from the standard (default) for the current format. When the symbol rate is changed, the signal generator will reconfigure the baseband generator. The time required to reconfigure the baseband generator is inversely proportional to the symbol rate: lower symbol rates require more time.

- `Filter:` shows the filter used. This example shows a standard Gaussian filter with a BbT of 0.500. This value can be changed in the Filter menu. An asterisk (*) next to the BbT value indicates that it differs from the current format.

- `Chan:` shows the selected channel (channel 0 of the standard frequency channel band). Grey text indicates an inactive function.

- `I/Q Scaling:` shows the value (100%) of the I/Q scaling. Grey text indicates an inactive function.

- `Data:` shows the unframed data selection. In this example, the text in this field is grey, indicating an inactive function (framed mode is on). Other selections include other PN sequences, fixed 4-bit patterns, fixed patterns of ones and zeroes, standard-specific patterns, user files, and external data.

- `Repeat:` shows the current pattern repeat mode (continuous or single).

- `Phase Pol:` shows the direction of rotation of the phase modulation vector (normal or inverted mode).

- `Full-Rate:` in PDC format, this field indicates whether PDC is set to full-rate or half-rate.

The visual representation of the timeslot pattern shows which timeslots are on (active). Any configuration changes apply to the active timeslots.

**Preset**            Pattern

## Data Mode Raw Enc TLM

**Supported**      E4438C with Option 409

This softkey sets the data generation mode for the GPS navigation message.

| | |
|---|---|
| Raw | This selection sets the navigation message mode to raw. Raw data is modulated onto the code at 50 bits per second, and no parity bits are computed by the ESG. The data source must be selected using the **Data** menu. |
| Enc | This selection sets the navigation message mode to encoded. Data is modulated onto the code at 50 bits per second, and the ESG computes 6 parity bits for every 24 data bits from the selected data source. The data source must be selected using the **Data** menu. |
| TLM | This selection sets the navigation message mode to TLM (telemetry). The ESG computes a standard default navigation transmission (see Remarks) for 50 bps modulation onto the C/A carrier. The default navigation transmission includes a telemetry word (TLM), a handover word (HOW), and default navigation data. |
| **Preset** | Raw |
| **Remarks** | For more information about data modes and the default navigation data transmission, see the *User's Guide* or the *GLOBAL POSITIONING SYSTEM STANDARD POSITIONING SERVICE SIGNAL SPECIFICATION*, 2nd Edition, June 2, 1995. |

## Data Negation

**Supported**      E4438C with Option 003 or 004

This softkey, for the N5102A module, accesses a menu that enables you to select either I or Q data negation. Negation changes the affected sample by expressing it in two's complement form, multiplying by negative one, and converting back to the selected numeric format.

## `Data out`

**Supported**      E4438C with Option 400

This field, displayed in the PRACH and DPCH Rear Panel Setup menu, indicates data out rear panel connector settings. For example, signal type and connection locations are shown.

**Remarks**      For information on the rear panel AUX I/O connector configuration, refer to chapter 1 of the *User's Guide*.

## Data Out Polarity Neg Pos

**Supported**      E4438C with Option 001/601or 002/602

This softkey is used to configure the polarity of the TTL signal for the data out signal. The data out signal is available from the AUX I/O connector on the rear panel of the signal generator.

Neg      Selecting Neg configures the CMOS logic high as 0 volts.

Pos      Selecting Pos configures the CMOS logic high as +3.3 volts.

**Preset**      Pos

## Data Polarity Neg Pos

### In the Signal Polarity menu

**Supported**      E4438C with Option 001/601or 002/602

This softkey is used to configure the polarity of the TTL compatible input signal at the DATA connector.

Neg      This choice configures the TTL logic high as 0 volts.

Pos      This choice configures the TTL logic high as +5 volts.

**Remarks**      This softkey is disabled for Option UN8/9 when external data and an external clock are used.

**In the BERT Menu**

> **Supported**       E4438C with Option UN7
>
> Use this softkey to set the input polarity of the data signal supplied to the rear panel BER DATA IN connector.
>
> Neg         With this choice, the polarity of the data signal is inverted.
>
> Pos         With this choice, the data signal is not inverted.
>
> **Preset**        Pos

## `Data Pwr`

> **Supported**       E4438C with Option 400
>
> This field displays the power level for the physical random access channel (PRACH) message data part relative to the message control power level. The power can be adjusted using the **Edit Item** softkey or by adjusting the data beta value.
>
> **Preset**        0.00 dB
>
> **Range**        –40.00 to 0.00 dB
>
> **Remarks**       Changing this field changes the `Data Beta` value. Refer to "Data Beta" for more information.

## Data/Clk/Sync Rear Outputs Off On

> **Supported**       E4438C with Option 001/601or 002/602
>
> This softkey is used to disconnect the output signals from the rear panel AUX I/O data out, data clock out and symbol sync out connectors. Normally, these output signals should be connected (softkey set to On position). However, disconnecting these outputs will decrease spurious signals that are sometimes present when you are operating at high symbol rates.
>
> Off         Selecting Off disconnects rear panel output signals.
>
> On          Selecting On connects rear panel output signals.

## `Data Rate`

> **Supported**       E4438C with Option 400
>
> This field displays the symbol rate for the selected OCNS channel.
>
> **Range**        7.5–960 ksps

## Data Setup

**Supported**        E4438C with Option 003 or 004

This softkey, for the N5102A module, accesses a menu that enables you to set the parameters for transmitted data.

## Data Type

**Supported**        E4438C with Option 003 or 004

This softkey, for the N5102A module, accesses a menu that enables you to select either filtered or unfiltered baseband data to be transmitted through the digital module.

When an ARB modulation format is on, this softkey is grayed out (inactive) and the data type is samples.

**Preset**        Samples

## `Data Type`

**Supported**        E4438C with Option 400

This field displays the data type for the selected channel. To change the field selection, highlight the `Data Type` field, press the **Edit Item** softkey and make a choice from the menu that appears.

**Preset**        *OCNS*: PN9

                      *DPCH*: PN9

                      *DPCCH*: 3 GPP STD

                      *DPDCH*: TrCH

                      *PICH*: PN9

                      *ChipARB*: PN9

                      *PRACH*: Mess Ctrl: 3 GPP STD, Mess Data: TrCH

## Date Format MDY DMY

**Supported**        All Models

This softkey is used to set the format of the display of the date.

MDY                Use this format to display the date as month-day-year.

DMY                Use this format to display the date as day-month-year.

## DAYLT

**Supported**        E4438C with Option 401

This field displays the current daylight saving time offset status for the CDMA2000 forward synchronization channel. To change the status, highlight the DAYLT field, press the **Edit Item** softkey and enter a new value.

**Preset**        00

**Range**        00 (off) or 01 (on)

## DC

**Supported**        All Models

Use this softkey to specify a dc level as the modulation waveform for the internally generated signal.

**Remarks**        This softkey is available after selecting the internal source to operate as a function generator.

## DCFM/DCΦM Cal

**Supported**        All Models

This softkey enables you to initiate a DCFM or a DCΦM calibration, depending upon which type of modulation is currently active. This calibration eliminates the offset in DCFM or DCΦM so that the carrier frequency remains the same with no modulation applied.

---

**NOTE**        If the calibration is performed with a dc signal applied, any deviation provided by the dc signal will be removed and the new zero reference point will be at the applied dc level. The calibration will have to be performed again when the dc signal is disconnected to reset the carrier signal to the correct zero reference.

---

**Remarks**        Use this calibration for externally applied signals. While the calibration can also be performed for internally generated signals, dc offset is not a normal characteristic for them.

## DCH 1–DCH6

**Supported**        E4438C with Option 400

These softkeys select the first transport channel to be the Eb (energy per bit) reference in the AWGN menu. When selected, the reference data rate is that of the physical transport channel DCH1–DCH6 respectively. The data rate for the channel appears in the *Ref Data Rate* field.

---

## DCS Base

**Supported**          All Models

This softkey selects DCS 1800 Base as the channel band for GSM. The output frequency depends on both the channel band and channel number selections.

**Preset**          *Channel*: 512

                *Frequency*: 1.805 GHz

**Range**          *Channels*: 512–885

                *Frequency*: 1.805–1.879 GHz

## DCS Mobile

**Supported**          All Models

This softkey selects DCS 1800 Mobile as the channel band for GSM. The output frequency depends on both the channel band and channel number selections.

**Preset**          *Channel*: 512

                *Frequency*: 1.710 GHz

**Range**          *Channels*: 512–885

                *Frequency*: 1.710–1.784 GHz

## DECT

This softkey appears in two different locations, to either select a predefined personality for a custom digital modulation format, or to access a menu from which you can configure a digital modulation.

### Selecting DECT for Custom Digital Modulations

**Supported**          E4438C with Option 001/601or 002/602

Use this softkey to select a predefined Digital European Cordless Telecommunications (DECT) personality for the current custom digital modulation format.

### Accessing the DECT Menu

**Supported**          E4438C with Option 402

Use this softkey to display a menu of softkeys where you can generate a data pattern formatted into either a framed structure (with the data bits in fields defined by the DECT protocol), or a sequence that can be output one or more times.

## DECT Off On

**Supported**       E4438C with Option 402

Use this softkey to set the operating state of the Digital European Cordless Telecommunications (DECT) communications format.

| | |
|---|---|
| Off | When you select Off, the DECT format is turned off. |
| On | When you select On, this sets up the internal hardware to generate the structure that follows the DECT format. The internal I/Q modulator generates GFSK digital modulation and the DECT and I/Q annunciators appear in the display. The RF carrier is modulated when you set **Mod On/Off** to On. |
| Preset | Off |
| Remarks | Setting the **DECT Off On** softkey to On presets the following softkeys in the I/Q and MUX menus: **I/Q Off On** softkey is set to On and the **Source 1** and **I/Q Out** softkeys are set to BBG 1. You can override these selections in the I/Q and MUX menus. |

## Dect Patterns

**Supported**       E4438C with Option 402

This softkey accesses a menu of Digital European Cordless Telecommunications (DECT)-specific data pattern selections. The following internally generated patterns are available:

- FDEV1_HS - (frequency deviation, half slot) 8 bits: repetitive pattern of 1, 0, 1, 0... followed by 32 ones, 32 zeroes, and 8 bits: repetitive pattern of 1, 0, 1, 0...

- FDEV1_FS - (frequency deviation, full slot) 128 bits: repetitive pattern of 1, 0, 1, 0... followed by 64 ones, 64 zeroes, and 64 bits: repetitive pattern of 1, 0, 1, 0...

  FDEV2_FS - (frequency deviation, full slot) 128 bits: repetitive pattern of 1, 0, 1, 0... followed by 64 ones, 64 zeroes, and 64 bits: repetitive pattern of 1, 0, 1, 0...

- FACCuracy - (frequency accuracy) repetitive pattern of 4 ones followed by 4 zeroes

- DM1 - All Models ones

- DM0 - All Models zeroes

## DECT Standard

**Supported**        All Models

This softkey selects a frequency band for DECT. The output frequency depends on both the frequency band and channel selection.

**Preset**        *Channel*: 9

             *Frequency*: 1.881 GHz

**Range**        *Channels*: 0–9

             *Frequency*: 1.897−1.881 GHz

## Dedicated Control

**Supported**        E4438C with Option 401

Use this softkey to insert a reverse link dedicated control channel into the current channel setup table.

## Default Message

**Supported**        E4438C with Option 401

This key selects the default message for the cdma2000 forward paging channel (F-PCH). When this key is selected, the word DEFAULT will appear in the Data field indicating that the default message is now ready to use.

## Default Gateway

**Supported**        All Models

Use this softkey to enter a gateway for LAN access to the signal generator from outside the current sub-network. The entry can remain empty which allows the signal generator to be accessed only by local hosts on the LAN.

**Remarks**        Your IT service can set up the default gateway.

## Define User Burst Shape

**Supported**        E4438C with Option 001/601or 002/602

Press this softkey to display a table editor where you can edit the rise and fall shapes of waveforms, and save them for later use. For more information on user burst shapes, see the *User's Guide*.

## Define User FIR

**Supported**　　　　E4438C with Option 001/601or 002/602

This softkey displays a table editor from which you can create and modify FIR filters. The FIR table editor allows a maximum filter length of 1024 coefficients, but the ESG hardware is limited to 64 symbols for real-time and 512 symbols for arbitrary waveform generation. The number of symbols equals the number of coefficients divided by the oversample ratio.

**Remarks**　　　　If you enter more than 64 symbols for real-time and 512 symbols for arbitrary waveform generation, the ESG cannot use the filter.

## Define User FSK

**Supported**　　　　E4438C with Option 001/601or 002/602

Use this softkey to display the FSK table editor, where you can define custom asymmetric (or symmetric) FSK modulation patterns. The FSK table editor enables you to define a frequency deviation and load a default symmetric FSK pattern (2-Lvl, 4-Lvl, 8-Lvl, 16-Lvl, or C4FM) or create a modulation pattern based on user-defined frequency values.

## Define User I/Q

**Supported**　　　　E4438C with Option 001/601or 002/602

Use this softkey to display the I/Q table editor, where you can directly define symbol positions. The I/Q table editor enables you to create custom constellation diagrams that you can save to an I/Q file catalog. For more information on mapping symbol positions with the I/Q table editor, see the *User's Guide*.

## Delay Setup

**Supported**　　　　E4438C with Option UN7

This softkey accesses a menu that enables you to select the configuration of the clock and gate delay parameters for BER measurements.

## Delayed Bits

**Supported**      E4438C with Option UN7

This softkey enables you to specify the number of bits to delay from the trigger event signal before starting the BER measurement.

**Preset**      0

**Range:**      0–65,535

**Remarks**      This softkey is enabled when the **Bit Delay Off On** softkey is set to On.

## Delete

**Supported**      E4438C with Option 001/601or 002/602

Use this softkey to access a menu from which you can select different methods of removing bits from the current bit file.

## Delete All Models NVWFM Files

**Supported**      E4438C with Option 001/601or 002/602

Use this softkey to delete all files of the currently displayed catalog type from the non-volatile waveform memory. Note that confirmation is required, by pressing **Confirm Delete**, before the segment will be deleted. This will delete all non-volatile marker (NVMKR) as well files

**Remarks**      To activate this key, the **Load Store** softkey on page 1 of this menu must be set to Load. Deletions cannot be recovered. If you want to cancel confirmation, press the **Return** hardkey.

## Delete All Models Regs in Seq [*n*]

**Supported**      All Models

This softkey enables you to delete the data saved in all of the registers of the selected sequence. Do not press this key until you have selected the correct sequence using the **Select Seq** key.

**Remarks**      You cannot recover data after this step. If you change your mind and do not wish to delete the data, press the **Return** hardkey

## Delete All Models Rows

**Supported**      E4438C with Option 001/601or 002/602

Use this softkey to delete all rows in the current table. The rows will not be deleted until you press the **Confirm Delete All Models Rows** softkey that appears. If you change your mind and do not want to delete the rows, press the **Return** hardkey instead of confirming the deletion.

## Delete All Models Sequences

**Supported**        All Models

This softkey enables you to delete all of the data in all saved registers of all sequences.

**Remarks**        You cannot recover data after this step. If you change your mind and do not wish to delete the data, press the **Return** hardkey.

## Delete All Models Waveforms

**Supported**        E4438C with Option 001/601or 002/602

Use this softkey to delete all waveforms from the sequence currently being edited. To save the changes, highlight the sequence and store.

**Remarks**        Deletions cannot be recovered. If you want to cancel confirmation, press the **Return** hardkey.

## Delete Bits

**Supported**        E4438C with Option 001/601or 002/602

Use this softkey to delete bits from the current bit file, including the currently highlighted bit and moving to the right. The number of bits is specified using the Number of Bits softkey.

## Delete File

**Supported**        All Models

This softkey enables you to delete a file in the catalog listing. Use the up and down arrow keys until the file you wish to delete is highlighted. Press **Delete File** and then press the **Confirm Delete** softkey. If you do not want to delete the file, press **Return** instead of **Confirm Delete**.

## Delete Row

**Supported**        All Models

This softkey enables you to delete a selected row in the list. Use the up and down arrow keys until any item is selected in the row you wish to delete. Press **Delete Row** and the entire row is deleted. If the last row in a list is deleted, it is replaced by the default value.

**Remarks**        You cannot recover data after this step. If you change your mind and do not wish to delete the row, press the **Return** hardkey.

## Delete Segment

**Supported**        E4438C with Option 001/601or 002/602

Use this softkey to delete the selected waveform segment in the displayed catalog. Note that confirmation is required, by pressing **Confirm Delete**, before the segment will be deleted.

**Remarks**        Deletions cannot be recovered. If you want to cancel confirmation, press the **Return** hardkey.

## Delete Selected Waveform

**Supported**        E4438C with Option 001/601or 002/602

Use this softkey to delete the highlighted waveform.

**Remarks**        Deletions cannot be recovered. If you want to cancel the delete process, press the **Return** hardkey.

## Delete Seq[*n*] Reg[*nn*]

**Supported**        All Models

Use this softkey to delete the contents of a specified register in a specified sequence, once you have selected the correct sequence and register using the **Select Seq** and **Select Reg** softkeys.

**Remarks**        You cannot recover the data after this step. If you change your mind and do not wish to delete the data, press the **Return** hardkey.

## Delete To Beginning

**Supported**        E4438C with Option 001/601or 002/602

Use this softkey to delete all bits to the beginning of the file, not including the currently highlighted bit.

## Delete To End

**Supported**        E4438C with Option 001/601or 002/602

Use this softkey to delete all bits to the end of the file, including the currently highlighted bit.

## Delete Waveform Sequence

**Supported**      E4438C with Option 001/601or 002/602

Use this softkey to delete the highlighted waveform sequence from the displayed catalog. Deletions cannot be recovered. Note that confirmation is required, by pressing **Confirm Delete**, before the sequence will be deleted.

**Remarks**      Deletions cannot be recovered. If you want to cancel confirmation, press the **Return** hardkey.

## Deselect All Models Items

**Supported**      All Models

Use this softkey to deselect all options in the list of hardware options. Selected options show an X in the column to the left of the option number. Deselected options have no X. Only those options that are selected can be enabled or calibrated.

## Deselect Item

**Supported**      All Models

Use this softkey to deselect the highlighted option from the list of hardware options. Selected options show an X in the column to the left of the option number. Deselected options have no X. Only those options that are selected can be enabled or calibrated.

## Device

**Supported**      E4438C with Option 003 or 004

This softkey, for the N5102A module, selects the external clock signal that is provided through the Device Interface connector as the clock source for the N5102A module. You must also set the interface module clock rate to match that of the external clock signal (see "Clock Rate" on page 100).

With this selection, the supplied clock is available as an output clock signal at the Clock Out and Device Interface connectors on the N5102A module.

| **CAUTION** | It is important that the signal generator, the interface module, and the DUT are locked to a common frequency reference. Failure to have a common frequency reference may result in a loss of data. For more information on using the N5102A to lock to a common frequency reference, see the *User's Guide*. |
|---|---|

## Device BTS MS

**Supported**      All Models

This softkey sets the frequency band type.

BTS              This mode selects the base transceiver station as the frequency band type.

MS              This mode selects mobile as the frequency band type

The selected mode will be displayed under the **Channel Band** softkey.

**Preset**          BTS

## Device Intfc

**Supported**      E4438C with Option 003 or 004

This softkey, selects a comprehensive loop back test that validates the delivery of digital data from the digital bus connector on the ESG to the Device Interface output connector on the N5102A module. This test requires the LOOP BACK TEST SINGLE ENDED IO DUAL 40 PIN board be connected to the interface module with no connections to the two 40 pin connectors.

Use this test to verify that the system is functioning properly after installation, or whenever the need arises. Running any loop back test turns off all active formats and the module. If this test fails, there are three other diagnostic tests that can help isolate the problem to the N5102A module, the digital bus cable, or the ESG For information on these tests, see the *User's Guide*.

## Diagnostics

**Supported**      E4438C with Option 003 or 004

This softkey, accesses a menu where you can select and run N5102A module loop back tests.

## Diagnostic Info

**Supported**      All Models

Use this softkey to access diagnostic information about the signal generator. Refer to Figure 0-3 for information on what is included in the display.

