Key and Data Field Reference
Volume 2: I-Z

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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I

I Gain

Supported   E4438C with Option 003

This softkey, for the N5102A module, enables you to adjust the gain for the I data. This is a fine adjustment that is independent of the Q data and can be used to complement the setting obtained using the **Scaling** softkey.

The gain is the gain of the digital sample. A sample is usually 16 bits and represents an analog voltage. This voltage is adjusted by the gain which will change the bit values. If the signal gain cannot be represented by 16 bits it will be clipped.

Preset   100.0%

Range   87.50–112.5%

I Offset

Supported   E4438C with Option 003

This softkey, for the N5102A module, enables you to adjust the DC offset for the I data. The offset can be used to compensate for an existing impairment or to introduce an impairment to the I data.

The offset is an adjustment to the analog level that is represented by the digital sample. The analog voltage is limited to a 16-bit data sample.

Preset   0.00%

Range   −100 to +100% of full scale

Immediate

Supported   E4438C with Option 001/601or 002/602

This softkey sets immediate as the waveform's response to triggers when using the single trigger mode in an ARB format. The waveform waits for and starts with the first trigger. A subsequent trigger immediately resets the waveform, which starts playing from the beginning.Use this softkey to enable immediate retriggering for single trigger operation. In this state, the waveform will reset and replay from the start immediately upon receiving a trigger.

When the ESG receives multiple triggers when only one is required, the signal generator uses the first trigger and ignores the rest. For more information on triggering, see the *E4428C/38C ESG Signal Generators User's Guide*.

In the BERT Menu

Supported   E4438C with Option UN7

This softkey starts the measurement as soon as the ESG achieves synchronization.

With **Immediate** selected, BER measurements are initiated and repeated until you set the **BERT Off On** softkey to Off, or until you set the BERT trigger source to Trigger Key, Bus, or Ext.

Impairments

Supported   E4438C with Option 406

Use this softkey to access a menu from which you can configure various impairment functions.

Preset   Off

Impairments Off On

Supported   E4438C with Option 406

This softkey sets the operating state of the impairment function.

Off   When you select Off, no impairment settings are applied.

On   When you select On, the impairment settings are applied.

Preset   Off

Impedance 75 Ohm High

Supported   E4438C with Option UN7

Use this softkey to set the input termination mode of the rear panel BER DATA IN, BER CLK IN, and BER GATE IN connectors.

75 Ohm   This choice sets the input termination mode to 75 ohms.

High   This choice sets the input termination mode high.

Preset: High

Increment Scramble Code

Supported   E4438C with Option 400

This softkey will sort carriers by frequency offset and auto-increment scramble codes starting from the current scramble code value for the lowest frequency carrier.

Remarks   If the lowest frequency carrier has a scramble code value of N/A, the auto-increment value will start at 0.

Increment Timing Offset

Supported   E4438C with Option 400

This softkey will sort carriers by frequency offset and auto-increment timing offsets. The new values will start with the current timing offset for the lowest frequency carrier and increment by 1 for each subsequent carrier.

Initial Phase

Supported   E4438C with Option 400

This field displays the initial phase of the muticarrier waveform. The units are not specified, but the value represents degrees.

Preset   0

Range   0–149

Init Pwr

In Uplink PhyCH Type PRACH

Supported   E4438C with Option 400

This field displays the initial power (Init Power) level of the preamble. The field is displayed in the PRACH Power Setup menu.

The Init Power field is coupled to and changes with the number of preambles, ramp step, and maximum power (Max Power) field. If a ramp step is set to a value other than 0.00 dB, the initial power will be the power level at the start of the ramp; the first preamble.

For example, if the number of preambles is set to 4, the ramp step set to 1 dB, and the maximum power set to –20 dBm, then the initial power will be –23 dBm. The first preamble will be at –23 dBm, second at –22 dBm, third at –21 dBm and fourth at –20 dBm.

Preset   –136.00 dBm

In Uplink PhyCH DPCH

Supported   E4438C with Option 400

This field displays the initial power (Init Pwr) level of the dedicated physical channel (DPCH). The field is displayed in the Transmit Power Control Setup menu.

The Init Pwr field is coupled to the Power Step field. The Power Step will only change in increments of the value set by the Power Step field. Init Power can not be set lower than the Minimum Power.

Preset	0.00 dB
Range	−40 to 0
Remarks	The **Power Mode Norm TPC** softkey must be set to **TPC** (TPC highlighted) for the Init Power field to appear.

Initial Bit Count

Supported	E4438C with Option 300

This softkey enables you to set the initial bit count for the sensitivity search measurement function in the EDGE uncoded configuration.

Preset	13920
Range	1392–2147483647

Initial Block Count

Supported	E4438C with Option 300

This softkey enables you to set the initial block count value for the sensitivity search measurement function in the EDGE downlink MCS5 or MCS9 configuration.

Preset	600
Range	*MCS5*: 1–1500000
	MCS9: 2–1500000
Remarks	For MCS9, only even values can be entered with a minimum value of 2. If odd numbers are entered, a +1 will be added to the value to make it an even value.

Initial Frame Count

Supported	E4438C with Option 300

This softkey enables you to set the initial speech frame count value for the sensitivity search measurement function in the GSM configuration.

Preset	25
Range	1–6000000

Initialize Phase Fixed Random

Supported   E4438C with Option 001/601or 002/602

This softkey sets the initial state for the tones, as part of initializing the multitone table editor.

Fixed   When you select Fixed, the initial phase of all tones are set to 0 degrees.

Random   When you select Random, the initial phase of the tones is set to randomly
                 generated phases based on the **Random Seed Fixed Random** softkey selection.

Preset   Fixed

Initialize Table

Supported   E44438C with Option 001/601or 002/602

This softkey accesses a menu that enables you to set the initial values for the multitone configuration.

Insert

Supported   E4438C with Option 001/601or 002/602

Use this softkey to access a menu from which you can select different methods of inserting bits, or to
execute the insertion of a specified number of bits.

Insert 0's

Supported   E4438C with Option 001/601or 002/602

Use this softkey to insert a specified number of zeros into the current position of the bit file editor.

Insert 1's

Supported   E4438C with Option 001/601or 002/602

Use this softkey to insert a specified number of ones into the current position of the bit file editor.

Insert DPDCH

Supported   E4438C with Option 400

This softkey enables you to insert a Dedicated Physical Data Channel (DPDCH) into the uplink Edit
Channel Setup table editor. After pressing this softkey, press the **Done** softkey to insert the channel into
the Edit Channel Setup table editor.

Remarks   This softkey is available in uplink only.

Insert PN9

Supported   E4438C with Option 001/601or 002/602

This softkey performs two functions:

- Accesses a menu of softkeys for setting the PN9 seed and inserting the PN sequence into the user file.

- Inserts the PN9 sequence into the user file.

Insert PN15

Supported   E4438C with Option 001/601or 002/602

This softkey performs two functions:

- Accesses a menu of softkeys for setting the PN15 seed and inserting the PN sequence into the user file.

- Inserts the PN15 sequence into the user file.

Insert Row

Supported   All Models

Use this softkey to insert a copy of the highlighted row directly above that row in a table or list.

Insert Selected Waveform

Supported   E4438C with Option 001/601or 002/602

Use this softkey to insert the highlighted waveform into the sequence you are building.

Insert Waveform

Supported   E4438C with Option 001/601or 002/602

This softkey accesses a menu and table editor which enable you to insert a waveform into the current row of the table editor.

Insert Waveform Sequence Contents
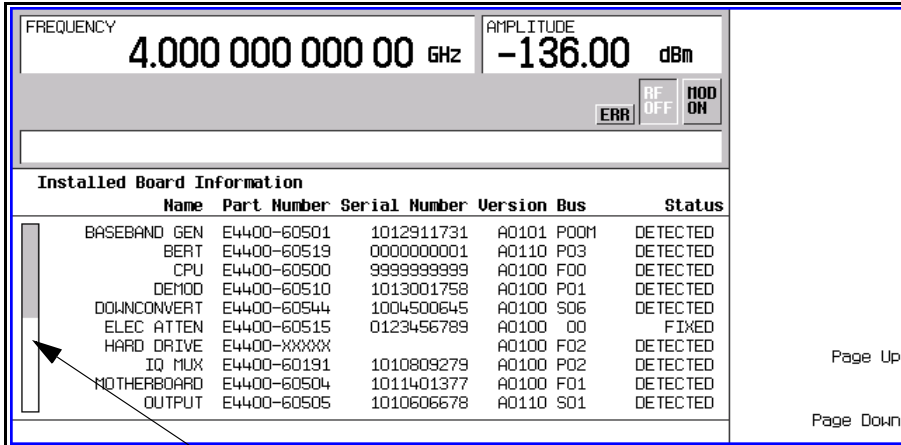
Supported   E4438C with Option 001/601or 002/602

Use this softkey to insert the contents of the highlighted sequence into the sequence you are building.

Installed Board Info

Supported   All Models

Use this softkey to display information about the installed boards in the signal generator. Refer to .

Figure 0-6   Installed Board Information

Additional Page Indicator

The gray and white vertical bar on the left side of the display indicates that there is an additional page of information. Use the **Page Down** softkey to display the next page. Use the **Page Up** softkey to return to the previous page.

Remarks   A status of DETECTED means that the installed board was automatically detected by the internal computer.

A status of FIXED means that the installed board or devise was detected and is available for use.

Instrument Adjustments

Supported   All Models

Use this softkey to access a menu of front panel adjustments for the signal generator. This menu enables you to adjust the reference oscillator, set the value of the step keys, and the front panel knob and so forth.

Instrument Info/Help Mode

Supported   All Models

Use this softkey to display a menu of softkeys detailing some of the signal generator functions and operations.

Instrument Options

Supported   All Models

Use this softkey to access a menu from which you can install license keys and manage hardware options.

Int

Supported   E4438C with Option 001/601or 002/602 and without Option UNB or 506

This softkey enables you to automatically toggle the RF output power for each timeslot between main and alternate amplitudes using the internal baseband generator's timeslot settings. You can assign either main or alternate amplitude to each timeslot using the **Timeslot Ampl Main Delta** softkey.

Int Phase Polarity Normal Invert

Supported   E4438C

Use this softkey to invert the internal Q signal, reversing the rotation direction of the phase modulation vector.

Normal	When you choose Normal, the phase relationship between the I and Q signals is not altered by the phase polarity function.
Invert	When you choose Invert, the in-phase component lags the quadrature-phase component by 90° in the resulting modulation.
Preset	Normal

Intermod

Supported   E4438C with Option 400

This softkey, in the downlink Test Setup menu, selects an intermodulation (Intermod) test. Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receiver a wanted signal on its assigned channel frequency in the presence of two or more interfering signals.

Remarks   The test parameters for this test are defined in 3GPP TS25.101.

Internal

Supported   All Models

Use this softkey to select internal ALC leveling.

In the Clock Source Menu (N5102A)

This softkey, for the N5102A module, selects the N5102A module internal clock as the clock source. This requires that the same external reference frequency be applied to both the Freq Ref connector and the ESG. You must also set the interface module reference frequency to match that of the applied signal (see "Reference Frequency" on page 385). This is the factory preset clock source selection. With this selection, the internal clock signal is available 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. For more information on using the N5102A module to lock to a common frequency reference, see the *N5102A Digital Signal Interface Module User's Guide*.

Internal

Supported   E4438C with Option 001/601or 002/602

This softkey selects an internally generated signal as the modulation output.

In the CDMA Menu

Supported   E4438C with Option 401

Use this softkey to configure the ESG to use the internal baseband generator data clock.

Int I/Q Skew Correction RF BB Off

Supported   E4438C

This softkey is used to select the skew path to be optimized.

RF   When RF is selected, the skew is optimized for the I/Q signal applied to the RF Output. The BB (external I/Q output) output will be functional, but the I/Q timing skew applied will be optimized for the RF path. When using this choice, seven symbols of latency are added to the Arb based waveform. While in real-time mode, the maximum number of user symbols for the FIR is limited to 32.

BB   When BB (baseband) is selected, the skew is optimized for the I/Q signal outputs

on the rear panel. The RF output will be functional, but the I/Q timing skew applied will be optimized for the BB path. When using this choice, seven symbols of latency are added to the Arb based waveform. While in real-time mode, the maximum number of user symbols for the FIR is limited to 32.

Off   When Off is selected, the factory I/Q timing skew is turned off. Using the signal generator in this mode does not add any latency symbols.

Preset   RF

Remarks   This softkey is not active for existing ESG customers downloading C.03.10 firmware. See "I/Q Timing Skew" on page 266 for manual adjustments.

Internal Monitor

Supported   All Models

This softkey selects the internal source as the low frequency output. The signal is available at the LF OUTPUT connector. The frequency and shape of the signal is internally configured.

Remarks   The internal monitor is selected after an instrument preset or when the on/off power-line switch is cycled.

Internal Pulse

Supported   All Models

This softkey enables you to internally generate a variable width pulse as the modulation waveform.

Internal Ref Bandwidth

Supported   All Models with Option UNJ

This softkey enables you to adjust the bandwidth of the internal reference oscillator.

Internal Square

Supported   All Models

This softkey enables you to internally generate a square wave as the modulation waveform.

Inverse Video Off On

Supported   All Models

This softkey selects the display mode, text and background, for the signal generator.

Off   Inverse mode is off, the signal generator has dark text on a light background; the normal display mode for the signal generator.

On	Inverse mode is on, the signal generator display has light text on a dark background.
Remarks	The inverse video state is not affected by a preset or by a power cycle.

Inverted

Supported   E4438C with Option 401

Use this softkey to reverse the direction of phase rotation of the internal Q signal. In this mode, the in-phase component lags the quadrature-phase component by 90°.

I Offset

Supported   E4438C

Use this softkey to enter an origin offset voltage for internally generated in-phase signals. This offset is used to remove imperfections in the in-phase signal or to introduce calibrated impairments.

Preset	0.0%
Range	−100% to 100%
Remarks	The **I/Q Adjustments Off On** softkey must be set to On to enable this adjustment.
	When using this key to minimize the LO feedthrough signal, optimum performance is achieved when the adjustment is made after all other I/Q path adjustments, such as those made with the [Int Phase Polarity Normal Invert] or [Modulator Atten xx db Manual Auto] softkeys. If other adjustments are made after minimization is performed, the LO feedthrough signal may increase.

I/O Setup

Supported   E4438C with Option UN7 or 300

Use this softkey to access a menu that enables you to configure the I/O parameters for the baseband bit error rate measurement.

IP Address

Supported   All Models

This softkey enables you to enter the internet protocol (IP) address for your IP network connection. No IP address is entered at the factory.

Remarks	The IP address setting is not affected by a preset or by a power cycle.

I/Q

Supported   E4438C with Option 001/601or 002/602

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

I/Q

Supported   E4438C

Use this hardkey to access a menu from which you can configure the internal I/Q modulator. You can also toggle the operational state of the I/Q modulator, external burst envelope, high crest mode, and ALC.

I/Q Adjustments

Supported   E4438C

Use this softkey to access a menu of I/Q adjustment choices for internally generated or externally applied I and Q signals. In this menu you can change the I/Q gain balance, I and Q offset voltages, and quadrature angle adjustment. You can also toggle the operational state of these I/Q adjustments.

The current operating state of the I/Q adjustments function is displayed under the
I/Q Adjustments softkey.

I/Q Adjustments Off On

Supported   E4438C

This softkey toggles the operating state of the I/Q adjustments.

Off	When this softkey is in the off position, I/Q adjustment values are not applied to the I and Q signals.
On	When this softkey is in the on position, the values entered for I/Q gain balance, quadrature angle adjustment, I offset, and Q offset are applied to the I and Q signals.
Preset	Off

I/Q Calibration

Supported   E4438C

Use this softkey to access a menu from which you can configure and execute an I/Q calibration. Start and Stop frequencies and calibration type such as user or full can be selected from the menu. In addition, in this menu you can execute the I/Q calibration and restore the original factory calibration data for the I/Q modulator.

Before the I/Q calibration starts, the signal generator saves the current instrument state and recalls the state after running the calibration. However, not all settings are saved. For example, waveform data, list points, and arb settings are not saved. These data types must be stored in the signal generator's memory catalog and loaded into waveform memory after the I/Q calibration completes. Refer to the *E4428C/38C ESG Signal Generators User's Guide* section on the instrument state register for a list of signal generator settings that are not saved.

Remarks   I/Q calibration data is not affected by a preset or by a power cycle.

An I/Q calibration should be performed approximately every 30 days, but it can be performed at any time to peak the performance of the I/Q modulator.

I/Q Delay

Supported   E4438C

Use this softkey to change the phase of I and Q in relation to triggers and markers. A positive value advances the I and Q phase. This setting affects both the external I/Q output signals and the baseband signal modulated on the RF output.

This feature is not compatible with constant envelope modulations and signals connected to the external I/Q inputs. Delay limits are dependent on the current signal configuration. The units are seconds and the range depends on the signal format but is limited to ± 1 second.

Preset   0.0 sec

Range   ± 1 second

I/Q Gain Balance Source 1

Supported   E4438C

Use this softkey to change the I to Q gain balance for the **Source 1** selection. For example, if you enter a value of 1 dB, the I signal will have 1 dB more amplitude than the Q signal. The gain balance adjustment can be used with externally applied I and Q signals or with internally generated I and Q signals. Use the gain balance to remove imperfections in I and Q or to introduce calibrated impairments.

Preset   0.00 dB

Range	−4 dB to 4 dB
Remarks	The **I/Q Adjustments Off On** softkey must be set to On to enable this adjustment.

I/Q Mapping Normal Invert

Supported	E4438C with Option 401

Use this softkey to toggle the I/Q outputs between normal and inverted.

Normal	In this state, the I/Q outputs are not inverted.
Invert	In this state, data on the I channel is switched to the Q channel, and data on the Q channel is switched to the I channel.
Preset	Normal

I/Q Mod Filter Manual Auto

Supported	E4438C

Use this softkey to access a menu from which you can either manually apply an I/Q modulation filter or select Auto to enable the ESG to automatically choose a filter based on the active digital modulation settings. You can override the automatic mode at any time by manually selecting a filter from this menu.

The selected filter type is displayed in parentheses.

Preset	Through
Remarks	This softkey appears in all Arb modulation format menus and under the **I/Q** front panel hardkey. When an Arb modulation format is turned on, the **I/Q Mod Filter Manual Auto** softkey under the **I/Q** hardkey will be disabled (greyed out).

I/Q Off On

Supported	E4438C

This softkey toggles the operating state of the internal I/Q modulator.

Off	This setting disables the internal I/Q modulator. You can turn off the I/Q modulation with this softkey even though the digital modulation mode is enabled. With this configuration, the RF output signal would not be modulated but the I/Q signals will be present at the rear panel I/Q outputs.
On	This setting enables the internal I/Q modulator. **I/Q Off On** is also toggled automatically to On when any of the digital modulation formats are enabled.
	When this softkey is set to On, the I/Q annunciator will be displayed.

Preset	Off
Remarks	RF output power will be attenuated if the I/Q modulator is turned on and an I/Q signal is not applied.
	Although you can enable I/Q modulation with this softkey, the RF carrier is modulated only when you have also set **Mod On/Off** to On.

I/Q Out

Supported	E4438C

Use this softkey to access a menu from which you can select a signal source to be routed to the rear panel I and Q output connectors.

Preset	Ext 50 Ohm
Remarks	When a digital modulation format is turned on, the **Source 1** and **I/Q Out** selections automatically switch to BBG1. When the digital modulation is turned off, the **Source 1** and **I/Q Out** selections automatically switch to Ext 50 Ohm. You can override the automatic settings by manually selecting a different source.

I/Q Out Gain Balance

Supported	E4438C

Use this softkey to change the I to Q gain balance at the rear panel I and Q external outputs. For example, if you enter a value of 1 dB, the I signal will have 1 dB more amplitude than the Q signal. Use the gain balance to remove imperfections in I and Q or to introduce calibrated impairments.

Preset	0.00 dB
Range	−4 dB to 4 dB

I/Q Output Atten

Supported	E4438C

Use this softkey to set the attenuation level of the I/Q signal at the rear panel I and Q output connectors. A setting of 0.00 dB will result in 100 percent output signal power, while a setting of 40.00 dB will result in 0.01 percent output signal power.

Preset	6.00 dB
Range	0.00–40.00 dB

I/Q Output Control

Supported   E4438C

Use this softkey to access a menu from which you can change the parameters that control the I and Q output signals. In this menu you can control the I/Q output attenuation levels, I/Q output gain balance, and I and Q offset voltages. You can also select an I/Q output filter.

I/Q Output Filter Manual Auto

Supported   E4438C

Use this softkey to access a menu of filters that can be applied to the I and Q output signals.

The selected filter type is displayed under the **I/Q Output Filter** softkey.

Preset   Through

Remarks   This softkey appears in all Arb modulation format menus and under the **I/Q** front panel hardkey. When an Arb modulation format is turned on, the **I/Q Output Filter Manual Auto** softkey under the **I/Q** hardkey will be disabled (greyed out).

IQ Phase Normal Invert

Supported   E4438C with Option 409

In the Real Time GPS menu

This softkey toggles the phase relationship of the GPS I and Q signals.

Normal	In this state, the C/A code phase is aligned with the in-phase component (I), and the P code phase is aligned with the quadrature-phase component (Q).
Invert	In this state, the Q signal is inverted, and the I component lags the Q component by 90 degrees in the resulting modulation.

Preset Normal

In the Real Time MSGPS menu

This softkey toggles the phase relationship of the MSGPS I and Q signals.

Normal	In this state, the I and Q signals are transmitted with positive polarity (I leads Q by 90 degrees).
Invert	In this state, the Q signal is inverted, and the I component lags the Q component by 90 degrees in the resulting modulation.

Preset   Normal

IQ Polarity Neg Pos

Supported   E4438C with Option 003 or 004

This softkey, for the N5102A module, sets the polarity of the I and Q data lines for the N5102A module.

Neg	The data on both the I and Q data lines are inverted. A digital one is represented by a low logic level at the output.
Pos	The polarity of the output data matches the input data. A digital one is represented by a high logic level at the output.

Preset   Pos

I/Q Scaling

This softkey adjusts the amplitude scaling of the I and Q signals.

In the Custom Real Time Menu

Supported   E4438C with Option 001/601or 002/602

Use this softkey to adjust the amplitude of both the I and Q outputs for better adjacent channel power (ACP) performance.

Preset   100%

Range   1-200%

In the Baseband Setup Menu

Supported   E4438C with Option 004

This softkey, for the N5102A module, enables you to adjust the scaling of both the I and the Q data transmitted through the N5102A module. For Option 003, see "Scaling" on page 406.

Preset   70%

Range   −100 to +100%

I/Q Timing Skew

Supported   E4438C

Use this softkey to input skew changes to the I and Q paths. Equal and opposite skew is applied to both paths (RF Output and I/Q outputs) simultaneously. A positive value delays the I signal relative to the Q signal, and a negative value delays the Q signal relative to the I signal.

Adjusting the skew can optimize the error vector magnitude (EVM) of modulating signals with high

data rates such as wireless LAN.

If the **Int I/Q Skew Correction RF BB Off** softkey is active, the I/Q signals are already optimized and adjusting I/Q timing skew would add an impairment to the signals. For signals routed to the rear panel outputs (BB), you may want to adjust the I/Q timing skew to account for any mismatch in the cables connected to the I/Q BNC connectors.

If the **Int I/Q Skew Correction RF BB Off** softkey is set to Off, then adjusting the I/Q timing skew could improve the EVM (Error Voltage Magnitude).

I/Q timing skew adjustments are preserved when the instrument state is saved. I/Q timing skew adjustments are also preserved when instrument settings are changed.

Using I/Q timing skew while playing a user-defined finite impulse response (FIR) filter file greater than 32 symbols in a non-ARB personality will generate an error.

Preset	0.000 sec
Range	±2 sec
Remarks	MSK, FSK, and C4FM are constant envelope modulations and skew cannot be applied (**Int I/Q Skew Correction RF BB Off** softkey should be set to Off). Refer to "Int I/Q Skew Correction RF BB Off" on page 258 and "I/Q Timing Skew Path RF BB" for more information.

I/Q Timing Skew Path RF BB

Supported	E4438C

This softkey selects the path to which I/Q timing skew adjustments will be applied. The choices are the RF path or the I/Q output (BB) path. The I/Q timing skew affects both paths. Adjustments can affect the deselected path which may be delayed improperly due to internal polarity differences between the paths. For example, if the BB (baseband) path is selected then adjustments could adversely affect the RF path.

If the **Int I/Q Skew Correction RF BB Off** softkey is set to Off, or there are no factory I/Q timing skew corrections data, then adjusting the I/Q timing skew for the desired path could improve the EVM of the signal. Adjusting the skew can optimize the error vector magnitude (EVM) of modulating signals with high data rates such as wireless LAN. Refer to "Int I/Q Skew Correction RF BB Off" on page 258 and "I/Q Timing Skew" on page 266 for more information.

Preset	RF
Range	N/A

I/Q Source 1

Supported	E4438C

Use this softkey to access a menu from which you can select a signal source to be routed to the internal I/Q modulator.

When a digital modulation format is turned on, the **I/Q Source 1** and **I/Q Out** selections automatically switch to BBG1. When the digital modulation is turned off, the **I/Q Source 1** and **I/Q Out** selections automatically switch to Ext 50 Ohm. You can manually override the automatic settings.

Preset   Ext 50 Ohm

I/Q Source 2

Supported   E4438C

Use this softkey to access a menu from which you can select an additional signal source to be summed with I/Q Source 1 and then routed to the internal I/Q modulator.

Preset   Off

IS95

Supported   E4438C with Option 401

Use this softkey to select the forward synchronization type as defined by the IS-95 CDMA standard.

IS-95

In the Standard Menu

Supported   E4438C with Option 001/601or 002/602

Use this key to select a standard cdmaOne IS-95 filter.

In the Baseband Generator Menu

Supported   E4438C with Option 001/601or 002/602

Use this softkey to select a standard IS-95 baseband filter.

IS-95 and IS-2000

Supported   E4438C with Option 001/601or 002/602

Use this softkey to access a menu of IS-95 and IS-2000 filters in the Select Filter menu. This menu displays the following filter choices: IS-95, IS-95 w/EQ, IS-95 Mod, IS-95 Mod w/EQ and IS-2000 SR3 DS.

IS-95 Mod

In the Standard Menu

Supported   E4438C with Option 001/601or 002/602

Use this key to select a modified version of the standard IS-95 filter. This filter is modified for improved adjacent channel power performance. The modification is done in a manner that meets the IS-95 error function criterion.

In the Baseband Generator Menu

Supported   E4438C with Option 001/601or 002/602

Use this softkey to select a modified version of the standard IS-95 baseband filter. This filter is modified for improved adjacent channel performance. The modification, however, is done in a manner that still meets the IS-95 error function criterion.

IS-95 Mod w/EQ

In the Standard Menu

Supported   E4438C

Use this softkey to select a modified version of the standard IS-95 filter. This filter is modified for improved adjacent channel power performance, and includes the equalizer for phase compensation required by a base station. The filter modification is done in a manner that meets the IS-95 error function criterion.

In the Baseband Generator Menu

Supported   E4438C with Option 001/601or 002/602

Use this softkey to select a modified version of the standard IS-95 baseband filter. This filter is modified for improved adjacent channel performance, and includes the equalizer specified by IS-95. The filter modification is done in a manner that still meets the IS-95 error function criterion.

IS-95 w/EQ

In the Standard Menu

Supported   E4438C

Use this softkey to select the standard IS-95 filter with the equalizer for phase compensation required by a base station.

In the Baseband Generator Menu

Supported   E4438C with Option 001/601or 002/602

Use this softkey to select a standard IS-95 baseband filter with an equalizer provided for phase compensation required by the base station.

IS95 OQPSK

Supported   E4438C with Option 001/601or 002/602

This softkey selects an IS95 offset quadrature phase shift keying (OQPSK) modulation in accordance with the IS95 standards. It appears in two locations, enabling you to either select a modulation, or load an I/Q map into the I/Q table editor. IS95 OQPSK modulation transmits data at the rate of 2 bits per symbol.

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 an IS95 OQPSK Modulation

Use this softkey to select IS95 OQPSK for modulating a continuous stream of the selected data pattern.

Loading an IS95 OQPSK I/Q Map into the Table Editor

Use this softkey to load an IS95 OQPSK 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 using the I/Q table editor, refer to the *E4428C/38C ESG Signal Generators User's Guide*.

IS95 QPSK

Supported   E4438C with Option 001/601or 002/602

This softkey selects an IS95 quadrature phase shift keying (QPSK) modulation in accordance with the IS95 standards. It appears in two locations, enabling you to either select a modulation, or load an I/Q map into the I/Q table editor. IS95 QPSK modulation transmits data at the rate of 2 bits per symbol.

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 an IS95 QPSK Modulation

Use this softkey to select IS95 QPSK for modulating a continuous stream of the selected data pattern.

Loading an IS95 QPSK I/Q Map into the Table Editor

Use this softkey to load an IS95 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 using the I/Q table editor, refer to the *E4428C/38C ESG Signal Generators User's Guide*.

IS-97 Levels

Supported   E4438C with Option 401

Use this softkey to set the IS-95A channel power levels to IS-97 standard specification levels.

IS2000

Supported   E4438C with Option 401

Use this softkey to select the forward synchronization type as defined by the IS-2000 CDMA standard.

IS-2000 SR3 DS

Supported   E4438C with Option 401

Use this softkey to select the standard IS-2000 spreading rate 3 direct spread filter.

Remarks   This softkey is only available when **Multicarrier Off On** is toggled to Off.

ISDN

Supported   E4438C with Option 400

This field displays the reference measurement setup data type selected for the DPCH as integrated services digital network (ISDN).

Remarks   Refer to "AMR 12.2 (25.944)" on page 52 for more information.

J

JSTD8

Supported   E4438C with Option 401

Use this softkey to select the forward synchronization type as defined by the JSTD8 CDMA standard.

K

Kaiser

Supported   E4438C with Option 001/601or 002/602

Use this softkey to apply the Kaiser windowing function to the selected filter. Selecting **Kaiser** also activates the Beta factor which you can adjust to change the trade-off between optimized ACP or EVM.

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.

L

LAN Config Manual DHCP

Supported   All Models

Use this softkey to select either manual or dynamic host configuration protocol (DHCP) as the method for designating the internet protocol (IP) address for the signal generator. The IP address mode, DHCP or manual, survives a preset or instrument reboot.

In DHCP mode, many of the softkeys in the LAN Config menu are inactive (grayed–out). The domain name service (DNS) and DHCP server assign, when possible, the Hostname, Subnet Mask, and Default Gateway. However, the IP address will always be assigned.

Manual   The user enters a signal generator IP address.

DHCP   The network server software assigns a temporary, dynamic, IP address for the signal generator, which can change.

LAN Setup

Supported   All Models

Use this softkey to access a menu enabling you to enter a local area network (LAN) host name and IP address for communication over the LAN.

Last Mkr Point

Supported   E4438C with Option 001/601or 002/602

This softkey sets the last marker point when you define a range of points on a waveform segment for the active marker. If you enter a value that is less than the first marker point, the last marker point automatically adjusts to match the first marker point. To set a single marker point at a specific sample point, make the first and last marker value the same. To select the active marker, use the **Marker 1 2 3 4** softkey. For more information on markers, see the *E4428C/38C ESG Signal Generators User's Guide*.

Preset   last waveform point

Range   first marker point– 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 is on. When it is available, the waveform is the waveform highlighted in the `Catalog of WFM1 Files` which is accessed from the **Set Markers** softkey.

`LCMask`

Supported   E4438C with Option 401

This field displays the current long code mask value (in hexadecimal) for the forward link paging, fundamental and supplemental channels. This 42-bit binary number creates the unique identity of the long code.

To change the long code mask for the paging channel, highlight the `LCMask` field, press the **Edit Item** softkey and set a new value using the **Field1**, **Field2** and **Field3** softkeys. To change the long code mask for the fundamental or supplemental channels, highlight the `LCMask` field, press the **Edit Item** softkey and set a new value using the **Header** and **Permuted ESN** softkeys.

Preset   *F-PCH:* 319A0200000
                    F-FCH, F-SCH1, F-SCH2: 31800000000

Range: 0–3FFFFFFFFFF

`Leap Seconds`

Supported   E4438C with Option 401

This field displays the current leap seconds value. The `Leap Seconds` field is used to correct the Universal Coordinated Time (UTC). To change the leap seconds value, use the down arrow key to move the cursor to the second of data fields and highlight the `Leap Seconds` field. Press the **Edit Item** softkey and enter a new hexadecimal value.

Preset   00

Range   00–FF

Left

Supported   E4438C with Option 400

This softkey selects a scramble code between 8191 and 16384 for the downlink ChipARB physical channel.

Left Alternate

Supported   E4438C with Option 400

This softkey sets the downlink channel scramble type to left alternate. Selecting
Left Alternate adds 8192 to the scramble code.

LF Out

Supported   All Models

Use this hardkey to access a menu of softkeys that enable you to configure the internal, low frequency
source.

LF Out Amplitude

Supported   All Models

This softkey enables you to scale the output of the signal at the LF OUTPUT connector.

Preset   0.0 V

Range   0.0−5.0 Vp

LF Out Freq

Supported   All Models

Pressing this key allows you to enter a frequency for the internal function generator.

Preset   400.0 Hz

Range   0.5 Hz−100.0 kHz
          0.5 Hz to 20.0 kHz if triangle, ramp or square wave is selected.

Remarks   This softkey is available after selecting function generator as the
          LF Out Source.

LF Out Off On

Supported   All Models

This softkey toggles the operating state of the source at the LF OUTPUT connector on and off.

Off   The low frequency output is disabled and no signal is available at the LF
          OUTPUT connector.

On   The selected source, for example function generator, is enabled and the signal is
          available at the LF OUTPUT connector.

Refer to the "LF Out Source" for more information on choosing the source.

Preset	Off
Remarks	Once you have toggled this state on, the signal is immediately available at the LF OUTPUT connector. Neither the **RF On/Off** hardkey nor the **Mod On/Off** hardkey affect this state.

LF Out Period

Supported	All Models

This softkey enables you to set the period of the low frequency pulse signal.

Range	16 ms–30.0 s
Remarks	This softkey is available after selecting the internal source to operate as a function generator and selecting pulse as the waveform type.

LF Out Source

Supported	All Models

Use this softkey to access a menu of available sources for the low frequency output. You can choose to output the signal from one of the internal sources as it is being used by a modulation or you can use the internal source as a function generator and select that signal to output at the LF OUTPUT connector.

If you choose an internal source, the frequency and shape of the signal at the LF OUTPUT connector is set by the internal source. For example, if the internal source is currently assigned to an AM path configuration and AM is turned on, the signal output at the LF OUTPUT connector will have the frequency and shape of the amplitude modulating signal. You can scale the amplitude of the output signal using the **LF Out Amplitude** softkey.