**Figure 0-3            Diagnostic Instrument Information**
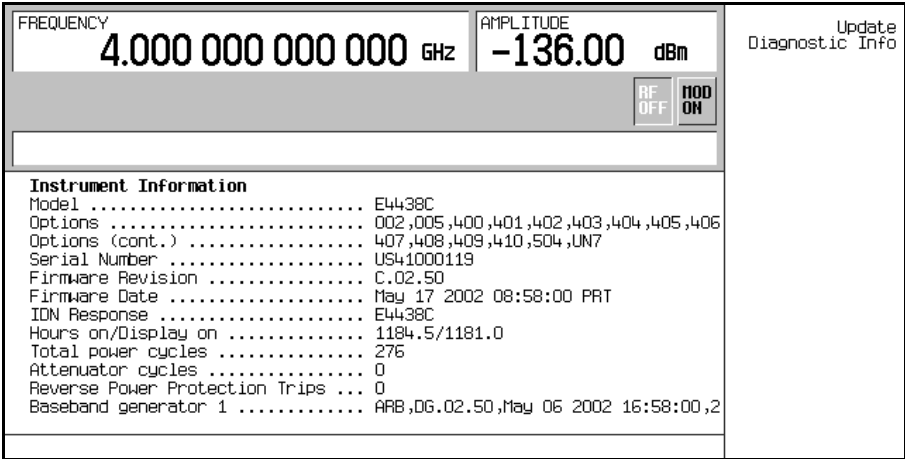


| | |
|---|---|
| Model | the model number of the signal generator |
| Options | a list of installed hardware and software options |
| Serial Number | the factory assigned serial number |
| Firmware Revision | the revision number for the signal generator's firmware |
| IDN Response | the characters returned after a remote *IDN query |
| Total hours on | the number of hours that the signal generator has been powered on |
| Total hours display has been on | the number of hours the display has been active (value does not include hours using the screen saver) |
| Total power cycles | the number of times the line power has been switched on |
| Attenuator cycles | the number of times the attenuator has been switched |
| Reverse Power Protection Trips | the number of times the reverse power protection circuit has been tripped. |

## Diff Data Encode Off On

**Supported**        E4438C with Option 001/601or 002/602

This softkey toggles the operational state of the signal generator's differential data encoding.

Off                  When the **Diff Data Encode Off On** softkey is set to Off, data bits are not encoded prior to modulation.

On                    When the **Diff Data Encode Off On** softkey is set to On, data bits are encoded prior to modulation. Differential encoding uses an exclusive-OR function to generate a modulated bit. Modulated bits will have a value of 1 if a data bit is different from the previous bit, or they will have a value of 0 if a data bit is the same as the previous bit.

For more information on differential data encoding, see the *User's Guide*.

**Preset**            Off

## Diff. Mode I Offset

**Supported**         E4438C

Use this softkey to enter a differential offset voltage for an in-phase signal that is routed to an external output connector. For example, if you enter a 200.0 mV offset value, the I output signal will have a 100.0 mV offset and the I-bar output signal will have a −100.0 mV offset.

**Preset**            0.000 V

**Range**             −3.000 to 3.000 V

## Diff. Mode Q Offset

**Supported**         E4438C

Use this softkey to enter a differential offset voltage for a quadrature-phase signal that is routed to an external output connector. For example, if you enter a 200.0 mV offset value, the Q output signal will have a 100.0 mV offset and the Q-bar output signal will have a −100.0 mV offset.

**Preset**            0.000 V

**Range**             −3.000 to 3.000 V

## Differential Encoding Off On

**Supported**         E4438C with Option 001/601or 002/602

Press this softkey to change the operational state of the user-defined differential encoding. For more information on differential encoding, see the *User's Guide*.

Off                   When differential encoding is set to Off, the user-defined differential encoding is disabled.

On                    When differential encoding is set to On, the user-defined differential encoding table is applied to the current user-defined modulation table.

**Remarks**           This setting is not affected by a preset or by a power cycle.

## Dig Bus Cable

**Supported**          E4438C with Option 003 or 004

This softkey, for the N5102A module, selects a loop back test that verifies the output capability from the ESG Digital Bus connector to the end of the digital bus cable. For more information, see the *User's Guide*.

## Digital Mod Define

**Supported**          E4438C with Option 001/601or 002/602

This softkey accesses a menu that enables you to set the symbol rate and assign a modulation type and filter for a custom digital modulation state. This menu also allows you to store the custom state to a file.

**Remarks**          This softkey is only available when the **Multicarrier Off On** softkey is toggled to Off.

## Digital Modulation Off On

**Supported**          E4438C with Option 001/601or 002/602

This softkey toggles the operating state of the arbitrary custom digital modulation generator.

Off          When the **Digital Modulation Off On** softkey is set to Off, the custom digital modulation generator is disabled.

On          When the **Digital Modulation Off On** softkey is set to On, the custom digital modulation generator builds a waveform that is specified by the user. You can create custom waveforms using predefined modulation types and filters.

**Preset**          Off

## Direction Input Output

**Supported**          E4438C with Option 003 or 004

This softkey, for the N5102A module, selects the direction of the data flow through the digital module. If you only have one of the options, the missing option selection greys out. (that is 003 **Output** active, 004 **Input** active, and 003 and 004 both active).

## Display

**Supported**        All Models

Use this softkey to access a menu for adjusting and testing the display functions. In this menu you can set up the screen saver, change the display brightness, and perform black and white pixel screen tests. In addition, inverse video can be selected and update in remote turned on or off.

## Display Markers

**Supported**        E4438C with Option 001/601or 002/602

Use this softkey to access a menu for viewing the selected waveform marker settings.

**Remarks**        The marker display shows the waveform marker information with up to 460 evenly spaced sample points, even when the sample point axis shows more than 460 points. To view desired marker and waveform information, you can adjust the display using the various zoom softkeys (see the "Z"section on page  511) and the **First Sample Point** softkey (see "First Sample Point" on page 207).

## Display Burst Shape

**Supported**        E4438C with Option 001/601or 002/602

Use this softkey to display a graph of the rise and fall burst shapes. For more information on burst shapes, see the *User's Guide*.

## Display Code Domain Power

**Supported**        E4438C with Option 400/401

This softkey displays a graphical representation of the code domain power. Power (in decibels) is represented on the y-axis and Walsh Code is represented on the x-axis.

The table represents the code domain power as a graph of the relationship between power in each channel (–40 to 0 dB) versus Walsh code (0 to highest code used in setup).

Total code domain power is displayed above the graph.

The following is an example of a Code Domain Power graph.
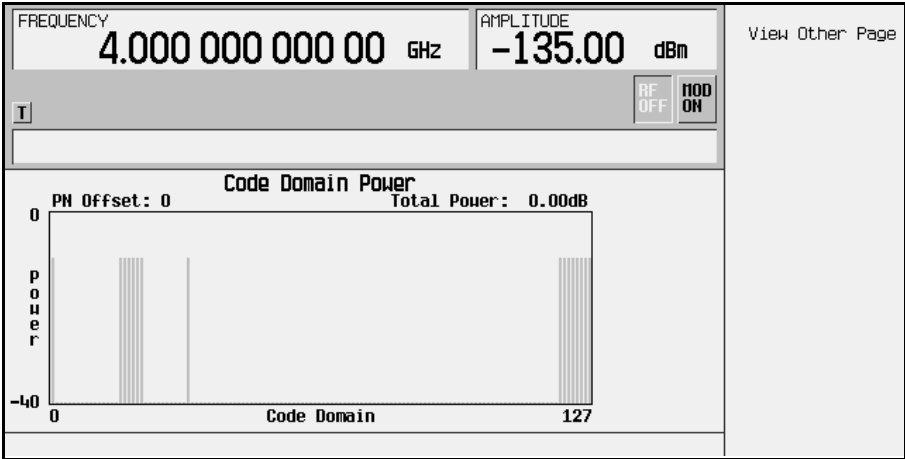


If more than one page exists, the **View Other Page** softkey will appear. You can use it to view subsequent pages. To return to the channel setup table editor, press **Return**.

**Remarks**     If there is channel data assigned to more than one PN offset, pressing the **Display Code Domain Power** softkey will open a menu where you can select **Previous PN Offset** or **Next PN Offset**.

## Display FFT

**Supported**     E4438C with Option 001/601or 002/602

Use this softkey to display a graphical representation of the filter frequency response (calculated using a fast Fourier transform). The following is an example of the frequency response of a root Nyquist filter with an oversample ratio of 4.
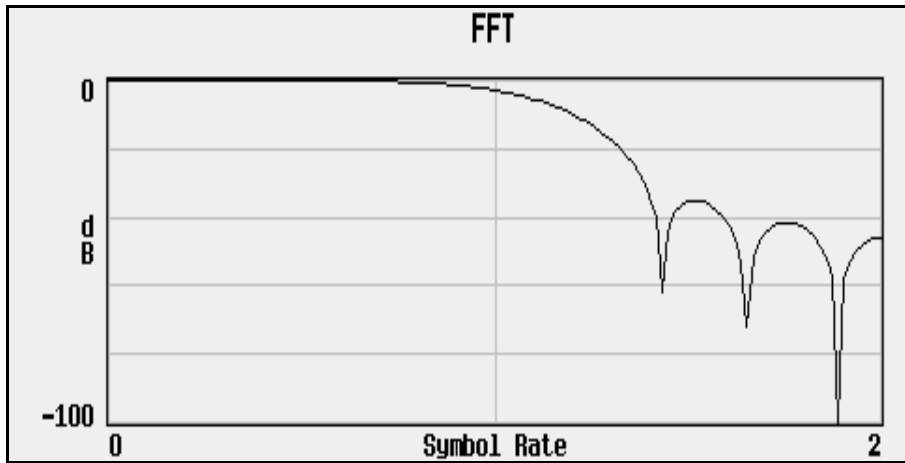
## Display Impulse Response

**Supported**　　　E4438C with Option 001/601or 002/602

Use this softkey to display a graphical representation of the filter impulse response in time. The following is an example of the impulse response of a root Nyquist filter with an oversample ratio of 4.
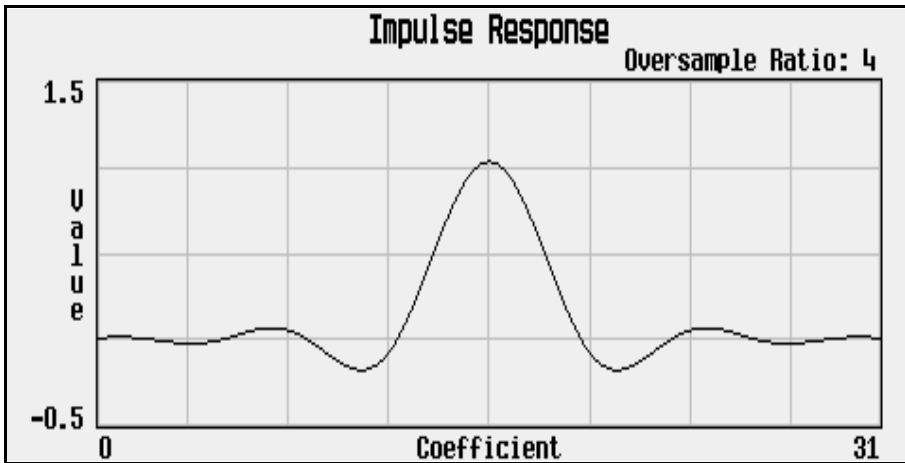
## Display I/Q Map

**Supported**          E4438C with Option 001/601or 002/602

Use this softkey to display an I/Q constellation map diagram of the current set of I/Q points. For more information on I/Q constellation map diagrams, see the *User's Guide*.

## DL Reference 1.1, 1.2, 2.1, 2.2

**Supported**          E4438C with Option 400

Use either **DL Reference 1.1**, **DL Reference 1.2**, **DL Reference 2.1**,or **DL Reference 2.2** to select a predefined compressed mode downlink reference parameter set. Reference parameter sets are defined in the 3GPP Standards.

## DM0

**Supported**          E4438C with Option 402

Use this softkey to select a binary data pattern that consists of all zeros. This internally generated data pattern is available for framed transmissions only. When **DM0** is selected, both the **B field** and the **Dect Patterns** softkeys show this selection, and DM0 appears in the B field, near the bottom of the text area of the display.

## DM1

**Supported**          E4438C with Option 402

Use this softkey to select a binary data pattern that consists of all ones. This internally generated data pattern is available for framed transmissions only. When **DM1** is selected, both the **B field** and the **Dect Patterns** softkeys show this selection, and DM1 appears in the B field, near the bottom of the text area of the display.

## DMOD

**Supported**          E4438C with Option 001/601or 002/602

Press this softkey to set the current catalog type to DMOD and display the catalog of DMOD files.

## Dn Custom Cont

**Supported**          E4438C with Option 402

Use this softkey to select a downlink continuous custom timeslot type for the active timeslot, which is configured using an internally generated data pattern, a downloaded sequence of bits stored in a user

 file, or by supplying external data. This timeslot is provided for flexibility; it is not a standard Trans European Trunked Radio (TETRA) timeslot. You cannot mix downlink and uplink timeslots.

If a timeslot is designated as uplink, it changes to downlink if any other timeslot is designated as downlink. The following table shows the change to a frame designated as uplink when you select either continuous downlink or discontinuous downlink.

| From Uplink Timeslot | To Continuous Downlink Timeslot | To Discontinuous Downlink Timeslot |
|---|---|---|
| Up Custom | Dn Custom Cont | Dn Custom Disc |
| Up Control 1 | Dn Custom Cont | Dn Custom Disc |
| Up Control 2 | Dn Custom Cont | Dn Custom Disc |

When you select **Dn Custom Cont** for a timeslot, the visual representation of the timeslot pattern updates.

## Dn Custom Disc

**Supported**          E4438C with Option 402

Use this softkey to select a downlink discontinuous custom timeslot type for the active timeslot, which is configured using an internally generated data pattern, a downloaded sequence of bits stored in a user file, or by supplying external data. This timeslot is provided for flexibility; it is not a standard Trans European Trunked Radio (TETRA) timeslot. You cannot mix downlink and uplink timeslots. If a timeslot is designated as uplink, it changes to downlink if any other timeslot is designated as downlink.

The following table shows the change to a frame designated as uplink when you select either continuous downlink or discontinuous downlink.

| From Uplink Timeslot | To Continuous Downlink Timeslot | To Discontinuous Downlink Timeslot |
|---|---|---|
| Up Custom | Dn Custom Cont | Dn Custom Disc |
| Up Control 1 | Dn Custom Cont | Dn Custom Disc |

| From Uplink Timeslot | To Continuous Downlink Timeslot | To Discontinuous Downlink Timeslot |
|---|---|---|
| Up Control 2 | Dn Custom Cont | Dn Custom Disc |
| Up Normal | Dn Normal Cont | Dn Normal Disc |

When you select **Dn Custom Disc** for a timeslot, the visual representation of the timeslot pattern updates.

## Dn Normal Cont

**Supported**        E4438C with Option 402

Use this softkey to select downlink continuous normal as the timeslot type for the active timeslot.

You cannot mix downlink and uplink timeslots. When a timeslot is designated as uplink, it changes to downlink if any other timeslot is designated as downlink. The following table shows the change to a frame designated as uplink when you select either continuous downlink or discontinuous downlink.

| From Uplink Timeslot | To Continuous Downlink Timeslot | To Discontinuous Downlink Timeslot |
|---|---|---|
| Up Custom | Dn Custom Cont | Dn Custom Disc |
| Up Control 1 | Dn Custom Cont | Dn Custom Disc |
| Up Control 2 | Dn Custom Cont | Dn Custom Disc |
| Up Normal | Dn Normal Cont | Dn Normal Disc |

When you select **Dn Normal Cont** for a timeslot, the visual representation of the timeslot pattern updates.

## Dn Normal Disc

**Supported**        E4438C with Option 402

Use this softkey to select downlink discontinuous normal as the timeslot type for the active timeslot.

You cannot mix downlink and uplink timeslots. If a timeslot is designated as uplink, it changes to downlink if any other timeslot is designated as downlink. The following table shows the change to a frame designated as uplink when you select either continuous downlink or discontinuous downlink.

| From Uplink Timeslot | To Continuous Downlink Timeslot | To Discontinuous Downlink Timeslot |
|---|---|---|
| Up Custom | Dn Custom Cont | Dn Custom Disc |
| Up Control 1 | Dn Custom Cont | Dn Custom Disc |

| From Uplink Timeslot | To Continuous Downlink Timeslot | To Discontinuous Downlink Timeslot |
|---|---|---|
| Up Control 2 | Dn Custom Cont | Dn Custom Disc |
| Up Normal | Dn Normal Cont | Dn Normal Disc |

When you select **Dn Normal Disc** for a timeslot, the visual representation of the timeslot pattern updates.

## Dn Sync Cont

**Supported**        E4438C with Option 402

Use this softkey to select downlink continuous synchronization as the timeslot type for the active timeslot.

You cannot mix downlink and uplink timeslots. When a timeslot is designated as uplink, it changes to downlink if any other timeslot is designated as downlink. The following table shows the change to a frame designated as uplink when you select either continuous downlink or discontinuous downlink.

| From Uplink Timeslot | To Continuous Downlink Timeslot | To Discontinuous Downlink Timeslot |
|---|---|---|
| Up Custom | Dn Custom Cont | Dn Custom Disc |
| Up Control 1 | Dn Custom Cont | Dn Custom Disc |
| Up Control 2 | Dn Custom Cont | Dn Custom Disc |
| Up Normal | Dn Normal Cont | Dn Normal Disc |

When you select **Dn Sync Cont** for a timeslot, the visual representation of the timeslot pattern updates.

## Dn Sync Disc

**Supported**        E4438C with Option 402

Use this softkey to select downlink discontinuous synchronization as the timeslot type for the active timeslot.

You cannot mix downlink and uplink timeslots. When a timeslot is designated as uplink, it changes to downlink if any other timeslot is designated as downlink. The following table shows the change to a

frame designated as uplink when you select either continuous downlink or discontinuous downlink.

| From Uplink Timeslot | To Continuous Downlink Timeslot | To Discontinuous Downlink Timeslot |
|---|---|---|
| Up Custom | Dn Custom Cont | Dn Custom Disc |
| Up Control 1 | Dn Custom Cont | Dn Custom Disc |
| Up Control 2 | Dn Custom Cont | Dn Custom Disc |
| Up Normal | Dn Normal Cont | Dn Normal Disc |

When you select **Dn Sync Disc** for a timeslot, the visual representation of the timeslot pattern updates.

## Do Cal

**Supported**       All Models

This softkey enables you to start a flatness calibration using the information from the user flatness list sweep table.

## Done

**Supported**       E4438C with Option 001/601or 002/602

This softkey is a terminator key. Press it to accept the current values that you are setting up.

## Done Inserting

**Supported**       E4438C with Option 001/601or 002/602

Use this softkey to exit the insertion mode and return to the edit menu.

## Do Power Search

**Supported**       All Models

Use this softkey to execute the power search calibration routine one time. Power search is an internal calibration routine used to achieve calibrated output power when the ALC is off. You can execute a power search at any time by pressing this softkey.

**Remarks**       The routine will execute only if RF is on and ALC is off.

## Doppler Shift

**Supported**        E4438C with Option 409

Use this softkey to compensate for the apparent change in the frequency of the GPS signal caused by the relative motion of the transmitter and receiver.

**Preset**        0.0 Hz

**Range**        −125 to 125 kHz

**Remarks**        The lower bound of the doppler shift is limited by the frequency set on the signal generator. For example, if the signal generator frequency is set to 100 kHz, then the lower limit of the doppler shift would be 0.00 Hz. The doppler shift cannot extend below the limitations of the signal generator.

## Down Custom

**Supported**        E4438C with Option 402

Use this softkey to select a downlink custom timeslot type for the active timeslot. A downlink custom timeslot is configured using an internally generated data pattern, a downloaded sequence of bits stored in a user file, or by supplying external data.

You cannot mix downlink and uplink timeslots. When a timeslot is designated as uplink, it changes to downlink if any other timeslot is designated as downlink.

When you have selected **Down Custom** for a timeslot, the visual representation of the timeslot pattern updates.

**Remarks**        The downlink custom timeslot is provided for flexibility; it is not a standard timeslot type.

## Down TCH

**Supported**        E4438C with Option 402

Use this softkey to select downlink traffic channel as the timeslot type for the active timeslot.

You cannot mix downlink and uplink timeslots. All Models traffic channels must be coupled to the same link at any one time.

When you select **Down TCH**, the frame pattern is output with continuous RF power. Power is on during off timeslots (according to the standard) and a continuous pattern of binary ones is sent during off timeslots.

When you select **Down TCH** for a timeslot, the visual representation of the timeslot pattern updates.

## Down TCH All Models

**Supported**        E4438C with Option 402

Use this softkey to select downlink traffic channel (base station to mobile) as the timeslot type for all timeslots. When you select **Down TCH All Models**, the frame pattern is output with continuous RF power. Power is on during off timeslots (according to the standard) and a continuous pattern of binary ones is sent during off timeslots. When all of the timeslots are off, RF power is off.

When you select **Down TCH All Models**, the visual representation of the timeslot pattern updates.

## Down/Up

**Supported**        E4438C with Option 400

This softkey is one of the selections available for setting the transport power control (TPC) pattern. The **Down/Up** softkey is used to repeatedly send *n* down commands followed by *n* up commands. The number of *n* down and up commands is defined in the TPC Pat Steps field of the DPCCH PhyCH Setup menu for uplink and DPCH PhyCH Setup menu for downlink.