If you choose to set the internal source as a function generator, you can select a frequency and shape in addition to selecting the amplitude for the LF output signal.

Preset	Internal Monitor
Remarks	When you use an internal source as a function generator, any modulation with the internal source selected is turned off.

LF Out Start Freq

Supported	All Models

This softkey enables you to change the starting frequency for swept-sine low frequency output. This key is coupled to the **LF Out Freq** softkey in the LF Out menu and the **LF Out Tone 1 Freq** softkey in the LF Out dual-sine menu. An LF Out start frequency setting is reflected in the **LF Out Freq** and **LF Out Tone 1 Freq** softkeys. Conversely, if you change the value for either the **LF Out Freq** softkey or the **LF Out Tone 1 Freq** softkey, the value for the LF Out start frequency is changed.

Preset	400.0 Hz
Range	0.1 Hz−100.0 kHz (minimum increment is 0.1 Hz)
Remarks	This softkey is available after selecting the internal source to operate as a function generator and selecting swept-sine as the waveform type.

LF Out Stop Freq

| **Supported** | All Models |

This softkey enables you to change the stop frequency for swept-sine low frequency output.

This key is coupled to the **LF Out Tone 2 Freq** softkey in the LF Out Dual-Sine menu. Any value set for the LF Out stop frequency is reflected in the **LF Out Tone 2 Freq** softkey.

Preset	400.0 Hz
Range	0.1 Hz−100.0 kHz (minimum increment is.1 Hz)
Remarks	This softkey is available after selecting the internal source to operate as a function generator and selecting swept-sine as the waveform type.

LF Out Sweep Time

| **Supported** | All Models |

This softkey enables you to set the sweep rate for the low frequency swept-sine output. The signal generator will sweep from the specified start frequency to the stop frequency at the rate set with this key.

Preset	100.0 ms
Range	1 ms−65.535 s (minimum increment is 1.0 ms)
Remarks	This softkey is available after selecting the internal source to operate as a function generator and selecting swept-sine as the waveform type.

LF Out Sweep Trigger

| **Supported** | All Models |

Use this softkey to access a menu of choices that enable you to select the triggering mode for the swept-sine low frequency output.

Free Run	The source will continue sweeping without a trigger signal.
Trigger Key	The source will sweep after the front panel **Trigger** hardkey is pressed.
Bus	The GPIB is used to trigger the source for a sweep.

Ext	An external trigger, either a positive or negative signal, is used to generate a sweep.
Preset	Free Run
Remarks	This softkey is available after selecting the internal source to operate as a function generator and selecting swept-sine as the waveform type.

LF Out Tone 1 Freq

Supported	All Models

This softkey enables you to set the frequency for the low frequency output tone 1.

This key is coupled to the **LF Out Freq** softkey in the LF Out menu and the **LF Out Start Freq** softkey in the LF Out Swept-Sine menu. An LF Out tone 1 frequency setting is reflected in the **LF Out Freq** and **LF Out Start Freq** softkeys.

Preset	400.0 Hz
Range	0.1 Hz–100.0 kHz (minimum increment allowed is 0.5 Hz)
Remarks	This softkey is available after selecting Function Generator as the LF source and after selecting LF source dual-sine as the waveform type.

LF Out Tone 2 Ampl % Of Peak

Supported	All Models

This softkey enables you to set the amplitude of the alternate frequency as a percent of the peak modulated amplitude. The sum of the two LF Out amplitudes results in the total LF Out amplitude set by the **LF Out Amplitude** softkey in the LF Out menu.

For example, if the total LF Out amplitude is 300 mVp and you set the LF Out tone 2 amplitude percent of peak to 33%, then the amplitude of LF Out tone 1 will be 200.0 mVp and the amplitude of LF Out tone 2 will be 100.0 mVp (33% of 300.0 mVp). The amplitude of the two tones will equal 300.0 mVp.

Preset	50.0%
Range	0.0–100% (minimum increment is 0.1%)
Remarks	This softkey is available after selecting the internal source to operate as a function generator and selecting dual-sine as the waveform type.

LF Out Tone 2 Freq

Supported   All Models

This softkey enables you to change the alternate frequency of the modulation source. The alternate frequency is the second frequency in the dual-sine mode or the stop frequency in swept-sine mode. This key is coupled to the **LF Out Freq** softkey in the LF Out menu and the **LF Out Stop Freq** softkey in the LF Out Swept-Sine menu.

Preset   400.0 Hz

Range   0.1 Hz−100.0 kHz (minimum increment allowed is 0.5 Hz)

Remarks   This softkey is available after selecting the internal source to operate as a function generator and selecting dual-sine as the waveform type.

LF Out Waveform

Supported   All Models

This softkey accesses a menu from which you can choose a waveform to be generated by the internal modulation source.

LF Out Width

Supported   All Models

This softkey enables you to set the pulse width for the low frequency output pulse signal.

Range   8.0 µS – 30 Sec

Remarks   In the LF Out menu this softkey is available after selecting the internal source to operate as a function generator and selecting pulse as the modulating waveform type.

Link Control

Supported   E4438C with Option 400/401

Use this softkey to access a menu from which you can select a real-time CDMA2000 or W-CDMA channel and modify its parameters.

Link Down Up

Supported   E4438C with Option 400

Use this softkey to select a W-CDMA downlink or uplink channel.

Down   Selects the downlink, base to UE, W-CDMA configuration.

Up   Selects the uplink, UE to base, W-CDMA configuration.

Preset: Down

Link Forward Reverse

Supported   E4438C with Option 401

Use this softkey to toggle the CDMA2000 channel setup link selection between forward and reverse.

Forward   This mode enables the settings for a forward link (base to mobile) channel setup.

Reverse   This mode enables the settings for a reverse link (mobile to base) channel setup.

Preset   Forward

List

Supported   All Models

This softkey enables you to specify that only signal generator list sweep files be included in the catalog of files.

Load All Models from NVWFM Memory

Supported   E4438C with Option 001/601or 002/602

This softkey enables you to load all of the files from non-volatile arbitrary waveform (NVWFM) memory to waveform (WFM1) memory where you can play the waveforms.

Load Cal Array From Step Array

Supported   All Models

This softkey enables you to set up a table that includes the start frequency, stop frequency, and number of points that are defined in the Configure User Flatness Step Array menu.

Load Default FIR

Supported   E4438C with Option 001/601or 002/602

Use this softkey to access a menu for automatically filling the FIR table editor with coefficient values from pre-defined filters such as Root Nyquist, Nyquist, Gaussian and Rectangle. The default filter parameters can also be selected in this menu allowing you to choose the filter alpha or BbT and the number of filter symbols.

Load Default FSK

Supported   E4438C with Option 001/601or 002/602

Use this softkey to access a menu from which you can select a default symmetric FSK modulation and configure the frequency deviation for the FSK modulation selected.

Load Default I/Q Map

Supported   E4438C with Option 001/601or 002/602

Use this softkey to access a menu from which you can select a standard I/Q mapping from a set of either PSK or QAM modulations.

Load From Selected File

Supported   All Models

Use this softkey to replace the current information in a table editor with the information in the highlighted file. You will be prompted for confirmation.

Remarks   This key is inactive unless at least one file has been stored to memory.

Load List From Step Sweep

Supported   All Models

This softkey enables you to copy the step sweep data points into the list sweep data points.

Remarks   You can have only one sweep list at a time so be certain that you wish to overwrite the existing list.

Load Mirror Image of Fall Shape

Supported   E4438C with Option 001/601or 002/602

Use this softkey to load the Rise Shape Editor with a mirror image of the Fall Shape Editor when editing a burst shape. For more information on editing burst shapes, see the *E4428C/38C ESG Signal Generators User's Guide*.

Remarks   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 Load Mirror Image of Rise Shape.

Load Mirror Image of Rise Shape

Supported   E4438C with Option 001/601or 002/602

Use this softkey to load the Fall Shape Editor with a mirror image of the Rise Shape Editor when editing a burst shape. For more information on editing burst shapes, see the *E4428C/38C ESG Signal Generators User's Guide*.

Remarks   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 Load Mirror Image of Fall Shape.

Load Segment from NVWFM Memory

Supported   E4438C with Option 001/601or 002/602

This softkey enables you to load the selected file from non-volatile arbitrary waveform (NVWFM) memory to waveform (WFM1) memory where you can play the waveform.

Load/Store

Supported   All Models

Use this softkey to access a menu for loading tables from, and storing tables to, non-volatile memory. Non-volatile memory enables you to retain files for future use after an instrument power cycle.

Load Store

Supported   E4438C

This softkey accesses a menu that enables you to load table values from, and store table values to, non-volatile memory. Non-volatile memory retains files for future use after an instrument power cycle.

Load   This enables you to load arbitrary waveform (NVARB) segments to the displayed catalog of files.

Store   This enables you to store waveform segments (WFM1) from volatile memory to non-volatile arbitrary waveform (NVWFM) memory.

Logic Type

Supported   E4438C with Option 003 or 004

This softkey, accesses a menu that enables you to select the logic type for the N5102A module data.

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.

Preset   3.3V CMOS

Long Code Mask

Supported   E4438C with Option 401

This field displays the current long code mask value (in hexadecimal) for the reverse link. This 42-bit binary number creates the unique identity of the long code. To change the long code mask, highlight the Long Code Mask field, press the **Edit Item** softkey and enter a new value.

Preset   00000000000

Range: 0–3FFFFFFFFFF

Long Code State

Supported   E4438C with Option 401

This field displays the current long code seed value (in hexadecimal) used to generate the actual long code. The long code is a PN sequence that is used for scrambling in the forward channels and spreading in the reverse channels. To change the long code seed, highlight the Long Code State field, press the **Edit Item** softkey and enter a new value.

Preset   0000000000

Range   0–3FFFFFFFFFF

Loop Back Test Type

Supported   E4438C with Option 003 or 004

This softkey, accesses a menu where you can select different loop back tests to verify the operation of the ESG digital output and the N5102A module.

To run the tests, see . For more information on loop back tests, see the *E4428C/38C ESG Signal Generators User's Guide*.

Preset   Device Intfc

Loop Selected Tests

Supported   All Models

This softkey is provided for self test diagnostics. For more information refer to the Troubleshooting chapter of the *E4428C/38C ESG Signal Generators Service Guide*.

Remarks   This key is included for use by service personnel.

Low Amplitude

Supported   E4438C with Option 300

This softkey enables you to set the minimum amplitude of the range to be searched.

Preset   *GSM*: TCH/FS −115.0 dBm

EDGE: DL MCS5 −110.0 dBm
DL MCS9 −100.0 dBm
Uncoded −105.0 dBm

Range   −136 to 13 dBm

Remarks   Optimum speed will be obtained if the search range is minimized to around 5–10 dB.

Low Capacity

Supported   E4438C with Option 402

Use this softkey to select low capacity as the timeslot type for the active timeslot. When you have selected **Low Capacity** for a timeslot, the visual representation of the timeslot type on the display updates to show the configuration.

Low Capacity with Z Field

Supported   E4438C with Option 402

Use this softkey to select low capacity with Z field as the timeslot type for the active timeslot. When you have selected **Low Capacity with Z Field** for a timeslot, the visual representation of the timeslot type on the display updates to show the configuration.

LTM OFF

Supported   E4438C with Option 401

This field displays the current offset of local time (where 01 = 30 minutes, 02 = 60 minutes, 03 = 90 minutes, and so on) from the system time. The local time offset is displayed in hexadecimal notation. To change the local time offset, highlight the LTM OFF field, press the **Edit Item** softkey and enter a new value.

Preset   00

Range   00−3F

LVDS

Supported   E4438C with Option 003 or 004

This softkey, sets the logic type for the N5102A module to low voltage differential signaling (LVDS).

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.

LVTTL

Supported   E4438C with Option 003 or 004

This softkey, sets the logic type for the N5102A module to a low voltage TTL signal.

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.

M

Manual

Supported   All Models without Options UNB or 506

This softkey enables you to manually toggle the RF output power between main and alternate amplitudes using the **Manual Trigger Main Delta** softkey.

Manual Mode Off On

Supported   All Models

This softkey toggles the operating state of the manual mode selection for the current sweep point.

Off   When Manual Mode is off, sweeping occurs over the entire list or range of points.

On   When Manual Mode is on, the selected sweep point controls the frequency and amplitude according to the sweep type.

Preset   Off

Remarks   This key is disabled when the **Sweep** softkey is set to Off.

Manual Point

Supported   All Models

This softkey enables you to choose a point in the sweep list. When Manual Mode is on, the selected point controls the output parameters (frequency and/or amplitude) according to the sweep type.

The number of selectable points is dependent on the number of sweep points in the current sweep configuration. This means that the maximum value may be less than the maximum range value shown in the Range field.

Preset   1

Range   *List Sweep*: 1–1601   *Step Sweep*: 2-65535

Remarks   This key is disabled when **Manual Mode Off On** is set to Off.

                       If list or step mode is controlling frequency and/or power, then the indexed point in the respective list(s) will be used.

                       If the point selected is beyond the maximum number in current sweep configuration, then the point will be set to the maximum possible point, and an error will be generated.

Manual Trigger Main Delta

Supported   All Models without Option UNB or 506

Use this softkey to manually toggle the RF output power between main and alternate amplitudes.

For more information on alternate amplitude, see the *E4428C/38C ESG Signal Generators User's Guide*.

Remarks   You must select **Manual** in the **Alt Ampl Trigger** menu for this softkey to be enabled.

Marker 1 2 3 4

Supported   E4438C with Option 001/601or 002/602

This softkey selects the active marker (1–4) to set or clear marker points. Each press of the softkey highlights a different marker number. The highlighted number is the active maker. Except for the Display Markers menu, all marker settings within the Set Markers menu apply to the highlighted marker number. Each marker routes an output signal to the rear-panel event connector number (EVENT 1, EVENT 2, EVENT 3, or EVENT 4) that corresponds to the marker number. For more information on markers and the rear-panel connectors, see the *E4428C/38C ESG Signal Generators User's Guide*.

Preset   1

Marker 1

Supported   E4438C with Option 001/601or 002/602

Use this softkey to route marker 1 to control the Pulse/RF Blank, ALC Hold, or Alternate Amplitude features. This softkey also creates a signal on the EVENT 1 rear panel BNC connector.

Marker 2

Supported   E4438C with Option 001/601or 002/602

Use this softkey to route marker 2 to control the Pulse/RF Blank, ALC Hold, or Alternate Amplitude features. This softkey also creates a signal on the EVENT 2 rear panel BNC connector.

Marker 3

Supported   E4438C with Option 001/601or 002/602

Use this softkey to route marker 3 to control the Pulse/RF Blank, ALC Hold, or Alternate Amplitude features. This softkey also creates a signal on the rear panel AUX I/O connector, pin 19.

Marker 4

Supported   E4438C with Option 001/601or 002/602

Use this softkey to route marker 4 to control the Pulse/RF Blank, ALC Hold, or Alternate Amplitude features. This softkey also creates a signal on the rear panel AUX I/O connector, pin 18.

Marker Polarity

Supported   E4438C with Option 001/601or 002/602

This softkey accesses a menu from which you can select the polarity (positive or negative) for each of the waveform markers. Marker polarity settings remain until you reconfigure them, preset the signal generator, or cycle the ESG power. After setting the marker polarities, it is recommended that you save the settings to the file header. Saving the marker polarities in the header ensures that the waveform (segment or sequence) uses the correct marker polarity when it is played. This is especially important when a waveform playback follows another waveform playback, because the previously played waveform could have a different polarity configuration. For more information on markers and file headers, see the *E4428C/38C ESG Signal Generators User's Guide*.

Marker 1 Polarity Neg Pos

Supported   E4438C with Option 001/601or 002/602

This softkey selects negative or positive polarity for marker 1. The marker polarity setting remains until you reconfigure it, preset the signal generator, or cycle the ESG power. It is also part of the file header information, so saving the file header saves the current marker polarity. Changing polarity inverts the output marker signal.

Neg   The marker signal is high during the period of no marker points.

Pos   The marker signal is high during the set marker points.

For more information on markers and file headers, see the *E4428C/38C ESG Signal Generators User's Guide*.

Marker 2 Polarity Neg Pos

Supported   E4438C with Option 001/601or 002/602

This softkey selects negative or positive polarity for marker two. The marker polarity setting remains until you reconfigure it, preset the signal generator, or cycle the ESG power. It is also part of the file header information, so saving the file header saves the current marker polarity. Changing polarity inverts the output marker signal.

Neg   The marker signal is high during the period of no marker points.

Pos   The marker signal is high during the set marker points.

For more information on markers and file headers, see the *E4428C/38C ESG Signal Generators User's Guide*.

Marker 3 Polarity Neg Pos

Supported   E4438C with Option 001/601or 002/602

This softkey selects negative or positive polarity for marker 3. The marker polarity setting remains until you reconfigure it, preset the signal generator, or cycle the ESG power. It is also part of the file header information, so saving the file header saves the current marker polarity. Changing polarity inverts the output marker signal.

Neg   The marker signal is high during the period of no marker points.

Pos   The marker signal is high during the set marker points.

For more information on markers and file headers, see the *E4428C/38C ESG Signal Generators User's Guide*.

Marker 4 Polarity Neg Pos

Supported   E4438C with Option 001/601or 002/602

This softkey selects negative or positive polarity for marker 4. The marker polarity setting remains until you reconfigure it, preset the signal generator, or cycle the ESG power. It is also part of the file header information, so saving the file header saves the current marker polarity. Changing polarity inverts the output marker signal.

Neg   The marker signal is high during the period of no marker points.

Pos   The marker signal is high during the set marker points.

For more information on markers and file headers, see the *E4428C/38C ESG Signal Generators User's Guide*.

Marker Routing

Supported   E4438C with Option 001/601or 002/602

This softkey accesses a menu from which you can select a marker for each of the marker routings (functions). The functions are Pulse/RF Blanking or ALC Hold. The routing settings remain until you reconfigure them, preset the signal generator, or cycle the ESG power. After setting the marker routings, it is recommended that you save the settings to the file header. Saving the marker routings in the header, ensures that the waveform (segment or sequence) uses the correct marker routings when played. This is especially important when a waveform playback follows another waveform playback, because the previously played waveform could have different routing configurations.

For example, if you play a waveform that has marker 2 set for Pulse/RF Blanking and then play a different waveform that has unspecified header settings for marker routings, the second waveform also uses RF blanking for marker 2. If the marker points for marker 2 on the second waveform are not set, the marker 2 signal remains low causing a continuous RF blanking condition (no RF output).

CAUTION   A spike in the RF output can occur if the marker routings and marker points (set marker points in the Set Markers menu) are not properly configured.

For more information on markers and file headers, see the *E4428C/38C ESG Signal Generators User's Guide*.

Marker Utilities

Supported   E4438C with Option 001/601or 002/602

This softkey accesses a menu from which you can configure waveform markers. The marker menu includes setting the polarity for markers, routing markers to functions (such as RF blanking, Alternate Amplitude, and ALC Hold,) and for setting markers for a specified waveform.

Max input

Supported   E4438C with Option 400

This softkey, in the downlink Test Setup menu, defines the maximum receiver input power at the user equipment (UE) antenna connector that does not degrade the specified BER performance. The receiver is stressed with high levels of interference from unwanted signals.

Max Pwr

Supported   E4438C with Option 400

This field displays the maximum power level for the physical random access channel (PRACH) preamble and the dedicated physical channel (DPCH). The maximum power setting is coupled to the ramp step and Init Power fields. Refer to "Init Pwr" on page 252. for more information.

Preset   −136.00 dBm

Range   −136.00 to 20 dBm

Remarks   The preamble power will ramp up to the maximum power set in the Max Pwr field or until the AICH signal is received.

The actual RF output is limited to the specifications of the signal generator although the value can be entered up to 20 dBm.

Mcarrier Spacing

Supported   E4438C with Option 401

Use this softkey to access a menu from which you can select the carrier spacing for multicarrier spreading.

Preset   1.25 MHz

Remarks   Cellular band uses 1.23 MHz and PCS band uses 1.25 MHz CDMA-standard carrier spacing.

Spreading type must be set to multicarrier and the spread rate must be 3 (SR3) for this setting to become active.

MCDMA

Supported   E4438C

Press this softkey to set the current catalog type to multicarrier CDMA (MCDMA) and display the catalog of MCDMA files.

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

MCS1 Configure

Supported   E4438C with Option 300

Use this softkey to select a downlink packet data traffic channel with block type 5 in accordance with GSM 05.03.

MDMOD

Supported   E4438C

Press this softkey to set the current catalog type to MDMOD and display the catalog of MDMOD files.

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

MDWCDMA

Supported   E4438C

Press this softkey to set the current catalog type to multicarrier downlink W-CDMA (MDWCDMA) and display the catalog of MDWCDMA files.

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

Measurement Mode BER/BLER% Search

Supported   E4438C with Option 300

This softkey selects the measurement mode for the GSM bit error rate test.

BER/BLER%   This choice selects bit error rate or block error rate as the measurement mode.

Search   This choice selects sensitivity search as the measurement mode.

Preset   BER/BLER%

Memory Catalog

Supported   All Models

Use this softkey to access a menu of choices enabling you to display a catalog of user files. In addition, the menu displays file management functions and a menu for choosing file types.

Message–Control Raw Data (RPS13)

Supported   E4438C with Option 400

This softkey assigns message control raw data to the selected rear panel AUX I/O output connector.

Remarks   The message control raw data signal can be assigned to numerous different output connectors/pins. The **(RPS13)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

Message–Control Raw Data Clock (RPS14)

Supported   E4438C with Option 400

This softkey assigns message control raw data clock to the selected rear panel AUX I/O output connector.

Remarks   The message control raw data clock can be assigned to numerous different output connectors/pins. The **(RPS14)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

Message–Data Raw Data (RPS11)

Supported   E4438C with Option 400

This softkey assigns message data raw data to the selected rear panel AUX I/O output connector.

Remarks   The message data raw data signal can be assigned to numerous different output connectors/pins. The **(RPS11)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

Message–Data Raw Data Clock (RPS12)

Supported   E4438C with Option 400

This softkey assigns the message data raw data clock to the selected rear panel AUX I/O output connector.

Remarks   The message data raw data clock can be assigned to numerous different output connectors/pins. The **(RPS12)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

Message Pulse (RPS22)

Supported   E4438C with Option 400

This softkey assigns message pulse to the selected rear panel AUX I/O output connector.

Remarks   The message pulse can be assigned to different output connectors/pins.

`Message Type`

Supported   E4438C with Option 401

This field displays the current message type value for the forward synchronization channel. The message types are displayed in hexadecimal notation. The message synchronizes the pilot PN sequence offset with the even second clock. To change the message type, highlight the `Message Type` field, press the **Edit Item** softkey and enter a new value.

Preset   01

Range   00–FF

Meter Address

Supported   All Models

This softkey enables you to select the external power meter GPIB address for use during the user flatness calibration.

Range   0–30

Remarks   The meter address is not affected by a preset or by a power cycle.

                 The power meter is controlled only through a GPIB cable.

Meter Channel A B

Supported	All Models

Use this softkey to toggle external power meter monitoring between channel A and channel B.

A	The external power meter is instructed to monitor channel A for input.
B	The external power meter is instructed to monitor channel B for input.
Remarks	This softkey is only available when using external power meters that have two channels.
	The power meter channel selection is not affected by a preset or by a power cycle.
	The power meter is controlled only through a GPIB cable.

Meter Timeout

Supported	All Models

This softkey enables you to select the remote timeout length of the external power meter during user flatness calibration.

Range	1.0 ms−100.0 s
Remarks	The meter timeout setting is not affected by a preset or by a power cycle.
	The power meter is controlled only through a GPIB cable.

MFCDMA

Supported	E4438C

Press this softkey to set the current catalog type to MFCDMA and display the catalog of MFCDMA files.

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

MFWCDMA

Supported	E4438C

Press this softkey to set the current catalog type to multicarrier forward link CDMA (MFWCDMA) and display the catalog of MFWCDMA files.

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

Min Power

Supported E4438C with Option 400

This field displays the minimum power level for the dedicated physical channel (DPCH). The minimum power setting is coupled to the power step and Init Power fields. Refer to for more information.

Preset –40.00 dBm

Range –40 to 0 dBm

Mirror Table

Supported E4438C with Option 001/601or 002/602

Use this softkey to mirror the FIR table entries such that the table doubles in size and the values in the top half of the table are duplicated in the bottom half of the table in reverse order.

Mkr 2 To RF Blank Off On

Supported All Models

This softkey enables you to select the operating state of the RF blanking function.

Off When you select Off, RF blanking is turned off when marker 2 is set low.

On When you select On, RF blanking is turned on when marker 2 is set low.

Preset Off

Mlt ESG Sync Trigger

Supported E4438C with Option 400

Use this softkey instantly synchronize the output signals of multiple ESGs while performing open-loop transmit diversity testing for W-CDMA. For more information on transmit diversity, refer to the *E4428C/38C ESG Signal Generators User's Guide*.

Mlt-ESG-Sync Trigger-Out (DRPS42)

Supported E4438C with Option 400

This softkey assigns the multiple ESG synchronization trigger 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 **(DRPS42)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

Mobile Setup

Supported   E4438C with Option 401

Use this softkey to access the table editor from which you can select and modify the parameters of the mobile station. Highlight the field you want to change and press the **Edit Item** key.

Remarks   This softkey is available for the reverse link only.

Mod Index

Supported   E4438C with Option 406

This softkey enables you to set the ratio of peak-to-peak frequency deviation to the bit rate for a Bluetooth signal.

Preset   0.315

Range   0.250–0.400

Mod Status Info Off On

Supported   All Models

This softkey turns the Modulation Status Information listing on or off.

On   When the modulation status is set to on, modulation information is displayed when you access one of the modulation menus, for example AM as shown in Figure 0-7 on page 300.

Off   When the modulation status is set to off, information about the status of the modulation, is not displayed.

Figure 0-7   **Modulation Status Information**

Mod	State	Depth/Dev	Source	Rate	Waveform
AM 1	Mod Off	0.1%	Internal	400.0Hz	Sine
AM 2	Off	0.1%	Internal	400.0Hz	Sine
AM WB	Off	0.3V=100%	I Input		
FM 1	Off	1.0000kHz	Internal	400.0Hz	Sine
FM 2	Off	1.0000kHz	Internal	400.0Hz	Sine
ØM 1	Off	0.000rad	Internal	400.0Hz	Sine
ØM 2	Off	0.000rad	Internal	400.0Hz	Sine
LFOut	Off	0.000Vp	Internal		
Pulse	Off	40.0usec	Internal	80.0usec	Pulse
Burst	Off		Ext1 DC		
I/Q	Off		Ext 50 Ohm		

Preset   On

Mode

Supported   E4438C

Use this hardkey to access a menu of modulation formats.

Mode 1 Optimize <10 kHz Offset

Supported   E4438C without UNJ

Use this softkey to set the phase-lock loop bandwidth to optimize phase noise for offsets below 10 kHz.

Mode 2 Optimize >10 kHz Offset

Supported   E4438C without UNJ

Use this softkey to set the phase-lock loop bandwidth to optimize phase noise for offsets above 10 kHz.

Modify All Models Scramble Codes

Supported   E4438C with Option 400

This softkey enables you to set the scramble code field for all channels to the same value.

Mode Setup

Supported   E4438C

Use this hardkey to return to the main menu of the active digital modulation format you most recently accessed under the **Mode** hardkey. If a digital modulation format offers softkey selections for both **Arb Waveform Generator** and **Real Time I/Q Baseband**, as it does with the Custom format, you must select one of these choices for the **Mode Setup** key to recognize you accessed the format, so it can return you to its main menu. After a power cycle, if you have not yet accessed a digital modulation format, the **Mode Setup** key accesses the digital modulation format menu, as if you pressed the **Mode** key.

Modify License Key

Supported   All Models

Press this softkey to enter the license key for the highlighted software option. Software options are linked to specific hardware options that must be installed before the software option is valid. Adding new software options requires the use of a license key provided by Agilent Technologies at the time of purchase. Once the license key is entered, the software option will be enabled when you press the **Proceed with Reconfiguration** softkey.

Remarks   If you enable an option that does not have the required hardware installed, the menus for that option will be activated but the option *cannot* operate, regardless of what the menus may indicate.

Modify Standard

Supported   E4438C with Option 402

This softkey accesses a menu of choices that enables you to modify the following aspects of the standard transmission:

• filter characteristics (including user-defined FIR filters)

• symbol rate

• modulation type (including user-defined modulations)

• burst shape characteristics (rising edge time and delay; falling edge time and delay)

• phase polarity

Modulation Catalog Types

Supported   E4438C

Press this softkey to reveal a menu of real time I/Q modulation file types that can be selected.

Modulation Type

Supported   E4438C with Option 001/601or 002/602

Use this softkey to access a menu from which you can select predefined or custom modulation types, create user-defined I/Q and FSK modulations, or restore the default modulation type.

Modulator Atten Manual Auto

Range   E4438C

This softkey toggles the attenuation mode of the internal I/Q modulator between manual and automatic.

Manual	In the manual mode, you can manually set the attenuation level of the I/Q modulator. A setting of 0.00 dB will result in 100 percent signal power, while a setting of 40.00 dB will result in 0.01 percent signal power.
Auto	In the automatic mode, the attenuation level is automatically set to a factory-determined value for best performance, based on the digital modulation settings.
Preset	Auto
Range	*Manual:* 0.00–40.00 dB *Auto:* N/A
Remarks	This softkey appears in all Arb modulation format menus and under the **Mux** front panel hardkey. When an Arb modulation format is turned on, the **Modulator Atten Manual Auto** softkey under the **Mux** hardkey will be disabled (greyed out).

Msg Ctrl

Supported   E4438C with Options 400, 403

This softkey is used to select the physical random access channel (PRACH) message control part as the reference for determining the power level for the Eb/No calculation. The selection is displayed in the E Ref field of the uplink physical random access channel PRACH AWGN table editor.

This selection is coupled to the data rate, C/N value (dB) field, the C Power field, and the N Power field and can change the values displayed by these fields.

Msg-Ctrl Data

Supported   E4438C with Option 400

This field displays the message control data type used for the uplink setup. To change the field selection, highlight the Msg-Ctrl Data field, press the **Edit Item** softkey and make a choice from the menu that appears.

Preset   3GPP STD

Remarks   The 3 GPP STD data is defined in 3GPP Standard TS25.211. This standard defines fields and slot formats.

Msg Data

Supported   E4438C with Options 400, 403

This softkey is used to select the physical random access channel (PRACH) data part as the reference for determining the power level for the Eb/No calculation. The selection is displayed in the E Ref field of the uplink physical random access channel PRACH AWGN table editor.

This selection is coupled to the data rate, C/N value (dB) field, the C Power field, and the N Power field and can change the values displayed by these fields.

Msg–Data Data

Supported   E4438C with Option 400

This field displays the data type used for the uplink physical random access channel (PRACH) code message data part setup. To change the field selection, highlight the Msg-Data Data field, press the **Edit Item** softkey and make a choice from the menu that appears.

Preset   TrCh

Remarks   The 3GPP STD data is defined in 3GPP standard TS25.211. This standard defines fields and slot formats.

Msg Pwr

Supported   E4438C with Option 400

This field displays the total message power for the physical random access channel (PRACH).

Preset   –136.00 dBm

Range   –136.00 to 20.00 dBm

Remarks   The actual RF output is limited to the specifications of the signal generator although the value can be entered up to 20 dBm.

MSK

Supported   E4438C with Option 001/601or 002/602

Use this softkey to select minimum shift keying (MSK) modulation for modulating a continuous stream of the selected data pattern. MSK modulation transmits data at the rate of 1 bit per symbol.

The current phase deviation value appears under the **MSK** softkey in the Modulation Type menu.

MTONE

Supported   E4438C

Press this softkey to set the current catalog type to MTONE and display the catalog of MTONE files.

Multicarrier Define

Supported   E4438C with Option 400/401

Use this softkey to access the multicarrier setup table, which is a table editor for defining custom digital modulation, IS-95A, CDMA2000, or W-CDMA multicarrier signals.

Remarks   This softkey is only available when **Multicarrier Off On** is toggled to On.

Multicarrier Off On

Supported   E4438C with Option 400/401

This softkey toggles the operating state of the multicarrier mode.

For information on multicarrier states, see the *E4428C/38C ESG Signal Generators User's Guide*.

Off	The selected modulation format has a single carrier in this state.
On	The multicarrier mode is enabled in this state. You can select a pre-defined IS-95A, CDMA2000, W-CDMA, or user-defined custom multicarrier signal.
Preset	Off
Remarks	For CDMA2000, the **Multicarrier Off On** softkey and related functions are accessible only when using the forward link setup.
	For W-CDMA, the **Multicarrier Off On** softkey and related functions are accessible only when using the downlink setup.

Multiframe Channel

Supported   E4438C with Option 402

Use this softkey to display a menu of softkeys used to configure the data field (E) with a multiframe pseudorandom bit pattern.

Multislot Off On

Supported   E4438C with Option 402

Use this softkey to turn bursting (ramping) on or off between the selected timeslot and the next higher numbered adjacent timeslot.

Off   This choice turns ramping on between timeslots.

On   This choice turns ramping off between timeslots.

Preset   Off

Remarks   Turning multislot on between an EDGE and GMSK timeslot may produce undesired spectral content. The undesired spectral content is a by product of the transition between two different modulation types without ramping.

Multiple Channels

Supported   E4438C with Option 400

This softkey displays a menu enabling you to set up one or more of the same type channels for insertion into the Edit Channel Setup table editor. After you have set the channel parameters and entered how many times you want the channel duplicated, press the **Done** softkey to insert the information into the Edit Channel Setup table editor.

Remarks   Multiple channels are only available for downlink.

Multitone

Supported   E4438C with Option 001/601or 002/602

This softkey accesses a menu of softkeys that enables you to create multitone signals using the dual arbitrary waveform generator. Within these menus, you will be able to create, select, and/or modify the waveform.

Multitone Off On

Supported   E4438C with Option 001/601or 002/602

This softkey sets the operating state for the multitone function of the dual arbitrary waveform generator.

Off   When you select Off, the multitone signal is turned off.

On   When you select On, the multitone signal is turned on.

Preset   Off

Mux

Supported   E4438C

Use this hardkey to access a menu from which you can configure the I/Q multiplexer.

N

N5102A Dig Bus

Supported   E4438C with Option 003 or 004

This softkey, for the N5102A module, selects a loop back test that verifies the connection and data transfer capability between the ESG and the N5102A module. The loop back for this test occurs at the input of the N5102A module and ensures that the Digital Bus input connector is functioning properly. For selecting the comprehensive test that includes verifying the operation of the N5102A module Device Interface output connector, see "Device Intfc" on page 146. To run the test, see "Run Loop Back Test" on page 400.

N5102A Interface

Supported   E4438C with Option 003 or 004

This softkey, accesses menus that enable you to control and set the N5102A module parameters.

N5102A Off On

Supported   E4438C with Option 003 or 004

This softkey, for the N5102A module, enables or disables the N5102A module.

In the output mode (Option 003), the interface module can only be turned on while a modulation format is active. If the modulation format is turned off while the module is on, the module will turn off and an error will be reported.

When the N5102A Interface is on, the ESG continuously polls the N5102A module to ensure it is connected. If the ESG determines that the N5102A module is not connected, it reports an error. This also occurs if power is not supplied to the N5102A module via the included power supply. If the module is disconnected while on, the interface turns off and reports an error.

| **NOTE** | If the softkey selection is On while setting the ESG parameters, the device under test can be subject to all output variations that are produced by intermediate setting changes. |

Preset   Off

N Power

Supported   E4438C with Option 400

This field displays the noise carrier power of the RF signal. This value is calculated from the RF power level. 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) = .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 .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, $2.53 \times 1.96 + 6.67$ is .010 milliwatts (approximately) and $10 \log_{10} .0100 = -20$ dBm; the signal generators RF power.

Preset   *Downlink*: –140.712917 dBm

                    Uplink: –138.957537 dBm

                    Uplink (PRACH): –138.935002 dBm

NADC

Supported   E4438C with Option 001/601or 002/602

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 NADC for Custom Digital Modulations

Use this softkey to select a predefined North American Digital Cellular (NADC) personality for the digital modulation format.

Accessing the NADC 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 (where the data bits are located in fields defined by the NADC protocol), or a sequence that can be output one or more times.

NADC Base

Supported   E4438C

This softkey selects Standard Base as the frequency band for NADC. The output frequency depends on both the channel band and channel number selections.

Preset	*Channel*: 1
	Frequency: 870.030 MHz
Range	*Channels*: 1–799, 990–1023
	Frequency: 870.030–893.970 MHz, 869.010–870.000 MHz

NADC Mobile

Supported   E4438C

This softkey selects Standard Mobile as the frequency band for NADC. The output frequency depends on both the channel band and channel number selections.

Preset	*Channel*: 1
	Frequency: 825.030 MHz
Range	*Channels*: 1–799, 990–1023
	Frequency: 825.030–848.970 MHz, 824.010–825.000 MHz

NADC Off On

Supported   E4438C with Option 402

Use this softkey to set the operating state of the North American Digital Cellular (NADC) communications format.

Off	When you select Off, the NADC format is turned off.
On	When you select On, this sets up the internal hardware to generate a signal that follows the NADC format. The internal I/Q modulator generates π/4DQPSK digital modulation and the NADC 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 **NADC 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.

Name And Store

Supported   E4438C

This softkey enables you to store and rename (if necessary) the highlighted sequence. The maximum file name length is 23 characters (alphanumeric and special characters).

Negate I Data Off On

Supported   E4438C with Option 003 or 004

This softkey, available for the N5102A module, enables or disables negation of the I data sample. Negation changes the sample by expressing it in two's complement form, multiplying by negative one, and converting back to the selected numeric format. This can be done for I samples, Q samples, or both.

The sample or word represents a quantized analog voltage level. This analog voltage can be added or multiplied. For a 16-bit sample, the range is from 0 to 65535 in offset binary or -32768 to + 32767 in 2's complement mode.

On   The I data is negated.

Off   No negation is performed.

Preset   Off

Negate Q Data Off On

Supported   E4438C with Option 003 or 004

This softkey, available for the N5102A module, enables or disables negation of the value of each sample of the Q data. Negation changes the affected sample by expressing it in two's complement form, multiplying by negative one, and converting back to the desired numeric format. This can be done for I samples, Q samples, or both.

The sample or word represents a quantized analog voltage level. This analog voltage can be added or multiplied. For a 16-bit sample, the range is from 0 to 65535 in offset binary or -32768 to + 32767 in 2's complement mode.

On   The Q data is negated.

Off   No negation is performed.

Preset   Off

Network ID

Supported   E4438C with Option 401

This field displays the current network identification number for the base station. The network identification number is displayed in hexadecimal notation. To change the network identification number, highlight the `Network ID` field, press the **Edit Item** softkey and enter a new value.

Preset   0001

Range   0000–FFFF

No Limits

Supported   E4438C with Option 300

This softkey enables you to set the pass/fail reporting function to use no limits. Therefore, no pass/fail result is displayed.

No Thresholds

Supported   E4438C with Option UN7

This softkey applies none of the stop-on-event criteria and enables the measurement to run for the selected total number of bits.

Noise

Supported   All Models

Use this softkey to select noise as the modulation waveform.

Remarks   The selected waveform applies to the path configuration you have selected. In the LF Out menu this softkey is available after selecting the internal source to operate as a function generator.

Noise is generated as a peak to peak value; the RMS value is about 80.0% of the displayed value.

Noise Bandwidth Factor

Supported   E4438C with Option 403

This softkey enables you to set the flat noise bandwidth to a minimum of 0.8 times the ARB sample clock rate, when the noise factor is 1, or 1.6 times the ARB sample rate if the factor is 2. The maximum bandwidth for noise is to 80 megahertz.

For example, if the ARB sample clock rate is set to 50 MHz, a noise bandwidth factor of 1 will give a flat noise bandwidth of 40 MHz whereas a noise bandwidth factor of 2 will give a flat noise bandwidth of 80 MHz.

The flat noise bandwidth increases with any oversampling by a factor equal to the oversampling.

NOTE	For a bandwidth factor of 2, the maximum sample clock rate is 50 MHz.

Preset	1
Choice	1 or 2

Noise Off On

Supported	E4438C with Options 400, 403 401, 403

Use this softkey to toggle the operating state of the calibrated noise generator.

Off	In this state, noise is not added to the active carrier.
On	In this state, the calibrated noise generator adds pseudorandom noise to the active carrier for sensitivity and selectivity measurements and bit error rate testing purposes.
Preset	Off
Remarks	The bandwidth for noise equals two times the chip rate.
	For the forward link, turning noise on will cause the even second delay value to be adjusted to include a delay for noise. For the reverse link, turning noise on will cause the even second delay and trigger advance values to be adjusted.

Noise Seed

Supported	E4438C with Option 406

This softkey enables you to set the value of the noise seed for the Bluetooth additive white Gaussian noise (AWGN) waveform generator. A change in the seed value changes the noise pattern.

Preset	1
Range	1–65535

Noise Seed Fixed Random

Supported   E4438C with Option 403

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

Fixed	When you select a Fixed value, the same noise seed will be used in order to generate the same waveforms each time.
Random	When you select Random, the noise seed will change in order to generate a waveform with different random data each time.
Preset	Fixed

Noise Setup

Supported   E4438C with Options 400, 403 401, 403

Use this softkey to access a menu from which you can configure and enable the calibrated noise personality.

None

Supported   E4438C with Option 001/601or 002/602

In the Predefined Mode Menu

In this menu, use the **None** softkey to set up **Custom** based on no particular format.

In the Security Level Menu

The **None** softkey presets the signal generator to the factory state.

Remarks   You must press **Enter Secure Mode** > **Confirm** to activate the None security level.

In the W-CDMA Menu

Supported   E4438C with Option 400

In the TrCH Menu

No encoder is used for coding transport channels. No error protection coding is applied to the selected channel data bits.

In the Window Menu

No windowing function is used for the selected filter. The filter is optimized for maximum passband performance: error vector magnitude (EVM).

In the ALC Hold Menu

This selection will free a marker that was previously dedicated to the signal generator's ALC Hold function.

NONE (RPS0)

Supported   E4438C with Option 400

This softkey assigns no signal to the selected rear panel AUX I/O output connector.

Remarks   The **NONE** softkey, designating no signal, can be assigned to numerous different output connectors/pins. The **(RPS0)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

Normal

In the CDMA Menu

Supported   E4438C with Option 401

Use this softkey to select the standard phase polarity for a signal. In this mode, the I and Q signals are not altered by the phase polarity function.

In the Real Time Menu

Supported   E4438C with Option 402

Use this softkey to select normal as the timeslot type for the active timeslot. This timeslot type applies to both Enhanced Data Rates for GSM Evolution (EDGE) and Global System for Mobile Communications (GSM).

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

In the W-CDMA Menu

Supported   E4438C with Option 400

This softkey selects a scramble code between 0 and 8191 for the downlink ChipARB physical channel.

Normal All Models

Supported   E4438C with Option 402

Use this softkey to select normal as the timeslot type for all timeslots. This timeslot type applies to both Enhanced Data Rates for GSM Evolution (EDGE) and Global System for Mobile Communications (GSM).

When you select **Normal All Models**, the visual representation of the timeslot pattern updates.

Num of Blk

Supported   E4438C with Option 400

This field displays the number of coded blocks set for each transport channel selected for the uplink physical channel. The total input data in one transport channel is the number of blocks multiplied by the block size

Preset	1 (for all transport channels)
Range	0–4095
Remarks	The total input data for one RACH is block size (BLKsize) multiplied by the number of blocks (NBLock).

Number of 80ms

Supported   E4438C with Option 400

This field, in the multiple PRACH mode: PRACH Code Setup menu, displays the number of physical random access channel (PRACH) pattern repetitions to generate. The pattern will be repeated after the PRACH start trigger has been received.

Preset:	1 (for all transport channels)
Range:	0–2147447836 or Infinity
Remarks	If infinity is selected, the pattern will repeat continuously. For this field to appear, the **PRACH Mode Single Multi** softkey must be set to **Multi.**

Number of Bits

Supported   E4438C with Option 001/601or 002/602

Use this softkey to specify the number of bits that will be affected by the current operation. Press the **Enter** softkey to apply the specified value.

Preset	1

Number of PRACH

Supported   E4438C with Option 400

This field, in the Uplink Physical Type:PRACH Code Setup menu, displays the number of physical random access channel (PRACH) pattern repetitions to generate. The pattern will be repeated after the PRACH start trigger has been received.

Preset:	1
Range:	1–2147483647 or Infinity
Remarks	If infinity is selected, the pattern will repeat continuously.
	This field will only appear when PRACH Mode is set to Single.

Num of Pre

Supported E4438C with Option 400

This field is one of the selections available for the Uplink PhyCH Type: PRACH Power Setup menu and indicates the number of preambles in the physical random access channel (PRACH). The field displays the same number as that displayed in the PhyCH Setup: PRACH Timing Setup menu.

Preset:	1 (for all transport channels)
Range:	1–8388607
Remarks	If infinity is selected, the preamble will repeat continuously.

Number of Preamble

Supported E4438C with Option 400

This field is one of the selections available for the Uplink PhyCH Type:PRACH Timing menu and displays the number of preambles to repeat in the physical random access channel (PRACH) pattern.

Preset:	1 (for all transport channels)
Range:	1–8388607
Remarks	If infinity is selected, the preamble will repeat continuously.

Number of Satellites

Supported E4438C with Option 409

This softkey enables you to set the number of satellites in view to use in the generated MSGPS signal.

Preset	8
Range	1–8

Number of Tones

Supported   E4438C with Option 001/601or 002/602

This softkey enables you to set the number of tones in the multitone table editor. This is done as part of initializing the table editor.

Preset   10

Range   2–64

Numeric Format

Supported   E4438C with Option 003 or 004

This softkey, for the N5102A module, accesses a menu that enables you to select the binary format (representation) for the data values that are transmitted. There are two binary format choices: 2's complement and offset binary.

Preset   2's Complement

NVARB Catalog Types

Supported   E4438C

This softkey accesses a menu from which you can select a non-volatile ARB waveform file type.

NVHDR

Supported   E4438C

This softkey specifies that only non-volatile ARB header file types be listed in the catalog of files.

NVMKR

Supported   E4438C

This softkey specifies that only non-volatile ARB marker file types be listed in the catalog of files.

NVWFM

Supported   E4438C

This softkey specifies that only non-volatile ARB waveform file types be listed in the catalog of files.

Nyquist

Supported   E4438C with Option 001/601or 002/602

This softkey selects a Nyquist (raised cosine) 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 **Nyquist** softkey to select this FIR filter for use in a modulation setup.

In the Load Default FIR Menu

In this menu, use the **Nyquist** softkey to access a menu from which you can change the filter alpha value, specify the number of symbols, apply a windowing function, and generate a new FIR table that is loaded with the coefficients for a Nyquist filter. If you change a parameter, you can press the **Generate** softkey again to reload the FIR table.

0

OCNS

Supported   E4438C with Option 400

This softkey selects an Orthogonal Channel Noise Source (OCNS) for insertion into the Edit Channel Setup table editor. All Models symbols inserted into the channel are random values, rather than specific bit fields. After you have selected the channel, a menu of symbol rates will be displayed. Pressing the **Symbol Rate** softkey inserts the OCNS into the Edit Channel Setup table editor.

Remarks   This softkey is only available for downlink.

Off

In the Standard Menu

Supported   All Models

In the Retrigger Mode Menu Use this softkey to disable retriggering for single trigger operation. In this state, triggers are ignored if they occur while a waveform is playing.

In the Sweep Menu

Supported   All Models

Use this softkey to turn off all sweep functions. The output signal is then set according to the current frequency and amplitude settings defined by the **Frequency** and **Amplitude** hardkeys.

In the Baseband Generator Menu

Supported   E4438C with Option 001/601or 002/602

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

In the Source 1 menu Use this softkey to turn off the Source 1 signal routing function. When this softkey is selected, no signals are routed 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 turn off the I/Q Out signal routing function. When this softkey is selected, no signals are routed to the rear panel I and Q output connectors.

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

In the Dual ARB Trigger Setup menu Use this softkey to turn off the external trigger delay feature.

Remarks   Access this key through the **Ext Delay** softkey.

In the W-CDMA Menu

Supported   E4438C with Option 400

This softkey 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. The **Off** softkey prevents the message part of the physical random access channel (PRACH) being played. Only preambles are transmitted.

Offset Binary

Supported   E4438C with Option 003 or 004

This softkey, for the N5102A module, sets the N5102A module data format to an offset binary representation of the data values.

Offset Q. Off On

Supported   E4438C with Option 001/601or 002/602

Press this softkey to change the operational state of the user I/Q offset Q.

Off   When this softkey is set to Off, the Q output is not delayed from the I output.

On   When this softkey is set to On, the Q output is delayed by 1/2 symbol from the I output.

Remarks   This setting is not affected by a preset or by a power cycle.

On

In the Baseband Generator Menu

Supported   E4438C with Option 001/601or 002/602

Use this softkey to enable retriggering for single trigger operation. In this state, the waveform will retrigger at the end and play one more time if a trigger occurs while the waveform is playing.

Remarks   Retriggers do not accumulate. If several triggers are received during a waveform, it will only be replayed only once.

In the W-CDMA Menu

Supported   E4438C with Option 400

This softkey 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. The **On** softkey enables the message part of the physical random access channel (PRACH). The message part is generated after the preambles, specified in by the `Num of Preamble` field, have played.

Remarks Action is initiated after pressing the **Apply Channel Setup** softkey.

On/Off

Supported E4438C with Option 400

This field, in the downlink orthogonal channel noise simulator (OCNS) and dedicated physical channel (DPCH), and in the uplink multiple physical random access channel (PRACH) timing code table editor, indicates the operating state of the channel.

Preset Off

OpenLoop Ant1

Supported E4438C with Option 400

Use this softkey to configure the ESG as antenna one in an open-loop transmit diversity test setup. Transmit diversity is used to diminish the effects of fading by transmitting the signal from two different cell sites (antennas), using two different encoding schemes.

Remarks For two-box Transmit Diversity testing, set one ESG to **OpenLoop Ant1** and set the other ESG to **OpenLoop Ant2**.

For more information on transmit diversity testing, see the *E4428C/38C ESG Signal Generators User's Guide*.

OpenLoop Ant2

Supported E4438C with Option 400

Use this softkey to configure the ESG as antenna two in an open-loop transmit diversity test setup. Transmit diversity is used to diminish the effects of fading by transmitting the signal from two different cell sites (antennas), using two different encoding schemes.

Remarks For two-box Transmit Diversity testing, set one ESG to **OpenLoop Ant1** and set the other ESG to **OpenLoop Ant2**.

For more information on transmit diversity testing, see the *E4428C/38C ESG Signal Generators User's Guide*.

OpenLoop Ant1 SCH TSTD OFF

Supported   E4438C with Option 400

Use this softkey to configure the ESG as antenna one in an open-loop transmit diversity test setup. This selection also deactivates time-switched transmit diversity (TSTD) for the synchronization

channel (SCH). Transmit diversity is used to diminish the effects of fading by transmitting the signal from two different cell sites (antennas), using two different encoding schemes.

Remarks   For two-box Transmit Diversity testing, set one ESG to **OpenLoop Ant1 SCH TSTD OFF** and set the other ESG to **OpenLoop Ant2 SCH TSTD OFF**.

For more information on transmit diversity testing, see the *E4428C/38C ESG Signal Generators User's Guide*.

OpenLoop Ant2 SCH TSTD OFF

Supported   E4438C with Option 400

Use this softkey to configure the ESG as antenna two in an open-loop transmit diversity test setup. This selection also deactivates time-switched transmit diversity (TSTD) for the synchronization channel (SCH). Transmit diversity is used to diminish the effects of fading by transmitting the signal from two different cell sites (antennas), using two different encoding schemes.

Remarks   For two-box Transmit Diversity testing, set one ESG to **OpenLoop Ant1 SCH TSTD OFF** and set the other ESG to **OpenLoop Ant2 SCH TSTD OFF**.

For more information on transmit diversity testing, see the *E4428C/38C ESG Signal Generators User's Guide*.

Operating Mode

Supported   E4438C with Option 401

Use this softkey to access a menu from which you can select a predefined CDMA-standard reverse link channel configuration for real-time signal generation.

Preset   RadioConfig 3/4 Traffic

Optimize Φ Noise

Supported   E4438C without UNJ

Use this softkey to access a menu for optimizing phase noise. In this menu, you can set the phase-lock loop bandwidth to optimize phase noise for offsets above or below 10 kHz, as shown in .

Figure 0-8   **Phase Noise Performance Mode 1 Versus Mode 2**
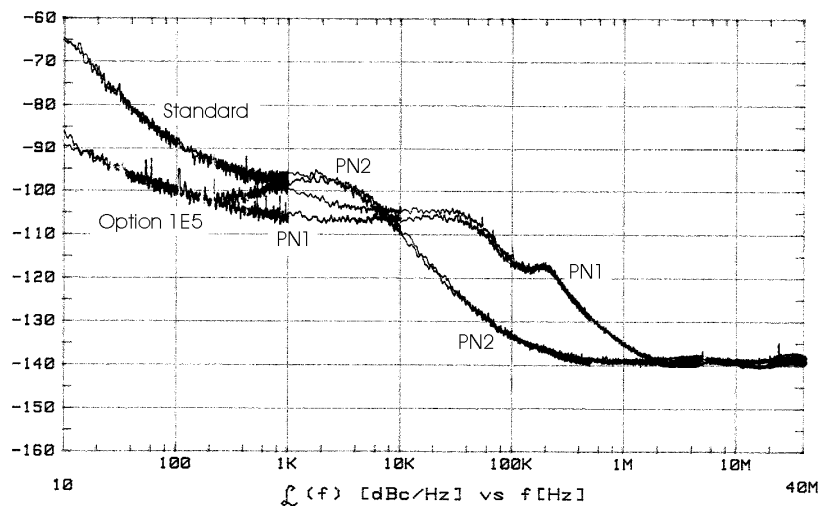
The selected phase noise optimization mode is displayed under the **Optimize F Noise** softkey.

Preset   Mode 2

Optimize ACP ADJ ALT

Supported   E4438C with Option 400

Use this softkey to optimize the power of the selected channel.

ADJ   The ADJ selection optimizes the adjacent channel power.

ALT   The ALT selection optimizes the alternate channel power.

Preset   ADJ

Remarks   This softkey is only available for a single DPCH downlink Arb W-CDMA channel.

Optimize FIR For EVM ACP

Supported   E4438C with Option 001/601or 002/602

Use this softkey to optimize the filter for minimized error vector magnitude (EVM) or for minimized adjacent channel power (ACP).

EVM	The EVM selection provides the most ideal passband.
ACP	The ACP selection improves stopband rejection.
Preset	*Custom:* ACP *Other formats:* EVM
Remarks	This feature applies only to root Nyquist, and Nyquist filters; the softkey is grayed out when any other filter is selected.

Options Info

Supported   All Models

Use this softkey to display all available options and the associated hardware. Refer to Figure 0-9 on page 324.

Figure 0-9   **Installed Option Information**

324

Option	The option number
Option Version	An alphabetic representation of the option revision
DSP Version	Version number of additional DSP code used with some hardware options

OQPSK

Supported   E4438C with Option 001/601or 002/602

This softkey selects an offset quadrature phase shift keying (OQPSK) 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. OQPSK modulation transmits data at the rate of 2 bits per symbol.

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 QPSK Modulation

Use this softkey to select offset quadrature phase shift keying (OQPSK) to modulate a continuous stream of the selected data pattern.

Loading a QPSK I/Q Map into the Table Editor

Use this softkey to load an offset quadrature phase shift keying (OQPSK) I/Q map 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 *E4428C/38C ESG Signal Generators User's Guide*.

Other Patterns

Supported   E4438C with Option 001/601or 002/602

Use this softkey to access a menu from which you can select a data pattern. Each pattern contains an equal number of ones and zeroes. The selected pattern will be repeated as necessary to fill the data area.

Out-of-sync Test Off On

Supported   E4438C with Option 400

This softkey toggles the operating state of theW-CDMA downlink out-of-sync test mode. In the out-of-sync test mode, you can test RF transmission control. The ESG simulates the loss of a downlink signal by stopping DPCH generation upon receiving a discontinuous transmission (DTX) signal through the PATT TRIG IN rear-panel BNC connector. For more information on out-of-sync testing, refer to the *E4428C/38C ESG Signal Generators User's Guide*.

Off   DPCH generation is not affected by a DTX signal.

On   DPCH generation is stopped while the DTX signal is in its active state.

Preset   Off

Output Blanking Off On Auto

Supported   All Models

Use this softkey to select how the RF output behaves during changes in signal generator frequency.

The RF output power level can fluctuate when the signal generator steps in frequency or when the frequency band changes. The output blanking function, when active, turns off the RF output during frequency changes. Once the frequency settles, the RF output turns on. These frequency changes also determine the frequency switching speed and settling time.

Off   RF output does not turn off when the signal generator frequency changes.

On   RF output turns off when the signal generator frequency changes.

Auto   RF output turns off only when frequency bands are crossed. Frequency changes within a frequency band do not turn the RF output off.

Preset   Auto

Remarks   Refer to the signal generator's data sheet for frequency switching speeds, settling times, and frequency band information.

Oversample Ratio

This softkey occurs in two different locations, enabling you to set the oversample ratio for either a custom modulation or a custom FIR filter.

In the CDMA Define Menu

Supported   E4438C with Option 401

This softkey enables you to set the oversample ratio (number of filter coefficients per symbol) for CDMA modulation. Acceptable values range from 2 through 8. Using larger oversample ratios results in more completely filtered images but also uses up more waveform memory.

The upper limit of the oversample ratio is adjusted based on the waveform length and chip rate. The maximum oversample ratio is the smaller of the following three values:

- 40 Mcps divided by the Chip Rate

- 8

- 32 divided by the Waveform Length (Waveform Length is the number of CDMA short codes)

Preset   5

Range   2–8 (upper limit may vary–see remarks)

In the Define User FIR Menu

Supported   E4438C with Option 001/601or 002/602

This softkey enables you to set the oversample ratio (number of filter coefficients per symbol) to be applied to a custom FIR filter design. Acceptable values range from 1 through 32, where the maximum combination of symbols and oversample ratio is 1024 coefficients. An FIR filter selected for use in CDMA, however, cannot have more than 512 coefficients so the number of symbols and the oversample ratio should be selected accordingly.

Generally, the higher the symbol rate, the lower the oversample ratio of the resampled filter. Table 0-10 describes the signal generator's maximum oversample ratio capabilities for each real-time modulation type:

Table 0-10   **Maximum Oversample Ratio Capabilities**

Modulation Type	BPS	Maximum Oversample Ratio
BPSK MSK 2-LVL FSK	1	16

Table 0-10　　　　　**Maximum Oversample Ratio Capabilities**

Modulation Type	BPS	Maximum Oversample Ratio
QPSK IS95 QPSK ISAT QPSK OQPSK IS95 OQPSK	2	16
8PSK D8PSK 8-LVL FSK	3	15
16PSK 16QAM	4	16
32QAM	5	15
64QAM	6	15
256QAM	8	16

Range　　　　1–32

Remarks　　　When the filter is selected for use, the signal generator may resample the filter with an oversample ratio between 2 and 16, based on the number of symbols, the symbol rate, and the number of bits per symbol of the modulation type.

　　　　　　　　This oversample ratio setting is not affected by a preset or by a power cycle.

Overwrite

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 follows:

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.

Remarks　　　You must press **Enter Secure Mode** > **Confirm** to activate the Overwrite security level.

OVSF Channelization Code

Supported   E4438C with Option 400

This field displays the orthogonal variable spreading factor (OVSF) code used by the CPICH.

Remarks   The length of the OVSF code, also known as the spreading factor (SF), is fixed to 0 and is not user defined. The other channels use channel code to refer to the OVSF code. for example the AICH.

P

P

Supported E4438C with Option 402

Use this softkey to make the preamble P field the active function. The current value appears in the P 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; a PP value of 5555 and an RFP value of AAAA.

Preset: AAAA

Packet (DH1)

Supported E4438C with Option 406

This softkey accesses the packet setup menu. A packet is a single bundle of information transmitted within a piconet. A DH1 packet covers a single timeslot.

Page Down

Supported All Models

This softkey enables you to move down in the display one page at a time.

Page Up

Supported All Models

This softkey enables you to move up in the display one page at a time.

Paging

Supported E4438C with Option 401

Use this softkey to insert a paging channel into the current table editor.

Paging Indicator

In the CDMA Menu

Supported   E4438C with Option 401

This field selects which paging slots to enable for the quick paging channel. The slots are 80 ms in duration and start 20 ms before the zero-offset pilot PN sequence. To change the number of enabled paging slots, highlight the `Paging Indicator` field, press the **Edit Item** softkey and enter a new value.

Preset   0

Range   *2.4 kbps data rate:* 0–190; 191 enables all slots; –1 disables all slots
                  4.8 kbps data rate: 0–382; 383 enables all slots; –1 disables all slots

In the W-CDMA Menu

Supported   E4438C with Option 400

This field displays the number of paging indicators per frame. This field is displayed for the paging indicator channel (PICH) and is used to alert the user equipment (UE) of a page message.

Preset   144

Remarks   This field is not user-definable. The value cannot be changed and the field is grayed-out. The user may transmit user defined paging indicators by selecting data type User File and loading the desired data file into the signal generator.

Par IQ Intrlvd

Supported   E4438C with Option 003 or 004

This softkey, for the N5102A module, enables parallel interleaving of the data samples transmitted, where the I sample is transmitted on the rising edge and the Q sample is transmitted on the falling edge.

For more information on parallel interleaved data transmissions, see the *E4428C/38C ESG Signal Generators User's Guide*.

Par QI Intrlvd

Supported   E4438C with Option 003 or 004

This softkey, for the N5102A module, enables parallel interleaving of the data samples transmitted, where the Q sample is transmitted on the rising edge and the I sample is transmitted on the falling edge.

For more information on parallel interleaved data transmissions, see he *E4428C/38C ESG Signal*

Generators User's Guide.

Parallel

Supported   E4438C with Option 003 or 004

This softkey, for the N5102A module, enables parallel data transmission. This is the factory preset port configuration.

Pass Amplitude

Supported   E4438C with Option 300

This softkey enables you to set the sensitivity search threshold amplitude value for the pass/fail evaluation.

Preset   *GSM*: −104.00 dBm

                     EDGE: DL MCS5 −101.0 dBm
                     DL MCS9 −91.5 dBm
                     Uncoded −95.0 dBm

Range   20.0 dBm to −136.0 dBm

Pass/Fail Limits

Supported   E4438C with Option UN7

This softkey enables you to set the limit value of the pass/fail judgement function.

Preset   0.01

Range   0.0000001–1.00

Pass/Fail Off On

Supported   E4438C with Option UN7

Use this softkey to set the operating state of the pass/fail judgement function.

Off   This choice disables the pass/fail function.

On   This choice causes the pass/fail judgement function to compare a BER measurement result with the threshold level defined by the Pass/Fail Limits function, and judges whether that BER measurement has passed or failed.

Preset: Off

Pass/Fail Update

Supported   E4438C with Option UN7

This softkey accesses the pass/fail judgement update mode menu. You can choose the cycle end mode where either a pass or fail judgement is made for each BER measurement result or the fail hold mode where the fail judgement is made once a failure has been found during one loop of BER repeat measurements.

Preset: Cycle End

Pass Through Preset

Supported   E4438C with Option 003 or 004

This softkey, for the N5102A module, enables you to transmit data through the digital module with no modifications. The resample ratio is set to 1 by adjusting the clock rate to match the baseband sample rate and all of the formatting functions are set so that the data is not modified. This softkey is grayed out (inactive) until a modulation format is activated.

For Option 004 input mode, the baseband clock rate is set to match the clock rate settings of the N5102A digital module.

Patt Trig In 1

Supported   E4438C with Option 001/601or 002/602

This softkey enables you to trigger the internal digital modulation pattern generator with a TTL/CMOS signal applied to the PATT TRIG IN rear panel BNC connector.

Patt Trig In 2

Supported   E4438C with Option 001/601or 002/602

This softkey enables you to trigger the internal digital modulation pattern generator with a signal applied to the AUX I/O rear panel D-connector. For a description of the AUX I/O rear panel D-connector, refer to the rear panel section of chapter 1 of the *E4428C/38C ESG Signal Generators User's Guide*.

Pattern Trigger

Supported   E4438C with Option 001/601or 002/602

Use this softkey to access a menu from which you can choose between the continuous, single or gated triggering modes. The menu also contains a **Trigger Setup** softkey that enables you to adjust the trigger source, the continuous mode, and the gate active polarity.

Remarks   The pattern trigger function is not available if you use either a PN data sequence, or an external data source.

Pause

Supported   E4438C with Option 409

Use this softkey to pause the currently playing MSGPS scenario.

Payload Data

Supported   E4438C with Option 406

This softkey accesses a menu from which you can select the payload data type. Payload data is the information that is carried in a packet. You can select from continuous PN9 (CPN9), truncated PN9 (TPN9), or create an 8-bit user defined pattern.

Preset   TPN9

PCCPCH

Supported   E4438C with Option 400

This softkey selects a Primary Common Control Physical Channel (PCCPCH) for insertion into the Edit Channel Setup table editor.

Remarks   This softkey is only available for downlink.

P–CCPCH

Supported   E4438C with Option 400

This softkey, in the downlink additive white gaussian noise (AWGN) channel, selects the primary common control physical channel (P–CCPCH) as the reference used to determine the Ec/No value.

Remarks   This softkey is also listed as a physical channel or as a channel block.

PCCPCH + SCH

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 downlink signals. After you have made this selection the Edit Channel Setup menu will display the signal parameters.

Remarks   This softkey is only available for downlink.

PCCPCH + SCH + 1 DPCH

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 downlink signals. After you have made this selection the Edit Channel Setup menu will display the signal parameters.

Remarks   This softkey is only available for downlink.

PCCPCH + SCH + 3 DPCH

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 downlink signals. After you have made this selection the Edit Channel Setup menu will display the signal parameters.

Remarks   This softkey is only available for downlink.

P-CCPCH data (DRPS39)

Supported   E4438C with Option 400

This softkey assigns primary common control physical channel (P-CCPCH) 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 **(DRPS39)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

P-CCPCH data-clk (DRPS38)

Supported   E4438C with Option 400

This softkey assigns the primary common control physical channel (P-CCPCH) 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 **(DRPS38)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

P Code Pwr

Supported   E4438C with Option 409

Use this softkey to set the P code power level, relative to the C/A code power level.

Preset   −3.00 dB

Range   −40.00 to 0.00 dB

Remarks   This softkey is grayed out when **Ranging Code** is set to **C/A**.

PCS Base

Supported   E4438C

This softkey selects PCS 1900 Base as the channel band for GSM. The output frequency depends on both the channel band and channel number selections.

Preset   *Channel*: 512

      Frequency: 1.930 GHz

Range   *Channels*: 512–810

      Frequency: 1.930–1.989 GHz

PCS Mobile

Supported   E4438C

This softkey selects PCS 1900 Mobile as the channel band for GSM. The output frequency depends on both the channel band and channel number selections.

Preset   *Channel*: 512

      Frequency: 1.930 GHz

Range   *Channels*: 512–810

      Frequency: 1.850–1.909 GHz

PDC

Supported   E4438C with Option 001/601or 002/602

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 PDC for Custom Digital Modulations

Use this softkey to select a predefined Personal Digital Cellular (PDC) personality for the digital modulation format.

Accessing the PDC 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 (where the data bits are located in fields defined by the PDC protocol) or a sequence that can be output one or more times.

PDC Bands

Supported   E4438C

Use this softkey to access a menu from which you can select the frequency bands for PDC. The output frequency depends on both frequency band and channel selections.

PDC Off On

Supported   E4438C with Option 402

Use this softkey to set the operating state of the Personal Digital Cellular (PDC) format. Setting **PDC Off On** to On sets up the internal hardware to generate a signal that follows the PDC format.

Off	When you select Off, the PDC format is turned off.
On	When you select On, this sets up the internal hardware to generate a signal that follows the PDC format. The internal I/Q modulator generates π/4DQPSK digital modulation and the PDC 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 **PDC 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.

Performance Req

Supported   E4438C with Option 400

This softkey, in the downlink Test Setup menu, selects a performance requirement for the selected physical channel. This is a static propagation condition that is determined by the maximum block error rate BLER allowed when the receiver input signal is at a specified E_b/N_o limit.

Permuted ESN

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 permuted electronic serial number used to communicate with a particular mobile.

Preset   00000000

Range   00000000–FFFFFFFF

P-GSM Base

Supported   E4438C

This softkey selects P-GSM 900 Base as the channel band for GSM. The output frequency depends on both the channel band and channel number selections.

Preset   *Channel*: 1

                        Frequency: 935.2 MHz

Range   *Channel*: 1–124

                        Frequency: 935.2–959.8 MHz

P-GSM Mobile

Supported   E4438C

This softkey selects P-GSM 900 Mobile as the channel band for GSM. The output frequency depends on both the channel band and channel number selections.

Preset   *Channel*: 1

                        Frequency: 890.2 MHz

Range   *Channel*: 1–124

                        Frequency: 890.2–913.8 MHz

Phase Dev

Supported   E4438C with Option 001/601or 002/602

Use this softkey to set the phase deviation for minimum shift keying (MSK) modulation.

The current phase deviation value appears under the **MSK** softkey in the Modulation Type menu.

Preset   90°

Range   0°-100°

Phase Polarity

Supported   E4438C with Option 401

This field displays the current I/Q signal phase polarity. To change the field selection, highlight the Phase Polarity field, press the **Edit Item** softkey and make a choice from the menu that appears.