## Downlink MCS-1

**Supported**        E4438C with Option 402

Use this softkey to access a selection of PN sequences that you can use as the downlink data for a packet data traffic channel that uses the packet data block type 5 modulation and coding scheme in accordance with the 3GPP standard GSM 05.03.

This packet data traffic channel is part of a multiframe structure with the following attributes:

- 52 frames

- frames 12 and 38 contain tail and control bits with the payload bits set to zero

- frames 25 and 51 are idle, and incorporate RF blanking

## Downlink MCS-5

**Supported**        E4438C with Option 402

Use this softkey to select a downlink packet data traffic channel with block type 9 that is in compliance with GSM 05.03. The MCS5 radio block contains a single RLC data block of 448 bits with a code rate of 0.37. This ensures that the maximum amount of Forward Error Correction (FEC) has been applied to the data.

This packet data traffic channel is part of a multiframe structure with the following attributes:

- 52 frames

- frames 12 and 38 contain tail and control bits with the payload bits set to zero

- frames 25 and 51 are idle, and incorporate RF blanking

## Downlink MCS-9

**Supported**        E4438C with Option 402

Use this softkey to select a downlink packet data traffic channel with block type 13 that is in compliance with GSM 05.03. The MCS9 radio block contains two RLC data blocks of 592 bits with a code rate of 1.0. No Forward Error Correction (FEC) has been applied to the data, thus reducing the overhead and enabling the fastest data rate transmission.

This packet data traffic channel is part of a multiframe structure with the following attributes:

- 52 frames

- frames 12 and 38 contain tail and control bits with the payload bits set to zero

- frames 25 and 51 are idle, and incorporate RF blanking

## DPCCH

### In the Arb W-CDMA Menu

**Supported**        E4438C with Option 400

This softkey selects a pre-defined setup to be built into a waveform. This selection is meant to be a one-button solution for quickly generating uplink signals. After you have made this selection the Edit Channel Setup menu will display the signal parameters.

### In the Real Time W-CDMA Menu

**Supported**        E4438C with Option 400

The DPCCH softkey, available in the uplink **DPCH AWGN Setup** mode, selects the dedicated physical control channel (DPCCH) as the Eb reference. Refer to "Eb/No Value" on page 176 for more information.

## DPCCH + 1 DPDCH

**Supported**        E4438C with Option 400

This softkey selects a pre-defined setup to be built into a waveform. This selection is meant to be a one-button solution for quickly generating uplink signals. After you have made this selection the Edit Channel Setup menu will display the signal parameters.

### DPCCH + 2 DPDCH

**Supported**        E4438C with Option 400

This softkey selects a pre-defined setup to be built into a waveform. This selection is meant to be a one-button solution for quickly generating uplink signals. After you have made this selection the Edit Channel Setup menu will display the signal parameters.

### DPCCH + 3 DPDCH

**Supported**        E4438C with Option 400

This softkey selects a pre-defined setup to be built into a waveform. This selection is meant to be a one-button solution for quickly generating uplink signals. After you have made this selection the Edit Channel Setup menu will display the signal parameters.

### DPCCH + 4 DPDCH

**Supported**        E4438C with Option 400

This softkey selects a pre-defined setup to be built into a waveform. This selection is meant to be a one-button solution for quickly generating uplink signals. After you have made this selection the Edit Channel Setup menu will display the signal parameters.

### DPCCH + 5 DPDCH

**Supported**        E4438C with Option 400

This softkey selects a pre-defined setup to be built into a waveform. This selection is meant to be a one-button solution for quickly generating uplink signals. After you have made this selection the Edit Channel Setup menu will display the signal parameters.

### DPCCH Channel Code

**Supported**        E4438C with Option 400

This field displays the value of the channel code. This code is an orthogonal variable spreading factor code (OVSF). The range of code numbers is dependent on and coupled to the slot format and symbol rate. To edit this field press the, **DPCH Code Setup** softkey, press the **DPCH DPCCH DPDCH** softkey until **DPCCH** is highlighted. Highlight the Channel Code field, press the **Edit Item** softkey and change the value using the table below.

**Preset**        0

**Range**          0 to 255 depending on the physical channel. Refer to Table 0-4.

**Table 0-4**

| Slot Format | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Symbol Rate (ksps) | 15 | 30 | 60 | 120 | 240 | 480 | 960 |
| Max Ch Code | 255 | 127 | 63 | 31 | 15 | 7 | 3 |

**Remarks**        The signal generator indicates slot format and channel code conflicts using the error messages area of the display. If the slot format is not compatible with the channel code, the "error -221 Settings Conflict" message is displayed. If the channel code number is incompatible with the slot format, the "value clipped to upper limit" is displayed.

## DPCCH Pilot data-clk (DRPS23)

**Supported**      E4438C with Option 400

This softkey assigns the dedicated physical control channel (DPCCH) pilot data clock to the selected rear panel output port. You can assign a signal to an output port by highlighting the desired row in the table editor and selecting the desired signal from the softkey menu.

**Remarks**        The **(DRPS23)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

## DPCCH Power

**Supported**      E4438C with Option 400

This field is display in two locations: the first location is the default summary screen for the dedicated physical channel (DPCH). No edits can be made from this screen location. The second location is under the **DPCH Power Setup** softkey where the (DPCCH) power is set. To edit, highlight the DPCCH Power field, press the **Edit Item** softkey and enter a new value.

**Preset**         -2.69000000E+000

## DPCCH Raw Data (RPS4)

**Supported**      E4438C with Option 400

This softkey assigns dedicated physical control channel raw data to the selected rear panel AUX I/O output connector.

**Remarks**       The DPCCH raw data can be assigned to several different output connectors. The **(RPS4)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

## DPCCH Raw Data Clock (RPS5)

**Supported**       E4438C with Option 400

This softkey assigns a dedicated physical control channel raw data clock to the selected rear panel AUX I/O output connector.

**Remarks**       The DPCCH raw data clock can be assigned to several different output connectors. The **(RPS5)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

## DPCCH Slot Format

**Supported**       E4438C with Option 400

This field displays the slot format used for the dedicated physical channel. Slot formats are coupled with the channel code and symbol rate. The 3GPP Technical Specification (TS) 25.211 describes the six slot formats for DPCCH.

**Preset**       Uplink: 0

**Range**       Uplink: 0–5 Refer to Table 0-5.

**Table 0-5**

| Slot Format | 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Symbol Rate (ksps) | 15 | 15 | 15 | 15 | 15 | 15 |
| Max Ch Code | 255 | 255 | 255 | 255 | 255 | 255 |
| Pilot Bits/Slot | 6 | 8 | 5 | 7 | 6 | 5 |
| TFCI Bits/Slot | 2 | 0 | 2 | 0 | 0 | 2 |
| FBI Bits/Slot | 0 | 0 | 1 | 1 | 2 | 2 |
| TPC Bits/Slot | 2 | 2 | 2 | 2 | 2 | 1 |

## DPCCH TFCI data-clk (DRPS22)

**Supported**        E4438C with Option 400

This softkey assigns the dedicated physical control channel (DPCCH) transmit format combination indicator (TFCI) data clock to the selected rear panel output port. You can assign a signal to an output port by highlighting the desired row in the table editor and selecting the desired signal from the softkey menu.

**Remarks**        The **(DRPS22)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

## DPCCH TPC data-clk (DRPS21)

**Supported**        E4438C with Option 400

This softkey assigns the dedicated physical control channel (DPCCH) transmit power control (TPC) data clock to the selected rear panel output port. You can assign a signal to an output port by highlighting the desired row in the table editor and selecting the desired signal from the softkey menu.

**Remarks**        The **(DRPS21)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

## DPCH

**Supported**        E4438C with Option 400

### In Real Time W-CDMA Downlink

This softkey inserts a dedicated physical channel (DPCH) into the downlink Edit Channel Setup table editor.

**Remarks**        A DPCH is the default channel setup and is selected when the signal generator is powered on or after a preset.

### In Real Time W-CDMA Uplink

This softkey selects a dedicated physical channel (DPCH) as the uplink channel type.

## DPCH DPCCH DPDCH

**Supported**        E4438C with Option 400

This softkey (found under the **DPCH Code Setup** softkey) selects the dedicated physical control channel (DPCCH) or the dedicated physical data channel (DPDCH) to be configured.

**Preset**        DPCCH

### DPCH 1

**Supported**         E4438C with Options 400, 403

This softkey, in the downlink additive white gaussian noise (AWGN) channel, selects the first DPCH channel as the Ec reference.

### DPCH1 DTX-Gate Trigger Polarity Neg Pos

**Supported**         E4438C with Option 400

This softkey allows you to select the polarity of the discontinuous transmission (DTX) trigger for out-of-synchronization testing. There are two choices for trigger polarity.

| | |
|---|---|
| Neg | The DTX period begins on a negative trigger transition and lasts as long as the trigger signal is in a low state. |
| Pos | The DTX period begins on a positive trigger transition and lasts as long as the trigger signal is in a high state. |

### DPCH 2

**Supported**         E4438C with Options 400, 403

This softkey, in the downlink additive white gaussian noise (AWGN) channel, selects the second DPCH channel as the Ec reference.

### DPCH 10ms Frame-Pulse (DRPS26)

**Supported**         E4438C with Option 400

This softkey assigns the DPCH 10 millisecond frame pulse to the selected rear panel output port. You can assign a signal to an output port by highlighting the desired row in the table editor and selecting the desired signal from the softkey menu.

**Remarks**         The **(DRPS26)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

### DPCH AGWN Setup

**Supported**         E4438C with Option 400

This softkey selects a dedicated physical channel (DPCH) additive white gaussian noise (AGWN) setup configuration screen.

## DPCH Channel Balance

**Supported**        E4438C with Option 400

This softkey allows real-time power control of the DPCH and orthogonal channel noise stimulator (OCNS) power levels. The power of all the active OCNS channels are raised or lowered to maintain the 0 dB output power, relative to the set carrier amplitude, as the DPCH1 power is varied in real-time.

**Remarks**        When selected, the table editor will display the DPCH1and OCNS powers. This softkey is active only when the OCNS and DPCH are both active.

## DPCH ChipARB FramePulse (DRPS40)

**Supported**        E4438C with Option 400

This softkey assigns the DPCH chip ARB frame pulse data to the selected rear panel output port. You can assign a signal to an output port by highlighting the desired row in the table editor and selecting the desired signal from the softkey menu.

**Remarks**        The **(DRPS40)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

## DPCH Code Setup

**Supported**        E4438C with Option 400

This softkey accesses a dedicated physical control channel (DPCCH) and dedicated physical data channel (DPDCH) code setup configuration screen.

## DPCH Compressed Frame Indicator (DRPS32)

**Supported**        E4438C with Option 400

This softkey assigns the DPCH compressed frame indicator signal to the selected rear panel output port. You can assign a signal to an output port by highlighting the desired row in the table editor and selecting the desired signal from the softkey menu.

**Remarks**        The **(DRPS32)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

## DPCH data-clk (DRPS28)

**Supported**        E4438C with Option 400

This softkey assigns the DPCH data clock to the selected rear panel output port. You can assign a signal to an output port by highlighting the desired row in the table editor and selecting the desired signal from the softkey menu.

**Remarks**   The **(DRPS28)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

## DPCH data stream (DRPS24)

**Supported**   E4438C with Option 400

This softkey assigns the DPCH data stream to the selected rear panel output port. You can assign a signal to an output port by highlighting the desired row in the table editor and selecting the desired signal from the softkey menu.

**Remarks**   The **(DRPS24)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

## DPCH Gap Indicator (DRPS33)

**Supported**   E4438C with Option 400

This softkey assigns the DPCH gap indicator signal to the selected rear panel output port. You can assign a signal to an output port by highlighting the desired row in the table editor and selecting the desired signal from the softkey menu.

**Remarks**   The **(DRPS33)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

## DPCH Input Signal Setup

**Supported**   E4438C with Option 400

This softkey is one of the menu selections from the **DPCH Rear Panel Setup** menu. When selected, the input rear panel signal routing for the uplink DPCH is displayed.

## DPCH Output Signal Setup

**Supported**   E4438C with Option 400

This softkey is one of the menu selections from the **DPCH Rear Panel Setup** menu. When selected, the output rear panel signal routing for the uplink DPCH is displayed.

## DPCH Rear Panel Setup

**Supported**   E4438C with Option 400

This softkey accesses a menu of two softkeys from which you can view or configure the rear panel signal connections, routing and signal types.

**Remarks**   Available for uplink only.

### DPCH Power Setup

**Supported**      E4438C with Option 400

This softkey accesses a configuration screen for the dedicated physical control channel (DPCCH) and dedicated physical data channel (DPDCH) power setup.

### DPCH TimeSlot pulse (DRPS25)

**Supported**      E4438C with Option 400

This softkey assigns the DPCH timeslot pulse to the selected rear panel output port. You can assign a signal to an output port by highlighting the desired row in the table editor and selecting the desired signal from the softkey menu.

**Remarks**      The **(DRPS25)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

### DPCH TPC-Bit Out (DRPS41)

**Supported**      E4438C with Option 400

This softkey assigns the DPCH transmit power control (TPC) bits to the selected rear panel output port. You can assign a signal to an output port by highlighting the desired row in the table editor and selecting the desired signal from the softkey menu.

**Remarks**      The **(DRPS41)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

### DPCH Trigger Setup

**Supported**      E4438C with Option 400

This softkey accesses a menu of uplink synchronization formats that can be applied to the active channel. The synchronization selections are chip and timeslot offsets, system frame number (SFN), and connection frame number (CFN).

### DPDCH

**Supported**      E4438C with Option 400

The DPDCH softkey, available in the uplink **DPCH AWGN Setup** mode (highlight the Eb Ref field and press Edit Item), selects the dedicated physical data channel (DPDCH) as the Eb reference. Refer to "Eb/No Value" on page 176 for more information.

**Remarks**      This channel selection is not available if PRACH is selected for physical channel type.

## DPDCH Channel Code

**Supported**        E4438C with Option 400

This field displays the value of the channel code. This code is an orthogonal variable spreading factor code (OVSF). The range of code numbers is dependent on and coupled to the slot format and symbol rate. To edit this field press the **DPCH Code Setup** softkey, press the **DPCH DPCCH DPDCH** softkey until **DPDCH** is highlighted. Highlight the Channel Code field, press the **Edit Item** softkey and change the value using the table below.

**Preset**          16

**Range**           0 to 255 depending on the physical channel. Refer to Table 0-6.

**Table 0-6**

| Slot Format | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Symbol Rate (ksps) | 15 | 30 | 60 | 120 | 240 | 480 | 960 |
| Max Ch Code | 255 | 127 | 63 | 31 | 15 | 7 | 3 |

**Remarks**         The signal generator indicates slot format and channel code conflicts using the error messages area of the display. If the slot format is not compatible with the channel code, the "error -221 Settings Conflict" message is displayed. If the channel code number is incompatible with the slot format, the "value clipped to upper limit" is displayed.

## DPDCH data-clk withDTX (DRPS20)

**Supported**        E4438C with Option 400

This softkey assigns the dedicated physical data channel (DPDCH) data clock to the selected rear panel output port, with discontinuous transmission (DTX) functionality. You can assign a signal to an output port by highlighting the desired row in the table editor and selecting the desired signal from the softkey menu.

**Remarks**         The **(DRPS20)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

## DPDCH data-clk withoutDTX (DRPS30)

**Supported**        E4438C with Option 400

This softkey assigns the dedicated physical data channel (DPDCH) data clock to the selected rear panel output port, without discontinuous transmission (DTX) functionality. You can assign a signal to an output port by highlighting the desired row in the table editor and selecting the desired signal from the softkey menu.

**Remarks**        The **(DRPS30)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

## DPDCH Power

**Supported**        E4438C with Option 400

This field is display in two locations: the first location is the default summary screen for the dedicated physical channel (DPCH). No edits can be made from this screen location. The second location is under the **DPCH Power Setup** softkey where the DPDCH power is set. To edit, highlight the DPDCH Power field, press the **Edit Item** softkey and enter a new value.

**Preset**        -2.69000000E+000

## DPDCH Raw Data (RPS2)

**Supported**        E4438C with Option 400

This softkey assigns dedicated physical data channel (DPDCH) raw data to the selected rear panel AUX I/O output connector.

**Remarks**        The DPDCH raw data can be assigned to several different output connectors. The **(RPS2)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

## DPDCH Raw Data Clock (RPS3)

**Supported**        E4438C with Option 400

This softkey assigns a dedicated physical data channel (DPDCH) raw data clock to the selected rear panel AUX I/O output connector.

**Remarks**        The DPDCH raw data clock can be assigned to several different output connectors. The **(RPS3)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

## DPDCH Slot Format

**Supported**        E4438C with Option 400

This field displays the slot format used for the dedicated physical channel. Slot formats are coupled with the channel code and symbol rate. The 7 slot formats for DPDCH are described in the 3GPP Technical Specification (TS 25.211).

**Preset**        Uplink: 2

**Range**        Uplink: 0–6 Refer to Table 0-7.

**Table 0-7**

| Slot Format | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Symbol Rate (ksps) | 15 | 30 | 60 | 120 | 240 | 480 | 960 |
| Max Ch Code | 255 | 127 | 63 | 31 | 15 | 7 | 3 |

## Drift Deviation

**Supported**        E4438C with Option 406

This softkey enables you to set the maximum deviation of the frequency drift for linear carrier frequency ramping or sinusoidal drift of the carrier frequency.

**Preset**        0.0 Hz

**Range**        −100.0 kHz to 100.0 kHz

## Dual ARB

**Supported**        E4438C with Option 001/601or 002/602

This softkey accesses a menu of choices for generating data patterns using the dual arbitrary waveform generator. Within these menus, you will be able to select and/or modify the waveform, waveform segments, waveform sequences, as well as the waveform generator's sample clock rate, internal/external reference (and with an external reference, the reference frequency) and an I/Q modulation filter.

## Dual-Sine

**Supported**        All Models

Use this softkey to select dual sine waves as the modulation for the signal. This softkey will access a menu of choices enabling you to set parameters for the dual-sine amplitude modulation waveform. You can set the rates for two separate tones according to the modulation type.

**Remarks**        In the LF Out menu, this softkey is available after selecting the internal source to operate as a function generator.

## Dummy

**Supported**        E4438C with Option 402

Use this softkey to select dummy as the timeslot type for the active timeslot. The dummy burst is used as filler information for unused timeslots on the forward link.

When you select **Dummy** for a timeslot, the visual representation of the timeslot pattern updates.

## Dummy Bearer 1

**Supported**        E4438C with Option 402

Use this softkey to select dummy bearer 1 as the timeslot type for the active timeslot. When you have selected **Dummy Bearer 1** for a timeslot, the visual representation of the timeslot type on the display updates.

## Dummy Bearer 2

**Supported**        E4438C with Option 402

Use this softkey to select dummy bearer 2 as the timeslot type for the active timeslot. When you have selected **Dummy Bearer 2** for a timeslot, the visual representation of the timeslot type on the display updates.

## DWCDMA

**Supported**        E4438C

Press this softkey to set the current catalog type to DWCDMA and display the catalog of DWCDMA files.

## Dwell Type List Step

**Supported**         All Models

This softkey selects the source data which defines the dwell times for the current sweep.

List          Choose List to sweep with dwell times that you have defined in the list sweep.

Step          Choose Step to sweep each point in the list with a dwell time set by the **Step Dwell** softkey in the Configure Step Sweep menu.

**Preset**        List

**Remarks**       When you are sweeping using the step sweep dwell time, the list sweep dwell time values are grayed out to indicate that they are not being used.

## `Dwell`

**Supported**         All Models

This field enables you to set the dwell time for a list sweep in the List Modes Values table editor.

# E

## E

**Supported**        E4438C with Option 402

Use this softkey to access a menu of data generation choices for configuring the EDGE or GSM timeslot encryption bit fields:

- Internal data (PN9, PN15, fixed, 4-bit repeating sequences, set patterns of ones and zeroes)

- Your own data (download a binary file, or input data using the DATA input connector)

- Multiframe structure using a choice of coding schemes

The data selection appears on the ESG display in the E field.

**Preset**        PN9

## E Ref

**Supported**        E4438C with Options 400, 403

This field displays the reference used for determining the Eb or Ec reference. This reference is used for specifying the bit rate of the physical transport channel. The reference can be the Preamble, Msg Ctrl, Msg Data, or RACH TrCH. These channels are choices from the Edit Item menu.

**Preset**        RACH TrCH

## E4416A

**Supported**        All Models

This softkey enables you to select an Agilent E4416A power meter to perform the automated user flatness correction process.

## E4417A

**Supported**        All Models

This softkey enables you to select an Agilent E4417A power meter to perform the automated user flatness correction process.