Preset   Normal

Phase Polarity Normal Invert

Supported   E4438C with Option 001/601or 002/602

Use this softkey to invert the internal Q signal, reversing the rotation direction of the phase modulation vector.

Normal   When you choose Normal, the phase relationship between the I and Q signals is not altered by the phase polarity function.

Invert   When you choose Invert, the in-phase component lags the quadrature-phase component by 90° in the resulting modulation. Inverted phase polarity is required by some radio standards, and it is useful for lower sideband mixing applications. The inverted selection also applies to the I, I-bar, Q, and Q-bar output signals.

Preset   Normal

Phase Ref Set

Supported   All Models

This softkey enables you to define the current relative phase of the RF output signal as zero. Then all phase parameters are set relative to this zero reference.

PHS

Supported   E4438C with Option 001/601or 002/602

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 PHS for Custom Digital Modulations

Use this softkey to select a predefined Personal Handy Phone System (PHS) personality for the digital modulation format.

Accessing the PHS 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 (where the data bits are located in fields defined by the PHS protocol) or a sequence that can be output one or more times.

PHS Off On

Supported   E4438C with Option 402

Use this softkey to set the operating state of the Personal Handy Phone System (PHS) format.

Off	When you select Off, the PHS format is turned off.
On	When you select On, sets up the internal hardware to generate the structure that follows the PHS format.The internal I/Q modulator generates π/4DQPSK digital modulation and the PHS 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 **PHS 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.

PHS Standard

Supported   E4438C

This softkey selects a frequency band for PHS. The output frequency depends on both the frequency band and channel selection.

Preset	*Channel*: 1
	Frequency: 1.895 GHz
Range	*Channels*: 1–82, 251–255
	Frequency: 1.895–1.919 GHz, 1.893–1.894 GHz

PhyCH Setup

Supported   E4438C with Option 400

This softkey displays a menu from which you can edit parameter fields and apply those parameters to the physical channel selected. The fields shown depend on the **PhyCH Type** selected.

Remarks   This softkey is available for uplink only.

PhyCH Type

Supported   E4438C with Option 400

This softkey displays a menu from which you can select available physical channel types.

Physical Channel

Supported   E4438C with Option 400

This softkey is always active unless the **Frequency** or **Amplitude** softkey is activated.Press the up/down arrow keys or rotate the front panel knob to select physical channel.

PI Bits

Supported   E4438C with Option 400

This field displays the number of bits in the paging indicator.

Preset: 288

Remarks   The field is not user definable.

PICH

Supported	E4438C with Option 400

This softkey selects a Paging Indicator Channel (PICH) for insertion into the Edit Channel Setup table editor.

Remarks	This softkey is only available for downlink.

In the AWGN Channel

This softkey, in the downlink additive white gaussian noise (AWGN) channel, selects the paging indicator channel as reference used to determine the Ec/No value. Refer to "Ec/No value" on page 177 for more information.

PICH 10ms FramePulse (DRPS37)

Supported	E4438C with Option 400

This softkey assigns the paging indicator channel (PICH) 10ms 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 **(DRPS37)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

PICH data (DRPS35)

Supported	E4438C with Option 400

This softkey assigns paging indicator channel (PICH) 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 **(DRPS35)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

PICH data-clk (DRPS34)

Supported	E4438C with Option 400

This softkey assigns the paging indicator channel (PICH) 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 **(DRPS34)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

PICH TimeSlot Pulse (DRPS36)

Supported   E4438C with Option 400

This softkey assigns the paging indicator channel (PICH) 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 **(DRPS36)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

Pilot

Supported   E4438C with Option 401

This softkey appears in different locations, enabling you to either select the pilot channel as a setup, or insert a pilot channel into the channel setup table editor.

In the Setup Select and CDMA2000 Select Menus

Use this softkey to select the pilot channel for the current IS-95A or CDMA2000 setup.

In the Channel Setup Table Editor

Use this softkey to insert a pilot channel into the current channel setup table.

Pilot Bits

Supported   E4438C with Option 400

This data field, in the Edit Channel Setup table editor, displays the pilot bits used for the selected channel. The number of bits available depends on the slot format of the channel.

Range   2 – 16

Remarks   Pilot bits are used as a timing reference in addition to the timing reference used by the CPICH.

This field is only available for downlink.

Pilot Power

Supported   E4438C with Option 400

This data field displays the power level of the pilot bits. Pilot bits are part of the DPCCH configuration.

Range   –20.00 to 20.00 dB

Remarks   Pilot bits are typically transmitted at higher power levels to ensure they are received correctly.

                This field is only available for downlink.

Playback Ratio

Supported   E4438C with Option 400

This field displays the ratio of compressed frames to uncompressed frames. For example, a playback ratio of 1:30 means that for every 30 normal frames there will be one compressed frame. The number entered for the playback ratio is the number of normal frames played before a compressed frame is played.

Preset   2

Range   1–4096

Remarks   The sequence (number entered in the Playback Ratio field) of normal frames to compressed frames will continuously play.

Plot CCDF

Supported   E4438C with Option 001/601or 002/602

This softkey displays a plot of the complementary cumulative distribution function for the selected waveform. The plot displays the probability that the instantaneous envelope power is x dB above the average power, where x is the number on the horizontal axis.
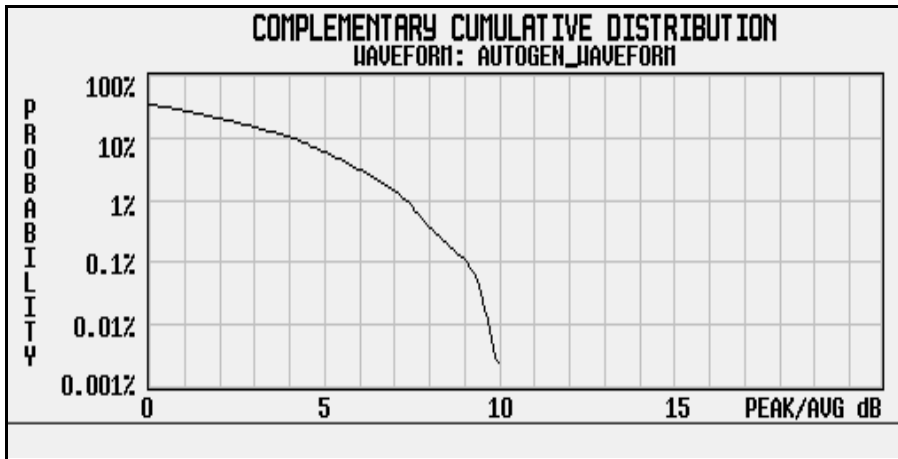
PN9

In the Baseband Generator Menu

Supported   E4438C with Option 001/601or 002/602

This softkey selects an internally generated, ITU standard PN9 pseudorandom bit pattern.

In the Real Time GPS Menu

Supported   E4438C with Option 409

This softkey selects an internally generated, ITU standard PN9 pseudorandom bit pattern.

In the Real Time TDMA Menu

Supported   E4438C with Option 402

This softkey selects an internally generated PN9 pseudorandom bit pattern.

For unframed transmissions, PN9 appears in the Data field in the top line of the text area of the display.

For framed transmissions, PN9 appears in either the Data field for most formats or the following fields:

DECT: B

EDGE and GSM: E

PDC and PHS: TCH

In the BERT Menu

Supported   E4438C with Option UN7

This softkey is one of the choices in the Data select menu. With PN9 selected, the incoming data to the BER DATA IN connector is assumed to be PN9 data.

PN9 Mode Normal Quick

Supported   E4438C with Option 402

This softkey sets the operating state of the pseudorandom 9-bit pattern generation.

Normal   When you select Normal mode, the maximum length PN9 sequence is generated. Use this mode for bit-error-rate testing (BERT).

Quick   When you select Quick mode, a truncated PN9 sequence is generated.

Preset   Normal

Remarks   This softkey is only available when the **Data Format Pattern Framed** softkey is set to Framed.

PN9 Mode Preset Normal Quick

Supported   E4438C

This softkey selects the preset value for PN9 mode.

Normal   The PN9 sequence is continuous from ONE timeslot to a matching timeslot.

Quick   The PN9 sequence is reset at the beginning of each timeslot.

PN9 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	PN9 Data–the incoming data to the BER DATA IN connector is assumed to be PN9 data.
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	PN9 Clock–the clock signal for the PN9 Data. The falling edge of the PN9 Clock indicates the center of PN9 Data. The PN9 Clock rate is 37.5 Mbits per second.
21, 22	No Data–outputs the signal that indicates the no data status. The no data status is reported when there have been no clock inputs for more than 3 seconds or there has 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.

PN11

Supported E4438C with Option 001/601or 002/602

This softkey selects an internally generated, ITU standard PN11 pseudorandom bit pattern.

In the Real Time TDMA Menu

Supported E4438C with Option 402

This softkey selects an internally generated PN11 pseudorandom bit pattern.

For unframed transmissions (patterns), PN11 appears in the Data field in the top line of the text area of the display.

For framed transmissions, PN11 appears in either the Data field for most formats or in the following fields:

DECT: B

EDGE and GSM: E

PDC and PHS: TCH

In the BERT Menu

Supported   E4438C with Option UN7

This softkey is one of the choices in the Data select menu. With PN11 selected, the incoming data to the BER DATA IN connector is assumed to be PN11 data.

PN15

In the Baseband Generator Menu

Supported   E4438C with Option 001/601or 002/602

This softkey selects an internally generated, ITU standard PN15 pseudorandom bit pattern.

In the Real Time GPS Menu

Supported   E4438C with Option 409

This softkey selects an internally generated, ITU standard PN15 pseudorandom bit pattern.

In the Real Time TDMA Menu

Supported   E4438C with Option 402

This softkey selects an internally generated PN15 pseudorandom bit pattern.

For unframed transmissions, PN15 appears in the Data field in the top line of the text area of the display.

For framed transmissions, PN15 appears in either the Data field for most formats or the following fields:

DECT: B

EDGE and GSM: E

PDC and PHS: TCH

In the BERT Menu

Supported   E4438C with Option UN7

This softkey is one of the choices in the Data select menu. With PN15 selected, the incoming data to the BER DATA IN connector is assumed to be PN15 data.

PN20

Supported   E4438C with Option 001/601or 002/602

This softkey selects an internally generated, ITU standard PN20 pseudorandom bit pattern.

In the Real Time TDMA Menu

Supported   E4438C with Option 402

This softkey selects an internally generated PN20 pseudorandom bit pattern.

For unframed transmissions, PN20 appears in the Data field in the top line of the text area of the display.

For framed transmissions, PN20 appears in either the Data field for most formats or the following fields:

DECT: B

EDGE and GSM: E

PDC and PHS: TCH

In the BERT Menu

Supported   E4438C with Option UN7

This softkey is one of the choices in the Data select menu. With PN20 selected, the incoming data to the BER DATA IN connector is assumed to be PN20 data.

PN23

Supported   E4438C with Option 001/601or 002/602

This softkey selects an internally generated, ITU standard PN23 pseudorandom bit pattern.

In the Real Time TDMA Menu

Supported   E4438C with Option 402

This softkey selects an internally generated PN23 pseudorandom bit pattern.

For unframed transmissions, PN23 appears in the Data field in the top line of the text area of the display.

For framed transmissions, PN23 appears in either the Data field for most formats or the following fields:

DECT: B

EDGE and GSM: E

PDC and PHS: TCH

In the BERT Menu

Supported   E4438C with Option UN7

This softkey is one of the choices in the Data select menu. With PN23 selected, the incoming data to the BER DATA IN connector is assumed to be PN23 data.

PN Offset

Supported   E4438C with Option 401

Use this softkey to select the PN offset as a column by which the table will be sorted.

PN Offset

Supported   E4438C with Option 401

This field displays the current pseudorandom number offset value. This is the time offset in the short sequence code assigned to each base station to give it a unique identity. To change the offset value, highlight the PN Offset field, press the **Edit Item** softkey and enter a new value.

Preset   0

Range   0–511

PN Sequence

Supported   E4438C with Option 001/601or 002/602

This softkey displays a menu of choices for pseudorandom internal data generation.

Preset   Depends on the format

Point Trigger

Supported   All Models

Use this softkey to access a menu from which you can select a triggering mode for a point-by-point sweep. You can also configure the polarity of the TTL signal output at the TRIG IN connector using the **Trigger In Polarity Neg Pos** softkey in this menu.

Preset   Free Run

Polarity Setup

Supported   E4438C with Option UN7

This softkey accesses a menu that enables you to select the polarity of the data, clock, and gate functions for BER measurements.

Port Config

Supported   E4438C with Option 003 or 004

This softkey, accesses a menu that enables you to select a parallel, serial, parallel interleaved IQ, or parallel interleaved QI data transmission between the N5102A module and the DUT.

Preset   Parallel

Post-FIR Clipping $|I+jQ|$

Supported   E4438C with Option 400

This field displays the clip (limit) level of the post-FIR I and Q waveform filtering. A level of 100.0% or 0.00 dB equates to no clipping.

Preset   100.0%

Range   10.0 through 100.0%, in 0.1% increments

                −20.0 through 0.00 dB, in 0.1 dB increments

Power

In the Standard Menu

Supported   All Models

This field enables you to set the power in the selected table editor.

In the CDMA Menu

Supported   E4438C with Option 401

This field displays the current channel power value. To change the channel power, highlight the
Power field, press the **Edit Item** softkey and enter a new value.

Preset   0.00dB

Range   –40.0 to 0.00 dB

Remarks   Channel power settings may change when Equal Powers or
                   Scale to 0dB is applied.

In the W-CDMA Menu

Supported   E4438C with Option 400

This field displays the power level for the selected channel relative to carrier power. In the downlink
ChipARB channel this field displays the power of the compressed data frame.

Range   –40.0 to 0.00 dB

Power

Supported   E4438C with Option 400

This softkey appears in the Multiple Channels menu where you can define a channel and then insert
multiple entries of that channel into the downlink Edit Channel Setup table editor.

Press the **Power** softkey, then enter a power level for the channels that will be inserted.

After you 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   0.00 dB

Range   –40.00 to 0.00 dB

Power Control Bits

Supported   E4438C with Option 401

This field displays the current CDMA2000 power control bits value. The mobile uses this value to request a power level change from the base station. To change the power control bits, highlight the Power Control Bits field, press the **Edit Item** softkey and enter a new value.

Preset   0000 hexidecimal

Range   0000–FFFF hexidecimal

Remarks   This field is available only for with the RadioConfig 3/4 Traffic pilot channel.

Power Control Signal Polarity Neg Pos

Supported   E4438C with Option 401

This softkey selects the polarity of the power control signal.

Preset   POS

Power dB

Supported   E4438C with Option 400

This data field displays the power of the selected channel and is displayed in the Edit Channel Setup table editor when the **Multicarrier Off On** softkey is set to Off.

Preset   0.00 dB

Range   –40.00 to 0.00 dB

Remarks   This field is displayed in both the uplink and downlink Edit Channel Setup table editor.

Power Hold Off On

Supported   E4438C with Option 400

This softkey sets the power control state of the dedicated physical channel (DPCH). The DPCH power is held on the **Hold On** selection. The **Hold Off** selection enables the dynamic power control.

Preset   1

Remarks   The power hold mode is automatically enabled when the dedicated physical channel (DPCH) **Power Mode Norm TPC** is set to **TPC**.

Power Meter

Supported   All Models

Use this softkey to access a menu from which you can select the external power meter model for use during the user flatness calibration.

Remarks   The power meter selection is not affected by a preset or by a power cycle.

The power meter is controlled only through a GPIB cable.

Power Mode Norm TPC

Supported   E4438C

This softkey is used to set the power control mode of the dedicated physical channel.

Norm   This choice selects the normal power mode.

TPC   This choice selects the transmit power control mode.

Preset   Norm

Power On Last Preset

Supported   All Models

This softkey selects the power-on operating state for the signal generator. You can select either last or preset.

Last   Each time you cycle power to the signal generator, it will turn on using the same settings as when last turned off.

Preset   Each time you cycle power to the signal generator, it will turn on in either the factory-defined preset condition or in a user-defined preset condition. You make the choice between factory and user-defined preset with the **Preset Normal User** softkey.

Remarks   If Last is active, the signal generator must not receive commands for at least 3 seconds before the power is turned off to guarantee that the most recent state is saved. The power-on state is not affected by a preset or by a power cycle.

Power On/Preset

Supported   All Models

Use this softkey to access a menu of choices for power on and preset conditions. Refer to

Power Search

Supported   All Models

This softkey enables you to select the power search mode. Power search is an internal calibration routine that improves output power accuracy when the automatic leveling control circuit (ALC) is off. A power search is recommended for pulse-modulated signals with pulse widths less than two microseconds.

If you are using external I/Q modulation, the power search routine assumes that the I/Q input level is $\sqrt{I^2 + Q^2}$ = 0.5 V_{rms}. Actual output amplitude will scale directly with $\sqrt{I^2 + Q^2}$.

The power search mode softkey selections are **Manual**, **Auto** and **Span.** They are described below.

Manual   The routine is not run until the **Do Power Search** softkey is pressed.

Auto   The routine will run automatically with each change to the RF frequency or power, and with each change to the AM, burst, pulse, or I/Q modulation state.

Span   Span mode activates the **Do Power Search** softkey and enables you to perform power searches over a selected range of frequencies. The power search corrections are then stored and used whenever the signal generator is tuned within the selected range.

Preset   Manual

Remarks   The **ALC Off On** softkey must be set to Off to enable the power search mode.

Power Search Reference Fixed Mod

Supported   E4438C with Option 001/601or 002/602

Use this softkey to select the reference used by the power search mode.

Fixed   A 0.5 V reference is used in this mode.

Mod   In modulated mode, the reference is the RMS value of the current I/Q modulation.

Preset   Fixed

Remarks   The **ALC Off On** softkey must be set to Off to enable the power search modes.

Power Step

Supported   E4438C with Option 400

This field, in the dedicated physical channel (DPCH) Transmit Power Control Setup menu, displays the increment value which the initial power (Init Power) is stepped.

Preset   0.5 dB

Pp-m

Supported   E4438C with Option 400

This field, in the Uplink Physical Type:PRACH Power menu, displays the power difference between the preamble and message control part of the physical random access channel (PRACH).

Preset   –4.56 dB

Range   –20.00 to 10.00 dB

PRACH

Supported   E4438C with Option 400

This softkey sets the channel type of the uplink physical channel to the physical random access channel (PRACH). The PRACH carries the random access channel (RACH) transport channel used by the user equipment (UE) to request registration on the network.

PRACH AGWN Setup

Supported   E4438C with Option 400

This softkey accesses a the configuration screen for the physical random access channel (PRACH) additive white gaussian noise (AGWN) setup for single and multiple PRACH modes.

PRACH Code Setup

Supported   E4438C with Option 400

This softkey accesses a the configuration screen for the physical random access channel (PRACH) code setup for single and multiple PRACH modes.

PRACH Input Signal Setup

Supported   E4438C with Option 400

This softkey is one of the menu selections from the PRACH Rear Panel Setup menu. When selected, the rear panel input signal routing for the uplink PRACH is displayed.

PRACH Mode Single Multi

Supported   E4438C with Option 400

Use this softkey to set the mode for the physical random access channel (PRACH).

Single   This selection configures the signal generator for a single PRACH.

Multi   This selection configures the signal generator for up to eight PRACHes.

PRACH Output Signal Setup

Supported   E4438C with Option 400

This softkey is one of the menu selections from the PRACH Rear Panel Setup menu. When selected, the rear panel output signal routing for the uplink PRACH is displayed.

PRACH Power Setup

Supported   E4438C with Option 400

This softkey accesses a the configuration screen for the physical random access channel (PRACH) power setup for single and multiple PRACH modes.

PRACH Power Setup Mode Pp-m Total

Supported   E4438C with Option 400

This softkey determines how power is set for the PRACH.

Pp-m   Selecting Pp-m, the difference between preamble power and message control power or total., sets the ratio of the preamble power and message control power.

Total   Selecting Total mode sets the total power of the following parameters: message total power (data and control) control and preamble power (Max power of preamble).

Preset   Pp-m

PRACH Processing (RPS19)

Supported   E4438C with Option 400

This softkey assigns physical random access channel (PRACH) processing to the selected rear panel AUX I/O output connector or BNC.

Remarks   The preamble raw data can be assigned to numerous different output connectors/pins. The **(RPS19)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

PRACH Pulse (RPS23)

Supported   E4438C with Option 400

This softkey assigns the physical random access channel pulse to the selected rear panel AUX I/O output connector or BNC.

Remarks   The PRACH pulse can be assigned to numerous different output connectors/pins. The **(RPS23)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

PRACH Rear Panel Setup

Supported   E4438C with Option 400

This softkey accesses a menu from which you can view or configure the rear panel signal connections, routing and signal types.

Remarks   Available for uplink only.

PRACH Trigger

Supported   E4438C with Option 400

This softkey is used to trigger a physical random access channel (PRACH) uplink transmission. This softkey is only available when **Trigger** is selected in the PRACH Trigger Source menu. The PRACH signal can be controlled in several ways.

Remarks   This softkey is grayed-out if **Immedi** is selected in the PRACH Trigger Source menu.

PRACH Trigger Setup

Supported   E4438C with Option 400

This softkey accesses a menu for physical random access channel (PRACH) synchronization timing offset, base delay Tp-a, trigger framing, and trigger polarity.

PRACH Trigger Polarity Neg Pos

Supported   E4438C with Option 400

This softkey is used to configure the polarity of the PRACH Trigger signal.

Neg   Triggering is on the falling high–to–low signal transition.

Pos   Triggering is on the rising low–to–high signal transition.

Preset   Pos

Remarks   Available for uplink only.

PRACH Trigger Source Immedi Trigger

Supported   E4438C with Option 400

This softkey selects the trigger type for the PRACH transmission. Refer to the "PRACH Trigger" on page 358 for more information on the PRACH trigger.

Immedi   This trigger source selection generates a PRACH sequence immediately.

Trigger   This selection generates a PRACH sequence after receiving the trigger command.

Preset   Immedi

PRACH Timing Setup

Supported   E4438C with Option 400

This softkey accesses the configuration screen for the physical random access channel (PRACH) timing setup for single and multiple PRACH modes.

PRAM File

Supported   E4438C with Option 402

This softkey accesses a menu from which you can select a Pattern RAM (PRAM) file residing in volatile waveform memory (WFM1). This softkey is available only when Pattern is the **Data Format Pattern Framed** softkey selection.

Pressing the **PRAM File** softkey lists all files residing in the WFM1 catalog of files (volatile memory), so the only way to identify the PRAM file is by the file name.

PRAM files are arrays of binary data in byte format. Each byte consists of a data bit, bit 0 (LSB), and 7-bits of control data. The signal generator converts each byte of the downloaded PRAM file into 4 bytes (32 bits), therefore a PRAM file will be four times the size of the source file. For more information on downloading files and PRAM file requirements, refer to the *E4428C/38C ESG Signal Generators Programming Guide*.

PRAT

> **Supported** E4438C with Option 401
>
> This field displays the current paging channel data rate value used by the base station. To change the data rate, highlight the PRAT field, press the **Edit Item** softkey and enter a new value.
>
> **Preset** 00
>
> **Range** 00–03

Preamble

> **Supported** E4438C with Options 400, 403
>
> This softkey is used to select the physical random access channel (PRACH) preamble as the reference for determining the power level for the Ec/No calculation. The selection is displayed in the E Ref field of the uplink physical random access channel PRACH AWGN table editor.
>
> This selection is coupled to the data rate, C/N value (dB) field, the C Power field, and the N Power field and can change the values displayed by these fields.

Preamble Pulse (RPS21)

> **Supported** E4438C with Option 400
>
> This softkey assigns preamble pulse to the selected rear panel AUX I/O output connector BNC. This signal is related to PRACH.
>
> **Remarks** The preamble pulse can be assigned to numerous different output connectors/pins. The **(RPS21)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

Preamble Raw Data (RPS15)

> **Supported** E4438C with Option 400
>
> This softkey assigns preamble raw data to the selected rear panel AUX I/O output connector or BNC. This signal is related to the PRACH.
>
> **Remarks** The preamble raw data can be assigned to numerous different output connectors/pins. The **(RPS15)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

Preamble Raw Data Clock (RPS16)

Supported   E4438C with Option 400

This softkey assigns preamble raw data clock to the selected rear panel AUX I/O output connector or BNC. This signal is related to the PRACH.

Remarks   The preamble raw data clock can be assigned to numerous different output connectors/pins. The **(RPS16)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

Predefined Mode

Supported   E4438C with Option 001/601or 002/602

This softkey accesses a menu of single-keypress setups for various formats. When you select a format, default values for components of the format (such as modulation type, filter, and bits per symbol) are automatically set up.

`Pre-FIR Clipping |I+jQ|`

Supported   E4438C with Option 400

This field displays the clip (limit) level of the pre-FIR I and Q waveform filtering. A level of 100.0% or 0.00 dB equates to no clipping.

Preset   100.0%

Range   10.0 through 100.0%, in 0.1% increments

                   −20.0 through 0.00 dB, in 0.1 dB increments

Pre-FIR Samples

Supported   E4438C with Option 003 or 004

This softkey, for the N5102A module, selects unfiltered data as the data type to be transferred through the N5102A module. When an ARB modulation format is on, this softkey is not accessible. In the Input mode, this data type limits the clock rate to 50 MHz for filters with a width 16 symbols, and 25 MHz for filters with a symbol width.

If this command is executed while an ARB modulation format is active, the parameter choice is changed, but it is not *used* by the signal generator until a real-time modulation format is turned on.

Because a query returns the current choice, regardless of whether or not an ARB format is active, you must query both states (data type and the modulation format) to know the signal generator's current setup.

Preset Language

Supported   All Models

Use this softkey to access a menu of choices for selecting the programming language that is implemented after the **Preset** key is pressed. You can choose between SCPI, which is the language chosen for the signal generator for remote implementation of all features, 8648-compatible, and four versions of 8656/57-compatible languages. The 8648- and 8656/67-compatible languages are provided for remote implementation of some features so that this signal generator can be compatible with systems that use those instruments. Refer to the *E4428C/38C ESG Signal Generators Programming Guide* for specifics on which commands are implemented.

Remarks   The preset language is not affected by an instrument preset or by a power cycle.

Preset List

Supported   All Models

This softkey enables you to delete the current sweep list and replace it with a new list consisting of one point at a default frequency, amplitude, and dwell time.

Remarks   Be certain that you want to delete the current sweep list; you cannot recover the information once you press **Preset List**.

Preset Normal User

Supported   All Models

This softkey enables you to select a factory-defined preset or user-defined preset state for the signal generator.

Normal   A factory-defined preset is used if **Normal** is selected.

User   A user-defined preset is used if **User** is selected.

Remarks   A user-defined preset state is saved with the **Save User Preset** softkey.

`Pre Sig`

Supported   E4438C with Option 401

This field enables you to set or edit the signature of the physical random access channel (PRACH) preamble for the multiple PRACH mode.

Preset   0

Range   0–15

`P REV`

Supported   E4438C with Option 401

This field displays the current protocol revision level value for the real-time CDMA2000 forward synchronization channel. The protocol revision level is displayed in hexadecimal notation. To change the revision level, highlight the `P REV` field, press the **Edit Item** softkey and enter a new value.

Preset   01

Range   00–FF

`P REV Min`

Supported   E4438C with Option 401

This field displays the minimum protocol revision level value for the real-time CDMA2000 forward synchronization channel. The minimum protocol revision level is displayed in hexadecimal notation. To change the minimum level, use the down arrow key to move the cursor to the second page of data fields and highlight the
`P REV Min` field. Press the **Edit Item** softkey and enter a new value.

Preset   01

Range   00–FF

Primary Key

Supported   E4438C with Option 400/401

Use this softkey to select the primary column by which the table will be sorted.

The current selection is displayed under the **Primary Key** softkey.

Preset   *IS-95A:* PN Offset
CDMA2000 (forward link): Config
CDMA2000 (reverse link): Rate
W-CDMA (downlink and uplink): Rate

Primary Scramble Code

Supported   E4438C with Option 400

This field displays the primary scramble code for the arb multicarrier waveform. The primary scrambling code consist of scrambling codes n=16×i where i = 0 through 511. The nth set of secondary scrambling codes consists of scrambling codes 16×i+k, where
k = 1 through 15.

There is one-to-one mapping between each primary scrambling code and the 15 secondary scrambling codes so that the i:th primary scrambling code corresponds to nth secondary scrambling codes.

Range   0–511

PSCH

Supported   E4438C with Option 400

This softkey inserts a Primary Synchronization Channel (PSCH) into the downlink Edit Channel Setup table editor. The PSCH, along with the Secondary Synchronization Channel (SSCH), provides an identifying signal to, and a timing reference for, each base station.

Remarks   This softkey appears in two different locations. If selected from the **Type** softkey menu in the **Multiple Channels** softkey menu, you must press the **Done** softkey to insert the channel into the Edit Channel Setup table editor.

Proceed With Reconfiguration

This softkey appears in two different menus.

In the Software Options Menu

Supported   All Models

Press this softkey to enable the selected software option. The selected option must display a valid license key, indicated by a check mark. After pressing this softkey, press the **Confirm Change** softkey to verify that you want to reconfigure the signal generator with the option selected. If you do not want to continue, press the **Return** key.

Remarks   If you enable an option that does not have the required hardware installed, the menus for that option will be activated but the option *cannot* operate, regardless of what the menus may indicate.

In the LAN Setup Menu

Supported   All Models

Press this softkey to enable any changes made in the LAN Setup menu. After pressing this softkey, press the **Confirm Change** softkey to verify that you want to reconfigure the signal generator with the changes you made. If you do not want to continue, press the **Return** key.

PSCH Power

Supported   E4438C with Option 400

This field displays the primary synchronization channel (PSCH) power. This channel consists of the primary synchronization code (PSC), a fixed 256-chip code broadcast by all W-CDMA base stations.

Preset   –8.30 dB

Range   –40.00 to 0.00 dB

PSCH State

Supported   E4438C with Option 400

This field displays the on/off state for the primary synchronization physical channel (PSCH).

Preset   On

PSK

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 PSK Modulation

Use this softkey to display a menu of phase shift keying (PSK) modulation types to modulate a continuous stream of the selected data pattern. You can choose from QPSK and OQPSK, BPSK, π/4 DQPSK, 8PSK, 16PSK, D8PSK and EDGE.

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

Use this softkey to display a menu of phase shift keying (PSK) modulation types that you can load into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *E4428C/38C ESG Signal Generators User's Guide*.

Pulse

Supported   All Models

This softkey enables you to select pulse as the modulating waveform.

Remarks   This key is available after selecting the internal source to operate as a function generator.

Pulse/RF Blank (None)

Supported   E4438C with Option 001/601or 002/602

This softkey enables you to select a marker for Pulse/RF blanking function. When a marker is used for RF blanking, the RF output is transmitted when the selected marker signal is high. When the selected marker signal is low, the RF is blanked. RF blanking also integrates ALC Hold, so there is no need to select the ALC Hold function when using the Pulse/RF Blank function.

Pulse Off On

Supported   All Models

This softkey toggles the operating state for the currently selected pulse modulation source.

Off   Use this setting to turn off the pulse modulation source.

On   Use this setting to turn on the pulse modulation source.

When pulse modulation is on, the PULSE annunciator is shown in the display.

Preset   Off

Remarks   The RF carrier is modulated by the enabled modulation only when you have also set **Mod On/Off** to On.

Pulse Period

Supported   All Models

This softkey enables you to change the pulse period for internally generated pulse modulation.

Preset   80.0 μsec

Range   8.0 usec−30.0 sec

Remarks   If the value for pulse period is less than the value for pulse width, pulse width is changed to be 20 us less than pulse period.

The pulse period applies only to internal pulse modulation; when external pulse

modulation or internal square pulse modulation is selected, this key is disabled.

Pulse Rate

Supported	All Models

This softkey enables you to change the pulse rate for the internal square pulse modulation.

Preset	400.0 Hz
Range	100.0 mHz−100.0 kHz
Remarks	The new value of pulse rate applies only to internal square pulse modulation; when external pulse modulation or internal pulse modulation is selected, this key is disabled.

Pulse Source

Supported	All Models

Use this softkey to access a menu of choices that enables you to select the pulse source for modulation inputs.

Preset	Internal Pulse
Remarks	The RF carrier is modulated by the enabled modulation only when you have also set **Mod On/Off** to On.

Pulse Width

Supported	All Models

This softkey enables you to change the pulse width for internally generated pulse modulation source.

NOTE	A power search is recommended for signals with pulse widths less than one microsecond. Refer to "Power Search" on page 355.

Preset	40.00 µsec
Range	4.0 usec−30.0 sec
Remarks	If the value for pulse period is less than the value for pulse width, pulse width is changed to be 20 ns less than pulse period.
	The pulse width applies only to internal pulse modulation; when external pulse modulation or internal square pulse modulation is selected, this key is disabled.

Puncture

Supported   E4438C with Option 400

The field displays the puncture rate percentage for the transport channel or, if a negative number, the number of bits to be added to the channel. Data can be removed from or added to the fully coded channel. The number of bits removed or inserted is displayed as a percentage of the total number of bits.

Range   –25400 to 100%

Remarks   This field is not user-definable. The value is computed based on the user selected TrCH setup.

PwrOffs

Supported   E4438C with Option 400

This field displays the power level set for the compressed data frames. The increase in transmitted power for compressed frames, expressed in decibels (dB), is typically increased to compensate for the loss in coding gain.

Preset   0

Range   0–6 dB or AUTO

Remarks   The power offset can also be automatically set by using the auto setting. The amount of gain depends on the number of DTX slots in the auto mode.

PWT

Supported   E4438C with Option 001/601or 002/602

This softkey selects a predefined personal wireless telephone (PWT) personality for the digital modulation format. The PWT standard is an adaptation of the DECT air-interface with a $\pi/4$ DQPSK modulation to reduce radio channel bandwidth.

Q

Q Gain

Supported	E4438C with Option 003

This softkey, for the N5102A module, enables you to adjust the gain for the N5102A module Q data. This is a fine adjustment, independent of the I data, that can be used to complement the setting obtained using the **Scaling** softkey.

The gain is the gain of the digital sample. A sample is usually 16 bits and represents an analog voltage. This voltage is adjusted by the gain which will change the bit values. If the signal gain cannot be represented by 16 bits it will be clipped.

Preset	100.0%
Range	87.50–112.5%

Q Offset

Supported	E4438C

This softkey adjusts the amplitude level of the quadrature-phase signal. This key appears as a percentage of full scale for standard I/Q and as an offset voltage for wideband I/Q.

For Standard I/Q

Use this softkey to enter an origin offset for standard quadrature-phase signals. 100% offset is equivalent to 500 mV DC at the input connector. This offset is used to remove imperfections in the quadrature-phase signal or to introduce calibrated impairments.

The **I/Q Adjustments Off On** softkey must be set to On to enable this adjustment.

When using this key to minimize the LO feedthrough signal, optimum performance is achieved when the adjustment is made after all other I/Q path adjustments, such as those made with the **Int Phase Polarity Normal Invert** or **Modulator Atten nnn db Manual Auto** softkeys. If other adjustments are made after minimization is performed, the LO feedthrough signal may increase.

Preset	0.0%
Range	−50% to 50%

For Wideband I/Q (Option 015)

Use this softkey to enter an origin offset for quadrature-phase signals in wideband I/Q mode. This offset is used to remove imperfections in the quadrature-phase signal or to introduce calibrated impairments. The **I/Q Adjustments Off On** softkey must be set to On to enable this adjustment.

For frequencies between 20 and 28.5GHz the I and Q signals are reversed. This is correct for internally generated signals but not for externally applied I and Q signals. In this frequency band you must switch the I and Q inputs to maintain the same phase relationship. Refer to chapter 1 of the *E4428C/38C ESG Signal Generators Service Guide*, section A37 44GHz for more information.

Preset	0.0000 V
Range	−1.0000 V to 1.0000 V

In the Gain, Offset & Scaling Menu (N5102A, Option 003)

This softkey enables you to adjust the DC offset for the N5102A module Q data. The offset can be used to compensate for an existing impairment or to introduce an impairment to the Q data.

The offset is an adjustment to the analog level that is represented by the digital sample. The analog voltage is limited to a 16-bit data sample.

Preset	0.00%
Range	−100 to 100% of full scale

Q Offset

Supported	E4438C

Use this softkey to set an origin offset voltage for internally generated quadrature-phase signals. This offset is used to remove imperfections in the quadrature-phase signal or to introduce calibrated impairments.

Preset	0.0%
Range	−100% to 100%
Remarks	The **I/Q Adjustments Off On** softkey must be set to On to enable this adjustment.
	When using this key to minimize the LO feedthrough signal, optimum performance is achieved when the adjustment is made after all other I/Q path adjustments, such as those made with the [Int Phase Polarity Normal Invert] or [Modulator Atten xx db Manual Auto] softkeys. If other adjustments are made after minimization is performed, the LO feedthrough signal may increase.

QAM

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 QAM Modulation

Use this softkey to display a menu of quadrature amplitude modulation (QAM) types to modulate a continuous stream of the selected data pattern. You can choose from 4QAM, 16QAM, 32QAM, 64QAM, and 256QAM.

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

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

Use this softkey to display a menu of quadrature amplitude modulation (QAM) types that you can load into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *E4428C/38C ESG Signal Generators User's Guide*.

QOF

Supported   E4438C with Option 401

This field displays the current quasi-orthogonal function channel value. To change the channel value, highlight the QOF field, press the **Edit Item** softkey and enter a new value.

Preset   0

Range   0–3

QPSK

Supported   E4438C with Option 001/601or 002/602

This softkey selects a 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. QPSK modulation transmits data at the rate of 2 bits per symbol.

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 QPSK Modulation

Use this softkey to select quadrature phase shift keying (QPSK) to modulate a continuous stream of the selected data pattern.

Loading a QPSK I/Q Map into the Table Editor

Use this softkey to load a quadrature phase shift keying (QPSK) I/Q map 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 *E4428C/38C ESG Signal Generators User's Guide*.

QPSK and OQPSK

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 QPSK and OQPSK Modulation

Use this softkey to access a menu of quadrature phase shift keying (QPSK) and offset quadrature phase shift keying (OQPSK) modulation types to modulate a continuous stream of the selected data pattern. QPSK and OQPSK modulations transmit data at the rate of 2 bits per symbol. You can choose from QPSK, IS95 QPSK, Gray Coded QPSK, OQPSK, and IS95 OQPSK.

Loading a QPSK and OQPSK I/Q Map into the Table Editor

Use this softkey to access a menu of quadrature phase shift keying (QPSK) and offset quadrature phase shift keying (OQPSK) modulation types that you can load into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *E4428C/38C ESG Signal Generators User's Guide*.

Quadrature Angle Adjustment

Use this softkey to adjust the phase angle between the I and Q vectors. The phase angle change occurs on the Q vector. When the quadrature angle adjustment is zero, the phase angle is 90 degrees. Positive skew increases the angle from 90 degrees while negative skew decreases the angle from 90 degrees.

In the I/Q Adjustment Menu

Supported   E4438C

This adjustment affects only the RF output path. It is applicable to both internally generated and externally applied I/Q signals.

Preset   0.00 degrees

Range   ±10 degrees, minimum increment of 0.01 degrees

Remarks   When operating the signal generator in the 3.3 to 4 GHz frequency range, quadrature angle adjustment settings greater than ±5 degrees will not be within specifications.

In the Baseband Specific Menu

Supported   E4438C with Option 001/601 or 002/602

This adjustment affects both the rear-panel I and Q signals, and the RF output path. It is applicable to only internally generated I/Q signals.

Preset   0.00 degrees

Range   ±30 degrees, minimum increment of 0.01 degrees

Quarter

Supported   E4438C with Option 401

Use this softkey to set the gating rate to one quarter, causing 4 power control groups (every fourth bit) to be transmitted. The gating rate field is available only in the reverse pilot channel.

R

RACH TrCH

Supported   E4438C with Options 400, 403

This softkey is used to select the physical random access channel (PRACH) random access channel (RACH) as the reference for determining the power level for the Eb calculation. The selection is displayed in the `E Ref` field of the uplink physical random access channel PRACH AWGN table editor.

This selection is coupled to the data rate, `C/N value (dB)` field, the `C Power` field, and the `N Power` field and can change the values displayed by these fields.

`Radio Config`

Supported   E4438C with Option 401

This field displays the current radio configuration value. The radio configuration is a set of traffic channel transmission formats that define parameters, such as data rates and modulation characteristics. Radio configurations 1 and 2 are IS-95 backwards compatible.

To change the radio configuration value, highlight the `Radio Config` field, press the **Edit Item** softkey and enter a new value.

Preset	*Forward Link: F-FCH:* 1; *F-SCH1 and F-SCH2:* 3 *Reverse Link:* depends on the selected operating mode
Range	*Forward Link: F-FCH:* 1–5; *F-SCH1 and F-SCH2:* 3–5 *Reverse Link:* depends on the selected operating mode

RadioConfig 1/2 Access

Supported   E4438C with Option 401

Use this softkey to select the RadioConfig 1/2 Access CDMA-standard reverse link channel configuration. This configuration consists of a radio configuration (RC) 1/2 reverse link access channel (R-ACH) only.

RadioConfig 1/2 Traffic

Supported   E4438C with Option 401

Use this softkey to select the RadioConfig 1/2 Traffic CDMA-standard reverse link channel configuration. This configuration consists of a radio configuration (RC) 1/2 reverse link fundamental channel (R-FCH) and an RC 1/2 reverse link supplemental 1 channel (R-SCH1).

RadioConfig 3/4 Common Control

Supported   E4438C with Option 401

Use this softkey to select the RadioConfig 3/4 Common Control CDMA-standard reverse link channel configuration. This configuration consists of a radio configuration (RC) 3/4 reverse link common control pilot channel (R-PICH) and an RC 3/4 reverse link common control channel (R-CCCH).

RadioConfig 3/4 Enhanced Access

Supported   E4438C with Option 401

Use this softkey to select the RadioConfig 3/4 Enhanced Access CDMA-standard reverse link channel configuration. This configuration consists of a radio configuration (RC) 3/4 reverse link enhanced access pilot channel (R-PICH) and an RC 3/4 reverse link enhanced access channel (R-EACH).

RadioConfig 3/4 Traffic

Supported   E4438C with Option 401

Use this softkey to select the RadioConfig 3/4 Traffic CDMA-standard reverse link channel configuration. This configuration consists of a radio configuration (RC) 3/4 reverse link traffic pilot channel (R-PICH), an RC 3/4 reverse link dedicated control channel (R-DCCH), an RC 3/4 reverse link fundamental channel (R-FCH), an RC 3/4 reverse link supplemental 1 channel (R-SCH1) and an RC 3/4 reverse link supplemental 2 channel (R-SCH2).

Ramp

Supported   All Models

This softkey enables you to specify ramp as the modulating waveform.

Preset   Positive

Remarks   In the LF Out menu this key is available after selecting the internal source to operate as a function generator.

Ramp

Supported   E4438C with Option 401

This field displays the operating state of the CDMA2000 power ramp function. When this function is enabled, the power level is increased over a time period specified by the Ramp Time data field, then decreased over the same period. The power ramp sequence is continuously repeated.

To toggle the power ramp operating state, highlight the Ramp field and press the **Edit Item** softkey.

Preset   On

Ramp Step

Supported   E4438C with Option 400

This field is displayed in the PhyCH Setup: PRACH Power Setup menu and indicates the ramp step power level. The ramp step is the power level increase for the physical random access channel (PRACH) preamble. The ramping step power is in decibels. Refer to "Init Pwr" on page 252 for more information.

Preset   0 dB

Range   0–10 dB

Remarks   Ramp step and Num of Pre are coupled to allow approximately 30 dB of range between the first and last preamble.

Ramp Time

Supported   E4438C with Option 401

This field displays the CDMA2000 power ramp time. When the power ramp is enabled, the power level is increased over a time period specified by the Ramp Time data field, then decreased over the same period. The power ramp sequence is continuously repeated.

To change the ramp time value, highlight the Ramp Time field, press the **Edit Item** softkey and enter a new value.

Preset   1

Range   1–80 frames

Random

Supported   E4438C with Option 400

This softkey selects random data as the data for the selected channel. Random data can be selected for both uplink and downlink.

Random Seed Fixed Random

Supported   E4438C with Option 001/601or 002/602

This softkey sets the mode of the random seed for the randomly generated phases of the multitone table editor tones. This is done as part of initializing the multitone table editor.

Fixed	When you select Fixed, the same random phases will be generated after each initialization.
Random	When you select Random, new phases will be generated after each initialization.
Preset	Fixed
Remarks	Use this softkey when the **Initialize Phase Fixed Random** softkey is set to the Random selection.

Ranging Code C/A P C/A+P

Supported   E4438C with Option 409

This softkey sets the ranging code type for the modulated GPS carrier.

C/A	This choice selects a 1023-bit pseudorandom C/A (coarse acquisition) code that is BPSK modulated onto the L1 (1575.42 MHz) carrier. The C/A code factory-set chip rate is 1.023 Mcps using a 10.23 Mcps reference clock.
P	This choice selects the precise (P) code which is a very long pseudorandom sequence that is BPSK modulated onto the L2 (1227.6 MHZ) carrier. The P code factory-set chip rate is 10.23 Mcps using a 10.23 Mcps reference clock.
C/A+P	This choice permits the C/A (coarse acquisition) and P (precise) codes to modulate the L1 carrier (1575.42 MHz) simultaneously by providing the C/A code on the I component and the P code in quadrature on the Q component.
Preset	C/A

Rate

Supported   E4438C with Option 400

This softkey selects the symbol rate, `Rate ksps,` as the parameter by which the Edit Channel Setup table editor will be sorted.

Preset   Rate

Remarks   This softkey appears in two different locations: the Primary Key softkey menu and the Secondary Key softkey menu. You must press the **Sort** softkey to order the listing.

Rate Full Half

Supported   E4438C with Option 402

Use this softkey to select either a full- or half-rate traffic channel. Notice that your selection, either full-rate or half-rate, is shown on the display directly above the timeslot pattern visual representation.

Full   When you select full-rate, the traffic channel utilizes two equally spaced timeslots of the frame. Timeslots 1, 2, and 3 are paired with timeslots 4, 5, and 6, respectively.

Half   When you select half-rate, the traffic channel utilizes one timeslot of the frame.

Preset   Full-rate

Rate ksps

Supported   E4438C with Option 400

This data field displays the symbol rate, in kilosymbols per second for the displayed channel.

Range: Downlink: 7.5 ksps–960 ksps

                Uplink: 15 ksps–960 ksps

Remarks   The rate choice menu is automatically shown when the appropriate channel is selected or when the field is edited.

                The symbol rate can not be changed for some channels.

Rate Match Attr

Supported   E4438C with Option 400

This field displays the rate matching attribute value for the selected transport channel. Press **Edit Item** to enter a value and terminate with the **Enter** softkey to set the value. A higher rate match attribute

number indicates a higher priority for the channels data bits. For example, the bits per frame will increase relative to other channels.

Preset: 256 for DCH1 and DCH2, 1 for all other transport channels

Range: 1–256

RCDMA

Supported E4438C

Press this softkey to set the current catalog type to reverse link CDMA (RCDMA) and display the catalog of RCDMA files.

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

Real-time AWGN Off On

Supported E4438C with Option 403

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

Off When you select Off, the noise function is disabled.

On When you select On, the noise function is enabled.

Real Time CDMA2000

Supported E4438C with Option 401

Use this softkey to access a menu from which you can create real time CDMA2000 modulations.

Real Time GPS

Supported E4438C with Option 409

Use this softkey to access a menu from which you can set up simulated Global Positioning System (GPS) single satellite signals.

Real Time GPS Off On

Supported	E4438C with Option 409

This softkey sets the operating state of the real time GPS personality.

Off	This selection turns off the GPS personality.
On	This selection turns on the GPS personality. The GPS personality simulates the signal produced by an individual GPS satellite.
Preset	Off

Real Time I/Q Baseband

Supported	E4438C with Option 001/601or 002/602

Use this softkey to access a menu from which you can build customized unframed data formats using the real time I/Q baseband generator.

Real Time I/Q Baseband 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 continuous real-time modulation generator.

Real Time MSGPS

Supported	E4438C with Option 409

Use this softkey to access a menu from which you can set up simulated multiple-satellite Global Positioning System (MSGPS) signals.

Real-time MSGPS Off On

Supported	E4438C with Option 409

This softkey sets the operating state of the real time MSGPS personality.

Off	This selection turns off the MSGPS personality.
On	This selection turns on the MSGPS personality. The MSGPS personality simulates the signals produced by multiple GPS satellites. Select a scenario file before turning MSGPS on.
Preset	Off

Real-time Noise Off On

Supported   E4438C with Option 403

This softkey toggles the operating state for the dual ARB real-time additive white gaussian noise (AWGN) noise generator. To define the noise bandwidth and carrier to noise ratio parameters, use the **Carrier to Noise Ratio**, **Carrier Bandwidth**, and **Noise Bandwidth Factor** softkeys.

Off   The real-time noise generator is off.

On   Applies noise to the waveform currently playing with the dual ARB player.

Preset   Off

Real-time Noise Setup

Supported   E4438C with Option 403

Use this softkey to access a menu from which you can select noise parameters that can be applied to a waveform file in real time. Noise parameters such as carrier to noise ratio and noise bandwidth factor can be used to configure noise on the waveform file that is being played by the dual ARB player.

Real Time TDMA

Supported   E4438C with Option 402

Use this softkey to access a menu of TDMA formats for creating real time modulations.

Real Time W-CDMA

Supported   E4438C with Option 400

Use this softkey to access a menu from which you can create real time W-CDMA modulations.

Rear Panel Input Setup

Supported   E4438C with Option 400

Use this softkey to access a menu from which you can configure real-time W-CDMA triggering input.

Rear Panel Output Setup

Supported   E4438C with Option 400

Use this softkey to access a menu from which you can assign W-CDMA output signals to various rear-panel ports. Highlight the desired rear-panel port in the table editor and select an output signal from the menu.

Recall

Supported   All Models

Use this hardkey to access a menu of softkeys that enables you to select or delete registers and sequences.

Preset   RECALL Reg

Recall Ref Osc Setting

Supported   All Models

Use this softkey to recall the last saved reference oscillator coarse and fine adjustment setting.

Remarks   This adjustment is intended for use by service personnel. Refer to the calibration guide for more information.

RECALL Reg

Supported   All Models

Use this softkey to recall an instrument state from a saved register. Recalling a register also selects that register number for all keys which specify a register number in this menu. You can also use the front panel knob and the up and down arrow keys to scroll through all saved registers for the selected sequence.

Recall Secondary Frame State

Supported   E4438C with Option 402

Use this softkey to recall the last instrument state saved as the data pattern for the secondary frame. This will overwrite the current instrument state. When the secondary frame state is turned on, the secondary frame will be generated using the recalled instrument state.

Rectangle

Supported   E4438C with Option 001/601or 002/602

Use this softkey to select a, rectangular pre-modulation filter from either the Select menu or the Load Default FIR menu.

In the Select (filter) Menu

In this menu, pressing the **Rectangle** softkey selects this FIR filter for use in a modulation setup.

In the Load Default FIR Menu

In this menu, use the **Rectangle** softkey to access a menu from which you can specify the number of symbols, apply a windowing function, and generate a new FIR table that is loaded with the coefficients for a rectangular filter. If you change a parameter, you can press the **Generate** softkey again to reload the FIR table.

Ref Data Rate

Supported   E4438C with Options 400, 403

This field displays the channel data rate used to calculate the Eb/No or Ec/No value. The rate is determined by the channel selected in the `Eb Ref` field (`E Ref` in uplink PRACH) field.

Preset   *Uplink (DPCH)*: 12.2 kbps

Uplink (PRACH): 8.4 kbps

Ref Measure Setup

Supported   E4438C with Option 400

This softkey accesses a menu from which you can select a reference measurement test setup for a physical channel. For downlink, this softkey is only available for the DPCH. For uplink, this softkey is available for DPDCH.

Preset   *Downlink*: N/A

Uplink: RMC 12.2 kbps

Ref Param Setup

Supported   E4438C with Option 400

This softkey accesses a menu from which you can select a compressed mode reference parameter set, as defined in the 3GPP specifications.

Preset   Custom

Ref Osc Coarse

Supported   All Models

This softkey is provided for adjusting the internal reference oscillator. Refer to the calibration guide for more information.

Remarks   This adjustment is intended for use by service personnel.

Ref Osc Fine

Supported   All Models

This softkey is provided for adjusting the internal reference oscillator. Refer to the calibration guide for more information.

Remarks   This adjustment is intended for use by service personnel.

Ref Oscillator Source Auto Off On

Supported   All Models

This softkey switches off and on the signal generator's capability of automatically selecting between the internal reference oscillator and an external reference oscillator.

Off   The signal generator uses the internal reference only, even if an external reference is connected.

On   The signal generator detects when a valid reference signal is present at the 10 MHz IN connector and automatically switches from internal to external reference operation.

Preset   On

Ref Param Setup (Custom)

Supported   E4438C with Option 400

This softkey accesses a menu from which a downlink (DL) reference type can be selected. The DL references available conform to parameters defined in 3GPP Standard TS25.101.

Preset   DL Reference 1.1

Remarks   This field is displayed in the uplink Compressed Mode Setup table editor

Ref Param Setup (TrCH BlkSize)

Supported   E4438C with Option 400

This softkey accesses a menu for setting the transport channel block size of the PRACH.

Preset   TrCH BlkSize 168

Remarks   This field is displayed for the DPCCH and the DPDCH in the Compressed Mode Setup table editor

Ref Sensitivity

Supported   E4438C with Option 400

This softkey is a signal button set up for "Reference Sensitivity Testing" as described in 3GPP TS 25.101. Pressing this softkey sets up the transport channel for testing the minimum receiver input power measured at the user equipment (UE) antenna connector at which the bit error rate (BER) does not exceed a specific value.

Reference Frequency

Supported   E4438C with Option 401

This softkey enables you to set the reference frequency of the external clock. It is available only when you are using an external reference applied to the BASEBAND GEN REF IN connector.

Preset   10.0000000 MHz

Range   250.0000 kHz-100.0000000 MHz

Reference Frequency

Supported   E4438C with Option 004

This softkey, for the N5102A module, enables you to specify the frequency of the external reference supplied to the Freq Ref connector. The specified frequency enables the internal source of the N5102A module to lock onto the externally supplied reference.

CAUTION   The module can lock onto a signal that is close to the specified reference frequency. If you specify a frequency that is different from what is being supplied, you won't get the right output, and might not get an error.

This softkey is grayed out (inactive) for the External and Device clock source selections.

Preset   10.0000000 MHz

Range   1–100 MHz

Reference Freq

Supported   E4438C with Option 001/601or 002/602

This softkey enables you to set the reference frequency of the external clock.

Preset   10.0000000 MHz

Range   250.0000 kHz–100.0000000 MHz

Remarks   This softkey is only available when you are using an external ARB reference applied to the BASEBAND GEN REF IN connector.

Reference Oscillator Adjustment

Supported   All Models

Use this softkey to access a menu of keys that are provided for adjusting the internal reference oscillator.

Remarks   This adjustment is intended for use by service personnel. Refer to the calibration guide for more information.

Reference 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	Data–the incoming data to the BER DATA IN connector is assumed to be PN9 data.
4	Sync Start–indicates the timing that the PN generator starts to generate a PN sequence. This signal can also indicate if the hardware is triggering a PN synchronization or making a measurement when the signal is high
20	Clock–the clock signal for the PN9 Data. The falling edge of the PN9 Clock indicates the center of PN9 Data. The PN9 Clock rate is 37.5 Mbits per second.
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	PRBS Ref–uses the pseudo-random bit stream as the reference signal.

Reference Setup

Supported   E4438C with Options 403

This softkey displays the ARB reference setup menu. From this menu you can adjust the arbitrary waveform generator (ARB) between internal and external and set the ARB sample clock.

Remote Language

Supported   All Models

Pressing this softkey reveals a menu of choices for the signal generator's remote language. The language selected will be implemented immediately without presetting the signal generator. Instrument specific languages such as 8657D NADC are available for compatibility with the signal generator. The SCPI language implements all of the signal generator's functions.

Remarks   Numerous instrument compatible languages are available for use by the signal generator. Refer to the *E4428C/38C ESG Signal Generators Programming Guide* for specifics on commands and information on programming languages.

Rename

Supported   E4438C with Option 001/601or 002/602

Use this softkey to rename the current bit file. The maximum file name length is 23 characters (alphanumeric and special characters).

Rename Segment

Supported   E4438C with Option 001/601or 002/602

This softkey enables you to rename the selected waveform segment in the displayed catalog. The maximum file name length is 23 characters (alphanumeric and special characters).

Reserved

Supported   E4438C with Option 401

This field displays the current reserved bit setting for the forward synchronization channel. These reserved bits in the frame structure of this channel may be used in the future. Presently, all bits that are marked as reserved bits should be set to "0" in all frames. The base station and mobile will ignore the reserved bits.

Preset   0

Reset & Run

Supported   E4438C with Option 001/601or 002/602

Use this softkey to select the Reset & Run mode for continuous triggering. When this mode is selected, the waveform generator plays a sequence or frame continuously upon triggering. The waveform generator responds to subsequent triggers by immediately restarting the sequence.

Reset RS-232

Supported   All Models

Use this softkey to clear the RS-232 read/write buffer. Any unprocessed data is cleared and the buffer is readied for sending and receiving data over the RS-232 interface.

Remarks   All Models other RS-232 communication parameters are unaffected.

Reset to Initial Power

Supported   All Models

This softkey sets the current output power to the Initial Power.

Remarks   Any time the power mode is changed, the start power is always set the initial power.

Resolution

Supported   E4438C with Option UN7

Use this softkey to specify the resolution of the clock and gate delays. Enter the value using the numeric keypad and terminate it by pressing the appropriate unit softkey.

Preset: 13.3 ns

Range: 26.7 nsec–80.0000 usec

Remarks   The minimum resolution is 13.3 ns and corresponds to 1/75 MHz. The 75 MHz is the sampling clock of the BERT board. It must be a multiple of the minimum resolution and if not, the gate delay time is automatically rounded to a value that is the multiple value closest to the entered value.

Restart

Supported   E4438C with Option 409

Use this softkey to set the scenario to the beginning without turning off the RF. If **Resume** is active, the scenario immediately starts playing; if **Pause** is active, press **Resume** to start playing the scenario.

Restore DECT Factory Default

Supported   E4438C with Option 402

Use this softkey to reset Digital European Cordless Telecommunications (DECT) configuration to the factory default values.

Restore Default Burst Shape

Supported   E4438C with Option 001/601or 002/602

Use this softkey to reset the burst shape parameters to their preset values.

Preset values

	Rise Time, bits	Rise Delay, bits	Fall Time, bits	Fall Delay, bits	Shape Type
Custom	5.000	0.000	5.000	0.000	sine
DECT	10.000	0.000	10.000	0.000	sine
EDGE	9.000	0.000	9.000	0.000	sine
GSM	3.000	0.000	3.000	0.000	sine
NADC	5.000	0.000	5.000	0.000	sine
PDC	4.000	0.000	4.000	0.000	sine

PHS	4.000	0.000	4.000	0.000	sine
TETRA	8.000	0.000	8.000	0.000	sine

Restore Default Filter

Supported   E4438C with Option 001/601or 002/602

Use this softkey to replace the current FIR filter with the default filter for the selected format.

Preset   *EDGE:* EDGE
GSM: Gaussian BbT = 0.300
DECT: Gaussian BbT = 0.500
CDMA2000 and IS-95A: IS-95 Mod w/EQ
Custom, NADC, and TETRA: Root Nyquist $\alpha = 0.350$
PDC, PHS, and Digital Modulation: Root Nyquist $\alpha = 0.500$
WCDMA: WCDMA

Restore Default Modulation Type

Supported   E4438C with Option 001/601or 002/602

Use this softkey to restore the default modulation type for the current real time custom digital modulation setup.

Restore Default Signal Polarities

Supported   All Models

This softkey is used to restore the signal generator's default signal polarities.

Restore Default Symbol Rate

Supported   E4438C with Option 001/601or 002/602

Use this softkey to replace the current symbol rate with the default symbol rate for the selected format.

Preset   *TETRA:* 18.000000 ksps
PDC: 21.000000 ksps
NADC, Custom: 24.300000 ksps
PHS: 192.000000 ksps
EDGE, GSM: 270.833333 ksps
DECT: 1.152000000 Msps

Remarks   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.

Restore EDGE Factory Default

Supported   E4438C with Option 402

Press this softkey to reset Enhanced Data Rates for GSM Evolution (EDGE) configuration to the factory default values.

Restore Factory Defaults

Supported   All Models with Option UNJ

This softkey re-sets the bandwidth of the reference oscillator to the factory-defined default state. The default value for the internal reference bandwidth is 125 Hz. The default value for the external reference bandwidth is 25 Hz

Restore GSM Factory Default

Supported   E4438C with Option 402

Use this softkey to reset Global System for Mobile Communications (GSM) configuration to the factory default values.

Restore NADC Factory Default

Supported   E4438C with Option 402

Use this softkey to reset North American Digital Cellular (NADC) configuration to the factory default values.

Restore PDC Factory Default

Supported   E4438C with Option 402

Use this softkey to reset Personal Digital Cellular (PDC) configuration to the factory default values.

Restore PHS Factory Default

Supported   E4438C with Option 402

Use this softkey to reset Personal Handy Phone System (PHS) configuration to the factory default values.

Restore System Defaults

Supported   All Models

This softkey is used to restore the signal generator's system defaults.

Restore System Files

Supported   All Models

Use this softkey to write all system configuration and calibration files residing on the signal generator's motherboard flash memory to the CPU flash memory. This operation overwrites all existing system configuration and calibration files on the signal generator's CPU flash memory.

NOTE	This function should be performed by trained personnel or under direction from the Agilent Service Center. Refer to the *E4428C/38C ESG Signal Generators User's Guide* for information on contacting the Agilent Service Center.

Restore TETRA Factory Default

Supported   E4438C with Option 402

Use this softkey to reset Trans European Trunked Radio (TETRA) configuration to the factory default values.

Resume

Supported   E4438C with Option 409

Use this softkey to continue playing the MSGPS scenario when it has been stopped with the **Pause** softkey. The scenario resumes from the point at which it was paused.

Resync Limits

Supported   E4438C with Option UN7

Use this softkey to specify the threshold level for resynchronizing BER measurements. Enter the value using the numeric keypad and terminate it by pressing the **%** or **ppm** softkeys.

Preset   0.4000

Range   0.0500–0.4000

Retrigger Mode

Supported   E4438C with Option 001/601or 002/602

Use this softkey to access a menu for configuring the waveforms's response to triggers while using the single trigger mode in an ARB format. The response selections determine whether the waveform accepts a trigger during playback, and if it does, how it responds to that trigger. The following is a list of the response selections:

- **Off**, page 319, causes the waveform to ignore triggers during playback

- **On**, page 320, causes a waveform to accept a trigger during playback and to restart after the current play finishes.

- **Immediate**, page 250, causes a waveform to accept a trigger during playback and to restart immediately after receiving the trigger

Preset   On

Remarks   When multiple triggers are receive when only one is required, the signal generator uses the first trigger and ignores any other received trigger. For more information on triggering, see the *E4428C/38C ESG Signal Generators User's Guide*.

Reverse

Supported   E4438C with Option 401

Use this key to select a reverse traffic channel for the IS-95A setup.

Reverse Power Protection Normal 8648

Supported   All Models

This softkey is available only after selecting 8648A/B/C/D language compatible mode for the signal generator. The softkey selects the signal generator's reverse power protection mode (RPP). The choices are normal mode and 8648-compatible mode.

Normal   In normal mode, a tripped RPP circuit causes a caution message to be displayed and the front panel to be locked. Eliminate the source of the excess reverse power at the RF OUTPUT connector. Then press the **Reset RPP** softkey to continue operating the signal generator

8648   In 8648 mode, a tripped RPP circuit, causes a caution message to be displayed and the front panel to be locked. However, any command sent over the GPIB will reset the RPP circuit and return you to normal signal generator operation. This mode is provided for compatibility with systems that use the 8648.

Remarks   Repeated tripping of the RPP can cause damage to the signal generator. It is best to eliminate the source of excess reverse power and then reset the reverse power protection circuit by pressing the **Reset RPP** softkey. The RPP mode is not affected by an instrument preset or by a power cycle.

Revert to Default Cal Settings

Supported   E4438C

Use this softkey to restore the original factory calibration data for the internal I/Q modulator.

RF During Power Search

Supported   All Models

This softkey enables you to select between **Normal** and **Minimum** power search modes.

Normal   When set to **Normal**, a power search is performed without setting the internal step attenuator to its maximum setting.

Minimum   When set to **Minimum**, the internal step attenuator is set to its maximum setting during power search to protect sensitive circuits.

Preset   Normal

R-GSM Base

Supported   E4438C

This softkey selects R-GSM 900 Base as the channel band for GSM. The output frequency depends on both the frequency band and channel selection.

Preset	*Channel*: 1
	Frequency: 935.200 MHz
Range	*Channels*: 0–124, 975–1023
	Frequency: 935.000–959.800 MHz, 921.200–934.800 MHz

R-GSM Mobile

This softkey selects R-GSM 900 Mobile as the channel band for GSM. The output frequency depends on both the frequency band and channel selection.

Supported	E4438C
Preset	*Channel*: 1
	Frequency: 890.200 MHz
Range	*Channels*: 0–124, 975–1023
	Frequency: 890.000–914.800 MHz, 876.200–889.800 MHz

Right

Supported   E4438C with Option 400

This softkey selects a scramble code between 16384 and 24575 for the downlink ChipARB physical channel.

Right Alternate

Supported   E4438C with Option 400

Use this softkey to set the downlink channel scramble type to right alternate. Selecting **Right Alternate** adds 16384 to the scramble code.

Rise Delay

Supported   E4438C with Option 001/601or 002/602

Press this softkey to adjust the burst shape rise delay.

Preset   0.000 bits

Range   Minimum and maximum values depend on modulation type and symbol rate.

Rise Time

Supported   E4438C with Option 001/601or 002/602

Press this softkey to adjust the burst shape rise 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.

Rising

Supported   E4438C with Option 401

Use this softkey to configure the signal generator to trigger on the rising edge of the signal applied to the PATT TRIG IN rear panel connector.

RMC 12.2 kbps (25.141)

Supported   E4438C with Option 400

This softkey sets the uplink reference measurement channel (RMC) test setup rate to 12.2 kbps as described in the 3GPP Technical Specification (TS) 25.141.

RMC 64 kbps (25.141)

Supported   E4438C with Option 400

This softkey sets the uplink reference measurement channel (RMC) test setup rate to 64 kbps as described in the 3GPP Technical Specification (TS) 25.141.

RMC 144 kbps (25.141)

Supported   E4438C with Option 400

This softkey sets the uplink reference measurement channel (RMC) test setup rate to 144 kbps as described in the 3GPP Technical Specification (TS) 25.141.

RMC 384 kbps (25.141)

Supported   E4438C with Option 400

This softkey sets the uplink reference measurement channel (RMC) test setup rate to 384 kbps as described in the 3GPP Technical Specification (TS) 25.141.

Root Nyquist

Supported   E4438C with Option 001/601or 002/602

This softkey selects a root Nyquist (root-raised cosine) pre-modulation filter from either the Select menu or the Load Default FIR menu.

In the Select (filter) Menu

In this menu, use the **Root Nyquist** softkey to select this FIR filter for use in a custom modulation setup.

In the Load Default FIR Menu

In this menu, use the **Root Nyquist** softkey to access a menu from which you can change the filter alpha value, specify the number of symbols, apply a windowing function, and generate a new FIR table that is loaded with the coefficients for a root Nyquist filter. If you change a parameter, you can press the **Generate** softkey again to reload the FIR table.

Rotation

Supported   E4438C with Option 003

This softkey, for the N5102A module, enables you to adjust the rotation of the IQ constellation for the N5102A module data.

Preset   0.0 deg

Range   0–360 degrees

RPICH

Supported   E4438C with Option 401

Use this softkey to turn on the reverse link pilot channel within the current CDMA2000 RadioConfig 3/4 Traffic channel configuration. All Models other reverse link channels are turned off.

RPICH RDCCH

Supported   E4438C with Option 401

Use this softkey to turn on the reverse link pilot and dedicated control channels within the current CDMA2000 RadioConfig 3/4 Traffic channel configuration. All Models other reverse link channels are turned off.

RPICH RDCCH RFCH

Supported   E4438C with Option 401

Use this softkey to turn on the reverse link pilot, dedicated control and fundamental channels within the current CDMA2000 RadioConfig 3/4 Traffic channel configuration. All Models other reverse link channels are turned off.

RPICH RDCCH RFCH RSCH1

Supported   E4438C with Option 401

Use this softkey to turn on the reverse link pilot, dedicated control, fundamental and supplemental 1 channels within the current CDMA2000 RadioConfig 3/4 Traffic channel configuration. The reverse link supplemental 2 channel is turned off.

RPICH RDCCH RSCH1 RSCH2

Supported   E4438C with Option 401

Use this softkey to turn on the reverse link pilot, dedicated control, supplemental 1 and supplemental 2 channels within the current CDMA2000 RadioConfig 3/4 Traffic channel configuration. The reverse link fundamental channel is turned off.

RPICH RFCH RSCH1 RSCH2

Supported   E4438C with Option 401

Use this softkey to turn on the reverse link pilot, fundamental, supplemental 1 and supplemental 2 channels within the current CDMA2000 RadioConfig 3/4 Traffic channel configuration. The reverse link dedicated control channel is turned off.