### E4418B

**Supported**       All Models

This softkey enables you to select an Agilent E4418B power meter to perform the automated user flatness correction process.

### E4419B

**Supported**       All Models

This softkey enables you to select an Agilent E4419B power meter to perform the automated user flatness correction process.

### EbNo

**Supported**       E4438C with Options 400, 403 401, 403

This field displays the energy per bit to noise power (EbNo) density ratio for the current forward or reverse link CDMA2000 channel. To change the EbNo ratio, highlight the EbNo field, press the **Edit Item** softkey and enter a new value.

**Preset**       0.00

**Range**       $min\ EbNo: 10\log_{10}\left(\dfrac{\text{Chip Rate}}{1000(\text{Bit Rate})}\right) + \text{Normalized Power}$

$max\ EbNo: 10\log_{10}\left(\dfrac{1000(\text{Chip Rate})}{\text{Bit Rate}}\right) + \text{Normalized Power}$

Where Normalized Power is the channel amplitude after adjusting the code domain power to 0 dB. Refer "Adjust Code Domain Power" on page 38.

For the forward fundamental channel:

$min\ EbNo: 10\log_{10}\left[\dfrac{\text{Chip Rate}}{1000(\text{Bit Rate})}\right] + \text{Normalized Power} + \text{RCFactor}$

$max\ EbNo: 10\log_{10}\left[\dfrac{1000(\text{Chip Rate})}{\text{Bit Rate}}\right] + \text{Normalized Power} + \text{RCFactor}$

RCFactor is dependent on the selected radio configuration.

The following table shows the RCFactor by radio configuration.

| RC | RCFactor |
|----|----------|
| 1 | $10\log_{10}\left[\dfrac{1}{2}\left(\dfrac{11}{11 + \dfrac{9600}{\text{Bit Rate}}}\right)\right]$ |
| 2 | $10\log_{10}\left[\dfrac{1}{2}\left(\dfrac{23}{23 + \dfrac{14400}{\text{Bit Rate}}}\right)\right]$ |
| 3, 4 | $10\log_{10}\left[\dfrac{11}{11 + \dfrac{9600}{\text{Bit Rate}}}\right]$ |
| 5 | $10\log_{10}\left[\dfrac{11}{11 + \dfrac{14400}{\text{Bit Rate}}}\right]$ |

**Remarks**          This setting is available for all channels except the pilot channel.

Noise must be turned on for this setting to be active.

## Eb/No Value

**Supported**          E4438C with Options 400, 403

This field displays the ratio of energy per bit to noise power density for the channel selected as the reference for the additive white gaussian noise (AWGN) channel. The Eb value is defined as the carrier power divided by bit rate. The No value is noise power divided by the bandwidth (3.84 MHz).

**Preset**          *Uplink*: 6.97971394 dB

*Uplink (PRACH)*: 4.10 dB

**Range**          –5.02 to 54.98 dB (when Eb Ref is DCH1 and the data rate is 12.2 ksps)

**Remarks**          This field appears in uplink only.

## Eb Ref

**Supported**        E4438C with Option 400

This field displays the reference used for determining the energy per bit reference. This reference is used for specifying the bit rate of the physical transport channel. To change the field selection, highlight the Eb Ref field, press the **Edit Item** softkey and make a choice from the menu that appears.

**Preset**        DCH1

**Remarks**        This field appears in uplink only.

## EcNo

**Supported**        E4438C with Options 400, 403 401, 403

This field displays the energy per chip to noise power (EcNo) density ratio for the forward or reverse link CDMA2000 pilot channel. To change the EcNo ratio, highlight the EcNo field, press the **Edit Item** softkey and enter a new value.

**Preset**        0.00

**Range**        *min EcNo*: –30 + Normalized Power

*max EcNo*: 30 + Normalized Power

Where Normalized Power is the channel amplitude after adjusting the code domain power to 0 dB. Refer "Adjust Code Domain Power" on page 38.

**Remarks**        This setting is available only for the pilot channel.

Noise must be turned on for this setting to be active.

## Ec/No value

**Supported**        E4438C with Options 400, 403

This field displays the ratio of the energy per chip to noise power for the channel selected as the reference for the additive white gaussian noise (AWGN) channel. Any one of several channels can be selected for the Ec reference.

**Preset**        –7.28 dB

**Range**        –5.00 to 20 dB

## Ec/No Value

**Supported**          E4438C with Options 400, 403

This field displays the ratio of energy per chip to noise power density for the channel selected as the reference for the additive white gaussian noise (AWGN) channel.

**Preset**             –20.50 dB

**Range**              –30.00 to 30.00 dB

**Remarks**            This field appears in uplink only and can only be edited if Preamble is selected in E Ref.

## Ec Ref

**Supported**          E4438C with Option 400

This field displays the reference used for determining the energy per chip reference power value displayed in the `Ec Ref Pow` field. To change the field selection, highlight the `Ec Ref` field, press the **Edit Item** softkey and make a choice from the menu that appears.

**Preset**             DPCH1

**Remarks**            This field appears in downlink only.

## Ec Ref Power

**Supported**          E4438C with Option 400

This field displays the channel power of the channel selected as the Ec reference. Any one of several channels can be selected for the Ec reference.

**Preset**             –10.20 dB

**Remarks**            This field appears in downlink only.

The power of the channel selected as the Ec reference is the only parameter that affects the overall C/N ratio since the chip rate is constant and equals the system bandwidth (3.84 MHz).

## EDGE

This softkey appears in three different locations, enabling you to select a predefined personality for a custom digital modulation format, access a menu from which you can configure a digital modulation, or select a pre-modulation filter.

**Selecting EDGE for Custom Digital Modulations**

**Supported**         E4438C with Option 001/601or 002/602

This softkey selects a predefined Enhanced Data Rates for GSM Evolution (EDGE) personality for the custom digital modulation format. Selecting EDGE automatically configures the format with an EDGE filter and digital modulation type.

**Remarks**         The EDGE filter and digital modulation type are preset with the EDGE personality.

**Accessing the EDGE Menu**

**Supported**         E4438C with Option 402

Use this softkey to display a menu of softkeys where you can generate a data pattern formatted into either a framed structure (with the data bits in fields defined by the EDGE protocol), or a sequence that can be output one or more times.

**Selecting the EDGE Filter**

Use this softkey in the Select (modulation type) menu to enable $3\pi/8$ rotating 8PSK modulation. EDGE modulation transmits data at the rate of 3 bits per symbol. EDGE modulation is the default selection as specified by the Enhanced Data Rates for GSM Evolution (EDGE) format.

**Remarks**         The EDGE filter is the default selection as specified by the EDGE format.

## EDGE (Rev 8.9.0 Release 1999)

**Supported**         E4438C with Option 402

This softkey accesses menus for utilizing the Enhanced Data Rates for GSM Evolution (EDGE) format that provide capabilities for customizing the modulation, filter, burst shape, and other attributes of the protocol.

## EDGE BERT Off On

**Supported**         E4438C with Option 300

This softkey toggles the operating state of the EDGE bit error rate test function.

Off         This choice will turn off any current EDGE BER measurements.

On         This choice will initiate synchronization to the base transceiver station (BTS) under test.

**Preset**:         Off

| Remarks | The following message appears if the amplitude level is incorrect when you toggle EDGE BERT on: |
|---|---|
|  | 522 "Demodulator Unleveled; Input amplitude underrange." |

## EDGE Off On

| Supported | E4438C with Option 402 |
|---|---|

Use this softkey to set the operating state of the Enhanced Data Rates for GSM Evolution (EDGE) format.

| Off | When you select Off, the EDGE format is turned off. |
|---|---|
| On | When you select On, this sets up the internal hardware to generate a signal that follows the EDGE format. The internal I/Q modulator generates 3π/8 rotating 8PSK digital modulation and the EDGE and I/Q annunciators are turned on in the display. Although the digital modulation is enabled with this softkey, the RF carrier is modulated by the enabled modulation only when you have also set **Mod On/Off** to On. |
| **Preset**: | Off |
| Remarks | Setting the **EDGE Off On** softkey to On presets the following softkeys in the I/Q and MUX menus: **I/Q Off On** softkey is set to On. and **Source 1** and **I/Q Out** softkeys are set to BBG 1. You can override these selections in the I/Q and MUX menus. |

## Edit Channel Setup

| Supported | E4438C with Option 400/401 |
|---|---|

This key accesses a table editor that enables you to define the channel parameters of the current IS-95A, CDMA2000, or W-CDMA signal.

Use the front-panel knob or the arrow keys to move the cursor within the table structure, and the numeric keypad to change values contained in the table.

| Remarks | You can move quickly through a large table using the keys found beneath the **Goto Row** softkey. |
|---|---|

## Edit Comment In Seq[*n*] Reg[*nn*]

**Supported**          All Models

This softkey enables you to edit an existing comment that is associated with a register in use. The register number is listed in the text area of the display and the comment is shown immediately following the register.

**Remarks**          This softkey appears only after a comment has been added to a register.

The comment line is limited to 55 alpha-numeric and special characters.

## Edit Description

**Supported**          E4438C with Option 001/601or 002/602

Use this softkey to access a menu from which you can create and edit text in the header description field for the currently displayed header. The maximum length of the header description field is 32 characters.

For this softkey to be active, the modulation format must be enabled and the file being displayed must be the active file.

## Edit Fall Shape

**Supported**          E4438C with Option 001/601or 002/602

Use this softkey to make the Fall Shape Editor the active function when editing a burst shape. For more information on editing burst shapes, see the *User's Guide*.

Note that this softkey is available when the Rise Shape Editor is the active function; when the Fall Shape Editor is the active function, this softkey toggles to **Edit Rise Shape**.

## Edit File

**Supported**          E4438C with Option 001/601or 002/602

Use this softkey to begin editing the selected file. You can edit bits individually, or select from a menu of editing tools. Binary files are automatically converted to bit files for editing.

**Remarks**          There is no undo capability. Bit files are saved after every modification.

## Edit Item

**Supported**          All Models

This softkey allows you to edit the currently highlighted field entry in any editor table. Once the edit has been made, the field will be updated with the selection.

### Edit Repetitions

**Supported**      E4438C with Option 001/601or 002/602

This softkey enables you to edit the number of repetitions of the highlighted sequence. Use the arrow keys, knob, or numeric keypad to enter the number of repetitions.

### Edit Rise Shape

**Supported**      E4438C with Option 001/601or 002/602

Use this softkey to make the Rise Shape Editor the active function when editing a burst shape. For more information on editing burst shapes, see the *User's Guide*.

Note that this softkey is available when the Fall Shape Editor is the active function; when the Rise Shape Editor is the active function, this softkey toggles to **Edit Fall Shape**.

### Edit Selected Waveform Sequence

**Supported**      E4438C with Option 001/601or 002/602

This softkey accesses a menu that enables you to edit the selected waveform sequence.

### Editing Keys

**Supported**      All Models

Use this softkey to access a menu from which you can create and edit text. In this menu you can delete the existing text in the active entry area, and you can toggle the editing mode from inserting text to replacing text.

### Editing Mode Insert Replace

**Supported**      All Models

Use this softkey to toggle the editing mode between insert and replace modes.

| | |
|---|---|
| Insert | Insertion mode causes text to be added directly to the left of the character that is highlighted by the cursor. |
| Replace | Replacement mode causes text to be entered in the position held by the cursor, overwriting any existing text in that position. |
| **Preset** | Insert |

## E-GSM Base

**Supported**     All Models

This softkey selects E-GSM 900 Base as the frequency band for GSM. The output frequency depends on both the channel band and channel number selections.

**Preset**        *Channel*: 1

                  *Frequency*: 935.200 MHz

**Range**         *Channels*: 0–124, 975–1023

                  *Frequency*: 935.000–959.800 MHz, 925.200–934.800 MHz

## E-GSM Mobile

**Supported**     All Models

This softkey selects E-GSM 900 Mobile as the frequency band for GSM. The output frequency depends on both the channel band and channel number selections.

**Preset**        *Channel*: 1

                  *Frequency*: 890.200 MHz

**Range**         *Channels*: 0–124, 975–1023

                  *Frequency*: 890.000–914.800 MHz, 880.200–889.800 MHz

## Enter Secure Mode

**Supported**     All Models

When this softkey is enabled, by pressing **Enter Secure Mode** > **Confirm**, it activates the selected security level. Once the secure mode is entered, the security level can only be increased. For more information about security functions, refer to the *User's Guide*.

## Equal Energy per Symbol

**Supported**     E4438C with Option 400

This softkey sets the channel powers so that all channels have equal energy per symbol, referenced to 7.5 ksps, and increasing by 3 dB for each doubling of the symbol rate.

## Equal Powers

**Supported**        E4438C with Option 400/401

Use this softkey to equalize power levels for all channels to the same value while scaling the total power to 0 dB.

## Erase

**Supported**        All Models

This softkey in the Utility menu removes all user files and user information. You must press **Enter Secure Mode** > **Confirm** to complete the Erase operation. For more information about security functions, refer to the *User's Guide*.

## Erase All Models

**Supported**        All Models

This softkey removes all user files, table editor files, flatness correction files, and baseband generator files. For more information about security functions, refer to the *User's Guide*.

## Erase and Overwrite All Models

**Supported**        All Models

This softkey removes all user files, table editor files, flatness correction files, and baseband generator files. The memory is then overwritten with random data as described below. For more information about security functions, refer to the *User's Guide*.

SRAM                All Models addressable locations will be overwritten with random characters.

HARD DISK           All Models addressable locations will be overwritten with random characters.

FLASH MEMORY  The flash blocks will be erased.

## Erase and Sanitize All Models

**Supported**        All Models

This softkey removes all user files, table editor files, flatness correction files, and baseband generator files. The memory is then overwritten with a sequence of data as described below. For more information about security functions, refer to the *User's Guide*.

SRAM                All Models addressable locations will be overwritten with random characters.

HARD DISK           All Models addressable locations will be overwritten with a single character, its complement, and then a random character.

FLASH MEMORY  The flash blocks will be erased.

## Err Insert

**Supported**          E4438C with Option 400

This field displays the type of error insertion mode applied to the data for the transport channel. The selections include BLER (block error rate), BER (bit error rate), and NONE. If the insertion mode is changed, press the **Apply Channel Setup** softkey to apply the mode and error rate selections.

**Preset**          NONE

**Remarks**          Scroll down the table editor in the TrCH Channel Setup menu to view this field.

This field appears in uplink only.

## Error Bits

**Supported**          E4438C with Option 400

This field displays the number of actual bit errors being generated. It is calculated from the desired BER value as set in the BER field after the **Apply Channel Setup** softkey is pressed and the error bits are inserted into the data for the transport channel.

**Preset**          0

**Remarks**          Scroll down the table editor TrCH Channel Setup menu to view this field. To insert the error bits, the Err Insert field must be set to BER.

## Error Blocks

**Supported**          E4438C with Option 400

This field displays the number of the actual error blocks being generated. It is calculated from the desired BLER value as set in the BLER field after the **Apply Channel Setup** softkey is pressed and the error blocks are inserted into the data of the transport channel.

**Preset**          0

**Remarks**          Scroll down the table editor TrCH Channel Setup menu to view this field. To insert the error bits, the Err Insert field must be set to BLER.

## Error Count

**Supported**          E4438C with Option UN7

This softkey enables you to set the residual error threshold for the number of events to stop function. To edit the error count value, press **Error Count**, enter the desired value using the numeric keypad, then press the **Enter** key that appears when editing commences.

**Preset**                100

**Range**:             0–1,000,000,000

## Error Info

**Supported**          All Models

Use this softkey to access a menu of choices enabling you to view and clear error messages. In this menu you can view any of the error messages in the queue, you can also clear all of the error messages in the queue.

**Remarks**          The error queue will hold up to 30 error messages before deleting the oldest error message to make room for the 31st error message.

## Error Out

**Supported**          E4438C with Option UN7

This softkey selects the following configuration for the bit error rate output using the AUX I/O rear panel connector:

| *Pin #* | *Data* |
|---|---|
| 1 | BER Meas End–outputs the signal that indicates the status of the bit error rate (BER) measurements. BER measurements are being executed when the signal is high. |
| 4 | BER Sync Loss–outputs the signal that indicates the synchronization loss state. This signal is only valid when the signal of the Meas End connector is high. Synchronization loss state is detected when the signal is low. |
| 20 | BER Test Out–outputs the signal that indicates the test result of the pass/fail judgment of the bit error rate measurements. The result is guaranteed at the falling edge of the signal of the Meas End connector. The result is pass when the signal is low; the result is fail when the signal is high. The signal is also high when the pass/fail judgment is set to off. |
| 21 | BER Error Out–output is normally low. One pulse whose width is about 80 ns indicates one error bit. Pulses for the error bits of one measurement cycle are not |

synchronized with the clock signal to the BER CLK IN connector, and are output during the signal of the Meas End connector when the measurement cycle is high.

22          BER No Data–outputs the signal that indicates the no data status. The no data status is reported when there has been no clock inputs for more than 3 seconds or there have been no data change for more than 200 bits. This signal is valid only when the signal of the Meas End connector is high. No data status is detected when the signal is low.

## Error Rate

**Supported**          E4438C with Option 300

This softkey enables you to set the frame erasure rate limit for the pass/fail judgement function.

**Preset**          10.0000%

**Range**          0%–100%

## ESG-Syn Sig (RPS24)

**Supported**          E4438C with Option 400

This softkey assigns the ESG synchronization signal to the selected rear panel AUX I/O output connector or BNC.

**Remarks**          The synchronization signal can be assigned to numerous different output connectors/pins. The **(RPS24)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

## E-TCH/F43.2

**Supported**          E4438C with Option 300 or 402

This softkey selects an enhanced full rate traffic channel for 43.2 kbits/s user data per GSM 05.03. The length of the RLC data block for this channel is 870 bits.

## Even Second Delay

**Supported**          E4438C with Option 401

This field displays the current value for the delay that aligns the RF with the even second clock pulse. To change the delay value, press the **Edit Item** softkey and enter a new value.

**Preset**          *Forward link:* 20.0 chips
                    *Reverse link:* 27.5 chips

**Range**:          0.5 cps–128 chips

**Remarks**    The even second delay value automatically adjusts to compensate for additional delays introduced when noise is turned on (Option 403).

## Exceeds Any Limits

**Supported**    E4438C with Option 300

This softkey causes a FAIL status to be displayed whenever any of the designated pass/fail limits (FER, Class Ib RBER, or Class II RBER) is exceeded. The pass/fail indication is provided at the end of each measurement.

## Exceeds Any Threshold

**Supported**    E4438C with Option 300

This softkey causes the measurement to end whenever the number of error events exceeds the threshold designated in the Threshold # of Events to Stop menu. This may occur before the number of frames to measure is reached.

## Execute Cal

**Supported**    E4438C

Use this softkey to begin the I/Q calibration routine for the specified frequency range.

**Remarks**    I/Q calibration data is not affected by a preset or by a power cycle.

The calibration can be aborted at any time during the procedure by pressing the **Abort Cal** softkey. If you abort the calibration, the previous calibration data is restored.

## Ext

This softkey is one of the choices in the following menus: Data, Sweep Trigger, Point Trigger, Pattern Trigger, Frame Trigger, Trigger Source, Alt Ampl Trigger, and AM, FM and ΦM Sweep Trigger. The available settings depend on which menu you select.

### In the Alt Ampl Trigger Menu

**Supported**    All Models without Option UNB or 506

In the Alt Ampl Trigger menu, choosing **Ext** enables you to remotely toggle the RF output power between main and alternate amplitudes using a TTL/CMOS signal applied to the TRIG IN connector.

### In the AM, Amplitude, FM, LF Output, and Sweep Trigger Menus

**Supported**    All Models

In the AM, Amplitude, FM, ΦM, LF Output, and sweep trigger menus, choosing **Ext** enables you to trigger a swept-sine amplitude, frequency, or phase modulation on either the negative or positive edge of a signal applied to the TRIG IN rear panel connector.

**Remarks**        Set the polarity of the trigger signal using the **Trigger In Polarity Neg Pos** softkey.

### In the BERT Menu

**Supported**        E4438C with Option UN7 or 300

This softkey enables a measurement to run when the external trigger line goes high, provided synchronization has already been achieved. If not already synchronized, the trigger is ignored.

### In the CDMA Menu

**Supported**        E4438C with Option 401

Use this softkey to select an external user signal as the modulating data stream. With **Ext** selected as the data source, you can apply the data signal to the DATA input connector.

### In the GSM/EDGE Data Menu

**Supported**        E4438C with Option 402

In this menu, pressing **Ext** selects an external user signal as the modulating data stream. Apply the data signal to the DATA input connector.

In framed mode, the external data is gated to the data fields of the timeslot.

| NOTE | In the EDGE format, the **Ext** data selection is not available when configuring both GMSK and EDGE timeslots for the same signal. |
|---|---|

### In the Pattern Trigger, Frame Trigger, and Trigger Source Menus

**Supported**        E4438C with Option 402

In these menus, choosing **Ext** enables you to trigger the internal digital modulation pattern generator with a TTL/CMOS signal applied to the PATT TRIG IN connector.

### In the Point Trigger Menu

**Supported**        All Models

In the Point Trigger menu, choosing **Ext** enables you to trigger a point-by-point sweep on either the negative or positive edge of a signal applied to the TRIG IN rear panel connector.

**Remarks**        Set the polarity of the trigger signal using the **Trigger In Polarity Neg Pos** softkey.

**In the Sweep Trigger Menu**

**Supported**      All Models

In the Sweep Trigger menu, choosing **Ext** enables you to trigger a full sweep on either the negative or positive edge of a signal applied to the TRIG IN rear panel connector.

**Remarks**      Set the polarity of the trigger signal using the **Trigger In Polarity Neg Pos** softkey.

**In the Real Time W-CDMA Menu**

**Supported**      E4438C with Option 400

This softkey allows the use of externally generated TPC patterns. The TPC clock
(3.3 V CMOS) on EVENT 4 of the auxiliary I/O connector is used as an event trigger for user TPC bits, which are applied to the signal generator's BURST GATE IN connector. The signal generator transmits the user TPC bits on DPCH #1. This allows the user to control UE transmit power in a closed loop process.

**Remarks**      This key appears in downlink only.

## Ext1

**Supported**      All Models

Use this softkey to select an externally applied signal as the modulation waveform after a signal source has been connected to the EXT 1 INPUT connector.

**Remarks**      The externally applied, ac-coupled input signal is tested for a voltage level and a display annunciator will indicate either a high or low condition if that voltage is $> \pm 3\%$ of 1 $V_p$.

## Ext1 DC-Coupled

**Supported**      All Models

Use this softkey to select an externally applied DC-coupled signal as the pulse source after a signal source has been connected to the EXT 1 INPUT connector.

## Ext2

**Supported**   All Models

Use this softkey to select an externally applied signal as the modulation waveform after a signal source has been connected to the EXT 2 INPUT connector.

**Remarks**   The externally applied, ac-coupled input signal is tested for a voltage level and a display annunciator will indicate a high or low condition if that voltage is > or $\pm3\%$ of 1 $V_p$.

## Ext2 DC-Coupled

**Supported**   All Models

Use this softkey to select an externally applied DC-coupled signal as the pulse source after a signal source has been connected to the EXT 2 INPUT connector.

## Ext 50 Ohm

**Supported**   E4438C

This softkey appears in the Source 1 and I/Q Out menus.

### In the Source 1 menu

Use this softkey to route external 50 ohm I and Q input signals to the internal I/Q modulator.

**Remarks**   The **Source 1** selection is independent of the **I/Q Out** selection.

### In the I/Q Out menu

Use this softkey to route external 50 ohm I and Q input signals to the rear panel I and Q output connectors.

**Remarks**   The **I/Q Out** selection is independent of the **Source 1** selection.

## Ext 600 Ohm

**Supported**   E4438C

This softkey appears in the Source 1 and I/Q Out menus.

### In the Source 1 menu

Use this softkey to route external 600 ohm I and Q input signals to the internal I/Q modulator.

**Remarks**   The **Source 1** selection is independent of the **I/Q Out** selection.

**In the I/Q Out menu**

Use this softkey to route external 600 ohm I and Q input signals to the rear panel I and Q output connectors.

**Remarks**   The **I/Q Out** selection is independent of the **Source 1** selection.

## Ext BBG Ref Freq

**Supported**   E4438C with Option 401

Use this softkey to enter the expected frequency of the external reference signal for the cdma2000 reverse link setup. To change the field selection, highlight the
Ext BBG Ref Freq field, press the **Edit Item** softkey and enter a new value.

**Preset**   19.6608 MHz

**Range**   1−100 MHz

**Remarks**   This setting must match the frequency of the signal that is supplied to the BASEBAND GEN REG IN rear panel BNC connector.

## Ext BBG Ref Freq

**Supported**   E4438C with Option 001/601or 002/602

Use this softkey to enter the frequency of the baseband generator reference signal that is supplied to the rear panel BASEBAND GEN REF IN connector.

**Preset**   13.0000000 MHz

**Range**   250.0000 kHz−100.0000000 MHz

**Remarks**   This softkey is used only when the **BBG Ref Ext Int** softkey is set to Ext.

## Ext CDMA Freq

**Supported**   E4438C with Option 401

This field is used to direct the mobile station to a CDMA channel having a primary paging channel. The mobile tunes to the Ext CDMA Freq field when it has a protocol revision level of 6 or greater, and it supports either the quick paging channel or radio configurations greater than 2. Otherwise, the mobile tunes to the CDMA Freq field for the CDMA channel.

To change the extended CDMA channel, use the down arrow key to move the cursor to the second page of data fields and highlight the Ext CDMA Freq field. Press the **Edit Item** softkey and enter a new value.

**Preset**   0

| Range | 0–2047 |
| --- | --- |
| Remarks | This field is grayed out (not editable) until the F-SYNCH Type field is set to IS2000. |

## Ext Clock Rate X1 X2 X4

| Supported | E4438C with Option 400 |
| --- | --- |

This softkey selects the external clock rate which is used to synchronize to the base station (BTS) chip clock. However, the BTS chip clock may be a multiple of 3.84 MHz. The signal generator divides the input rate by the selected multiple to obtain the 3.84 MHz chip clock

| X1 | 3.84 MHz external clock |
| --- | --- |
| X2 | 7.68 MHz external clock. This is 2x the rate of the chip clock. |
| X4 | 15.36 MHz external clock. This is 4x the rate of the chip clock. |
| Preset: | X1 |
| Remarks | The softkey is valid for uplink and only when the BBG data clock is set to external. |

## Ext Coupling DC AC

| Supported | All Models |
| --- | --- |

This softkey selects the coupling for the externally applied modulation input signal.

| DC | This selects direct current for the input signal. |
| --- | --- |
| AC | This selects alternating current for the input signal. |
| Preset | DC |

## Ext Data Clock Normal Symbol

| Supported | E4438C with Option 001/601or 002/602 |
| --- | --- |

Use this softkey to toggle the external data clock between Normal and Symbol.

| Normal | When you select Normal, you must supply a bit clock signal to the DATA CLOCK input connector, and a one-shot or continuous signal to the SYMBOL SYNC input connector (an unlock occurs if you select external data without these signals). |
| --- | --- |
| Symbol | When you select Symbol, a symbol clock must be provided to the DATA CLOCK input. |

For 2-bit-per-symbol modulation formats (such as π/4DQPSK), no signal is required at the DATA CLOCK input connector. Instead, the data is clocked on both the rising and falling edges of the SYMBOL SYNC signal.

**Preset**          Normal

**Remarks**          This softkey has no effect in internal data mode.

## Ext Delay Bits

**Supported**          E4438C with Option 001/601or 002/602

Use this softkey to set the external trigger delay. When **Ext Delay Off On** is On, transmission of the triggered data is delayed after the external trigger event by the number of bits specified.

For most TDMA formats, there is one bit per symbol. However, there are 3 bits per symbol for the EDGE format. If the selected number of delay bits is not a multiple of the number of bits per symbol, the entered value is rounded down to the next whole symbol value.

**Preset**          0

**Range**          0-1,048,575 bits

**Remarks**          This softkey is inactive until **Ext** is selected as the triggering source.

Pattern Trigger functions are not available if you use either a PN data sequence or an external data source.

## Ext Delay

**Supported**          E4438C with Option 001/601or 002/602

For only the Dual ARB, use this softkey to access a menu to enable the external trigger delay feature, by selecting the trigger delay type, or to disable the external trigger delay function

**Preset**          Off

**Remarks**          This softkey is inactive until **Ext** is the selected triggering source.

Pattern Trigger functions are not available if you use either a PN data sequence or an external data source.

## Ext Delay Off On

**Supported**          E4438C with Option 001/601or 002/602

For other than the Dual ARB, use this softkey to enable or disable the insertion of a delay in the path of the selected external trigger.

Off          When you select Off, no delay is inserted into the path of the externally applied

trigger.

| On | When you select On, the selected delay is inserted into the path of the externally applied trigger. The duration of the delay is specified using the **Ext Delay Bits** softkey, or the **Ext Delay Time** softkey. |
| --- | --- |
| **Preset** | Off |
| **Remarks** | This softkey is inactive until an external triggering source is selected. |
| | Pattern Trigger functions are not available if you use either a PN data sequence or an external data source. |

## Ext Delay Samples

**Supported**      E4438C with Option 001/601or 002/602

For only the Dual ARB, this softkey enables you to set number of samples for the external trigger delay. External trigger delay may be adjusted to trigger a waveform at a specified number of samples after an external trigger signal has been received at the PATT TRIG IN or AUX I/O rear panel connectors.

| **Preset** | 0 samples |
| --- | --- |
| **Range** | 0–100 Msa |
| **Remarks** | This softkey is inactive until **Ext** is the selected triggering source. |

## Ext Delay Time

**Supported**      E4438C with Option 001/601or 002/602

This softkey enables you to set the time for the external trigger delay. External trigger delay may be adjusted to trigger a waveform at a specified length of time after an external trigger signal has been received at the PATT TRIG IN or AUX I/O rear panel connectors.

| **Preset** | 2.000 ms |
| --- | --- |
| **Range** | 2.0 µs through 3600 s |
| **Remarks** | This softkey is inactive until **Ext** is the selected triggering source. |
| | Pattern Trigger functions are not available if you use either a PN data sequence or an external data source. |

## Ext Frame Trigger Delay

**Supported**      E4438C with Option 300

This softkey enables you to set an offset value to be used with the External Frame Trigger function.

The delay value is the offset from the beginning of timeslot 0. For information on how to determine the offset value, refer to the *User's Guide*.

**Preset**            0.00

**Range**             −1250 to 1250 symbols (with a resolution of 0.25 symbol)

**Remarks**           The External Frame Trigger functions are available only when the
                      **Frame Trigger Source BCH PDCH** softkey is set to PDCH.

## Ext Frame Trigger Polarity Neg Pos

**Supported**         E4438C with Option 300

Use this softkey to select the external frame trigger polarity to match the pulse logic currently in use. Refer to Figure 0-4.

Neg                   This selects the reference edge to be the falling edge of the pulse.

Pos                   This selects the reference edge to be the rising edge of the pulse.

**Figure 0-4**
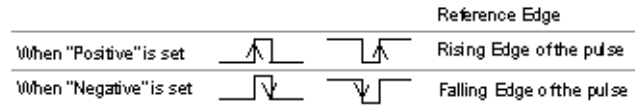


**Preset**            Pos

**Remarks**           The External Frame Trigger functions are available only when the
                      **Frame Trigger Source BCH PDCH** softkey is set to PDCH.

## Ext In 600 Ohm I Offset

**Supported**         E4438C

Use this softkey to enter an origin offset voltage for externally applied in-phase signals. This offset is used to remove imperfections in the in-phase signal or to introduce calibrated impairments.

**Preset**            0.000 V

**Range**             0.000–5.000 V

**Remarks**           The **I/Q Adjustments Off On** softkey must be set to On to enable this adjustment.

## Ext In 600 Ohm Q Offset

**Supported**         E4438C

Use this softkey to set an origin offset voltage for externally applied quadrature-phase signals. This offset is used to remove imperfections in the quadrature-phase signal or to introduce calibrated impairments.

| | |
|---|---|
| **Preset** | 0.000 V |
| **Range** | 0.000–5.000 V |
| **Remarks** | The **I/Q Adjustments Off On** softkey must be set to On to enable this adjustment. |

## Ext Polarity Neg Pos

| | |
|---|---|
| **Supported** | E4438C with Option 001/601or 002/602 |

Use this softkey to set the external trigger source polarity when EXT is the trigger source selection.

| | |
|---|---|
| Neg | The signal generator triggers an event when it receives a negative change in the signal at the PATT TRIG IN or AUX I/O rear panel connectors. |
| Pos | The signal generator triggers an event when it receives a positive change in the signal at the PATT TRIG IN or AUX I/O rear panel connectors. |
| **Preset** | Neg |
| **Remarks** | This softkey is inactive (grayed out) until an external triggering source is selected. It is also grays out when Gated is the trigger mode, even with an external trigger source. To change polarity for the Gated trigger mode, use the **Gate Active Low High** softkey. |

## Ext Polarity Normal Inverted

| | |
|---|---|
| **Supported** | All Models |

Use this softkey to set the external pulse source polarity.

| | |
|---|---|
| Normal | This selects the normal polarity for the external pulse source. |
| Inverted | This selects an inverted polarity for the external pulse source. |
| **Preset** | Normal |

## Ext Source

| | |
|---|---|
| **Supported** | E4438C |

Use this softkey to access a menu from which you can select an external triggering source. You can select either **Patt Trig In 1** (the PATT TRIG IN rear panel BNC connector), or **Patt Trig In 2** (the AUX I/O D-shell rear panel connector).

The current external triggering source selection appears under the **Ext Source** softkey.

## External

**Supported**          E4438C with Option 003 or 004

This softkey, for the N5102A module, selects the external clock signal provided through the Ext Clock In connector as the clock source for the N5102A module. You must also set the interface module clock rate to match that of the external clock signal (see "Clock Rate" on page 100). With this selection, the external clock is available as an output clock signal at the Clock Out and Device Interface connectors on the N5102A module.

---

**CAUTION**          It is important that the signal generator, the interface module, and the device are locked to a common frequency reference. Failure to have a common frequency reference may result in a loss of data. For more information on using the N5102A to lock to a common frequency reference, see the *User's Guide*.

---

## External

**Supported**          E4438C with Option 401

Use this softkey to select an external data clock that you apply to the DATA CLOCK connector.

# F

## FACC

**Supported**          E4438C with Option 402

Use this softkey to select a binary data pattern (frequency accuracy) that consists of a repetitive pattern of 4 ones followed by 4 zeroes. This internally generated data pattern is available for framed transmissions only. When **FACC** is selected, both the **B field** and the **Dect Patterns** softkeys show this selection, and FACC appears in the B field located near the bottom of the text area of the display.

## Fail Hold

**Supported**          E4438C with Option UN7

This softkey selects the mode that retains the fail judgement information during one loop of BER repeat measurements. This lets you determine when a failure occurs at least once during an entire cycle of measurements. This softkey is one of the choices in the Pass/Fail Update menu.

## Fall Delay

**Supported**          E4438C with Option 001/601or 002/602

Press this softkey to adjust the burst shape fall delay.

**Preset**          0.000 bits

**Range**          Minimum and maximum values depend on modulation type and symbol rate.

## Fall Time

**Supported**          E4438C with Option 001/601or 002/602

Press this softkey to adjust the burst shape fall time.

**Preset**          TETRA: 8.000 bits
Custom, NADC: 5.000 bits
*PDC, PHS:* 4.000 bits
*EDGE:* 9.000 bits
*GSM:* 3.000 bits
*DECT:* 10.000 bits

**Range**          Minimum and maximum values depend on modulation type and symbol rate.

## Falling

| | |
|---|---|
| **Supported** | E4438C with Option 401 |

Use this softkey to configure the ESG to trigger on the falling edge of the signal applied to the selected rear panel pattern trigger input.

## `FBI Bits Count`

| | |
|---|---|
| **Supported** | E4438C with Option 400 |

This data field, in the Edit Channel Setup table editor displays the quantity of Feedback Information (FBI) bits in the associated channel. You can enter the number of FBI bits you want for the uplink channel selected.

| | |
|---|---|
| **Preset** | 0 |
| **Range** | 0 – 2 |
| **Remarks** | The FBI gives feedback to the base station used for closed loop transmit diversity and site selection diversity transmission (SSDT). |

## `FBI Bits Value`

| | |
|---|---|
| **Supported** | E4438C with Option 400 |

This data field, in the Edit Channel Setup table editor, displays the Feedback Information (FBI) bits value. You can highlight this field and then enter in the value of the FBI bits for the uplink channel selected.

| **Range** | FBI Bits Count | FBI Bits Value |
|---|---|---|
| | 0 | N/A |
| | 1 | 0 or 1 |
| | 2 | 00 – 11 |
| **Remarks** | FBI bit values are binary representations. | |

## FBI Pattern

**Supported**          E4438C with Option 400

This field displays the 30-bit data pattern of the feedback information (FBI) bits set in the **PhyCH Setup** menu for the uplink DPCCH. The FBI bits are used to implement closed loop format diversity by controlling the phase or phase and amplitude of the second antenna of the base station. The FBI bits are also used for site selection diversity transmit power control during a soft handoff. The slot format determines the number of FBI bits per slot. Refer to the TS25.211 standard for more information.

**Preset**          00000000

**Range:**          0 to 3FFFFFFF

**Remarks**          A PN9 or PN15 sequence, a fixed number (hexadecimal value) or a User File can be selected for the FBI bits.

## FBI State

**Supported**          E4438C with Option 400

This field indicates the On/Off state for the feedback information (FBI) bits. The off state means that no FBI bits are included in the uplink DPCCH. The FBI state is dependent on the slot format number.

**Preset**          Off

## FCDMA

**Supported**          All Models with Option UNJ

Press this softkey to set the current catalog type to FCDMA and display the catalog of FCDMA files.

## FCOR

**Supported**          E4438C with Option 402

Use this softkey to select the 80-bit frequency correction bits (FCOR) as the timeslot type for the active timeslot. The preset hexadecimal value reflects the Trans European Trunked Radio (TETRA) format, and appears in the FCOR field near the bottom of the text area of the display.

When you select **FCOR** for a timeslot, the visual representation of the timeslot pattern updates.

**Preset**          FF0000000000000000FF

**Range**          0–FFFFFFFFFFFFFFFFFFFF

## FCorr

**Supported**          E4438C with Option 402

Use this softkey to select frequency correction as the timeslot type for the active timeslot. Frequency correction is a burst where all of the bits are set to zero. This burst is used for synchronizing the mobile to the correct frequency.

When you select **FCorr** for a timeslot, the visual representation of the timeslot updates.

## FDEV1_FS

**Supported**          E4438C with Option 402

Use this softkey to select a binary data pattern (frequency deviation, full-slot) that consists of 128 bits: repetitive pattern of 1, 0, 1, 0... followed by 64 ones, 64 zeroes, and 64 bits: repetitive pattern of 1, 0, 1, 0... This internally generated data pattern is available for framed transmissions only. When you select **FDEV1_FS**, both the **B field** and the **Dect Patterns** softkeys show this selection, and FDEV1_FS appears in the B field located near the bottom of the text area of the display.

**Remarks**          This softkey is available only for the DECT personality.

## FDEV1_HS

**Supported**          E4438C with Option 402

Use this softkey to select a binary data pattern (frequency deviation, half-slot) that consists of 8 bits: repetitive pattern of 1, 0, 1, 0... followed by 32 ones, 32 zeroes, and 8 bits: repetitive pattern of 1, 0, 1, 0... This internally generated data pattern is available for framed transmissions only. When you select **FDEV1_HS**, both the **B field** and the **Dect Patterns** softkeys show this selection, and FDEV1_HS appears in the B field located near the bottom of the text area of the display.

## FDEV2_FS

**Supported**          E4438C with Option 402

Use this softkey to select a binary data pattern (frequency deviation, full-slot) that consists of a repetitive pattern of 1, 0, 1, 0... This internally generated data pattern is available for framed transmissions only. When you select **FDEV2_FS**, both the **B field** and the **Dect Patterns** softkeys show this selection, and FDEV_FS appears in the B field located near the bottom of the text area of the display.

## Field1

**Supported**         E4438C with Option 401

Use this softkey to access a menu from which you can set the field 1 hexadecimal value for the forward paging long code mask. The default value is in accordance with the IS-2000 specification.

**Preset**            0−1FFF

**Range**             18CD

## Field2

**Supported**         E4438C with Option 401

Use this softkey to access a menu from which you can set the field 2 hexadecimal value for the forward paging long code mask. The default value is in accordance with the IS-2000 specification.

**Preset**            00

**Range**             0−1F

## Field3

**Supported**         E4438C with Option 401

Use this softkey to access a menu from which you can set the field 3 hexadecimal value for the forward paging long code mask. The default value is in accordance with the IS-2000 specification.

**Preset**            000

**Range**             0−FFF

## Filter

**Supported**         E4438C with Option 001/601or 002/602

Use this softkey to access a menu from which you can select a filter type, restore the default filter, define a unique FIR filter, or optimize the filter for the best EVM or ACP.

You can also adjust the filter alpha when Nyquist or root Nyquist filters are selected or the bandwidth time product for Gaussian filters.

## Filter

### In the CDMA Menu

**Supported**  E4438C with Option 401

This field displays the currently selected filter type. To change the filter type, highlight the `Filter` field, press the **Edit Item** softkey and select from the softkey menus presented.