RS-232 Baud Rate

Supported   All Models

Use this softkey to access a menu of choices enabling you to set the baud rate for data communication over the RS-232 interface.

Range   300 – 57600 baud

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

RS-232 Echo Off On

Supported   All Models

This softkey selects the operating state of the RS-232 echo function.

On   When set to on, every character sent to the signal generator is echoed to the controller display.

Off   When set to off, characters sent to the signal generator are not echoed to the controller display.

Remarks   The echo state is not affected by a preset or by a power cycle.

RS-232 Setup

Supported   All Models

Use this softkey to access a menu of choices enabling you to configure communication protocol over the RS-232 interface.

RS-232 Timeout

Supported   All Models

This softkey enables you to set the RS-232 interface timeout period. If further input is not received within the assigned timeout period while a SCPI command is being processed, then the command is aborted and the RS-232 input buffer is cleared.

Remarks   The timeout period value is not affected by a preset or by a power cycle.

Run Complete Self Test

Supported   All Models

Use this softkey to run an automated, internal diagnostic test that checks for detectable hardware failures. If there are hardware failures in the signal generator, refer to the Troubleshooting chapter of the *E4428C/38C ESG Signal Generators Service Guide*.

Remarks   This key is included for use by service personnel.

Run Highlighted Tests

Supported   All Models

This softkey is provided for self-test diagnostics. If any tests fail then refer to the Troubleshooting chapter of the *E4428C/38C ESG Signal Generators Service Guide*.

Remarks   This key is included for use by service personnel.

Run Loop Back Test

Supported   E4438C with Option 003 or 004

This softkey, for the N5102A module, starts the selected diagnostic loop back test and returns the results of the test as a pass or fail.

Run Selected Tests

Supported   All Models

This softkey is provided for self-test diagnostics. If any tests fail refer to the Troubleshooting chapter of the *E4428C/38C ESG Signal Generators Service Guide*.

Remarks   This key is included for use by service personnel.

RWCDMA

Supported   E4438C

Press this softkey to set the current catalog type to RWCDMA and display the catalog of RWCDMA files.

Remarks   A catalog type selection is not affected by a preset or by a power cycle.

S

S

This softkey appears in multiple locations.

In the DECT Format

Supported   E4438C with Option 402

This softkey selects the 16-bit synchronization word (S) as the active function. The preset hexadecimal value (when normal preset is selected) for synchronization reflects the DECT format. The current value for S appears in the S field of the display.

Preset: *RFP timeslots*: E98A

                     PP timeslots: 1675

In the EDGE Format

Supported   E4438C with Option 402

After selecting the GMSK timeslot, use this softkey to enter the 1-bit binary stealing flag for both stealing flag fields. Although the stealing flag fields accept binary values of zero or one, the front panel data entry is hexadecimal. Entering a value that is greater than one, sets the value to one.

Preset   0

Choices   0 or 1

In the GSM Format

Supported   E4438C with Option 402

After selecting the normal timeslot, use this softkey to enter the 1-bit binary stealing flag for both stealing flag fields. Although the stealing flag fields accept binary values of zero or one, the front panel data entry is hexadecimal. Entering a value that is greater than one, sets the value to one.

Preset   0

Choices   0 or 1

SA

Supported   E4438C with Option 402

Use this softkey to select a slow associated control channel as the timeslot type for the active timeslot.

SACCH

Supported   E4438C with Option 402

Use this softkey to select the 12-bit slow associated control channel (SACCH). SACCH is used for transmission of control and supervision messages between a base station and a mobile. The preset hexadecimal value (when normal preset is selected) for SACCH reflects the North American Digital Cellular (NADC) or Personal Digital Cellular (PDC) format, displayed in the SACCH field near the bottom of the text area of the display.

Preset   *PDC*: 0000 (UP TCH and Up VOX),
000000 (Dn TCH)

NADC: 000

Range   *PDC*: 0000–FFFF (UP TCH and Up VOX),
000000–FFFFFF (Dn TCH)

NADC: 000–FFF

Samples

In the N5102A Interface Data Type Menu

Supported   E4438C with Option 003 or 004

This softkey, for the N5102A module, selects ESG filtered samples as the baseband data. This is the factory preset data type. When an ARB modulation format is on, this softkey is not accessible.

In the Dual ARB Ext Delay Menu

Supported   E4438C with Option 001/601or 002/602

For the external trigger delay, this softkey selects samples as the delay type. After selecting this softkey, the signal generator returns to the previous menu where the **Ext Delay Samples** softkey now appears in place of the **Ext Delay Time** softkey. Use the **Ext Delay Samples** softkey to set the sample value.

Sample Point

Supported   E4438C with Option 001/601or 002/602

This softkey sets the starting sample point for the Arb waveform marker display. You can use the arrow keys, the knob, or the numeric keys to set this value, which must be greater than or equal to 1, and less than or equal to the total number of waveform points in the selected waveform.

Sanitize

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 follows:

SRAM	All Models addressable locations will be overwritten with random characters.
HARD DISK	All Models addressable locations will be overwritten with a single character and then a random character.
FLASH MEMORY	The flash blocks will be erased.
Remarks	You must press **Enter Secure Mode** > **Confirm** to activate the Sanitize security level.

Satellite ID

Supported   E4438C with Option 409

Use this softkey to set the identification number of the simulated GPS satellite or ground transmitter. The signal generator uses the unique pseudorandom noise (PRN) code assigned to the selected ID number to generate the C/A and P codes.

Preset   1

Range   1–37

Save

Supported   All Models

This hardkey accesses a menu of selections used to save and delete registers (instrument states) and sequences (groups of registers). The menu displays the registers in use and any comments associated with the register used in the most recently accessed sequence. The menu updates whenever you make changes to the registers or to the comments.

When using waveform files, the save function also saves a reference to the waveform file (the name of the waveform file) along with instrument settings associated with the file.

NOTE	The save function does not save waveform data, arb settings, or table entries. When working with waveform files, store the file, then use the save function to save the signal generator settings along with the reference to the waveform file. Refer to the *E4428C/38C ESG Signal Generators User's Guide* for information on storing waveform data files.

The signal generator has 10 sequences with each sequence comprised of 100 registers. The registers are available for saving instrument states, and the amount of memory available for storage depends on the available signal generator memory and the size of the instrument state files. Refer to the *E4428C/38C ESG Signal Generators User's Guide* for more information on save and recall states.

Save Reg

Supported   All Models

Use this softkey to save the current instrument state in the specified register.

Save Secondary Frame State

Supported   E4438C with Option 402

Use this softkey to perform the following functions:

- save the current instrument state to memory using the selected format (such as DECT) as the prefix and _SECONDARY_FRAME as the suffix

- move the data pattern to the end of the data generator memory where it can be used to generate the secondary frame data

Remarks   When you turn on the secondary frame state, the secondary frame is generated as needed using the saved instrument state.

Save Setup to Header

Supported   E4438C with Option 001/601or 002/602

This softkey enables you to save the header information displayed in the `Current Inst. Settings` field of the table editor to a header file for the modulation format currently being used. Once this softkey is pressed, the instrument settings of the `Current Inst.` Settings field will be displayed in the `Saved Header Settings` field.

Remarks   For this softkey to be active, the modulation format must be enabled and the file being displayed must be the active file.

Save Seq[*n*] Reg[*nn*]

Supported   All Models

This softkey enables you to save the current instrument state in the specified register within the specified sequence. The instrument state includes all of your setup selections except list sweep data and functions that do not change by the preset function or by a power cycle.

Remarks   Do not press this key until you have specified the correct sequence and register using the **Select Seq** and **Select Reg** softkey.

Save User Preset

Supported   All Models

Use this softkey to establish a user-defined preset state. Set up the signal generator for conditions that you want to use for your unique preset state. Once defined, press the **Save User Preset** softkey to save the state. Only one user-defined preset state is allowed, any previously-saved state will be over-written. Press the **Preset Normal User** softkey to select **User**, and your instrument state will be recalled by the signal generator any time you press **Preset**. Refer to "Preset Normal User" on page 362 for more information.

Remarks   The user's state definition is a state file; it is not affected by an instrument preset or by a power cycle.

Scale To 0dB

Supported   E4438C with Option 400/401

This softkey scales all of the current channel powers so that the total power equals 0 dB while maintaining the power ratios between the individual channels.

Scale Waveform Data

Supported   E4438C with Option 001/601or 002/602

This softkey accesses a menu of selections that enable you to permanently scale an arbitrary waveform file. Unlike runtime scaling, which scales a playing waveform, this type of scaling is applied to a selected waveform residing in volatile waveform memory (WFM1). After scaling, the waveform can be moved to non-volatile waveform (NVWFM) memory. To scale a waveform that resides in NVWF, select the waveform in NVWFM memory, then use the **Load Store** softkey to load the selected segment into WFM1.

Remarks   As the waveform is scaled down, it can lose bits of resolution. Once a bit of resolution is lost, it can not be regained by increasing the scaling value of the waveform.

Scaling

This softkey enables you to change the scaling percentage of the selected waveform or I and Q signals. It appears in two menus.

In the Scale Waveform Data Menu (Dual ARB)

Supported   E4438C with Option 001/601or 002/602

This softkey enables you to change the scaling percentage of the selected waveform. Use this softkey to set the scaling percentage to a resolution of 0.01% within the specified range. After entering the desired scaling percentage, terminate the entry with the % softkey. For more information about scaling, refer to the *E4428C/38C ESG Signal Generators User's Guide*.

Preset   100.00%

Range   1.00%–100.00%

In the Gain, Offset & Scaling Menu (N5102A, Option 003)

Supported   E4438C with Option 601 or 602

This softkey adjusts the scaling of the I and Q data for the N5102A module. This feature is primarily used to remove overrange errors.

The scaling value changes the analog voltage level represented by the digital sample or word. A sample is usually represented by 16 bits. If the analog voltage cannot be represented by 16 bits then the output will be clipped. Scaling will adjust the analog voltage level and can be used to prevent clipping.

Preset   70.00%

Range   -100 to 100%

SCCPCH

Supported   E4438C with Option 400

This softkey selects a Secondary Common Control Physical Channel (SCCPCH). The SCCPCH is used to transmit pages and signals to idling UEs.

Remarks   The pre-defined Test Models 1, 2, and 3 each have a SCCPCH as a part of the configuration. The SCCPCH can also be selected from the Edit Channel Setup, Insert Row menu and the Multiple Channels, Type menu.

Scenario

Supported   E4438C with Option 409

Use this softkey to access a catalog of MSGPS scenario files.

SCPI

Supported   All Models

This softkey is available in the Preset Language menu and the Remote Language menu. All Models signal generator features can be accessed using SCPI (Standard Commands for Programmable Instruments). Choosing **SCPI** in the Preset Language menu allows you to select this remote language as the default after a normal preset. Choosing **SCPI** in the Remote Language menu allows you to immediately use this language to control the signal generator.

Scramble

Supported   E4438C with Option 400

This softkey appears in the Multiple Channels menu where you can define a channel and then insert multiple entries of that channel into the downlink Edit Channel Setup table editor.

Press this softkey to access a menu where you can select the scramble code, scramble type, and scramble offset for those channels.

After you enter the desired values, press the **Done** softkey to terminate the entry.

Remarks   This softkey is only available for downlink.

Scramble Code

Supported   E4438C with Option 400

This softkey selects a scramble code or enables you to sort the Edit Channel Setup table editor by scramble code number. The primary scrambling codes consist of scrambling codes $n=16 \times i$ where $i = 0$ through 511. The nth set of secondary scrambling codes consists of scrambling codes $16 \times i+k$, where $k = 1$ through 15.

There is a one-to-one mapping between each primary scrambling code and the 15 secondary scrambling codes so that the i:th primary scrambling code corresponds to nth secondary scrambling codes.

For uplink, the scrambling code is used to encode DPCH.

Preset   0

Range   0–511

Remarks   This key appears in several locations. In the Sort menu, this softkey will order the channels by the scramble code. In other locations this softkey enables you to enter in a scramble code number. The scramble code number can be entered from a menu, front-panel knob, up/down arrow keys or from the numeric keypad.

Scrambling Code

In Real Time W-CDMA Downlink

Supported   E4438C with Option 400

This data field displays the scramble code for each of the channels in the Edit Channel Setup table editor.

Preset   0

Range   0–511

Remarks   This field is only displayed in the downlink Edit Channel Setup table editor.

In Real Time W-CDMA Uplink

Supported   E4438C with Option 400

This data field displays the scramble code used to encode the dedicated physical channel (DPCH) and physical random access channel (PRACH) message part.

Preset   0

Range   *DPCH*: 0–16777215

PRACH:0–8191

Scramble Off On

Supported   E4438C with Option 402

Use this softkey to set the operating state of the scramble capability.

Off   When you select Off, the scrambling function is turned off.

On   When you select On, the data in the related fields will be scrambled using the seed value set with the **Scramble Seed** softkey.

Preset   Off

Remarks   This softkey is only available when the **Data Format Pattern Framed** softkey is set to Framed.

Scramble Offset

Supported   E4438C with Option 400

This softkey sets the scramble offset in the downlink Edit Channel Setup table editor. This is a value that is multiplied by 16 and added to the primary code. The primary code is entered under the scramble code softkey. To change the scramble offset, rotate the front-panel knob until the desired value is displayed, use the arrow keys, or enter the value using the numeric keypad and press the **Enter** and **Done** softkeys.

Preset   0

Range   0–15

Remarks   This softkey is only available for downlink.

Scramble Offset

Supported   E4438C with Option 400

This data field displays the scramble code offset for each of the channels in the Edit Channel Setup table editor.

Preset   0

Range   0–15

Remarks   This field is only displayed in the downlink Edit Channel Setup table editor.

Scramble Seed

Supported   E4438C with Option 402

This softkey enables you to set the value of the scramble seed. Scramble seed specifies the scramble starting point in the PRBS generator. Enter values in hexadecimal.

In the Trans European Trunked Radio (TETRA) format, the 32-bit scramble seed comprises four fields. The two least significant bits are defined by the TETRA format as 1 (but you must input them anyway). The remaining 30 bits are the extended color code that is divided into three fields:

• mobile country code
• mobile network code
• color code

The two least-significant bits are appended to the color code, so if, for example, you set a color code of 1, a scramble seed of 7 is required.

Preset   *TETRA*: FFFFFFFF

              PHS: 3FFF

Range	*TETRA*: 00000000–FFFFFFFF
	PHS: 000–3FF
Remarks	This softkey is only available when the **Data Format Pattern Framed** softkey is set to Framed.

Scramble Type

Supported	E4438C with Option 400

This softkey accesses a menu from which you can select Standard, Right Alternate, or Left Alternate as the scramble type in the downlink Edit Channel Setup table editor.

Preset	Standard
Remarks	This softkey is only available for downlink.

Scramble Type

Supported	E4438C with Option 400

This data field displays the scramble type for each of the channels in the Edit Channel Setup table editor.

Preset	STD

Scrambling Code

Supported	E4438C with Option 400

This field is displayed in the uplink PRACH Code Setup and DPCH Code Setup menus and the downlink base station (BTS) menu. For uplink, the scrambling code is used to encode the signature of the physical random access channel (PRACH) preamble. For downlink, the scramble code is determined by the value set in the SecScr Code OS (secondary scramble code offset) field. The secondary scrambling code is the sum of the primary scramble code and the non-zero secondary scramble code offset. The primary scramble code is the product of the value set in the Scrambling Code field (0–511) and 16.

Range	*Downlink*: 0–511
	Uplink: 0–8191

ScrCode Type

Supported	E4438C with Option 400

This field is displayed in the downlink ChipARB and displays the scramble code being used. To change the field selection, highlight the ScrCode Type field, press the **Edit Item** softkey and make a

choice from the menu that appears.

Normal	Select scramble codes (16*511 + 15) 0–8191
Left	Normal + 8192 = 16384
Right	Left + Normal = 24575
Preset	Normal

Screen Saver Delay:

Supported   All Models

This softkey enables you to set a time interval before the screen saver is activated. This event, activating the screen saver, occurs after the specified time interval if there is no input from the front panel.

Range   1–12 hours

Remarks   The screen saver delay state is not affected by a preset or by a power cycle.

Screen Saver Mode

Supported   All Models

This softkey selects **Light Only** or **Light & Text** for the screen saver. When you set the screen saver to Light Only, the display light is turned off after screen saver delay time has expired. When you set the screen saver to Light & Text, the display light and the text are turned off.

Remarks   The screen saver mode is not affected by a preset or by a power cycle.
If you are leaving the display unchanged for long periods of time, set the mode to light & text; this prevents text burn-in on the display.

Screen Saver Off On

Supported   All Models

This softkey selects the screen saver mode.

Off	With the screen saver off, the display remains on indefinitely.
On	With the screen saver on, the display is turned off after a specified time interval when no input from the front panel has occurred. The display will turn back on when any front panel signal generator key is pressed
Remarks	The screen saver mode is not affected by a preset or by a power cycle.

Search DL MCS5 Configure

Supported   E4438C with Option 300

Use this softkey to select the downlink MCS5 packet data channel to configure for the sensitivity search measurement.

Search DL MCS9 Configure

Supported   E4438C with Option 300

Use this softkey to select the downlink MCS9 packet data channel to configure for the sensitivity search measurement.

Search Uncoded Configure

Supported   E4438C with Option 300

Use this softkey to select the downlink uncoded channel to configure for the sensitivity search measurement.

Second DPDCH I Q

Supported   E4438C with Option 400

This softkey selects whether the second DPDCH, if present, is set on I or Q. Subsequent DPDCH channels will alternate between I and Q.

I   The second DPDCH is on I.

Q   The second DPDCH is on Q.

Preset   Q

Remarks   This softkey is displayed in the uplink Edit Channel Setup menu.

Secondary Frame Off On

Supported   E4438C with Option 402

Use this softkey to select the operating state of the secondary frame. The secondary frame is a data pattern that coexists with the primary (the pattern that can be modified either from the front panel or by using SCPI commands).

Off   When you select Off, the secondary frame is turned off.

On   When you select On, the secondary pattern is generated from the instrument state saved using the **Save Secondary State** softkey.

Preset   Off

Remarks A frame must have already been set as the secondary frame to turn the secondary state on.

Secondary Frame Trigger

Supported E4438C with Option 402

This softkey accesses a menu of choices for triggering the use of either the primary frame or the secondary frame (whichever is not being currently used) when the current frame is completed. You can choose to trigger using the front panel **Trigger** hardkey, an external trigger supplied to the PATTERN TRIG IN connector, or by a SCPI command.

Preset Ext

Secondary Key

Supported E4438C with Option 400/401

Use this softkey to select the secondary column by which the table will be sorted.

The current selection is displayed under the **Secondary Key** softkey.

Preset *IS-95A:* Walsh Code
CDMA2000 (forward link): Rate
CDMA2000 (reverse link): Rate
W-CDMA (downlink and uplink): Spread Code

SecScr Code OS

Supported E4438C with Option 400

This field displays the secondary scramble code offset. The secondary scramble code offset is added to the primary scramble code.

Preset 0

Range: 0–15

Security

Supported All Models

This softkey accesses a menu of security functions that enable you to protect and remove classified proprietary information stored or displayed in the instrument. For more information about these security functions, refer to the *E4428C/38C ESG Signal Generators User's Guide*.

Security Level

Supported   All Models

This softkey selects the secure mode and enables you to select a level of security. The **Enter Secure Mode** softkey must be selected and set to **Confirm** to activate the selected security level. Power must be cycled to perform the selected cleaning operation. Selecting **None** will preset the signal generator to the factory state. For other cleaning operation descriptions, see **Erase**, **Overwrite**, and **Sanitize**.

Preset   None

Remarks   You must press **Enter Secure Mode** > **Confirm** to activate the selected security level.

Seed

Supported   E4438C with Option 001/601or 002/602

Use this softkey to enter the initial value of the pseudorandom bit sequence.

Seg Advance Mode

Supported   E4438C with Option 001/601or 002/602

This softkey accesses a menu to configure how play moves from segment to segment within a waveform sequence. This key is available only in the dual ARB player. The menu contains the following choices:

- **Single**, page 427, causes a segment to play once and wait for a trigger before the sequence advances to the next segment.

- **Continuous**, page 118, causes a segment to play continuously until receiving another trigger. Upon receiving the trigger, the sequence advances to the next segment, which then plays continuously.

When the ESG receives multiple trigger occurrences when only one is required, the signal generator uses the first trigger and ignores the rest. For more information on triggering, see the *E4428C/38C ESG Signal Generators User's Guide*.

Segment Advance

Supported   E4438C with Option 001/601or 002/602

This softkey sets segment advance as the dual ARB player trigger mode. The segment advance mode controls the way the signal generator plays segments within a sequence. This includes determining whether a segment plays once or continuously, and when the sequence advances to the next segment. To set these parameters, use the softkeys located in the Seg Advance Mode menu.

The first segment in the sequence starts to play after the signal generator receives an initial trigger. Subsequent triggers cause the next segment in a sequence to play. If a segment is playing when the

trigger is received, the current segment completes playing before the sequence advances to the next segment.

When the ESG receives multiple trigger occurrences when only one is required, the signal generator uses the first trigger and ignores the rest. For more information on triggering, see the *E4428C/38C ESG Signal Generators User's Guide.*

Select

Supported   E4438C with Option 001/601or 002/602

There are two softkeys named Select, one in the Filter menu and one in the Modulation type menu. In the Filter menu, you can select a pre-modulation filter type; in the Modulation type menu, you can select a modulation.

Selecting a Filter

In the Filter menu, use this softkey to access a menu for selecting the pre-modulation filter type. You can choose from Root Nyquist, Nyquist, Gaussian, Rectangle, APCO 25 C4FM, UN3/4 Gaussian (for backward compatibility with previous models of ESG), W-CDMA and various IS-95 and IS-2000 filters. In addition to the pre-defined filters, you can access the catalog of files stored in the signal generator memory. You can select any filter that you have either created externally and downloaded into memory, or that you have created internally in the Define User FIR menu and then subsequently stored. The selected filter type is displayed under the **Select** softkey.

Preset   *NADC, PDC, PHS, TETRA and Custom:* Root Nyquist
GSM, DECT: Gaussian
EDGE: EDGE
CDMA,CDMA2000: IS-95 Mod w/EQ
WCDMA: WCDMA
GPS: Rectangle

Selecting a Modulation

In the Modulation Type menu, use this softkey to access a menu for defining the modulation types. In addition to the pre-defined modulations, you can access a catalog of FSK or I/Q files stored in the signal generator memory, where you can select a modulation that you have created and stored in either the Define User FSK or Define User I/Q menu.

The selected modulation type is displayed under the **Select** softkey.

Preset   *Custom, NADC, PDC, PHS, and TETRA:* π/4 DQPSK
DECT: 2-Lvl FSK
EDGE: EDGE
GSM: MSK

Select/Deselect All Models

Supported   All Models

This softkey is provided for self-test diagnostics. Refer to the Troubleshooting chapter of the *E4428C/38C ESG Signal Generators Service Guide*.

Remarks   This key is intended for use by service personnel.

Select/Deselect Test

Supported   All Models

This softkey is provided for self-test diagnostics. Refer to the Troubleshooting chapter of the *E4428C/38C ESG Signal Generators Service Guide*.

Remarks   This key is intended for use by service personnel.

Select File

Supported   E4438C with Option 001/601or 002/602

Use this softkey to select a file in the displayed catalog of files. If you select a custom file as a data pattern for modulated transmissions, UserFile appears in the Data field of the text display. If you select a custom file as the modulation type, UserFile appears in the Mod Type field of the text display.

Select File is located in each of the catalogs of files.

Select Reg

Supported   All Models

Use this softkey to select a specific register to be highlighted in the list of saved states.

Remarks   If you use the front panel knob, each state is automatically activated as you pass over it.

Select Reg:

Supported   All Models

This softkey enables you to select a register for all softkeys that specify a register in this menu. For example, if you want to select register 5, press **Select Reg:**. The currently selected register is displayed in the active entry area. Change the number to 5 and press the **Select Reg** terminator softkey. Register 5 is now displayed in all softkeys which specify a register in this menu.

You can also use this softkey to select a register and save the current instrument state to that register. For example, if you want to select and save to register 6, press **Select Reg:**. The currently selected

register is displayed in the active entry area. Change the number to 6 and press the **Save Reg** terminator softkey. Register 6 is now displayed in all softkeys which specify a register in this menu and the current instrument state has been saved to register 6.

Range   00–99

Remarks   This setting is not affected by a preset or by a power cycle.

Select Scenario

Supported   E4438C with Option 409

Use this softkey to select the currently highlighted scenario file.

Select Seq:

Supported   All Models

This softkey enables you to select a sequence for all softkeys which specify a sequence in this menu. For example, if you want to select sequence 4, press **Select Seq:**. The currently selected sequence is displayed in the active entry area. Change the number to 4 and press the **Enter** terminator softkey. Sequence 4 is now displayed in all softkeys that specify a sequence in this menu.

Range   0–9

Remarks   This setting is not affected by a preset or by a power cycle.

Select Waveform

Supported   E4438C with Option 001/601or 002/602

This softkey enables you to select the type of signal for the dual arbitrary waveform (dual ARB) to generate.

Remarks   If there are no waveforms or sequences, this softkey selects None.

Self Test

Supported   All Models

This softkey accesses an automatic, internal diagnostic test that checks for detectable hardware failures. If there are hardware failures in the signal generator, refer to the Troubleshooting chapter of the *E4428C/38C ESG Signal Generators Service Guide*.

Remarks   This key is intended for use by service personnel.

Sensitivity Search Configure

Supported   E4438C with Option 300

This softkey accesses a menu that enables you to configure the parameters for the sensitivity search measurement functions.

Remarks   This softkey is active when the **Measurement Mode BER/BLER% Search** softkey is set to Search.

Seq

Supported   All Models

Press this softkey to set the current catalog type to Seq and display the catalog of sequence files.

Remarks   This key is intended for use by service personnel.

Serial

Supported   E4438C with Option 003 or 004

This softkey, for the N5102A module, enables serial data transmission through the N5102A module.

Service Adjustments

Supported   All Models

This softkey accesses a menu of functions for servicing the signal generator.

NOTE   All functions in this menu should be performed by trained service personnel or under the direct guidance of the Agilent Service Center. Refer to the *Installation Guide* for information on contacting the Agilent Service Center.

Set ALC Level

Supported   All Models

This softkey sets the ALC level while the attenuator hold function is active. The output power is the ALC level minus the attenuator setting.

This key is active only when you have toggled the **Atten Hold Off On** key to On.

Preset   −20.00 dBm

Range   −20.00 dBm to 20.00 dBm

Set Atten

Supported   All Models

This softkey sets the attenuation level when the attenuator hold function is active (On). The output power is the ALC level (**Set ALC Level** softkey) minus the attenuator setting.

This key is active only when you have toggled the **Atten Hold Off On** key to On.

Preset   130.00 dB

Range   0.00–130.00 dB

Set Date

Supported   All Models

This softkey is used to set the date of the display clock. Enter the date in the year-month-day (YYYYMMDD) format and terminate the entry by pressing the **Enter** softkey.

Set Markers

Supported E4438C with Option 001/601or 002/602

This softkey accesses a menu that lets you configure waveform markers for waveform segments. The ESG provides four markers that work independently of each other. Each marker routes an output signal to the rear-panel event connector number (EVENT 1, EVENT 2, EVENT 3, or EVENT 4) that corresponds to the marker number. A marker consists of marker points placed at defined sample points in a waveform segment. This means that a marker point cannot be less than one or greater than the last sample point in the waveform. For more information on markers and the rear panel connectors, see the *E4428C/38C ESG Signal Generators User's Guide*.

In the Dual ARB

The waveform segment is the waveform highlighted in the `Catalog of WFM1 Files` which is accessed from the **Set Markers** softkey. To configure markers on a waveform, the waveform file must reside in volatile (WFM1) memory. For instructions on loading waveform files from non-volatile memory (NVWFM), refer to the **Load Store** softkey, available in the dual ARB mode, and the *E4428C/38C ESG Signal Generators User's Guide*.

In All Other ARB Formats

This softkey is greyed out unless the ARB format is on. When it is available, the waveform segment is the waveform highlighted in the `Catalog of WFM1 Files` which is accessed from the **Set Markers** softkey.

Set Marker Off All Points

Supported E4438C with Option 001/601or 002/602

This softkey clears all marker points on the waveform for the active marker. To clear a single marker point or a range of marker points, use the **Set Marker off Range Of Points** softkey. To select the active marker, use the **Marker 1 2 3 4** softkey. For more information on markers, see the *E4428C/38C ESG Signal Generators User's Guide*.

In the Dual ARB

The waveform segment 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 is on. When it is available, the waveform is the waveform highlighted in the `Catalog of WFM1 Files` which is accessed from the **Set Markers**

softkey.

Set Marker Off Range Of Points

Supported   E4438C with Option 001/601or 002/602

This softkey accesses a menu that lets you remove either a single marker point or a range of marker points on a waveform segment for the active marker. Using keys in the menu, you can select any points previously placed on the waveform by designating the first and last points in a range of points. To clear a single marker point, enter the same value for the first and last marker points.While you can use the range method to clear all marker points on the waveform, it is faster to use the **Set Marker Off All Points** softkey. For more information on markers, see the *E4428C/38C ESG Signal Generators User's Guide*.

In the Dual ARB

The waveform segment 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 is on. When it is available, the waveform is the waveform highlighted in the `Catalog of WFM1 Files` which is accessed from the **Set Markers** softkey.

Set Marker On First Point

Supported   E4438C with Option 001/601or 002/602

This softkey sets a marker point on the first sample point of the selected waveform for the active marker. For waveforms generated on the signal generator, the ESG automatically places a marker point at the first waveform sample point for markers 1 and 2. For downloaded waveform files without markers, the ESG creates a default marker file, but does not set any marker points. To select the active marker, use the **Marker 1 2 3 4** softkey. For more information on markers, see the *E4428C/38C ESG Signal Generators User's Guide*, and for information on downloading files, see the *E4428C/38C ESG Signal Generators Programming Guide*.

In the Dual ARB

The waveform segment 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 is on. When it is available, the waveform is the waveform highlighted in the `Catalog of WFM1 Files` which is accessed from the **Set Markers**

softkey.

Set Marker On Range Of Points

Supported   E4438C with Option 001/601or 002/602

This softkey accesses a menu that lets you set either a single marker point or a range of marker points on a waveform segment for the active marker. For waveforms generated on the signal generator, the ESG automatically places a marker point at the first waveform sample point for markers 1 and 2. For downloaded waveform files without markers, the ESG creates a default marker file, but does not set any marker points. To select the active marker, use the **Marker 1 2 3 4** softkey. For more information on markers, see the *E4428C/38C ESG Signal Generators User's Guide*, and for information on downloading files, see the *E4428C/38C ESG Signal Generators Programming Guide*.

Marker points are cumulative, so setting multiple marker point ranges with different range values without first clearing the existing points places additional marker points on the waveform. Because of this cumulative behavior, it is a good practice to clear existing marker points prior to setting new points. This eliminates unexpected marker pulses. See **Set Marker Off All Points**, page 420 and **Set Marker Off Range Of Points**, page 421 for information on removing marker points.

NOTE   You can set markers for either positive or negative polarity. The following discussion assumes positive marker polarity. When using negative marker polarity, the marker pulses occur during the periods of no marker points.

There are three ways to place marker points using range values:

- consecutive marker points over a range that collectively create a single marker pulse that spans the range

- equally spaced marker points over a range, so that a marker pulse occurs at each sample point that coincides with a marker point (Using this method, you can configure a clock signal by setting the **# Skipped Points** softkey to one.)

- a single marker point placed at a specific sample point on the waveform, which outputs a single pulse relative to the marker point location (To configure a single marker point, set the first and last range points to the same number.)

In the Dual ARB

The waveform segment 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 is on. When it is available, the waveform is the waveform highlighted in the `Catalog of WFM1 Files` which is accessed from the **Set Markers** softkey.

Set Time

Supported   All Models

This softkey is used to set the time of the display clock in the 24 hour format. Enter the hour values (00–23), minute and seconds values (00–59), and terminate the entry by pressing the **Enter** softkey.

Setup Select

Supported   E4438C with Option 401

Use this softkey to access a menu for defining the type of digital modulation, IS-95A, or multicarrier IS-95A setup required for your application.

Preset	*Digital Modulation:* NADC *IS-95A:* 9 Ch Fwd *Multicarrier IS-95A:* 3 Carriers
Remarks	To access the multicarrier IS-95A Setup Select menu, **Multicarrier Off On** must be set to On.

SF/2

Supported   E4438C with Option 400

This softkey, in the Compressed Mode Setup menu, indicates that the compressed mode is implemented by reducing the spread factor (SF) by a factor or two. The reduction in the SF allows for a doubling of the data rate. Refer to "CM Method" on page 102 for more information.

Remarks   If 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.

SFN–CFN Frame Offset

Supported   E4438C with Option 400

This softkey sets the system frame number – connection frame number (SFN-CFN) frame offset. When selected, this softkey adds a delay to the frame counter by specifying the starting frame number. Frame number "0" starts with the system sync trigger reset signal when the frame offset is set to zero. For example, if the frame offset is set to two, the signal generator counter starts 2 frames after the system sync trigger.

Preset   0

Range   0–255

SFN reset-signal (DRPS5)

Supported   E4438C with Option 400

This softkey assigns an SFN reset 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 **(DRPS5)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

SFN RST Polarity Neg Pos

Supported   E4438C with Option 400

This softkey sets the polarity of the system frame number (SFN) reset (RST) signal for uplink synchronization.

Neg   The signal generator responds to a falling edge reset signal.

Pos   The signal generator responds to a rising edge reset signal.

Preset   Positive

SFN slot-pulse (DRPS10)

Supported   E4438C with Option 400

This softkey assigns an SFN slot 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 **(DRPS10)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

SFN sync-pulse (DRPS6)

Supported   E4438C with Option 400

This softkey assigns an SFN synchronization 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 **(DRPS6)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

Shape

Supported   E4438C with Option 001/601or 002/602

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

Show Waveform Sequence Contents

Supported   E4438C with Option 001/601or 002/602

This softkey displays the contents of the selected waveform sequence in a table format. The content information displayed is a list of the waveforms and corresponding repetitions for that sequence.

Remarks   This softkey is only active when a sequence is highlighted.

SigGen Dig Bus

Supported   E4438C with Option 003 or 004

This softkey, for the N5102A module, selects a loop back test that verifies the output capability of the ESG Digital Bus connector. This test requires the use of the DIG BUS LOOP BACK FIXTURE (supplied with the N5102A module). This is the factory preset loop back test selection. To run the test, see .

Signal Polarity Setup

Supported   E4438C with Option 001/601or 002/602

This softkey accesses a menu of external signals and choices for selecting the polarity of those signals.

Signal Type IQ IF

Supported   E4438C with Option 003 or 004

This softkey, for the N5102A module, is applicable for only the output direction with parallel and parallel interleaved data transmissions. The signal type softkey enables you to select the digital signal type for the output of the N5102A module. For a serial port configuration and input mode, this softkey is grayed out (inactive) and IQ shows as the signal type.