**Preset**  *Forward Link:* IS-95 w/EQ
*Reverse Link:* IS-95

### In the Real Time W-CDMA Menu

**Supported**  E4438C with Option 400

This field displays the currently selected filter type. Press the **Edit Item** softkey to access a menu from which you can select a filter type or user defined FIR filter, change the filter alpha, optimize the FIR filter for EVM or ACP, or restore the default filter.

**Preset**  Root Nyquist

## Filter Alpha

**Supported**  E4438C with Option 001/601or 002/602

Use this softkey to make the filter's alpha parameter active in either the Filter menu or the Load Default FIR menu.

### In the Filter Menu

In this menu, the **Filter Alpha** softkey changes the alpha parameter of the selected root Nyquist or Nyquist filter.

**Preset**  *WCDMA:* 0.220
*Custom, NADC, and TETRA:* 0.350
*Other formats:* 0.500

**Range**  0.000−1.000

**Remarks**  This key only appears after choosing a root Nyquist or Nyquist filter. If a Gaussian filter is in use, you will see **Filter BbT**. If any other filter is in use, this key is replaced with a grayed-out key labeled **Filter Factor N/A**.

**In the Load Default FIR Menu**

In this menu, the **Filter Alpha** softkey changes the alpha parameter of the root Nyquist or Nyquist filter coefficients loaded into the FIR table editor. After entering the alpha value, you can press **Generate** to modify the filter coefficients in the table editor.

| | |
|---|---|
| **Preset** | *GSM and EDGE:* 0.500<br>*Other formats:* 0.350 |
| **Range** | 0.000–1.000 |

## Filter BbT

| | |
|---|---|
| **Supported** | E4438C with Option 001/601or 002/602 |

Use this softkey to make the bandwidth-multiplied-by-bit-time (BbT) filter parameter active in either the Filter menu or the Load Default FIR menu.

**In the Filter Menu**

In this menu, the **Filter BbT** softkey changes the BbT parameter of the selected Gaussian filter.

| | |
|---|---|
| **Preset** | 0.350 |
| **Range** | 0.000–1.000 |
| **Remarks** | This key only appears after choosing a Gaussian filter. If a root Nyquist or Nyquist filter is in use, you will see **Filter Alpha**. If any other filter is in use, this key is replaced with a grayed-out key labeled **Filter Factor N/A**. |

**In the Load Default FIR Menu**

In this menu, the **Filter BbT** softkey changes the BbT parameter of the Gaussian filter coefficients loaded into the FIR table editor. After entering the BbT value, press **Generate** to modify the filter coefficients in the table editor.

| | |
|---|---|
| **Preset** | 0.200 |
| **Range** | 0.000–1.000 |

## Filter Factor

| | |
|---|---|
| **Supported** | E4438C with Option 001/601or 002/602 |

This grayed-out softkey is displayed when the filter in use does not contain an adjustable alpha or BbT parameter (such as the IS-95 filter selections or a user-defined FIR filter). This softkey changes to **Filter Alpha** when Root Nyquist or Nyquist is selected, and **Filter BbT** when Gaussian is selected.

## Filter Factor N/A

**Supported**        E4438C with Option 001/601or 002/602

This grayed-out softkey is displayed when a filter is in use that does not contain an adjustable alpha or BbT parameter (such as the IS-95 filter selections or a user-defined FIR filter).

**Remarks**        **This softkey changes to either Filter Alpha** or **Filter BbT** when the appropriate root Nyquist, Nyquist or Gaussian filter is selected for use.

## Filter Symbols

**Supported**        E4438C with Option 001/601or 002/602

This softkey selects the number of symbols for the current FIR filter. The FIR table editor allows a maximum filter length of 1024 coefficients with a maximum oversample ratio of 32 and a maximum of 64 symbols. If you create a FIR filter with greater than 32 symbols, the maximum symbol rate decreases by one half. If you create a FIR filter with greater than 16 and less than or equal to 32 symbols, the maximum symbol rate decreases by one quarter.

**Preset**        8

**Range**        1–64

## FIR

**Supported**        All Models

This softkey enables you to specify that only signal generator FIR files be listed in the catalog of files.

While the **FIR** softkey is available on all models, you can only create FIR files with a baseboard generator option installed on your E4438C (that is Option 001/601or 002/602).

## First Mkr Point

**Supported**        E4438C with Option 001/601or 002/602

This softkey sets the first marker point in a range of marker points on a waveform segment for the active marker. If you enter a value for the first marker point that is greater than the last marker point, the last marker point automatically adjusts to match the first marker point. To select the active marker, use the **Marker 1 2 3 4** softkey. For more information on markers, see the *User's Guide*.

**Preset**        1

**Range**        1–last waveform point

### In the Dual ARB

The waveform is the waveform highlighted in the `Catalog of WFM1 Files` which is accessed from the **Set Markers** softkey.

### In All Other ARB Formats

This softkey is not available unless the ARB format, such as Custom real-time, is on.

## First Sample Point

**Supported**        E4438C with Option 001/601or 002/602

This softkey sets the starting sample point for the Arb waveform marker display. Set the sample point using the arrow keys, the knob, or the numeric key pad to a value that is greater than or equal to one, and less than or equal to the maximum number of waveform points in the selected waveform

**Preset**        1

**Range**        1–Maximum number of waveform points

## First Spread Code

**Supported**        E4438C with Option 401

This softkey is available for an uplink channel definition and appears after selecting the **Insert DPDCH** softkey.

The spread code, for the channel highlighted in the Edit Channel Setup table editor, can be changed using the **Edit Item** softkey. This is useful when inserting several channels so that each new channel will have a spread code 1 higher than the previously inserted channel, and the group will start at the selected first spread code.

After you have set the first spread code, press the **Done** softkey to insert the information into the table editor.

If the warning `Domain Conflict` is displayed in the table, check the existing entries in the table editor for any duplication of an existing spread code and give them unique spread code values.

**Preset**:          1

**Range:**          0 – 63

## FIX4

**Supported**          E4438C with Option 001/601or 002/602

Use this softkey to select a 4-bit repeating sequence data pattern and make it the active function. The selected 4-bit pattern will be repeated as necessary to fill the data area.

**Preset**          0000

**Range**          0000−1111

## Flat Noise BW

**Supported**          E4438C with Options 400, 403

This field displays the flat noise bandwidth for the additive white gaussian noise (AWGN) channel. The flat noise bandwidth (FNB) is calculated (FNB = 1.6 x Chip rate) and is the bandwidth corresponding to a 0 dB roll-off point.

**Remarks**          In PRACH mode, scroll to the second page of the display screen to view this field.

## Flatness Off On

**Supported**          All Models

This softkey toggles the operating state of the user flatness corrections to the output power.

Off          When flatness is off, user flatness correction is not applied to the output power.

On          When flatness is on, user flatness correction is applied to the output power. You can use flatness correction to maintain a constant power level at the point of detection.

**Preset**          Off

## FM/ΦM

**Supported**          All Models

Use this hardkey to access a menu from which you can configure modulation type (FM, normal phase modulation, or wideband phase modulation), path, deviation and deviation coupling, source, rate, waveform, and DCFM/DCΦM calibration.

## FM/ΦM

**Supported**    All Models

Use this softkey to access a menu from which you can configure modulation type (FM, normal phase modulation, or wideband phase modulation), path, deviation and deviation coupling, source, rate, waveform, and DCFM/DCΦM calibration.

## FM ΦM Normal High BW

**Supported**    All Models

This softkey toggles between the menus for frequency modulation (FM), normal phase modulation (ΦM), and wideband phase modulation (ΦM High BW).

| | |
|---|---|
| Normal | This choice enables you set the phase deviation as high as N x 80 radians with a 3.0 dB bandwidth at 100.0 kHz. Refer to the **FM Dev** softkey description for N values. |
| High BW | This choice provides increased bandwidth while restricting the maximum deviation to deviation settings up to N x 8 radians. Refer to the **FM Dev** softkey description for N values. |
| Preset | FM |
| Remarks | The deviation limits are dependent upon the carrier frequency. This limiting occurs only after the modulation is turned on. |

## FM Dev

**Supported**    All Models

This softkey enables you to set the frequency deviation for the currently selected modulation path. The range of values allowed depends on the carrier frequency. The maximum peak deviation for a frequency is calculated by multiplying N times 8 MHz. (Table 0-8 lists the values for N and the resulting maximum peak deviations.)

**Table 0-8**

| Carrier Frequency | N | Maximum Peak Deviation (Standard) | Maximum Peak Deviation (Standard) |
|---|---|---|---|
| 100 kHz to 250 MHz | 1 | 8 MHz | 1 MHz |
| > 250 MHz to 500 MHz | 1/2 | 4 MHz | 500 kHz |
| > 500 MHz to 1 GHz | 1 | 8 MHz | 1 MHz |
| > 1 GHz to 2 GHz | 2 | 16 MHz | 2 MHz |

Table 0-8

| Carrier Frequency | N | Maximum Peak Deviation (Standard) | Maximum Peak Deviation (Standard) |
|---|---|---|---|
| > 2 GHz to 4 GHz | 4 | 32 MHz | 4 MHz |
| > 4GHz to 6 GHz | 8 | 64 MHz | 8 MHz |

For example, if you choose a carrier frequency of 450 MHz, multiply 1/2 by 8 MHz resulting in a 4 MHz maximum peak deviation.

| | |
|---|---|
| **Preset** | 1.0 kHz |
| **Range** | Depends on current carrier frequency setting. |
| **Remarks** | The new value of FM deviation applies only to whichever FM path configuration you have currently selected. Also, whenever FM Path 1 is used with FM Path 2, the deviation for FM Path 1 must be greater than or equal to the deviation for FM Path 2 |

## FM Dev Couple Off On

| | |
|---|---|
| **Supported** | All Models |

This softkey toggles the operating state of the FM deviation coupling.

| | |
|---|---|
| Off | When FM deviation coupling is off, the FM Path 1 and FM Path 2 deviation values are independent of each other. |
| On | When FM deviation coupling is on, the FM Path 1 and FM Path 2 deviation values are linked. Any change you make to one FM deviation value is applied to both. |
| **Preset** | Off |

## FM Off On

| | |
|---|---|
| **Supported** | All Models |

This softkey toggles the operating state of the currently selected frequency modulation.

| | |
|---|---|
| Off | Use this setting to turn off the currently selected frequency modulation. |
| On | Use this setting to turn on the currently selected frequency modulation. |

Whenever frequency modulation is enabled, the FM annunciator is turned on in the display.

| | |
|---|---|
| **Preset** | Off |

| Remarks | Although you can turn on frequency modulation with this key, the RF carrier is modulated by the enabled modulation only when you have also set **Mod On/Off** to On. |
|---|---|

## FM Path 1 2

| Supported | All Models |
|---|---|

This softkey toggles the selection between FM Path 1 and FM Path 2.

| FM Path 1 | This selection enables you to configure the modulation characteristics for FM Path 1, using the remaining softkeys in the FM menu. |
|---|---|
| FM Path 2 | This selection enables you to configure the modulation characteristics for FM Path 2, using the remaining softkeys in the FM menu. |

FM Path 1 and FM Path 2 define two standard frequency modulation configurations which can be used together. FM Path 1 and FM Path 2 are summed internally for composite modulation. Either path can be switched to any one of the modulation sources: Internal, Ext1, or Ext2.

| Preset | FM Path 1 |
|---|---|
| Remarks | FM Path 2 is limited to a maximum rate of 1 MHz. FM Path 2 must be set to a deviation less than FM Path 1. |

## FM Rate

| Supported | All Models |
|---|---|

This softkey enables you to change the internal modulation frequency for the FM Path 1 and FM Path 2 configurations.

| Preset | 400.0 Hz |
|---|---|
| Range | 0.1 Hz−20.0 kHz (minimum increment is 0.1 Hz)<br>0.1 Hz−100.0 kHz (if sinewave is selected as the internal waveform) |
| Remarks | The new value of FM rate applies only to whichever FM path configuration you have currently selected. |

## FM Source

**Supported**        All Models

Use this softkey to access a menu from which you can select an internally generated or externally applied modulation input for the frequency modulation source. The internal modulation is always ac-coupled. For externally applied signals, you can choose between ac- and dc-coupled modulation.

**Preset**        Internal

**Remarks**        A 1.0 volt peak voltage input is required for calibrated FM deviation settings. The EXT 1 LO/HI and EXT 2 LO/HI display annunciators will turn on if the peak input voltage differs from 1.0 volt by more than 3%. (The LO/HI annunciators only function for ac-coupled external inputs.)

## FM Start Rate

**Supported**        All Models

This softkey enables you to change the starting frequency of the internally generated modulation source for swept-sine frequency modulation.

**Preset**        400.0 Hz

**Range**        0.1 Hz−100.0 kHz (minimum increment is 0.1Hz)

**Remarks**        This key is coupled to the **FM Rate** softkey in the initial FM menu and the **FM Tone 1 Rate** softkey in the FM dual-sine menu. Any value set for **FM Start Rate** is reflected in the **FM Rate** and **FM Tone 1 Rate** softkeys.

## FM Stop Rate

**Supported**        All Models

This softkey enables you to change the ending frequency of the internally generated modulation source for swept-sine frequency modulation.

**Preset**        400.0 Hz

**Range**        0.1 Hz−100.0 kHz (minimum increment is 0.1Hz)

**Remarks**        This key is coupled to the **FM Tone 2 Rate** softkey in the FM dual-sine menu. Any value set for **FM Stop Rate** is reflected in the **FM Tone 2 Rate** softkey.

## FM Sweep Time

**Supported**      All Models

Use this softkey to set the sweep time of the swept sine analog modulation.

**Preset**      100.0 msec

**Range**      1.0 msec-65.535 sec

## FM Sweep Trigger

**Supported**      All Models

Use this softkey to access a menu from which you can select the triggering mode for the swept-sine frequency modulation.

**Preset**      Free Run

**Remarks**      You can also configure the polarity of the TTL signal output at the TRIG IN connector using the **Trigger In Polarity Neg Pos** softkey on this menu.

## FM Tone 1 Rate

**Supported**      All Models

This softkey enables you to set the internal modulation rate for tone 1 of the dual-sine FM waveform.

**Preset**      400.0 Hz

**Range**      0.1 Hz−100.0 kHz (minimum increment is 0.1 Hz)

**Remarks**      This key is coupled to the **FM Rate** softkey in the initial FM menu and the **FM Start Rate** softkey in the FM swept-sine menu. Any value set for FM Tone 1 Rate is reflected in the **FM Rate** and **FM Start Rate** softkeys.

## FM Tone 2 Ampl Percent Of Peak

**Supported**      All Models

This softkey enables you to adjust the amplitude of the alternate frequency as a percentage of the peak analog modulation amplitude. For example, if the tone 2 amplitude is set to 30.0% of the total amplitude, then the amplitude of the primary frequency is 70.0% of the total amplitude.

**Default**      50.0%

**Range**      0.0%−100.0%

**Remarks**      This is applicable only for the dual-sine function.

## FM Tone 2 Rate

**Supported**      All Models

This softkey enables you to set the internal modulation rate for tone 2 of the dual-sine FM waveform.

| | |
|---|---|
| **Default** | 400.0 Hz |
| **Range** | 0.1 Hz−100.0 kHz (minimum increment is 0.1 Hz) |
| **Remarks** | This key is coupled to the **FM Stop Rate** softkey in the FM swept-sine menu. Any value set for FM Tone 2 Rate is reflected in the **FM Stop Rate** softkey. |

## FM Waveform

**Supported**      All Models

Use this softkey to access a menu of choices that enables you to select the frequency modulation waveform that can be produced by the internal modulation source.

| | |
|---|---|
| **Preset** | Sine |
| **Remarks** | This softkey is only enabled when Internal is selected in the FM Source menu. |

## Format Hard Drive

**Supported**      E4438C with Option 005

| | |
|---|---|
| **CAUTION** | This operation erases all data on the hard drive and should be performed by trained personnel or under direction from the Agilent Service Center. Refer to the *User's Guide* for information on contacting the Agilent Service Center. |

This softkey formats the signal generator's hard drive. This operation erases ARB waveform files and any other user files on the signal generator's hard drive.

### Format SRAM memory

**Supported**     All Models

---

**CAUTION**     This operation erases all data in SRAM memory and should be performed by trained personnel or under direction from the Agilent Service Center. Refer to the *User's Guide* for information on contacting the Agilent Service Center.

---

This softkey formats static RAM (SRAM) memory, which erases the last state file, un-saved table editor files, and persistent state setups (contrast, brightness, and so forth).

### FPICH

**Supported**     E4438C with Option 401

Use this softkey to turn on the forward link pilot channel within the current CDMA2000 channel configuration. All Models other forward link channels are turned off.

### FPICH FQPCH FPCH

**Supported**     E4438C with Option 401

Use this softkey to turn on the forward link pilot, quick paging and paging channels within the current CMDA2000 channel configuration. All Models other forward link channels are turned off.

### FPICH FSYNCH

**Supported**     E4438C with Option 401

Use this softkey to turn on the forward link pilot and synchronization channels within the current CMDA2000 channel configuration. All Models other forward link channels are turned off.

### FPICH FSYNCH FFCH

**Supported**     E4438C with Option 401

Use this softkey to turn on the forward link pilot, synchronization and fundamental channels within the current CMDA2000 channel configuration. All Models other forward link channels are turned off.

### FPICH FSYNCH FFCH FSCH1

**Supported**   E4438C with Option 401

Use this softkey to turn on the forward link pilot, synchronization, fundamental and supplemental 1 channels within the current CMDA2000 channel configuration. All Models other forward link channels are turned off.

### FPICH FSYNCH FFCH FSCH1 FSCH2

**Supported**   E4438C with Option 401

Use this softkey to turn on the forward link pilot, synchronization, fundamental, supplemental 1 and supplemental 2 channels within the current CMDA2000 channel configuration. All Models other forward link channels are turned off.

## Frame Clock Interval

**Supported**   E4438C with Option 400

This softkey displays a menu from which you can select a frame clock interval for the uplink synchronization signal.

**Preset**   80 msec

**Remarks**   When using the frame clock, use a frame clock period which has a period equal to or longer than that of the longest transport channel transmission time interval (TTI) period. For example, RMC 12.2k has a TTI period of 20 msec, therefore the 80 msec, 2560 msec or SFN_RST signal should be used.

## Frame Clock Polarity Neg Pos

**Supported**   E4438C with Option 400

This softkey sets the polarity of the frame clock signal.

Neg   The signal generator frame clock timing uses the falling edge of the frame clock signal.

Pos   The signal generator frame clock timing uses the rising edge of the frame clock signal.

**Preset**   Positive

## Frame Count

**Supported**      E4438C with Option 300

This softkey appears in two different locations enabling you to designate the number of frames to measure in either a sensitivity search or in a BER% configuration.

### BER% TCH/FS Configure Menu

This softkey enables you to set the number of frames to measure. Unless a stop-on-event threshold has been set, the measurement ends normally when the selected number of speech frames have elapsed.

**Preset**      100

**Range**      1–6000000

### Sensitivity Search Configure Menu

This softkey enables you to set the total number of frames to measure for the final measurements during a sensitivity search. This number implies the number of Class Ib and Class II bits to be measured.

**Preset**      100

**Range**      1–6000000

## Frame Erasure

**Supported**      E4438C with Option 300

This softkey causes the measurement to end when the number of erased speech frames exceeds the specified threshold.

**Preset**      120

**Range**      0–1000000

## Frame Erasure Ratio

**Supported**      E4438C with Option 300

This softkey enables you to set the frame erasure ratio (FER) limit for the pass/fail judgement function. The measurement fails if the FER exceeds the set threshold.

Frame erasure ratio is defined as the number of speech frames erased by the BTS to the total number of speech frames in the measurement period.

**Preset**      0.1000% FER

**Range**      0–100%

## Frame Length

**Supported**          E4438C with Option 401

This field displays the current frame length value. The frame length depends on the radio configuration and channel type, and it affects the data rate and frame offset. To change the frame length value, highlight the Frame Length field, press the **Edit Item** softkey and enter a new value. If the field is grayed out, you cannot change the value. The following table lists the frame lengths by channel type:

| | Forward Link | Reverse Link | | | |
|---|---|---|---|---|---|
| **Channel Type** | **F-PCH** | **R-ACH** | **R-DCCH R-FCH** | **R-SCH1 R-SCH2** | **R-EACH R-CCCH** |
| **All Model Values**[1] | 20 ms | 20 ms | 5 ms 20 ms | 20 ms 40 ms 80 ms | 5 ms 10 ms 20 ms |

1. Applies only to radio configurations 3 and 4. All Models channels with radio configurations 1 and 2 use 20 ms only.

**Preset**          20 ms

**Range**          See the above table.

## Frame Offset

**Supported**          E4438C with Option 401

This field displays the current frame offset value. The frame offset skews the traffic channel frames from system time in integer multiples of 1.25 ms. To change the frame offset, highlight the Frame Offset field, press the **Edit Item** softkey and enter a new value.

The following table lists the frame offsets by channel type, radio configuration (RC), and frame length (FL):

| | Forward Link | Reverse Link | | | |
|---|---|---|---|---|---|
| | | RC 1/2 | RC 3/4 | | |
| Channel Type | F-FCH F-SCH1 F-SCH2 | R-ACHR-FCH R-SCH1 | R-DCCH R-FCH | R-SCH1 R-SCH2 | R-CCCH R-EACH |
| All Model Values | 0–15[1] | 0–15 | *FL 5:* 0–3 *FL 20:* 0–15 | *FL 20:* 0–15 *FL 40:* 0–31 *FL 80:* 0–63 | *FL 5:* 0–3 *FL 10:* 0–7 *FL 20:* 0-15 |

1. This parameter is shared between the F-FCH, F-SCH1 and F-SCH2 channels. When you change the frame offset for one channel, the other channels will also change.

**Preset**          0

**Range**          See the above table.

## Frame Polarity Neg Pos

**Supported**          E4438C with Option 003 or 004

This softkey, for the N5102A module, sets the polarity of the frame marker that delineates the beginning of each sample during a serial data transmission.

Neg          The frame line is low while data for the first sample is available.

Pos          The frame line is high while data for the first sample is available.

The frame marker is not affected by phase and skew adjustments.

For a parallel port configuration, this softkey is grayed out (inactive). For information on selecting serial data, see .

**Preset**          Pos

## Frame Struct

**Supported**          E4438C with Option 400

This field displays the frame structure used for the compressed mode. This field is available for the downlink ChipARB channel. To change the field selection, highlight the Frame Struct field, press the **Edit Item** softkey and make a choice from the menu that appears.

In frame structure A, the pilot field of the last slot in the transmission gap is transmitted and transmission is turned off during the rest of the transmission gap.

In frame structure B, the TPC field of the first slot in the transition gap and the pilot field of the last slot in the transmission gap are transmitted and transmission is turned off during the rest of the transmission gap.

**Preset**          A

## Frame Sync Trigger Mode Single Cont

**Supported**       E4438C with Option 400

This softkey selects the uplink synchronization trigger mode.

Single              The signal generator generates frames based on the reference clock.

Cont                The signal generator continuously aligns the sync signal with frame timing.

**Preset**          Single

## Frame Trigger

**Supported**       E4438C with Option 402

### In the TDMA Menu

Use this softkey to display a menu of softkeys where you can trigger a framed pattern. You can choose to trigger using the front panel **Trigger** key, an external trigger supplied to the PATTERN TRIG IN connector, or by a *TRG command or GET (group execute trigger) signal sent over GPIB.

### In the Edge Menu

This softkey enables the output signal of the EVENT 1 rear panel BNC/SMB connector. The frame trigger signal is one clock pulse at every first cycle of a frame to indicate the beginning of a frame.

**Preset**          Trigger

**Remarks**         This softkey is inactive for unframed or continuously repeated data.

## Frame Trigger Setup

**Supported**       E4438C with Option 400

This softkey accesses a menu from which you can select configurations for uplink synchronization. The menu includes the following selections: Sync Source, Frame Clock Interval, Frame Clock Polarity, SRN RST Polarity, and Frame Sync Trigger Mode.

## Frame Trigger Source BCH PDCH

**Supported**          E4438C with Option 300

This softkey enables you to select the synchronization source for the EDGE bit error rate loopback test.

| | |
|---|---|
| BCH | This choice selects the broadcast channel (BCH) as the synchronization source. The test equipment can use a BCH signal from the BTS to determine the required transmit timeslot, frame and multiframe timing. The BCH signal is always transmitted in timeslot 0 and contains multiframe information. |
| PDCH | This choice selects a packet data channel (PDCH) as the synchronization source. PDCH synchronization relies on the BTS to monitor the delay of the access bursts and update the timing advance values in the next downlink signaling message following the access burst. |

**Preset**          BCH

## Frame Trigger Source Int Ext

**Supported**          E4438C with Option 300

Use this softkey to select the frame trigger source.

| | |
|---|---|
| Int | This selects an internal source as the frame trigger signal and is the automatic setting that can not be changed until the **Frame Trigger Source BCH PDCH** softkey is set to PDCH. |
| Ext | This selects an external source as the frame trigger signal for PDCH synchronization. |

**Preset**          Int

**Remarks**          The External Frame Trigger functions are available only when the **Frame Trigger Source BCH PDCH** softkey is set to PDCH.

## Free Run

This softkey appears in the Continuous Mode, Sweep Trigger, and Point Trigger Menus.

### In the Continuous Mode Menu

**Supported**          E4438C with Option 001/601or 002/602

When this softkey is selected, the waveform generator immediately plays a sequence or segment continuously without waiting for a trigger. The waveform generator does not respond to triggers.

**In the Sweep Trigger and Point Trigger Menus**

| | |
|---|---|
| **Supported** | All Models |

| | |
|---|---|
| Sweep Trigger | Selecting the **Free Run** softkey in the Sweep Trigger menu immediately triggers the sweep. |
| Point Trigger | The **Free Run** softkey in the Point Trigger menu causes the sweep to pause for the dwell time that has been configured for each point in the sweep. |

## Freq

| | |
|---|---|
| **Supported** | All Models |

This softkey enables you to set the signal generator to sweep frequency data only. The amplitude is set at a constant level determined by the **Amplitude** hardkey.

| | |
|---|---|
| **Remarks** | You can define a sweep containing both amplitude and frequency information and still choose to sweep frequency only. |

## Freq Channels

| | |
|---|---|
| **Supported** | All Models |

Use this softkey to display a menu of softkeys from which you can assign frequency channels and frequency bands.

## Freq Channels Off On

| | |
|---|---|
| **Supported** | All Models |

This softkey sets the operating state of the RF output.

| | |
|---|---|
| Off | When you select off, the state of the RF output is set in terms of Hertz. |
| On | When you select on, the operating state of the RF output frequency is determined by the frequency band and frequency channel settings. |
| **Preset** | Off |
| **Remarks** | Freq offset and Freq Multiplier still affect the real RF output frequency when Freq Channels is On. |

## Freq Dev

**Supported**         E4438C with Option 001/601or 002/602

This softkey appears in two different locations. You can use this softkey to select the maximum frequency deviation for an FSK modulation or to set a deviation for the FSK table editor.

### Selecting a Symmetric FSK Modulation

Press this softkey to set the maximum frequency deviation for symmetric FSK modulation.

**Preset**         *DECT:* 288.0 kHz
                   *Other formats:* 400.0 Hz

**Range**         0 Hz–4 times the current symbol rate setting (20 MHz maximum)

### Loading a Symmetric FSK Pattern into the FSK Table Editor

Press this softkey to define a custom frequency deviation convention in the FSK table editor. For more information on using the FSK table editor, see the *User's Guide*.

**Preset**         3.1250000 Hz

**Range**         0 Hz–20 MHz

**Remarks**        This setting is not affected by a preset or by a power cycle.

## Freq Drift Type Linear Sine

**Supported**         E4438C with Option 406

This softkey sets the frequency drift type. This enables you to select a frequency drift impairment as part of a Bluetooth setup. Refer to Figure 0-5.

Linear              When you choose Linear, the carrier frequency deviates from the center carrier frequency in a positive or negative linear direction, depending on the drift deviation setting. For example, a drift deviation setting of 15 kHz would cause the carrier frequency to drift in a linear fashion from the carrier frequency to 15 kHz above the intended center carrier frequency.

Sine                When you choose Sine, the carrier frequency drifts above and below its designated center carrier frequency in a sinusoidal fashion. It has a period equal to the length of a timeslot. Since a packet is shorter than a timeslot, it is not fully impaired by the second half of the drift cycle. Therefore, it is recommended that you run separate positive and negative drift impairments using the **Drift Deviation** softkey (for example, 15 kHz and –15 kHz).

A frequency drift impairment repeats at the beginning of each timeslot, and occurs across a period of time equal to the duration of one fully loaded DH1 packet.

**Figure 0-5**
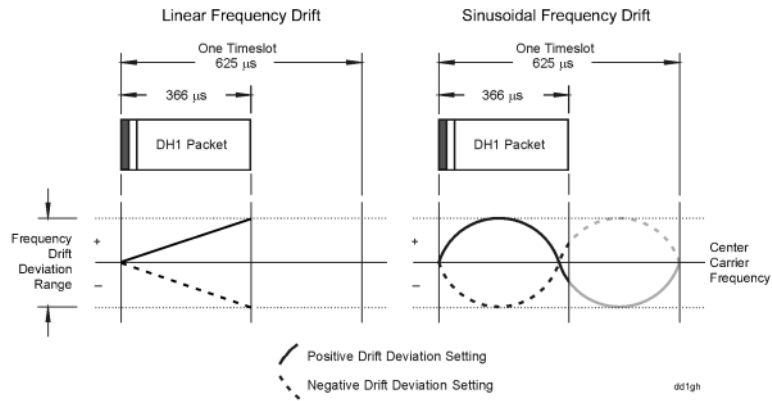


**Preset**            Sine

## Freq Multiplier

**Supported**         All Models

This softkey enables you to multiply the frequency shown on the display without changing the frequency output at the RF OUTPUT connector (simulating the frequency at the output of a harmonic multiplier).

For any multiplier other than 1, the MULT indicator is shown in the frequency area of the display.

**Preset**            1

**Range**             −100 to +1000 (excluding 0)

**Remarks**           The displayed frequency value is equal to the actual frequency, minus the reference frequency, times the multiplier, plus the offset frequency.

## Freq Offset

**Supported**         All Models

This softkey enables you to set a value for frequency offset. For example, if the current output frequency is 1.0 MHz and you enter a frequency offset of 3.0 MHz, the output frequency will remain

at 1.0 MHz but the display will show a frequency of 4.0 MHz. This feature enables you to simulate the frequency at the output of a frequency translating device.

When an offset has been entered, the OFFS indicator is turned on in the frequency area of the display.

**Preset**         0.00 Hz

**Range**         −200.0 GHz to 200.0 GHz

**Remarks**         A frequency offset can be entered at any time during normal operation and also when you are operating in frequency reference mode.

A frequency offset changes the value shown in the frequency area of the display but does not affect the output frequency.

### In the Bluetooth Menu

**Supported**         E4438C with Option 406

This softkey enables you to set a carrier frequency offset impairment for a Bluetooth setup.

**Preset**         0.0 Hz

**Range**         −100.0 kHz to 100.0 kHz

## Freq Offset

### In the Arb W-CDMA Menu

**Supported**         E4438C with Option 400

This data field, in the multicarrier define menu, displays the frequency offset for each of the carriers.

**Range**         − 35.0 to 37.5 MHz

**Remarks**         Multicarrier is only available for downlink.

### In the Multitone Menu

**Supported**         E4438C with Option 001/601or 002/602

This data field displays the frequency offset for each tone. The offset is determined by the value set for the frequency spacing.

## Freq Ref Off On

**Supported**          All Models

This softkey toggles the operating state of the frequency reference mode.

Off                    The frequency reference mode is turned off, and the output frequency is not
                       affected by the reference value set by the **Freq Ref Set** softkey.

On                     The frequency value displayed is equal to the current hardware output frequency
                       minus the reference value set by the **Freq Ref Set** softkey. All Models frequency
                       parameters will now be set as relative to the reference value.

                       Frequency offsets can be used with frequency reference mode. In this situation,
                       the display will show the frequency calculated as the current hardware output
                       frequency minus the reference value plus the frequency offset.

**Preset**             Off

**Remarks**            Frequency reference mode only changes the display; it does not change the RF
                       output frequency.

## Freq Ref Set

**Supported**          All Models

Use this softkey to set the current output frequency plus the offset frequency as the frequency
reference value. Pressing this softkey also causes the **Freq Ref Off On** softkey to toggle to the On
position, turning on frequency reference mode. All Models frequency parameters are then set as
relative to the reference value.

**Preset**             0.00 Hz

**Range**              0.00 Hz–highest frequency (depends on the signal generator option)

## Freq Spacing

**Supported**          E4438C with Option 001/601or 002/602

This softkey enables you to set the spacing between tones in the multitone table editor. When there are
an odd number of tones, the center tone is placed at the carrier frequency and the other tones are
spaced incrementally, according to the set value. With an even number of tones, the mid-point of the
two center tones is placed at the carrier frequency.

**Preset**             10.000 kHz

**Range**              100.0 Hz–80.0 MHz (depends on the number of tones)

## Freq Start

| **Supported** | All Models |
|---|---|

This softkey enables you to set the frequency of the first point in the sweep.

| **Preset** | Highest frequency (depends on the signal generator option) |
|---|---|
| **Range** | 0.00 Hz–highest frequency (depends on the signal generator option) |

## Freq Stop

| **Supported** | All Models |
|---|---|

This softkey enables you to set the frequency of the last point in the sweep.

| **Preset** | Highest frequency (depends on the signal generator option) |
|---|---|
| **Range** | 0.00 Hz–highest frequency (depends on the signal generator option) |

## Freq & Ampl

| **Supported** | All Models |
|---|---|

Use this softkey to set the signal generator to sweep both frequency and amplitude data.

| **Remarks** | Both the frequency and the amplitude lists must have the same number of points or one must have only one point. If a list has only one point, then that point is used for each of the other list's points. |
|---|---|

## `Frequency`

| **Supported** | All Models |
|---|---|

This field enables you to set or edit a frequency value in the table editor.

## Frequency

There are two types of keys that use this title, the front-panel hardkey and a softkey in Option UN7. This key enables you to change the RF output frequency

### On the Front-Panel

| **Supported** | All Models |
|---|---|

In addition to changing the RF output frequency, this key also accesses a menu of softkeys that enable you to configure various frequency functions such as the reference frequency and phase, and specifying the oscillator source.

| Preset | Highest frequency (depends on the signal generator option) |
|--------|-----------------------------------------------------------|
| Range | 100 kHz–highest frequency (depends on the signal generator option) |
| Remarks | When Freq Channels is turned On this hardkey enables Frequency Channel selection. |

**In the Baseband BERT Menu**

| Supported | Option UN7 |
|-----------|------------|

This softkey changes the RF output frequency.

| Preset | Highest frequency (depends on the signal generator option) |
|--------|-----------------------------------------------------------|
| Range | 100 kHz–highest frequency (depends on the signal generator option) |

## Frequency and Amplitude Setup

| Supported | Option 007 |
|-----------|------------|

Use this softkey to access a menu to set frequency and amplitude of the RF OUTPUT signal.

## FSK

| Supported | E4438C with Option 001/601or 002/602 |
|-----------|--------------------------------------|

Use this softkey to access a menu of frequency shift keying (FSK) modulation types for modulating a continuous stream of the selected data pattern. You can also change the default frequency deviation.

In the memory catalog, this softkey enables you to specify that only signal generator FSK files be listed in the catalog of files.

## F-SYNCH Type

| Supported | E4438C with Option 401 |
|-----------|------------------------|

This field displays the forward synchronization channel type. To change the field selection, highlight the F-SYNCH Type field, press the **Edit Item** softkey and make a choice from the menu that appears.

| Preset | JSTD8 |
|--------|-------|

## Full

| Supported | E4438C with Option 401 |
|-----------|------------------------|

Use this softkey to set the gating rate to full, causing all 16 power control groups to be transmitted. The gating rate field is only available on the reverse pilot channel.

## Function Generator

**Supported**        All Models

This key configures the internal source to operate as a function generator.

**Remarks**        When you use the internal source in this capacity, any modulation with the internal source selected is turned off.

## FWCDMA

**Supported**        E4438C with Option 001/601or 002/602

Press this softkey to set the current catalog type to FWCDMA and display the catalog of FWCDMA files.

# G

## G

**Supported**    E4438C with Option 402

This softkey enables you to change the hexadecimal value for the guard time field. Guard time appears in the visual representation of the timeslot as a 24.75-bit field. In the actual implementation, the guard time field in timeslots 0 and 4 are 27 bits long and the remaining timeslots contain 24-bit fields. Use hexadecimal to enter the value; the signal generator will convert it to binary.

The guard time field is always modulated (but not bursted), even when the timeslot is off. If the guard time and T2 symbols of the current timeslot and the T1 symbols of the next timeslot do not match, the burst shape may not be smooth (even if the current timeslot is turned off).

**Preset**    Refer to Table 7.

**Table 0-9**

| Timeslot # | Guard Time Field (Normal & Custom) |
|------------|-------------------------------------|
| 0          | 7FFFFFF                             |
| 1          | 0FFFFFF                             |
| 2          | 0FFFFFF                             |
| 3          | 0FFFFFF                             |
| 4          | 7FFFFFF                             |
| 5          | 0FFFFFF                             |
| 6          | 0FFFFFF                             |
| 7          | 0FFFFFF                             |

**Range**    *Timeslots 0 and 4*: 0 through 7FFFFFF

*Timeslots 1, 2, 3, 5, 6, and 7*: 0 through 0FFFFFF

**Remarks**    The implementation is documented in the GSM format "GSM REC. 05.10 Section 5.7" as follows: "Optionally, the BS may use a timeslot length of 157 bit periods on timeslots with TN=0 and 4, and 156 bit periods on timeslots with TN=1, 2, 3, 5, 6, 7, rather than 156.25 bit periods on all timeslots."

### Gain, Offset & Scaling

**Supported**  E4438C with Option 003

This softkey, for the N5102A module, accesses a menu that enables you to adjust the gain, DC offset, scaling, and IQ rotation for the transmitted data.

### Gain Unit dB Lin Index

**Supported**  E4438C with Option 400

This softkey selects the units of power when in the Edit Channel Setup menu for uplink, for the uplink channel.

| | |
|---|---|
| dB | This selects the uplink power in decibel units. |
| Lin | This selects the uplink power as ratios. |
| Index | This selects the uplink power according to the numbered rows table in the specification. |
| **Preset** | dB |
| **Remarks** | When either dB or linear ratio is selected, arbitrary power levels may be entered. If signaling index is selected, only integers from 0 to 15 can be entered. |

### Gap1 1st

**Supported**  E4438C with Option 400

The Gap1 1st field displays the difference in the power level of the frame with the gap to a frame without the transmission gap. A frame with a gap is transmitted at a higher power level than a frame without a gap. This field is displayed for the uplink compressed mode configuration.

There are two methods for setting up a transmission gap, a single frame method and a double frame method. In the signal frame method, the transmission gap is located within the compressed frame depending on the transmission gap length (TGL). In the double frame method, the transmission gap is located at the center, between two, adjacent frames. Refer to 3GPP Standard 25.215 and 3GPP Standard 25.212 for more information.

A transmission gap pattern can have one or two transmission gaps, depending on the transmission gap start distance (TGD) value. If TGD is defined, both Gap1 and Gap2 are available in one transmission gap pattern. If the TGD is undefined, then it is implied and only Gap1 is available in one transmission gap pattern. See .

| | |
|---|---|
| **Preset** | 0.00 dB |
| **Remarks** | This field is displayed on the second page of the Compressed Mode Setup table editor. Scroll down the table to view the field. |

## Gap1 2nd

**Supported**          E4438C with Option 400

The Gap1 2nd field displays the difference in the power level of the frame with the gap to a frame without the transmission gap. A frame with a gap is transmitted at a higher power level than a frame without a gap. This field is displayed for the uplink compressed mode operation and only when the transmission gap start distance (TGD) field is defined. If the double frame method is used (where the transmission gap spans two radio frames) then Gap1 2nd is the power offset of the second radio frame. See "Gap2 2nd" on page 232 for more information.

**Preset**          0.00 dB

**Remarks**      See "Gap1 1st" on page 231 for compressed mode transmission gap information.

                This field is displayed on the second page of the Compressed Mode Setup table editor. Scroll down the table to view the field. It is not active when TGD is undefined.

## Gap2 1st

**Supported**          E4438C with Option 400

The Gap2 1st field displays the difference in the power level of the frame with the gap to a frame without the transmission gap. A frame with a gap is transmitted at a higher power level than a frame without a gap. This field is displayed for the uplink compressed mode function and only when the transmission gap start distance (TGD) field is defined.

The Gap2 1st field implies that a dual frame transmission gap method is used. The dual frame method is activated when the TGD is defined.

**Preset**          0.00 dB

**Remarks**      See "Gap1 1st" on page 231 for compressed mode transmission gap information.

                This field is displayed on the second page of the Compressed Mode Setup table editor. Scroll down the table to view the field. It is not active when TGD is undefined.

## Gap2 2nd

**Supported**          E4438C with Option 400

The Gap2 2nd field displays the difference in the power level of the frame with the gap to a frame without the transmission gap. A frame with a gap is transmitted at a higher power level than a frame without a gap. This field is displayed for the uplink compressed mode function and only when the transmission gap start distance (TGD) field is defined.