IQ	The output of the N5102A module is digital IQ data, which is applicable to both parallel/parallel interleaved and serial port configurations.
IF	The digital I and Q samples are combined and modulated on an intermediate frequency (IF) carrier. The frequency of the IF (the center frequency of the modulated IF signal) is set to one-fourth of the sample rate (for example, for a 400 MHz clock rate, the IF is 100 MHz). This is available for only the output direction with parallel and parallel interleaved data transmissions.
Preset	IQ

Signature

Supported   E4438C with Option 400

This field displays the signature for the PRACH preamble. The signature points to a node on the orthogonal variable spreading factor code (OVSF) code tree at a spread factor (SF) of 16. The signature helps the base station (BTS) know what OVSF code is going to be used to spread the message part of the PRACH signal.

Preset   0

Range   0–15

Sine

This softkey appears in two different locations, enabling you to either select a sine burst shape, or specify sine as a modulation waveform.

Selecting Sine as a Burst Shape

Supported   E4438C

Use this softkey to specify sine for the timeslot burst shape. Sine, as it is modified by the default burst rise and fall values, is the default burst shape.

Specifying Sine as a Modulation Waveform

Supported   All Models

This softkey enables you to specify sine as the modulation waveform for the internally generated, ac-coupled signal.

Remarks   The selected waveform applies only to the path configuration you have currently selected.

Single

Supported   E4438C with Option 001/601or 002/602

This softkey sets the signal generator to play a waveform or output a data pattern only once after receiving a trigger. The softkey appears in multiple menus with some differences in behavior as described in the following subsections.

In the Trigger Menu (ARB Formats)

This softkey selects the single trigger mode, which sets up a waveform to play once after receiving a trigger. In addition to selecting the mode, you can also configure the waveform's response to triggers using the selections found by pressing the **Retrigger Mode** softkey. The response parameters determine

whether the waveform accepts a trigger during playback or not, and if it does, how it responds to that trigger.

In the Pattern Trigger Menu (Real-Time Custom)

This softkey selects the single trigger mode, which sets up a waveform to play once after receiving a trigger. Unlike the single mode selection in the ARB formats, there are no further settings for the single triggering mode.

In the Seg Advance Mode Menu (Dual ARB Player)

The **Single** softkey is one of two waveform response selections while using the segment advance trigger mode. Its selection provides the following waveform responses to triggers:

- After receiving the first trigger, the first segment plays to completion.
- When the waveform receives a trigger after a segment completes, the sequence advances to the next segment and plays that segment to completion.
- When the waveform receives a trigger during play, the current segment plays to completion. Then the sequence advances to the next segment, and it plays to completion.
- When the waveform receives a trigger either during or after the last segment in a sequence plays, the sequence resets and the first segment plays to completion.

When the ESG receives multiple trigger occurrences when only one is required, the signal generator uses the first trigger and ignores the rest. For more information on triggering, see the *E4428C/38C ESG Signal Generators User's Guide.*

Single Sweep

Supported   All Models

Use this softkey to set up the signal generator to perform a single sweep operation. The signal generator will begin the sweep as soon as the sweep trigger is received. When single sweep is selected, the signal generator sets the power and the frequency on the first or starting point of the sweep. If the sweep trigger was set to **Free Run**, a sweep is initiated immediately. In the Sweep/List menu this softkey is active when Freq, Ampl, or Freq & Amp are the sweep types and disabled when **Sweep** is set to Off.

The ARMED annunciator appears in the display, unless the sweep trigger is set to **Free Run**

Slot Format

Supported   E4438C with Option 400

This field sets the slot format for the downlink DPCH, or the currently selected uplink physical channel DPCCH, DPDCH, or PRACH.

Slot formats define the data configuration for each slot of a frame for parameters such as the spread factor (SF), symbol rate, and the number of bits per slot. The 3GPP standard TS 25.211 defines the slot formats for the physical channels. Because the slot format determines the symbol rate, when you change a slot format value, the signal generator changes the symbol rate to match the new slot format. The reverse is also true. If you change the symbol rate, the signal generator changes the slot format value to match the new symbol rate.

The signal generator also changes the channel code, when the channel code value exceeds the SF for the new slot format value.

NOTE   Whenever a channel code changes, ensure that the new value is orthogonal to the channel codes for all other physical channels.

As shown in the Range field below, each channel has a different number of available slot formats.

	Link Direction	*Channel*	*Slot Format*
Preset	Downlink	DPCH	0
	Uplink	DPCCH	0
		DPDCH	0
		PRACH	2
Range	*Link Direction*	*Channel*	*Slot Format*
	Downlink	DPCH	0–16
	Uplink	DPCCH	0–5
		DPDCH	0–6
		PRACH	0–3

Software Options

Supported   All Models

This softkey accesses a menu from which you can configure your signal generator to enable any software option that you have purchased. Software options are linked to specific optional hardware that must first be installed before the software option can be used. Adding new software options requires the use of a license key that is provided by Agilent Technologies at the time of purchase.

Remarks   Do not modify the license key for enabled software options: you will disable the option.

NOTE   If a previously installed software option becomes disabled, verify the following:

- the optional hardware is present/installed.
- the hardware option is enabled.
- the software option is enabled with the correct license key.

Refer to your License Key Certificate for the correct license key or, if the option was installed by Agilent Technologies, contact your local service office and tell them the instrument's model number, the host ID number, and the software option that should be enabled.

Sort Table

In the CDMA Menu

Supported   E4438C with Option 401

Use this softkey to access a menu from which you can sort the CDMA channel setups based on the values in the columns selected using the **Primary Key** (first sort) and **Secondary Key** (second sort) softkeys.

In the W-CDMA Menu

Supported   E4438C with Option 400

This softkey accesses a menu from which you can sort the Edit Channel Setup table editor files by selecting primary and secondary keys. The primary and secondary keys are columns in the Edit Channel Setup table editor.

Remarks   Sorting of the uplink channel is done by spread code and/or rate. The downlink channel can be sorted by spread code, rate, and/or scramble code.

Span Type User Full

Supported   All Models

This softkey enables you to select the frequency range for a span power search. You can specify the range by selecting **User**, or you can select the full range of the signal generator by selecting **Full**.

Spcl Pattern 0's 1's

Supported   E4438C with Option UN7

Use this softkey to select the bit type for the special pattern ignore function.

0's	This choice selects 0's as the bit type for the special pattern ignore function. With this choice, the signal generator detects and ignores 160 or more consecutive bits of 0's in the incoming bit stream. The bits are included in the PN sequence bit count, but are ignored for BER measurements.
1's	This choice selects 1's as the bit type for the special pattern ignore function. With this choice, if the signal generator detects and ignores 160 or more consecutive bits of 1's in the incoming bit stream. The bits are included in the PN sequence bit count, but are ignored for BER measurements.

Preset   0's

Remarks   This key is enabled when the **Special Pattern Ignore Off On** softkey is set to On.

Spcl Pattern Ignore Off On

Supported   E4438C with Option UN7

Use this softkey to set the operating state of the special pattern ignore function.

Off	This choice disables the special pattern ignore function.
On	With this choice, the signal generator ignores a stream of 160 or more consecutive 1's or 0' in the PN sequence bit count.

Preset   Off

Spectrum Invert Off On

Supported   E4438C with Option 300

Use this softkey to set the spectrum inverting state of the received RF signal.

Off	With this choice, the spectrum state is unaffected.
On	This choice inverts the RF signal.

Preset	On

Spread Code

Supported	E4438C with Option 400

This softkey selects spread code values as the parameter for sorting the Edit Channel Setup table editor.

Spread Code

Supported	E4438C with Option 400

This data field displays the spread code number used for each channel in the Edit Channel Setup table editor. The spread code is an Orthogonal Variable Spread Factor (OVSF) code. This field is displayed for both uplink and downlink setups.

Preset	*Downlink*: 8
	Uplink: 0
Range	*Downlink*: 0–511
	Uplink: 0–255
Remarks	The maximum spreading code that can be used for a particular channel depends on the selected symbol rate for that channel.

Spread Rate

Supported	E4438C with Option 401

This field displays the current spread rate value. The grayed-out text in this field indicates that you cannot change the value.

Preset	1
Remarks	Spread rate 1 equals 1.2288 Mcps.

Spread Rate

Supported	E4438C with Option 401

Use this softkey to access a menu from which you can choose a spread rate for the current CDMA2000 waveform.

Preset	SR1
Remarks	This softkey becomes inactive (text is grayed-out) when multicarrier mode is on since the spread rate data is already contained in the individual carrier setups.

Spread Rate 1

Supported   E4438C with Option 401

Use this softkey to select spread rate 1 for the CDMA2000 waveform.

Spread rate 1 equals a 1.2288 Mcps chip rate. Spread rate 1 has the advantage of being spectrally more efficient than spread rate 3, but with lower available data rates.

Spread Rate 3

Supported   E4438C with Option 401

Use this softkey to select spread rate 3 for the CDMA2000 waveform.

Spread rate 3 equals a 3.6864 Mcps chip rate. Higher data rates can be achieved using spread rate 3, though offset by greater bandwidth/spectrum usage.

Spreading Type Direct Mcarrier

Supported   E4438C with Option 401

This softkey toggles the CDMA2000 waveform spreading type between single (direct spread) and multiple carriers.

Direct	In this mode, transmissions are spread over a single carrier.
Mcarrier	In this mode, transmissions are spread over three carriers.
Preset	Direct
Remarks	This softkey is available only when the spread rate is 3, **Link Forward Reverse** is set to Forward, and **Multicarrier Off On** is set to Off.

Spurious Response

Supported   E4438C with Option 400

This softkey selects spurious response as the test setup. The spurious response test is a measure of the receiver's ability to receive a desired signal in the presence of an unwanted signal. Refer to 3GPP Standard TS 25.101 for information on the spurious response setup.

Square

Supported   All Models

This softkey enables you specify a square wave as the modulating waveform.

Remarks   In the LF Out menu this softkey is available after selecting the internal source to operate as a function generator. The modulation applies only to the path configuration you have selected.

SR1 9 Channel

Supported   E4438C with Option 401

Use this softkey to insert a forward link, spread rate 1, 9 channel CDMA2000 setup into the multicarrier table.

SR1 Pilot

Supported   E4438C with Option 401

Use this softkey to insert a forward link, spread rate 1, single pilot channel CDMA2000 setup into the multicarrier table.

SR3 Direct 9 Channel

Supported   E4438C with Option 401

Use this softkey to insert a forward link, spread rate 3, direct spread, 9 channel CDMA2000 setup into the multicarrier table.

SR3 Direct Pilot

Supported   E4438C with Option 401

Use this softkey to insert a forward link, spread rate 3, direct spread, single pilot channel CDMA2000 setup into the multicarrier table.

SR3 Mcarrier 9 Channel

Supported   E4438C with Option 401

Use this softkey to insert a forward link, spread rate 3, multicarrier spread, 9 channel CDMA2000 setup into the multicarrier table.

SR3 Mcarrier Pilot

Supported   E4438C with Option 401

Use this softkey to insert a forward link, spread rate 3, multicarrier spread, single pilot channel CDMA2000 setup into the multicarrier table.

SSCH

Supported   E4438C with Option 400

Pressing this softkey inserts a Secondary Synchronization Channel (SSCH) into the downlink Edit Channel Setup table editor. The SSCH channel sends a pattern of codes in each frame and is used to provide an identifying signal and timing reference for each base station.

SSCH 2nd Scramble Group

Supported   E4438C with Option 400

This field displays the secondary synchronization code (SSC) group. The SSC represents a code group of 16 subcodes, each with a length or 256 chips.

Preset   2nd Scramble Group 0

Range   0–15

SSCH Power

Supported   E4438C with Option 400

This field displays the secondary synchronization channel (SSCH) power. This channel consists of the secondary synchronization code (SSC), a fixed 256-chip code broadcast by all W-CDMA base stations (BTS).

Preset   −8.30 dB

Range   −40 dB to 0

SSCH State

Supported   E4438C with Option 400

This field displays the on/off state for the secondary synchronization channel (SSCH).

Preset   On

Standard

Supported   E4438C with Option 400

This softkey sets the downlink channel scramble type to standard.

Remarks   Standard scramble, left alternate, and right alternate are the scramble type choices.

`Start Access Slot Position` in 80ms Period

Supported   E4438C with Option 400

This field enables you to set or edit the physical random access channel (PRACH) start access position within 80ms for the multiple PRACH mode.

Preset   0

Range   0–59

Remarks   Access this field by setting the **PRACH Mode Single Multi** softkey to **Multi** then press **PRACH Timing Setup.**

Start Frequency

In the I/Q Calibration Menu:

Supported   E4438C

Use this softkey to set the start frequency for an I/Q calibration.

You can select a portion of the frequency range for an I/Q calibration by setting the **Calibration Type User Full** softkey to User and entering new start and stop frequencies. This softkey is automatically set to the minimum specified frequency of the signal generator if you have set the **Calibration Type User Full** softkey to Full. If you toggle back to User from the Full setting, the User value for **Start Frequency** will be restored.

Range   100 kHz-stop frequency setting (up to maximum frequency of instrument)

Remarks   This softkey is grayed out (not editable) until the calibration type is set to User.

                     The **Start Frequency** setting is not affected by an instrument preset or by a power cycle.

In the Power Search Menu:

Supported   All Models

This softkey sets the start frequency for a span power search over a user specified range.

`Start Sub-Channel#`

Supported   E4438C with Option 400

This field displays the sub-channel number used for the first preamble generation timing of physical random access channel (PRACH).

Preset   0

Range   0–11

Remarks   The 80 msec frame clock matches the cycle of sub-channel number zero.

Start-Trigger EchoBack (RPS25)

Supported   E4438C with Option 400

This softkey assigns the physical random access channel start trigger pulse to the selected rear panel AUX I/O output connector or BNC.

Remarks   The PRACH pulse can be assigned to numerous different output connectors/pins. The **(RPS25)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

State

Supported   All Models

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

`State`

Supported   E4438C with Option 401

This field displays the operating state of the selected real time CDMA2000 channel. To toggle the operating state of the selected channel, highlight the `State` field and press the **Edit Item** softkey.

Preset   Depends on the channel configuration

Step Dwell

Supported   All Models

This softkey enables you to set the dwell time for each point of a step sweep. The dwell time is the amount of time the sweep is guaranteed to pause after setting the frequency and power for the current sweep/list point.

Preset   2.0 ms

Range	1.0 ms−60.0 s (in 1.0 ms increments)
Remarks	Dwell time is used when the point trigger is set to **Free Run**.

Step/Knob Ratio

Supported	All Models

This softkey enables you to set the ratio between the increment value of the step keys and the front panel knob. For example, if you set the increment value for frequency to 1.0 MHz and set the step/knob ratio to 10/1, when frequency is the active function the up and down arrow keys will change the frequency in 1.0 MHz steps and the front panel knob will change the frequency in 1/10th of 1.0 MHz steps.

When you press **Step/Knob Ratio** the number displayed in the active entry area represents the arrow keys step size in the ratio. To enter a new value, rotate the front panel knob until the desired value is displayed, use the up and down arrow keys, or enter the value using the numeric keypad and press the **Enter** terminator key.

Range	1−10,000
Remarks	This ratio applies only when you have a function active that has an associated increment value. The step/knob ratio is not affected by a preset or by a power cycle.

Stop CFN

Supported	E4438C with Option 400

This field displays the first radio frame of the first pattern 1 connection frame number (CFN). It defines the stop CFN number to end compressed mode when a stop trigger occurs. When the stop trigger occurs, the next stop CFN will terminate the compressed mode operation regardless of the transmission gap pattern repetition count (TGPRC) number.

Preset	0
Range	0–255
Remarks	The signal generator counts the CFN relative to the system sync signal.

Stop Frequency

In the I/Q Calibration Menu:

Supported	E4438C

Use this softkey to set the stop frequency for an I/Q calibration.

You can select a portion of the frequency range for an I/Q calibration by setting the **Calibration Type User**

Full softkey to User and entering new start and stop frequencies. This softkey is automatically set to the maximum specified frequency of the signal generator if you have set the **Calibration Type User Full** softkey to Full. If you toggle back to User from the Full setting, the User value for **Stop Frequency** will be restored.

Range	Current start frequency setting-maximum frequency of instrument
Remarks	This softkey is grayed out (not editable) until the calibration type is set to User.
	The **Stop Frequency** setting is not affected by an instrument preset or by a power cycle.

In the Power Search Menu:

Supported	All Models

This softkey sets the stop frequency for a span power search over a user specified range.

Stop Measurement

Supported	E4438C with Option 300

This softkey stops the current measurement.

Remarks	This softkey is active only when the format is enabled.

Store All Models To NVARB Memory

Supported	E4438C with Option 001/601or 002/602

This softkey enables you to store all of the files from arbitrary waveform (ARB) memory to non-volatile arbitrary waveform (NVARB) memory.

Store All Models To NVWFM Memory

Supported	E4438C with Option 001/601or 002/602

This softkey enables you to store all of the files from arbitrary waveform (WFM1) memory to non-volatile arbitrary waveform (NVWFM) memory.

Store Custom CDMA State

Supported	E4438C with Option 401

Use this softkey to access a menu from which you can store the current custom CDMA state into a user-defined file. Afterward, you can recall this custom state from the signal generator's memory.

Along with the contents of the CDMA channel table editor (channel types, Walsh code, power levels, PN offset, and data), this softkey enables you to store the following signal generator state information to the memory catalog:

- FIR filter

- FIR filter file name

- FIR filter alpha

- FIR filter BbT

- channel setup

- chip rate

- waveform length

- oversample ratio

- normal or inverted I/Q mapping

- I/Q clipping

Store Custom Dig Mod State

Supported   E4438C with Option 001/601or 002/602

This softkey accesses a menu that enables you to store the current custom digital modulation state into a user-defined file. Afterward, you can recall this custom state from the signal generator's memory using the **Custom Digital Mod State** softkey.

This softkey stores the following signal generator state information to the memory catalog:

- filter information

- symbol rate

- modulation type

- FSK deviation

Remarks   This softkey is only available when **Multicarrier Off On** is toggled to Off.

Store Custom Multicarrier

Supported   E4438C with Option 401

Use this softkey to access a menu from which you can store the contents of the multicarrier table editor into a file.

This softkey enables you to store the following information for each carrier:

- type of carrier

- frequency offset

- power level

- number of different carriers

- clipping parameters

- increment scramble code setting

- increment timing offset setting

Remarks   User defined files created using firmware prior to C.02.40 did not save the setting for Increment Scramble Code, Increment Timing Offset, and Clipping Type settings. When loading user defined files created with firmware prior to C.02.40, Increment Scramble Code and Increment Timing Offset will default to Off and the Clipping Type settings will default to 100%. Firmware C.02.40 will save the Increment Scramble Code, Increment Timing Offset and Clipping Type settings.

To recall a custom multicarrier setup, use the **Custom CDMA Carrier** softkey.

Store Custom W-CDMA State

Supported   E4438C with Option 400

This softkey accesses a menu where you can store the current custom W-CDMA state into a file. The stored state file can be recalled for later use as described under the **Custom W-CDMA State** softkey.

Along with the contents of the W-CDMA channel table editor, the following information is also stored:

- FIR filter

- FIR filter file name

- FIR filter alpha

- FIR filter BbT

- FIR filter channel (EVM or ACP)

- I/Q Mapping

- Link

- Chip rate

- ARB reference clock source (internal or external)

- ARB reference clock frequency

- Clipping Level

- Downlink TFCI state

- Uplink TFCI state

- Uplink DPDCH (second DPDCH I or Q)

- Uplink Scramble Code

Store Ref Osc Setting

Supported   All Models

This softkey enables you to store the current coarse and fine reference oscillator adjustment settings. Refer to the calibration guide for more information.

Remarks   This adjustment is intended for use by service personnel.

Store Segment To NVARB Memory

Supported   E4438C with Option 001/601or 002/602

This softkey enables you to store the selected file from arbitrary waveform (ARB) memory to non-volatile arbitrary waveform (NVARB) memory.

Store Segment To NVWFM Memory

Supported   E4438C with Option 001/601or 002/602

This softkey enables you to store the selected file from arbitrary waveform (WFM1) memory to non-volatile arbitrary waveform (NVWFM) memory.

Store To File

Supported   All Models

Use this softkey to store the current data to a file in the internal non-volatile memory for later recall and use. The maximum file name length is 23 characters (alphanumeric and special characters).

Sub Channel Timing (RPS17)

Supported   E4438C with Option 400

This softkey assigns sub channel timing to the selected rear panel AUX I/O output connector or BNC. The sub channel number sets the start of preamble transmission.

Remarks   The sub-channel timing can be assigned to numerous different output connectors/pins. The **(RPS17)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

Subnet Mask

Supported   All Models

This softkey is used to configure the LAN subnet mask.

Remarks   Your IT service can define up a subnet mask for the signal generator.

Sum

Supported   E4438C

This routes a portion of the summed I/Q signals from source one and two, to the rear panel I and Q output connectors.

Remarks   The softkey is greyed out until both source one and two have a signal source selection that is routed to the IQ modulator.

Summing Ratio (SRC1/SRC2) x.xx dB

Supported   E4438C

This softkey enables you to set the power level difference (ratio) between the source one and the source two signals when the two signals are summed together, and is active only when both **I/Q Source 1** and **I/Q Source 2** softkeys have a source selection. A positive ratio value reduces the amplitude for source two while a negative ratio value reduces the amplitude for source one.

The range for the summing ratio is dependent on the modulator attenuator (mod atten) setting for the signal generator that is summing the signals together. The minimum range is achieved when the modulator attenuator setting is zero and the maximum range is reached when the maximum attenuator value is used. The range can be calculated using the following formula:

$\pm$ Range = 50 dB + Mod Atten

Preset   0.00 dB

Range   *Min*: $\pm$ 50 dB   *Max*: $\pm$ 90 dB

Remarks   The softkey is greyed out until both source one and two have a signal source selection.

When an Arb modulation format is active, the modulator attenuator is set by using the **Modulator Atten Manual Auto** softkey located in the Arb modulation format under the **ARB Setup** softkey. The **Modulator Atten Manual Auto** softkey located in the Mux menu will be grayed out when an Arb format is active. See for more information.

Supplemental1 Traffic

Supported   E4438C with Option 401

Use this softkey to access a menu from which you can define and insert one or more supplemental 1 traffic channels into the CDMA2000 channel setup.

Remarks   This softkey is available only when **Multicarrier Off On** is set to Off.

Supplemental2 Traffic

Supported   E4438C with Option 401

Use this softkey to access a menu from which you can define and insert one or more supplemental 2 traffic channels into the CDMA2000 channel setup.

Remarks   This softkey is available only when **Multicarrier Off On** is set to Off.

SW

Supported   E4438C with Option 402

Use this softkey to select the 20-bit frame synchronization word as the active function. The preset hexadecimal value (when normal preset is selected) for SW reflects the Personal Digital Cellular (PDC) format, and appears in the SW field near the bottom of the text area of the display.

Preset   *UP TCH and Up VOX*: 785B4

            Dn TCH: 87A4B

Swap IQ Off On

Supported   E4438C with Option 003 or 004

This softkey, for the N5102A module, enables and disables the IQ swap feature. When this feature is on, the I data is available on the Q data bus and the Q data is available on the I data bus.

Preset   Off

Sweep

Supported   All Models

Use this softkey to access a menu from which you can configure the sweep parameters. In this menu you can choose to sweep frequency only, amplitude only, or both frequency and amplitude. You can also choose to turn off all sweep functions.

Preset   Off

Sweep Direction Down Up

Supported   All Models

This softkey enables you to change the direction of the sweep.

Down	Choose Down to sweep from the last point in the list sweep to the first point, or from the step sweep stop frequency and amplitude to the start frequency and amplitude.
Up	Choose Up to sweep from the first point in the list sweep to the last point, or from the step sweep start frequency and amplitude to the stop frequency and amplitude.

Preset   Up

Sweep/List

Supported   All Models

Use this hardkey to access a menu of softkeys that enables you to define a series of points containing frequency, amplitude, and dwell time information for the signal generator to sweep.

Sweep Repeat Single Cont

Supported   All Models

This softkey toggles the sweep repetition between single sweep and continuous sweep types. The sweep and point triggers will then trigger the sweep.

Single	Choose Single to configure the instrument to perform a single sweep upon triggering.
Cont	Choose Cont to configure the instrument to perform a continuous sweep loop upon triggering.

Preset   Cont

Sweep Retrace Off On

Supported   All Models

This softkey enables or disables a sweep retrace. When set to On, the signal generator, upon completion of a sweep, will reset the sweep to the first sweep point. When set to Off, the signal generator, upon completion of a sweep, will not retrace the sweep but remain on the last sweep point.

On   At completion of the sweep, the sweep retraces and stops at the first sweep point.

Off   The sweep does not retrace but remains on the last sweep point. The sweep resets to the first sweep point.

Preset   On

Sweep Trigger

Supported   All Models

Use this softkey to access a menu from which you can select a triggering mode for a full sweep. You can select from the following choices: Free Run, Bus (software triggering), Trigger Key (used with the front-panel trigger hardkey), or Ext (for using a TTL-level signal supplied to the TRIGGER IN connector).

Free Run   The source will continue sweeping without waiting for a trigger signal. For the point trigger, the sweep pauses for the dwell time.

Trigger Key   The source will sweep after the front-panel **Trigger** hardkey is pressed.

Bus   The GPIB or LAN interface is used to trigger the source for a sweep.

Ext   An external trigger, applied to the TRIGGER IN connector, triggers an event. For pattern or frame triggering, the trigger is applied to the PATTERN TRIG IN connector. You can configure the signal generator to respond to a positive (rising edge) or negative (falling edge) TTL signal at the TRIGGER IN or PATTERN TRIG IN connector using the **Trigger In Polarity Neg Pos** softkey.

Preset   Free Run

Sweep Type List Step

Supported   All Models

This softkey toggles the sweep type between list sweep and step sweep.

List   You can create a list sweep by supplying the frequency, amplitude, and dwell time for each point in the sweep.

Step You can create a step sweep by supplying the start and stop frequency and amplitude, the number of points, and a dwell time. The signal generator then calculates the points between the first and last point in a linear manner.

Preset List

Swept-Sine

Supported All Models

This softkey selects a swept-sine wave for the modulation waveform. A menu of choices for setting the parameters is also available with this softkey. The menu selections are dependent on the modulation format.

In each of these menus the TRIGGER OUT polarity can be selected to be either positive or negative.

Remarks In the LF Out menu this softkey is available after selecting the internal source to operate as a function generator.

Symbol Rate

This softkey appears in several different locations.

As a menu

Supported E4438C with Option 001/601or 002/602

Use this softkey to access a menu from which you can set a new transmission symbol rate or restore the default symbol rate.

As a Setting

Supported E4438C with Option 001/601or 002/602, 402

Use this softkey to set a new transmission symbol rate value.

The current symbol rate is displayed under the **Symbol Rate** setting softkey.

NOTE In real-time TDMA modulation formats when using EDGE and GMSK, or multiframe EDGE, or multiframe GSM, limit the symbol rate to no more than 271 ksps. Although higher rates may work, they are not supported.

Preset *Custom, NADC*: 24.300 ksps
PDC: 21.000 ksps
DECT: 1.152000 Msps
PHS: 192.000 ksps

EDGE, GSM: 270.833 ksps
TETRA: 18.000 ksps
APCO 25 w/C4FM, APCO 25 w/CQPSK: 4.800ksps
CDPD: 19.200 ksps
PWT: 576.000 ksps

Range   *EDGE:* 1 sps-25.000000 Msps
                 Other formats: 1 sps-50.000000 Msps

Remarks   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.
                 If the data pattern is FIX4, the frequency of the signal generated by the signal
                 generator will be scaled to 1/8 of the displayed symbol rate.

                 A change in the bit rate value will affect the symbol rate value; refer to the ESG
                 SCPI Reference for a list of the minimum and maximum symbol rate values.

In W-CDMA Menus

Supported   E4438C with Option 400

In downlink, this softkey appears in the Multiple Channels menu where you set a symbol rate value,
define a channel and then insert multiple entries of that channel into the Edit Channel Setup table
editor.

In uplink, this softkey appears in the Insert DPDCH menu where you can set a symbol rate value,
select the number of channels, and select the first spread code.

Preset   Downlink: 30 ksps

                 Uplink: 60 ksps

Range   Downlink: 7.5 ksps–960 ksps

                 Uplink: 15 ksps–960 ksps

Symbol Rate

Supported   E4438C with Option 400

This field displays the symbol rate for the selected channel. The symbol rate is shown in the active
entry area of the display. For downlink, this field is displayed for the DPCH channel. For uplink, this
field is active for the DPCCH and DPDCH.

Preset   *DPCH*: 7.0 ksps

                 DPCCH: 15.0 ksps

                 DPDCH: 60.0 ksps

Range   7.5–960.0 ksps

Slot Format, Symbol Rate and Maximum Channel Code for downlink are determined from Table 0-11:

Table 0-11

Slot Format	0-1	2-7	8-11	12	13	14	15	16
Symbol Rate (ksps)	7.5	15.0	30.0	60.0	120.0	240.0	480.0	960.0
Max Ch Code	511	255	127	63	31	15	7	3

Slot Format, Symbol Rate and Maximum Channel Code for uplink are determined from Table 0-12:

Table 0-12

Slot Format	0	1	2	3	4	5	6
Symbol Rate (ksps)	15.0	30.0	60.0	120.0	240.0	480.0	960.0
Max Ch Code	255	127	63	31	15	7	3

Symbol Sync Out

Supported   E4438C with Option 400

This field, displayed in the PRACH and DPCH output Rear Panel Setup menu, indicates symbol sync out rear panel connector settings. For example, signal type and connection locations are shown. For more information on the rear panel AUX I/O connector configuration, refer to chapter 1 of the *E4428C/38C ESG Signal Generators User's Guide.*

Symbol Sync Out 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 SYM SYNC OUT pin of the AUX I/O connector.

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

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

Symbol Sync 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 SYMBOL SYNC connector.

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

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

Preset   Pos

Symbol Timing Err

Supported   E4438C with Option 406

This softkey enables you to set a symbol timing error in either parts per million (ppm) or hertz (Hz). A 20 ppm timing error corresponds to a 20 Hz shift in the symbol rate.

Preset   0.0

Range   –50 ppm to 50 ppm

Sync

In the CDMA Menu

Supported   E4438C with Option 401

Use this softkey to insert a synchronization channel into the current channel setup table.

In the Real Time TDMA Menu

Supported   E4438C with Option 402

Use this softkey to select synchronization as the timeslot type for the active timeslot. Synchronization is a downlink burst that allows the mobile to synchronize in time with the base station.

When you select **Sync** for a timeslot, the visual representation of the timeslot pattern on the display updates to show the selection.

SYNC

In the NADC Format

Supported   E4438C with Option 402

This softkey enables you to select the 28-bit synchronization word that is used for slot synchronization, equalizer training, and timeslot identification.

The current value appears in the SYNC field near the bottom to the text area of the display.

Preset   A91DE4A

Range   0000000–FFFFFFF

In the PHS Format

Supported   E4438C with Options 400, 403 402

Press this softkey to select a synchronization channel as the timeslot type for the active timeslot. This channel includes the correct burst envelope timing and, for internally generated data, a correct cyclic redundancy check (CRC).

Sync Delay

Supported   E4438C with Option 400

This field value sets the delay of the system frame number (SFN) synchronization when a Multi-ESG-Sync Trigger-In signal is received.

Preset   0 chips

Range   0–38399 chips

Remarks   This function provides the capability of Inter-Cell Soft Handover test as described in TS.34.121 7.7.1 of the 3GPP standard. The test requires two basestations that generate the same signal but have a 10 chip timing offset. The two basestations are simulated by two ESGs and Sync Delay is the synchronization delay between the ESGs.

Sync Out

Supported   E4438C with Option 001/601or 002/602

Use this softkey to access a menu of choices for outputting a 1-bit synchronization signal to the EVENT 1 rear panel connector. You can set the synchronization signal to occur at various points, relative to the selected data pattern.

Preset   Begin Pattern

Sync Out Offset

Supported	E4438C with Option 001/601or 002/602

Press this softkey to set an offset from the synchronization location.

Preset	0 bits
Range	*DECT:* −479 through +479 bits *EDGE and GSM:* −155 through +155 bits *NADC, PDC:* −323 through +323 bits *PHS:* −239 through +239 bits *TETRA:* −509 through +509 bits
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.

Sync Source BCH TCH/PDCH

Supported	E4438C with Option 300

This softkey enables you to select the synchronization source for the GSM 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.
TCH/PDCH	This choice selects a traffic channel (TCH) or a packet data channel (PDCH) as the synchronization source. TCH synchronization relies on the BTS to supply a TCH training sequence to which the receiver can synchronize. However, the receiver must be told which timeslot is being received, since it has no absolute reference (unlike a BCH, which is always transmitted in timeslot 0). PDCH synchronization relies on the BTS to monitor the delay of the access bursts and update the timing advance values in the next downlink signalling message following the access burst. PDCH synchronization is used when one of the GSM channels CS1, CS4, or MCS1 is selected.
Preset	BCH

Sync Source SFN FClk ESG

Supported   E4438C with Option 400

This softkey sets the uplink synchronization signal to system frame number reset signal or to the frame clock signal.

SFN   Selects the system frame number reset signal as the synchronization source.

FClk   The synchronization source is the frame clock signal.

ESG   The synchronization source is a primary signal generator.

Preset   FClk

Synchronize to BCH/TCH/PDCH

Supported   E4438C with Option 300

This softkey releases the current synchronization with the base transceiver station (BTS) and immediately tries to synchronize to the sync source that is selected. This softkey also stops the measurement.

Preset   BCH

Remarks   This softkey is active when the **GSM BERT Off On** softkey is set to On.

Synchronize to BCH/PDCH

Supported   E4438C with Option 300

This softkey releases the current synchronization with the base transceiver station (BTS) and immediately tries to synchronize to the sync source that is selected. This softkey also stops the measurement.

Preset   BCH

System ID

Supported   E4438C with Option 401

This field displays the current system identification value. Changing the system identification value enables the signal generator to identify itself as another signal generator when used as a replacement. To change the system identification, highlight the System ID field, press the **Edit Item** softkey and enter a new hexadecimal value.

Preset   0007

Range   0000−7FFF

T

T1

Supported   E4438C with Option 402

Use this softkey to edit the 9-bit tail fields in the normal burst timeslot. Use hexadecimal to enter the value; the signal generator will convert it to binary.

Preset   1FF

Range   0–1FF

T2

Supported   E4438C with Option 402

Use this softkey to edit the 9-bit tail fields in the normal burst timeslot. Use hexadecimal to enter the value; the signal generator will convert it to binary.

Preset   1FF

Range   0–1FF

Target %

Supported   E4438C with Option 300

This softkey enables you to set the target bit error rate (BER) or residual bit error rate (RBER) in percent (the percent of allowable errors) for the GSM BER sensitivity search.