The Gap2 2nd field implies that a dual frame transmission gap method is used. The dual frame method is activated when the TGD is defined. A transmission gap pattern sequence consists of alternating transmission gap patterns 1 and 2; each pattern consists of 1 or 2 transmission gaps.

**Preset**          0.00 dB

**Remarks**         See "Gap1 1st" on page 231 for compressed mode transmission gap information.

This field is displayed on the second page of the Compressed Mode Setup table editor. Scroll down the table to view the field. It is not active when TGD is undefined.

## Gate Active Low High

**Supported**       E4438C with Option 001/601or 002/602

This softkey sets the active trigger state for the gated trigger mode. The modulating signal's response to the low or high selection differs between the ARB formats and real-time custom.

| Gate Active Selection | Trigger Signal State | ARB | Real-Time |
|---|---|---|---|
| High | High | Waveform file stops playing | Data pattern modulates the carrier signal |
| | Low | Waveform file plays | Data pattern stops modulating the carrier signal |
| Low | High | Waveform file plays | Data pattern stops modulating the carrier signal |
| | Low | Waveform file stops playing | Data pattern modulates the carrier signal |

For more information on triggering, see the *User's Guide*.

**Remarks**         Even though this softkey is always active (not grayed out), the selections apply to only the Gated trigger mode (**Gated** softkey).

## Gate Clk Delay

**Supported**       E4438C with Option UN7

This softkey enables you to specify the number of delay bits for the gate function. One bit of delay corresponds to a one bit delay of the input gate clock. Enter the desired value using the numeric keypad and terminate it by pressing the **Bits** softkey.

**Preset**          1 bit

**Range**           1–16384 bits

**Remarks**         This softkey is enabled when the gate delay is on and clock is the gate mode.

## Gate Delay Off On

| | |
|---|---|
| **Supported** | E4438C with Option UN7 |

Use this softkey to set the operating state of the gate delay adjustment function.

| | |
|---|---|
| Off | With this choice, the gate delay adjustment function is inactive. |
| On | With this choice, the gate delay adjustment function is active and the **Gate Time Delay** and **Resolution** softkeys are enabled when and the gate mode is set to time. If the gate mode is set to clock, the **Gate Clock Delay** softkey is enabled. |
| **Preset** | Off |

## Gate Mode Time Clk

| | |
|---|---|
| **Supported** | E4438C with Option UN7 |

Use this softkey to select the operating mode of the gate delay.

| | |
|---|---|
| Time | When you select Time, the **Gate Time Delay** and **Resolution** softkeys become active. |
| Clk | When you select Clock, the **Gate Clock Delay** softkey becomes active. |
| **Preset** | Time |
| **Remarks** | This softkey is enabled when the gate delay is on. |

## Gate Off On

| | |
|---|---|
| **Supported** | E4438C with Option UN7 |

Use this softkey to toggle the operating state of the gate signal.

| | |
|---|---|
| Off | This choice disables the gate function. |
| On | This choice activates the gate signal connected to the rear panel BER GATE IN connector. |
| **Preset** | Off |

## Gate Polarity Neg Pos

| | |
|---|---|
| **Supported** | E4438C with Option UN7 |

Use this softkey to set the gate signal input polarity supplied to the rear panel BER GATE IN connector.

| | |
|---|---|
| Neg | With this choice, the signal is valid when the gate signal is low. |
| Pos | With this choice, the signal is valid when the gate signal is high. |

**Preset**    Pos

## Gate Time Delay

**Supported**    E4438C with Option UN7

This softkey enables you to specify the delay time of the gate signal. The gate delay time must be a multiple of the minimum resolution value and if not, the gate delay time is automatically rounded to a value that is the multiple value closest to the entered value. Enter the value using the numeric keypad and terminate it by pressing the appropriate units softkey.

| | |
|---|---|
| **Preset** | 26.7 nsec |
| **Range** | 26.7 nsec–1 sec |
| **Remarks** | This softkey is enabled when the gate delay is on and time is set to the gate mode. |

## Gated

**Supported**    E4438C with Options 001/601 or 002/602

This softkey sets the signal generator to the gated trigger mode, which causes the waveform (modulating signal) to repeatedly start and stop in response to an externally applied trigger signal.

To use the gated trigger mode, you must also select **Ext** from the Trigger Source menu. The length of each transmission depends on the duty period of the trigger signal and the gate polarity selection, which is set with the **Gate Active Low High** softkey. The polarity selection also determines which state (negative or positive) of the trigger signal causes an interruption in the modulating signal.

The external trigger signal connects to either the PATTERN TRIG IN connector or the Auxiliary I/O connector (PATT TRIG IN 2 pin). To select the connector, use the **Ext Source** softkey.

The gated trigger mode functions differently for ARB and Real Time I/Q Baseband (Custom real-time) signals.

ARB    The waveform waits for the first inactive trigger signal state to begin playing. After the first inactive trigger occurrence, the waveform stops playing during active states and plays during inactive states. The waveform stops at the last played sample point and restarts at the next sample point.

Real-Time Custom The modulating signal waits for the first active trigger signal state, then begins transmission. After the initial trigger, the behavior depends on whether the signal incorporates framed or unframed data. Because the ESG provides only unframed data, to transmit a framed data signal you must create an external file that incorporates the framing and download it to the ESG. The following list describes the behavior differences between the two types of data transmissions:

- Unframed data transmits during active states and stops during inactive states.

The signal stops at the last transmitted symbol and restarts at the next symbol.

- Framed data starts transmitting at the beginning of a frame during active states and stops at the end of a frame when the end occurs during inactive states. If the end of the frame extends into the next active state, the signal transmits continuously.

For more information on downloading files, see the *Programming Guide*; for more information on triggering, see the *User's Guide*.

## Gating Rate

**Supported**        E4438C with Option 401

This field displays the current gated transmission of the mobile and is only available for the pilot channel in the RadioConfig 3/4 Enhanced Access and RadioConfig 1/4 Common Control reverse link channel configurations. To change the field selection, highlight the Gating Rate field, press the **Edit Item** softkey and make a choice from the menu that appears.

**Preset**        Full (16 bits)

## Gaussian

**Supported**        E4438C with Option 001/601or 002/602

This softkey selects a Gaussian pre-modulation filter from either the Select (filter) menu or the Load Default FIR menu.

### In the Select (filter) Menu

In this menu, use the **Gaussian** softkey to select this FIR filter for use in a modulation setup.

### In the Load Default FIR Menu

In this menu, use the **Gaussian** softkey to access a menu from which you can change the filter BbT value, specify the number of symbols, apply a windowing function, and generate a new FIR table that is loaded with the coefficients for a Gaussian filter. If you change a parameter, you can press the **Generate** softkey again to reload the FIR table.

## Generate

**Supported**        E4438C with Option 001/601or 002/602

Use this softkey to create a new FIR table that is based on the user-specified alpha or filter Bbt value, number of symbols, and windowing selection.

### GMSK

**Supported**          E4438C with Option 402

This softkey configures a normal GSM timeslot in the EDGE modulation format.

### Goto

**Supported**          All Models

Use this softkey to access a menu from which you can select a row or page in a table or list of items.

### Goto Bottom Row

**Supported**          All Models

Use this softkey to move the selection bar to the last row in the current table or list
of items.

### Goto Middle Row

**Supported**          All Models

Use this softkey to move the selection bar to the middle row in the current table or list of items.

### Goto Row

**Supported**          All Models

Use this softkey to access a menu from which you can select a row in the current table or list of items.

### Goto Top Row

**Supported**          All Models

Use this softkey to move the selection bar to the first row in the current table or list of items.

### GPIB Address

**Supported**          All Models

This softkey enables you to change the signal generator's GPIB address. The GPIB address is set to 19
at the factory.

**Preset**          19

**Range**          0–30

| Remarks | The GPIB address setting is not affected by a preset or by a power cycle. |
|---|---|

## GPIB Listener Mode

| Supported | All Models |
|---|---|

Use this softkey to return the GPIB back to the listener mode after a user flatness correction.

## GPIB/RS-232/LAN

| Supported | All Models |
|---|---|

Use this softkey to access a menu of configuration choices for GPIB, RS-232, and LAN.

## GPS

### In the Mode menu

| Supported | E4438C with Option 409 |
|---|---|

Use the Global Positioning System (GPS) softkey to access a menu from which you can select **Real Time GPS** or **Real Time MSGPS**. The **Real Time GPS** selection enables you to set up a GPS signal that simulates the transmission from a single satellite. The **Real Time MSGPS** selection enables you to set up a GPS signal that simulates the transmissions from multiple satellites.

### In the Catalog Type menu

| Supported | E4438C with Option 409 |
|---|---|

This softkey enables you to specify that only signal generator GPS scenario files be listed in the catalog of files.

## GPS Ref (f0)

| Supported | E4438C with Option 409 |
|---|---|

Use this softkey to set the GPS reference clock signal frequency. If an external source is being used, its frequency must match the value set with this softkey.

| Preset | 10.230000 Mcps |
|---|---|
| Range | 1.000 kcps–12.500000 Mcps (Real Time GPS)<br>10.23 Mcps ± 10% (Real Time MSGPS) |
| Remarks | In Real Time GPS mode, a change to the **GPS Ref (f0)** value will cause the P code and C/A code chip rates to change.<br><br>In Real Time MSGPS mode, a change to the **GPS Ref (f0)** value will cause the C/A code chip rate to change. |

## GPS Ref Clk Ext Int

**Supported**      E4438C with Option 409

This softkey toggles the GPS reference clock (chip clock) source selection between internal and external.

Ext             This selection sets the signal generator to use an external reference clock, which is supplied to the DATA CLOCK INPUT connector.

Int              This selection sets the instrument to use the internal reference clock.

**Preset**         Int

**Remarks**      If an external reference clock is being used, its frequency must match the value set with the **GPS Ref (f0)** softkey.

## Gray Coded QPSK

**Supported**     E4438C with Option 001/601or 002/602

This softkey selects a Gray Coded quadrature phase shift keying (QPSK) modulation. It appears in two locations, enabling you to either select a modulation, or load an I/Q map into the I/Q table editor. Gray Coded QPSK modulation transmits data at the rate of 2 bits per second. The constellations for this modulation type are designed so that adjacent symbols differ by only one bit.

The following figures show the I/Q constellation mapping differences between different QPSK modulation selections.

| QPSK & OQPSK | IS95 QPSK & IS95 OQPSK | Gray Coded QPSK |
|---|---|---|
| 01    00 | 10    00 | 01    11 |
| 11    10 | 11    01 | 00    10 |

### Selecting a Gray Coded QPSK Modulation

Use this softkey to select Gray Coded quadrature phase shift keying (QPSK) to modulate a continuous stream of the selected data pattern.

### Loading a Gray Coded QPSK I/Q Map into the Table Editor

Use this softkey to load a Gray Coded quadrature phase shift keying (QPSK) I/Q bit pattern into the I/Q table editor. You can use the table editor to modify the constellation mapping.

For more information on mapping symbol positions with the I/Q table editor, see the *User's Guide*.

## GSM

This softkey appears in two different locations, to either select a predefined personality for a custom digital modulation format, or to access a menu from which you can configure a digital modulation.

### Selecting GSM for Custom Digital Modulations

**Supported**     E4438C with Option 001/601or 002/602

Use this softkey to select a predefined Global System for Mobile Communication (GSM) personality for the digital modulation format.

**Accessing the GSM Menu**

**Supported**        E4438C with Option 402

Use this softkey to display a menu of softkeys where you can generate a pattern formatted in either a framed structure (where the data bits are located in fields defined by the GSM protocol), or a sequence that can be output one or more times.

## GSM BERT Off On

**Supported**        E4438C with Option 300

This softkey sets the operating state of the GSM bit error rate test (BERT) function.

| | |
|---|---|
| Off | This choice will turn off any current GSM BER measurements. |
| On | This choice will cause the GSM BERT function to initiate synchronization to the base transceiver station (BTS) under test. |
| **Preset** | Off |
| **Remarks** | The following message appears if the amplitude level is incorrect when you toggle GSM BERT on: |

`522 "Demodulator Unleveled; Input amplitude underrange."`

## GSM/Edge Bands

**Supported**        E4438C

This softkey accesses a menu from which you can select the frequency bands for GSM. The output frequency depends on both frequency band and channel selections.

## GSM Off On

**Supported**        E4438C with Option 402

Use this softkey to set the operating state of the Global System for Mobile Communications (GSM) format.

| | |
|---|---|
| Off | When you select Off, the GSM format is turned off. |
| On | When you select On, this sets up the internal hardware to generate a signal that follows the GSM format. The internal I/Q modulator generates GMSK digital modulation and the GSM and I/Q annunciators are turned on in the display. Although the digital modulation is enabled with this softkey, the RF carrier is modulated by the enabled modulation only when you have also set **Mod On/Off** to On. |

| | |
|---|---|
| **Preset** | Off |
| **Remarks** | Setting the **GSM Off On** softkey to On presets the following softkeys in the I/Q and MUX menus: **I/Q Off On** softkey is set to On and the **Source 1** and **I/Q Out** softkeys are set to BBG 1. You can override these selections in the I/Q and MUX menus. |

## GSM 450 Base

**Supported**    All Models

This softkey selects GSM 450 Base as the frequency band for GSM. The output frequency depends on both the channel band and channel number selections.

| | |
|---|---|
| **Preset** | *Channel*: 259 |
| | *Frequency*: 460.600 MHz |
| **Range** | *Channels*: 259–293 |
| | *Frequency*: 460.600–467.400 MHz |

## GSM 450 Mobile

**Supported**    All Models

This softkey selects GSM 450 Mobile as the frequency band for GSM. The output frequency depends on both the channel band and channel number selections.

| | |
|---|---|
| **Preset** | *Channel*: 259 |
| | *Frequency*: 450.600 MHz |
| **Range** | *Channels*: 259–293 |
| | *Frequency*: 450.600–457.400 MHz |

## GSM 480 Base

**Supported**    All Models

This softkey selects GSM 480 Base as the frequency band for GSM. The output frequency depends on both the channel band and channel number selections.

| | |
|---|---|
| **Preset** | *Channel*: 306 |
| | *Frequency*: 489.000 MHz |
| **Range** | *Channels*: 306–340 |
| | *Frequency*: 489.000–495.800 MHz |

## GSM 480 Mobile

**Supported**         All Models

This softkey selects GSM 480 Mobile as the frequency band for GSM. The output frequency depends on both the channel band and channel number selections.

| | |
|---|---|
| **Preset** | *Channel*: 306 |
| | *Frequency*: 479.000 MHz |
| **Range** | *Channels*: 306–340 |
| | *Frequency*: 479.000–485.800 MHz |

## GSM 850 Base

**Supported**         All Models

This softkey selects GSM 850 Base as the frequency band for GSM. The output frequency depends on both the channel band and channel number selections.

| | |
|---|---|
| **Preset** | *Channel*: 128 |
| | *Frequency*: 869.200 MHz |
| **Range** | *Channels*: 128–251 |
| | *Frequency*: 869.200–893.800 MHz |

## GSM 850 Mobile

**Supported**         All Models

This softkey selects GSM 850 Mobile as the frequency band for GSM. The output frequency depends on both the channel band and channel number selections.

| | |
|---|---|
| **Preset** | *Channel*: 128 |
| | *Frequency*: 824.200 MHz |
| **Range** | *Channels*: 128–251 |
| | *Frequency*: 869.200–848.800 MHz |

# H

## Half

**Supported**     E4438C with Option 401

Use this softkey to set the gating rate to half, causing 8 power control groups (every other bit) to be transmitted. The gating rate field is available only in the reverse pilot channel.

## Hamming

**Supported**     E4438C with Option 001/601or 002/602

Use this softkey to apply the Hamming windowing function to the selected filter.

Windowing can be applied to any default FIR filter that you load into the Define User FIR table. Windowing improves out of band performance (ACP), but simultaneously degrades passband performance (EVM), by smoothing the filter's transition to zero.

**Remarks**     Hamming is the windowing type applied when you toggle the
**Optimize FIR For EVM ACP** softkey to the ACP selection.

## Hann

**Supported**     E4438C with Option 001/601or 002/602

Use this softkey to apply the Hann windowing function to the selected filter.

Windowing can be applied to any default FIR filter that you load into the Define User FIR table. Windowing improves out of band performance (ACP), but simultaneously degrades passband performance (EVM), by smoothing the filter's transition to zero.

## HSDPA

**Supported**     E4438C with Option 418

This softkey accesses a menu from which you can control the off and on state for Agilent's Signal Studio for HSDPA over W-CDMA software.

## Header

**Supported**     E4438C with Option 401

Use this softkey to access a menu from which you can set the forward fundamental or supplemental channel long code mask header used to communicate with a particular mobile.

| | |
|---|---|
| **Preset** | 0318 |
| **Range** | 0000–03FF |

## Header Utilities

| | |
|---|---|
| **Supported** | E4438C with Option 001/601or 002/602 |

This softkey accesses the menu where you can view a waveform's header information. From this menu you can edit the header description, clear the file header information or save the current signal generator file header settings.

## Help Mode Single Cont

| | |
|---|---|
| **Supported** | All Models |

The utility menu **Instrument Info/Help mode** softkey access the **Help Mode Single Cont** softkey. The help text is a short description of any hardkey or softkey.There are two help modes available on the signal generator: single and continuous.

| Single | In single mode, when you press the **Help** hardkey, help text is provided for your next key press. Pressing any key afterward exits the help function and activates the key. |
|---|---|
| Cont | In continuous mode, when you press the **Help** hardkey, help text is provided for each key press in addition to activating the function of the key (except for the **Preset** hardkey). You will remain in continuous mode until either the **Help** softkey is pressed again or the help mode is toggled back to single mode. |
| **Remarks** | The help mode is not affected by a preset or by a power cycle. |

## High Amplitude

| | |
|---|---|
| **Supported** | E4438C with Option 300 |

This softkey enables you to set the highest amplitude of the range to be searched.

| **Preset** | *GSM*: TCH/FS −90.0 dBm |
|---|---|
| | *EDGE*: DL MCS5 −80.0 dBm<br>DL MCS9 −85.0 dBm |
| **Range** | −136 dBm to 13 dBm |

## High Crest Mode Off On

**Supported**          E4438C

This softkey toggles the operating state of the high crest mode from either the I/Q hardkey menu or the Arb Setup menu.

### In the I/Q Hardkey Menu

**Supported**          E4438C

Use this softkey to reduce the ALC level of externally applied I/Q input signals.

| | |
|---|---|
| Off | Turn high crest mode off to disable the I/Q high crest mode. |
| On | Turn high crest mode on for externally applied signals with high crest factors (such as CDMA). High crest mode reduces the ALC level by 7.5 dB, allowing the signal generator to process these signals with less distortion. For crest factors higher than 4 dB, I/Q drive levels should be reduced by 1 dB for each dB above that level. In high crest mode, the maximum output level is reduced and power level accuracy is degraded. |
| **Preset** | Off |
| **Remarks** | This softkey is available only when **I/Q Off On** is set to On and no other modulation format is on. |

### In the Arb Setup Menu

**Supported**          E4438C with Option 001/601 or 002/602

Use this softkey to reduce the ALC level of waveforms used with the dual arbitrary (dual ARB) waveform player.

| | |
|---|---|
| Off | Turn high crest mode off to disable the dual ARB high crest mode. |
| On | Turn high crest mode on for arbitrary I/Q waveforms with high crest factors (such as downloaded Signal Studio for 802.11 signals). High crest mode reduces the ALC level by 7.5 dB, allowing the signal generator to process these signals with less distortion and improved EVM. For crest factors higher than 4 dB, I/Q drive levels should be reduced by 1 dB for each dB above that level. In high crest mode, the maximum output level is reduced and power level accuracy is degraded. |
| **Preset** | Off |
| **Remarks** | The high crest mode is automatically turned on by some Signal Studio applications. You can manually override this automatic selection at any time. |

## Higher Layer

**Supported**          E4438C with Option 400

This softkey choice selects higher layer scheduling method as the compressed mode (CM) method. The emulated higher layer scheduling method keeps the same physical layer data rate even when a transmission gap is created. Refer to "CM Method" on page 102 for more information on the CM method.

**Remarks**          To access this softkey, highlight the CM Method field on the **Comp Parameter Setup** screen and press **Edit Item**.

## Hostname

**Supported**          All Models

This softkey enables you to enter the hostname for the local area network connection. No hostname is entered at the factory.

**Remarks**          The hostname setting is not affected by a preset or by a power cycle.

## HSPDSCH

**Supported**          E4438C with Option 400

This softkey selects a high speed physical downlink shared channel (HS-PDSCH) for insertion into the Edit Setup table editor.

## HSSCCH

**Supported**          E4438C with Option 400

This softkey selects a high speed shared control channel (HS-SCCH) for insertion into the Edit Channel Setup table editor.