Preset   2%

Range   0–100%

Target BER %

Supported   E4438C with Option 300

This softkey enables you to set the target bit error rate (BER) in percent (the percent of allowable errors) for the EDGE uncoded channel BER sensitivity search.

Preset   2%

Range   0–100%

Target BLER %

Supported   E4438C with Option 300

This softkey enables you to set the target block error rate (BLER) in percent (the percent of allowable errors) for the EDGE downlink MCS5 or MCS9 channel BER sensitivity search.

Preset   2%

Range   0–100%

TCH

Supported   E4438C with Option 402

This softkey appears in two locations.

In the Timeslot Type Menu

In this menu, this softkey selects traffic channel as the timeslot type for the active timeslot. When you select **TCH** for a timeslot, the visual representation of the timeslot pattern on the display immediately updates to show the configuration.

In the Configure TCH Menu

In this menu, this softkey accesses a menu of choices for internal data generation (PN sequences, fixed, 4-bit repeating sequences, set patterns of ones and zeroes) or you can choose to supply your own data (download a binary file or input data using the DATA INPUT connector) for configuring the timeslot TCH fields.

Preset   PN23

TCH/FS

Supported   E4438C with Option 402

This softkey selects a mulitframe pattern with a full rate speech traffic channel for the selected timeslot. The multiframe structure consists of 26 frames, where frame 12 contains the slow associated control channel (SACCH) and frame 25 is idle. The idle frame uses RF blanking.

TCH All Models

Supported   E4438C with Option 402

Use this softkey to select traffic channel as the timeslot type for all timeslots in either the uplink or the downlink channel, depending on which is active.

When you select **Up TCH All Models**, the visual representation of the timeslot pattern on the display immediately updates.

tDPCH Offset

Supported   E4438C with Option 400

This field displays the timing offset for the DPCH and Chip ARB. Each numeric value entered is equivalent to 256 chips or 1/10 of a timeslot offset. The timing offset affects the crest factor of the signal. By varying the timing offset, the probability of all DPCH's adding in phase and producing a high peak-to-average ratio or crest factor is minimized. Base stations vary the timing between DPCHs so that amplifiers can be run at the most efficient level. The signal generator duplicates this behavior.

Range   0–149

Test Models

Supported   E4438C with Option 400

Use this softkey to display a menu of pre-configured Test Model setups for the W-CDMA downlink channel setup.

Test Model 1 W/ 16 DPCH

Supported   E4438C with Option 400

This softkey selects Test Model 1 with 16 DPCHs for the W-CDMA downlink channel setup.

Test Model 1 W/ 32 DPCH

Supported   E4438C with Option 400

This softkey selects Test Model 1 with 32 DPCHs for the W-CDMA downlink channel setup.

Test Model 1 W/ 64 DPCH

Supported   E4438C with Option 400

This softkey selects Test Model 1 with 64 DPCHs for the W-CDMA downlink channel setup.

Test Model 2

Supported   E4438C with Option 400

This softkey selects Test Model 2 for the W-CDMA downlink channel setup.

Test Model 3 W/ 16 DPCH

Supported   E4438C with Option 400

This softkey selects Test Model 3 with 16 DPCHs for the W-CDMA downlink channel setup.

Test Model 3 W/ 32 DPCH

Supported   E4438C with Option 400

This softkey selects Test Model 3 with 32 DPCHs for the W-CDMA downlink channel setup.

Test Model 4

Supported   E4438C with Option 400

This softkey selects Test Model 4 for the W-CDMA downlink channel setup.

Test Model 5 w/2HSPDSCH

Supported   E4438C with Option 400

This softkey selects Test Model 5 with 6 dedicated physical channels (DPCH) and 2 high speed physical downlink shared channels (HS-PDSCH).

Test Model 5 w/4HSPDSCH

Supported   E4438C with Option 400

This softkey selects Test Model 5 with 14 dedicated physical channels (DPCH) and 4 high speed physical downlink shared channels (HS-PDSCH).

Test Model 5 w/8HSPDSCH

Supported   E4438C with Option 400

This softkey selects Test Model 5 with 30 dedicated physical channels (DPCH) and 8 high speed physical downlink shared channels (HS-PDSCH).

Test Setup

Supported   E4438C with Option 400

This softkey accesses a menu of pre-defined test setups. The tests are in compliance with 3G TS 25.101 specifications.

TETRA

Supported   E4438C with Option 001/601or 002/602

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 TETRA for Custom Digital Modulations

Use this softkey to select a predefined Trans European Trunked Radio (TETRA) personality for the digital modulation format.

Accessing the TETRA 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 (where the data bits are located in fields defined by the TETRA protocol) or a sequence that can be output one or more times.

TETRA Bands

Supported   E4438C

Use this softkey to access a menu from which you can select the frequency bands for TETRA. The output frequency depends on both frequency band and channel selections.

TETRA Base 390/400

Supported   E4438C

This softkey selects Base 390–400 as the frequency band for TETRA. The output frequency depends on both frequency band and channel selections.

Preset   *Channel*: 3600

                Frequency: 390.000 MHz

Range   *Channels*: 3600–4000

                Frequency: 390.000–400.000 MHz

TETRA Base 420/430

Supported   E4438C

This softkey selects Base 420-430 as the frequency band for TETRA. The output frequency depends on both frequency band and channel selections.

Preset   *Channel*: 800

                 Frequency: 420.000 MHz

Range   *Channels*: 800–1200

                 Frequency: 420.000–430.000 MHz

TETRA Base 460/470

Supported   E4438C

This softkey selects Base 460-470 as the frequency band for TETRA. The output frequency depends on both frequency band and channel selections.

Preset   *Channel*: 2400

                 Frequency: 460.000 MHz

Range   *Channels*: 2400–2800

                 Frequency: 460.000–470.000 MHz

TETRA Base 915/921

Supported   E4438C

This softkey selects Base 915-921 as the frequency band for TETRA. The output frequency depends on both frequency band and channel selections.

Preset   *Channel*: 600

                 Frequency: 915.000 MHz

Range   *Channels*: 600–840

                 Frequency: 915.000–921.000 MHz

TETRA Mobile 380/390

Supported   E4438C

This softkey selects Mobile 380–390 as the frequency band for TETRA. The output frequency depends on both frequency band and channel selections.

Preset   *Channel*: 3600

Frequency: 380.000 MHz

Range   *Channels*: 3600–4000

Frequency: 380.000–390.000 MHz

TETRA Mobile 410/420

Supported   E4438C

This softkey selects Mobile 410-420 as the frequency band for TETRA. The output frequency depends on both frequency band and channel selections.

Preset   *Channel*: 800

Frequency: 410.000 MHz

Range   *Channels*: 800–1200

Frequency: 410.000–420.000 MHz

TETRA Mobile 450/460

Supported   E4438C

This softkey selects Mobile 450-460 as the frequency band for TETRA. The output frequency depends on both frequency band and channel selections.

Preset   *Channel*: 2400

Frequency: 450.000 MHz

Range   *Channels*: 2400–2800

Frequency: 450.000–460.000 MHz

TETRA Mobile 870/876

Supported   E4438C

This softkey selects Mobile 870–876 as the frequency band for TETRA. The output frequency depends on both frequency band and channel selections.

Preset   *Channel*: 600

              Frequency: 870.000 MHz

Range   *Channels*: 600–840

              Frequency: 870.000–876.000 MHz

TETRA Off On

Supported   E4438C with Option 402

This softkey enables you to select the operating state of the Trans European Trunked Radio (TETRA) communications format.

Off   When you select Off, the TETRA format is turned off.

On   When you select On, this sets up the internal hardware to generate the structure that follows the TETRA format. The internal I/Q modulator generates π/4DQPSK digital modulation, and the TETRA and I/Q annunciators appear 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 **TETRA 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.

TFCI

Supported   E4438C with Option 400

This field displays the TFCI code.

Preset   0

Range   0 – 1023

Remarks   The number of TFCI bits sent to each timeslot are determined by the slot format.

TFCI Field Off On

Supported   E4438C with Option 400

Use this softkey to set the transport format combination indicator (TFCI) field on or off for all the channels in the Edit Channel Setup table editor.

Off   The TFCI field displays a grayed-out N/A.

On   On selects TFCI for insertion in the selected channel.

This is an optional bit pattern that describes and gives information on what services are available; for example, data and video. It allows the user equipment (UE) or the base station (BTS) to determine the active service and bit rates in each service.

Preset   On

Remarks   The TFCI field applies to every DPCH channel in downlink. The TFCI only applies to the DPCCH channel in uplink as this channel carries the control information for all of the DPDCH channels present.

TFCI Pat

Supported   E4438C with Option 400

This field displays the transport format combination indicator (TFCI) bits. This is a 10-bit pattern that describes the services in use so that blind rate detection does not have to be performed.

Preset   0

Range   0–1023 (decimal)

Remarks   This softkey is available for downlink. The TFCI is optional and describes the services in use (for example, voice and data).

TFCI Pattern

Supported   E4438C with Option 400

This field, in the uplink configuration, displays the transport format combination indicator (TFCI) bit pattern set in the **PhyCH Setup** menu for a physical channel. Press the **Edit Item** softkey to enter in a desired bit pattern. See "Slot Format" on page 429 for more information.

The TFCI is an optional field describing what services are in use (for example, data and video). Fixed rate service does not include TFCI.

Preset   0000

Range   0000–03FF (hexadecimal)

TFCI Power dB

Supported   E4438C with Option 400

This field displays the total power, in dB, for the TFCI bits in the selected channel.

Preset   0.00 dB

Range   – 20 dB to 20 dB

Remarks   This field is only available for downlink.

TFCI State

Supported   E4438C with Option 400

This field displays the on/off status for the transport format combination indicator (TFCI) bits. If the field indicates on, then the TFCI bits are included in the dedicated physical control channel (DPCCH). The TFCI is coupled to the Slot Format field. Refer to "Slot Format" on page 429 for more information.

Tfirst

Supported   E4438C with Option 400

This field displays the first transmission slot at which a gap appears. The entry in this field, sets the starting position of the first DTX slot from the compressed frame boundary.

Range   0–7

TGCFN

Supported   E4438C with Option 400

This field displays the transmission gap connection frame number (TGCFN). This is the connection frame number (CFN) of the first radio frame of the first pattern (pattern 1) within the transmission gap pattern sequence. Refer to "Gap1 1st" on page 231 for more information.

Preset

Range   0–255

Remarks   This field is displayed for the uplink configuration in the Compressed Mode Setup table editor.

TGD

Supported   E4438C with Option 400

This field displays the transmission gap start distance (TGD) or, if only one transmission gap is used, "Undefined". The TGD is the duration between the starting slots of two consecutive transmission gaps within a transmission gap pattern, expressed in number of slots. Refer to for more information.

Selecting the **Undefined** softkey for this field, designates only one transmission gap is to be used.

The position of the second transmission gap within a radio frame(s) complies with the limitations established in the 3GPP standard.

Preset   Undefined

Range   15–269

Remarks   This field is displayed in the Compressed Mode Setup table editor for the uplink configuration.

Tgl

Supported   E4438C with Option 400

This field displays the transmission gap length (Tgl) in the compressed frames. The Tgl is the number of consecutive idle slots during the compressed mode transmission gap. The Tgl field is available for the downlink compressed mode configuration.

Range   1–7

Remarks   This field is displayed for downlink.

TGL1

Supported   E4438C with Option 400

This field displays the transmission gap length 1 (TGL1). This is the duration of the first transmission gap, expressed in slots, within the transmission gap pattern.

Preset   7

Range   3, 4, 5, 7, 10, or 14 slots

Remarks   This field is displayed in the Compressed Mode Setup table editor for the uplink configuration. See "TGPL2" for more information.

TGL2

Supported   E4438C with Option 400

This field displays the transmission gap length 2. This is the duration of the second transmission gap, expressed in slots, within the transmission gap pattern. When Omitted is specified as the parameter, then TGL2 = TGL1. The transmission gap pattern length 1 and 2 can have one or two transmission gaps. Refer to 3 GPP TS25.215
version 4.1.0 Release 4 for more information.

Preset	Omitted
Range	3, 4, 5, 7, 10, 14 or Omitted
Remarks	This field is displayed in the Compressed Mode Setup table editor for the uplink configuration.

TGPL1

Supported   E4438C with Option 400

This field displays the duration of the transmission gap pattern length 1 (TGPL1). The duration is expressed in number of frames used for the TGPL1.

Preset	2 frames
Range	1–144
Remarks	This field is displayed in the Compressed Mode Setup table editor for the uplink configuration.

TGPL2

Supported   E4438C with Option 400

This field displays the duration of the transmission gap pattern length 2 (TGPL2). The duration is expressed in the number of frames used for the TGPL2. If this parameter is set to omitted, then TGPL2 = TGPL1.

Preset	Omitted
Range	1–144
Remarks	This field is displayed in the Compressed Mode Setup table editor for the uplink configuration.

TGPRC

Supported	E4438C with Option 400

This field displays the transmission gap pattern repetition count (TGPRC) number. This is the number of transmission gap patterns within the transmission gap pattern sequence. Use the Edit Item softkey to select a repetition to use.

Preset	1
Range	1–511 or Infinity
Remarks	When Infinity is selected, the compressed mode patterns are continuously transmitted. For counts 1–511, the compressed mode patterns will end after the specified repetition number.

TGPS

Supported	E4438C with Option 400

This field indicates the active/inactive state for the transmission gap pattern sequence (TGPS).

Preset	Inactive
Remarks	This field is displayed for the DPCCH and the DPDCH in the Compressed Mode Setup table editor

TGPS Inactive Active

Supported	E4438C with Option 400

This softkey enables the transmission of the compressed frame sequence. Compressed frame sequence will not be transmitted until the front panel or external trigger is received.

Inactive	Compressed mode is disabled.
Active	Compressed mode is enabled.
Preset	Inactive

TGPSI

Supported   E4438C with Option 400

The transmission gap pattern sequence indicator (TGPSI) is a parameter that references the compressed mode pattern sequence. You can change the TGPSI number by rotating the control knob or by entering a value using the keypad.

Preset	TGPSI 1
Range	*Downlink:* 1
	Uplink: 1–6
Remarks	This softkey is displayed in the Compressed Mode Setup menu.

TGSN

Supported   E4438C with Option 400

This field displays the transmission gap starting slot number (TGSN). The transmission gap pattern begins in a radio frame (called the first radio frame of the transmission gap pattern) and contains at least one transmission gap slot. The TGSN is the slot number of the first transmission gap slot within the first radio frame of the transmission gap pattern.

Preset	0
Range	0–14
Remarks	This field is displayed for the DPCCH and the DPDCH in the uplink configuration.

Threshold

Supported   E4438C with Option UN7

This softkey accesses a menu that enables you to select the input level of the BER CLK IN, BER DATA IN, and BER GATE IN rear panel connectors.

Preset	1.4 V

Threshold # of Events to Stop

Supported   E4438C with Option UN7

This softkey accesses a menu that enables you to select the parameters of the events-to-stop function. If no stop criteria is specified, the measurement continues until the number of frames to measure is met.

Through

Supported   E4438C

Use this softkey to enable a path selection that bypasses all filters. This is useful for using external filters at frequencies different to those supplied internally.

`Time`

Supported   E4438C with Option 401

This field displays the current system time value. To change the system time, highlight the `Time` field, press the **Edit Item** softkey and enter a new hexadecimal value.

Preset   000000000

Range   000000000–FFFFFFFFF

Time

Supported   E4438C with Option 001/601 or 002/602

For the external trigger delay, this softkey selects time (nanoseconds to seconds) as the delay type. After selecting this softkey, the signal generator returns to the previous menu where the time delay is set using the **Ext Delay Time** softkey.

Time/Date

Supported   All Models

Use this softkey to access a menu from which you can set the time and date functions of the clock display.

Time/Date Off On

Supported   All Models

Use this softkey to set the state of the display clock.

Off   When you select Off, the display clock is off.

On   When you select On, the display clock is turned on.

Preset   Off

Timeslot

Supported   E4438C with Option 402

This softkey enables you to select a timeslot to be configured. Choose any of the available timeslots in the active channel.

Preset	*NADC, PHS, TETRA*: 1
	Other Formats: 0
Range	0–7

Timeslot Ampl Main Delta

Supported	E4438C with Option 402

Use this softkey to set the selected timeslot RF output power source.

Main	This choice selects the current RF output as the power level.
Delta	This choice selects an alternate power level (Delta) that is determined by the difference between the current amplitude and the amplitude that is selected with the Alternate Amplitude menu. To accesses this menu, press **Amplitude** > **More (1 of 2)** > **Alternate Amplitude**. This menu enables you to configure the alternate amplitude.
Preset	Main

Timeslot Off On

Supported	E4438C with Option 402

Use this softkey to set the operating state of the selected timeslot. The visual representation of the timeslot pattern reflects the timeslot status in the active channel.

Off	This selection turns the timeslot off.
On	This selection turns the timeslot on.
Preset	*DECT, EDGE, GSM, and PDC*: On (timeslot 0)
	NADC and PHS: On (timeslot 1)
	TETRA: On (timeslot 1), Off (timeslots 2 through 4)

Timeslot Offset

Supported	E4438C with Option 400

This softkey, in the DPCH and PRACH Trigger Delay menu, enables you to set the number of slots to be delayed from the uplink synchronization source.

The range for the PRACH is affected by the Tp-a value that is set using the **Base Delay Tp-a** softkey.

Preset	0			
Range	*DPCH*: 0 – 119	*PRACH*:	*Tp-a Setting*	*Timeslot Offset*
			0	-14 to 119
			7680	-11 to 119
			12800	-9 to 119

Remarks   The actual timing offset is defined as:

(Timeslot Offset + Timing Offset $\times$ 2560) – (Tp–a) [chips]

Timeslot Type

Supported   E4438C with Option 402

This softkey accesses a menu from which you can set the timeslot type for the active timeslot.

The visual representation of the timeslot pattern on the display is updated to show the current selection.

Preset   *DECT*: Traffic Bearer (timeslot 0)

EDGE and GSM: Normal (timeslot 0)

NADC: Up TCH (timeslot 1)

PDC: Up TCH (timeslot 0)

PHS: TCH (downlink 1)

TETRA: Uplink Normal (all timeslots)

Timing Offset (numeric value) chip

Supported   E4438C with Option 400

This softkey, available in the PRACH Trigger Delay Setup and DPCH Trigger Delay Setup, enables you to specify the number of chips to be delayed in addition to the slot delay between the downlink frame clock and uplink frame timing signals. The actual delay time is the sum of 1024 chips, the slot delay, and the timing offset.

Preset   0

Range   *PRACH, DPCH*: −512 to 2560

Remarks   A minus value means a negative delay. The actual timing offset

DPCH= Timeslot Delay + Timing Offset (T0) $\times$ 2560 – T0 (chips)

PRACH= Timeslot Delay + Timing Offset (T0) $\times$ 2560 – Tp-a (chips)

where T0 = 1024 chips.

This is the standard timing offset between downlink and uplink.

Timing Offset

Supported   E4438C with Option 400

This field displays the timing offset for the arb multicarrier waveform.

Preset   0

Range   0–149

tOCNS Offset

Supported   E4438C with Option 400

This field displays the timing offset for the orthogonal channel noise simulator (OCNS). The timing offset affects the crest factor of the signal. By varying the timing offset, the probability of all OCNS's adding in phase and producing a high peak-to-average ratio or crest factor is minimized. Base stations vary the timing between OCNSs so that amplifiers can be run at the most efficient level. The signal generator duplicates this behavior.

Range   0–149

Toggle Marker 1

Supported   E4438C with Option 001/601or 002/602

This softkey enables or disables marker1 for the selected segment of a waveform sequence.

Preset   Off

Toggle Marker 2

Supported   E4438C with Option 001/601or 002/602

This softkey enables or disables marker 2 for the selected segment of a waveform sequence.

Preset   Off

Toggle Marker 3

Supported   E4438C with Option 001/601or 002/602

This softkey enables or disables marker 3 for the selected segment of a waveform sequence.

Preset   Off

Toggle Marker 4

Supported   E4438C with Option 001/601or 002/602

This softkey enables or disables marker 4 for the selected segment of a waveform sequence.

Preset   Off

Toggle Markers

Supported   E4438C with Option 001/601or 002/602

This softkey accesses a menu from which you can toggle markers 1 and 2 to enable or disable markers for selected segments of a sequence.

Toggle State

Supported   E4438C with Option 001/601or 002/602

In the multitone editor, this key enables you to turn the individually selected tone on and off. This determines whether or not a particular tone is generated.

Total Bits

Supported   E4438C with Option UN7

Use this softkey to specify the total number of bits to be measured for one measurement cycle.

Preset   10,000

Range   100–4294967295

`Total Bits`

Supported   E4438C with Option 400

This field displays the actual number of total bits after the error bits are inserted into the current data of each transport channel.

Preset   0

Remarks   This data field is on the second page of the table editor.

Total Blocks

Supported   E4438C with Option 400

This field displays the actual number of total blocks after the error blocks are inserted into the current data of each transport channel.

Preset   0

Remarks   This data field is on the second page of the table editor.

TotalPwr

Supported   E4438C with Option 400

This field displays the total in-channel power (carrier with noise) as defined by the 3GPP standard. The total power is a sum of the carrier power (C Power) and in-channel noise power (N Power). A change in amplitude, carrier to noise, and noise related parameters will cause a recalculation of this value.

Preset   −138.91

Range   −138.91 to 20

Remarks   The maximum value depends on the power option installed in the signal generator.

Tp-m

Supported   E4438C with Option 400

This field displays the time period, in access slots, between the physical random access channel (PRACH) preamble and message for single and multiple PRACH modes.

Preset   3 access slots

Range   1–15 access slots

Tp-p

Supported   E4438C with Option 400

This field displays the time period between the one preamble and another preamble before the message part for single and multiple physical random access channel (PRACH) modes.

Preset   3 access slots

Range   1–60 access slots

TPC

Supported	E4438C with Option 400

This data field displays the hexadecimal transmit power control (TPC) values for the selected channel in the Edit Channel Setup table editor. The binary conversion of this hex number will consist of 15 values which are transmitted during one frame. For more information refer to the Users Guide.

Preset	555
Range	0000–7FFF
Remarks	TCP values determine how the transmit power of the base station and user equipment (UE) will vary.

TPC Pat Steps

Supported	E4438C with Option 400

This field displays the number of successive down and up commands for the transport power control (TPC) pattern, when the TPC Pattern field is set to Up/Down or Down/Up.

In uplink, the power of the base station (BTS) will decrease or increase by 1 dB on a slot-by-slot basis for every down or up command. The TPC pattern has a number of different formats See for more information.

Preset	1
Range	1–80

TPC Pat Trig Polarity Neg Pos

Supported	E4438C with Option 400

This softkey sets the pattern trigger polarity for transmit power control (TPC) for the uplink dedicated physical control channel (DPCCH). The choices are negative or positive.

Pos	The signal generator responds to a rising edge trigger transition.
Neg	The signal generator responds to a falling edge trigger transition.
Preset	Positive

TPC Pattern

Supported   E4438C with Option 400

This field displays the transmit power control (TPC) pattern command format in use. The TPC Pattern is used to change the base station (BS) power level. To change the current selection, highlight the TPC Pattern field, press the **Edit Item** softkey and make a choice from the menu that appears.

Preset   Up/Down

TPC Power dB

Supported   E4438C with Option 400

This data field displays the power for the transmit power control (TPC) bits.

Preset   0.00 dB

Range   – 20 dB to 20 dB

Remarks   This field is only available for downlink.

TPC UserFile Trig

Supported   E4438C with Option 400

This field selects the operating state for transmit power control (TPC) pattern trigger. The field is available for the uplink dedicated physical control channel (DPCCH).

Off   When you select Off, the operating state is turned off.

On   When you select On, the operating state is turned on.

Preset   Off

Traffic

Supported   E4438C with Option 401

This softkey appears in two different locations, enabling you to either insert a traffic channel into the current CDMA Channel Setup table, or select a menu from which you can define and insert one or more fundamental traffic channels into the current CDMA2000 Channel Setup table.

Traffic Bearer

Supported   E4438C with Option 402

Use this softkey to select traffic bearer as the timeslot type for the active timeslot. When you have selected **Traffic Bearer** for a timeslot, the visual representation of the timeslot type on the display immediately updates.

Traffic Bearer with Z Field

Supported   E4438C with Option 402

Use this softkey to select traffic bearer with Z field as the timeslot type for the active timeslot. When you have selected **Traffic Bearer with Z Field** for a timeslot, the visual representation of the timeslot type on the display immediately updates.

Transmit Link RFP PP

Supported   E4438C with Option 402

Use this softkey to select the operating state of the frame.

RFP	When you select RFP, the timeslot number, type and configuration settings are applied to the twelve radio fixed part (RFP) timeslots.
PP	When you select PP, the timeslot number, type and configuration settings are applied to the twelve portable part (PP) timeslots.
Preset	RFP
Remarks	RFP and PP timeslots can be active concurrently.

Transmit Power Control Setup

Supported   E4438C with Option 400

This softkey accesses the dedicated physical channel (DPCH) Transmit Power Control Setup configuration screen.

Remarks   This softkey appears only when DPCH **Power Mode Norm TPC** softkey is set to **TPC** (TPC is highlighted).

Transmit Settings

Supported   E4438C with Option 300

This softkey accesses the GSM or EDGE menu of softkeys used for selecting framed data, configuring timeslots, and selecting frequency channels.

Transp Chan A

Supported   E4438C with Option 400

Use this softkey to select transport channel A as the data input to the currently selected physical channel.

Transp Chan B

Supported   E4438C with Option 400

Use this softkey to select transport channel B as the data input to the currently selected physical channel.

Transp Group A B

Supported   E4438C with Option 400

Use this softkey to select the transport channel data for the selected physical channel.

A	This softkey selects transport channel A as the data for the selected physical channel.
B	This softkey selects transport channel B as the data for the selected physical channel.
Preset:	A
Remarks	There are two transport layer definitions and either one can be applied to either DPCH. This can be used to test multiple transport layer scenarios, RMC 12.2 and AMR for example, without having to lose synchronization with the mobile. The mobile is only required to change OVSF codes thus saving time.

Transport Setup

Supported   E4438C with Option 400

Use this softkey to access a menu from which you can configure the transport channels.

Transp Position Flexible Fixed

Supported   E4438C with Option 400

This softkey selects a coupling mode for the downlink transport type and determines the method of transport channel multiplexing (TrCH MUX) used to form the coded composite transport channel.

Flexible   This selection sets the block set size (BSSize) and tracks the block size.

Fixed   This selection allows the BSSize and block size to be edited. The values are limited to two values; equal to BSSize or 0. An error message is generated if a value other than these is enter and the setting will default to the BSSize.

Preset   Fixed

Remarks   See "Blk Size" on page 76 for more information.

Transport CH

Supported   E4438C with Option 400

This softkey selects the data generated from the transport channel setup as the data source for the currently selected physical channel message data part.

Remarks   You can access this softkey by highlighting the Msg-Data Data data field in the uplink physical channel setup table editor.

TrCH BER

Supported   E4438C with Option 400

This field displays the error rate for the dedicated physical data channel (DPDCH). These errors are inserted between the second interleaver in the transport layer and the spreading and scrambling in the physical layer. The error ratio or BER is set with the TrCH BER Cycle and TrCH BER ErrLen fields and is calculated by using the following formula: TrCH BER ErrLen/TrCH BER Cycle.

Preset   0

TrCH BER Cycle

Supported   E4438C with Option 400

The TrCH BER Cycle field is used with the TrCH BER ErrLen field to set the BER of the dedicated physical data channel (DPDCH) stream between the transport layer and physical layer. The ratio, TrCH BER ErrLen/TrCH BER Cycle sets the TrCH bit error rate. For example, if TrCH BER ErrLen is equal to 25 and the TrCH BER Cycle is 100, then there will be 25 bit errors in every 100 bits or a bit error rate of 0.25.

Preset   0 bit cycle

Range   0–65535

TrCH BER ErrLen

Supported   E4438C with Option 400

This field displays the error length, in bits, of the transport channel bit errors (TrCH BER) for the uplink dedicated physical data channel (DPDCH). The error length value must be smaller than or equal to the TrCH BER Cycle length. Refer to "TrCH BER Cycle" on page 479.

Preset   0 bit cycle

Range   0–4095

TrCH BlkSize 168

Supported   E4438C with Option 400

This softkey selects a channel configuration as defined in 3GPP Standard TS25.104. This softkey is available in the Uplink Physical Type:PRACH Preamble menu. Parameters are defined for a transport block size of 168.

TrCH BlkSize 360

Supported   E4438C with Option 400

This softkey selects a channel configuration as defined in the 3GPP Standard TS25.104.This softkey is available in the Uplink Physical Type:PRACH Preamble menu. Parameters are defined for a transport block size of 360.

TrCH Setup

Supported   E4438C with Option 400

This softkey accesses a menu in which you can edit transport channel (TrCH) data. This softkey is active with physical channel type DPCH for downlink and physical channel type DPDCH for uplink configurations.

Remarks   The default setting for the transport channel is DCH 1 and is available for both uplink and downlink configurations.

TrCH State Off On

Supported   E4438C with Option 400

This softkey turns the selected transport channel off or on. Select transport channel #2, #3, #4, #5, or #6 to active this key. These transport channels can also be turned on or off with this softkey. Channels must be turned on in sequence. For example, channel 3 must be on before channel 4 can be turned on.

Preset   Transport channel #1 is always in the active state after an instrument preset.

Triangle

Supported   All Models

This softkey selects a triangle wave as the modulation.

Remarks   The modulation applies only to the path configuration you have currently selected.

Trigger

Supported   E4438C with Option 001/601or 002/602

Trigger softkey

Use this softkey to access menus from which you can select and configure signal generator trigger modes:

- **Continuous**, page 118
- **Single**, page 427
- **Gated**, page 235
- **Segment Advance**, page 414 (available for the dual ARB only)

Trigger hardkey

Pressing this hardkey immediately initiates one of the following events when it is the current trigger source selection:

- A ramp (Option 007), step or list sweep

- A point to point list or step sweep

- A swept-sine waveform for AM, FM, and ΦM (requires Option UNT)

- A swept-sine waveform for LF Output

- A waveform using the ARB formats or real-time custom (Option 001/601or 002/602)

The **Trigger** hardkey has auto-repeat capability. Holding the key down repeatedly triggers the waveform. When the ESG receives multiple trigger occurrences when only one is required, the signal generator uses the first trigger and ignores the rest. For more information on triggering, see the *E4428C/38C ESG Signal Generators User's Guide.*

Trigger Advance

Supported   E4438C with Option 401

This field displays the current number of chips that the trigger is advanced. The trigger advance is referenced to the ESG even second clock and is used to synchronize the ESG with the base station. The base station's timing signal is input at the PATT TRG IN rear panel connector. To change the trigger advance, highlight the Trigger Advance field, press the **Edit Item** softkey and enter a new value.

Preset   28

Range   0–2457599

Remarks   The trigger advance value automatically adjusts to compensate for additional delays introduced when noise is turned on (Option 403).

Changing the trigger advance value may cause the signal generator to lose synchronization with the base station signal.

Trigger & Run

Supported   E4438C with Option 001/601or 002/602

This softkey is one of the continuous trigger mode waveform response selections found in the Continuous Mode menu. This response selection causes the waveform to wait for a trigger. After receiving the initial trigger, the waveform plays continuously and ignores all subsequent triggers. The signal generator plays the waveform or transmits the data pattern 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 (real-time custom). For more information on triggering, see the *E4428C/38C ESG Signal Generators User's Guide.*

Trigger Edge

Supported   E4438C with Option 401

This field indicates whether the ESG will trigger on the rising or the falling edge of the base station trigger signal. To change the field selection, highlight the
Trigger Edge field, press the **Edit Item** softkey and make a choice from the menu that appears.

Preset   Falling

Trigger In Polarity Neg Pos

Supported   All Models

This softkey toggles the polarity of the TTL trigger signal at the TRIGGER IN connector and is active when the sweep trigger is set to Ext.

Pos   The swept-sine sweep will start on the rising edge of the trigger signal and stop with the falling edge of the trigger signal.

Neg   The swept-sine sweep will start on the falling edge of the trigger signal and stop with the rising edge of the trigger signal.

This key is used in the swept-sine FM, ΦM, and LF Out, and the Sweep/List menus. When the polarity is changed in any one of these menus, it is changed in all the menus. In the LF Out menu, this key appears after first selecting the internal source to operate as a function generator and then selecting Ext as the LF Out sweep trigger.

Preset   Pos

Trigger Key

Supported   All Models

Use this softkey to enable the front panel **Trigger** hardkey to trigger an event.

Pressing the **Trigger Key** softkey in the appropriate menu will enable the front panel **Trigger** hardkey to immediately do one of the following:

- Sweep trigger– Initiate a step or list sweep.

- Point trigger– Cause the sweep to step point-by-point in a step or list sweep.

- AM, FM, or ΦM– Initiate a single sweep of swept-sine amplitude, frequency, or phase modulation.

- Swept-sine LF output– Initiate a swept-sine low frequency output.

- Digital modulation formats– Initiate a burst to output a frame or data sequence. For framed transmissions, you can toggle between the primary and/or secondary framed data. For patterned transmissions, you can trigger a single output of modulated data that is not framed.

- Bit error rate test (BERT)– Initiate a bit error rate test.

Remarks   The **Trigger** hardkey has autorepeat capability. Hold it down and you will repeatedly trigger until you release the key.

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

Trigger Out Polarity Neg Pos

Supported   All Models

This softkey toggles the polarity of the TTL signal at the rear panel TRIGGER OUT connector.

Pos	The trigger out signal is asserted high (+5.0 V) at the start of the swept-sine modulation sweep and low (0.0 V) when the sweep is concluded.
Neg	The trigger out signal is low (0.0V) at the start of the swept-sine modulation sweep and high (5.0V) when the sweep ends.

This key is used in the swept-sine FM, ΦM, and LF Out, and the Sweep/List menus. When the polarity is changed in any one of these menus, it is changed in all the menus.

In the LF Out menu this key is available after selecting the internal source to operate as Function Generator 1.

Preset   Pos

Trigger Polarity Setup

In the Real Time W-CDMA Uplink PRACH Menu

Supported   E4438C with Option 400

Use this softkey to access a menu from which you can set the physical random access channel (PRACH) and the acquisition indicator channel (AICH) trigger polarity

In the Real Time W-CDMA Uplink DPCH Menu

Supported   E4438C with Option 400

Use this softkey to access a menu from which you can set the Compressed Mode Start Trigger Polarity, Compressed Mode Stop Trigger Polarity, TPC Pattern Trigger Polarity, TPC Bit Signal Polarity, and the Power Control Signal Polarity.

In the Real Time W-CDMA Downlink Menu

Supported   E4438C with Option 400

Use this softkey to access a menu from which you can set the Compressed Mode Start Trigger Polarity, Compressed Mode Stop Trigger Polarity, and DPCH1 DTX-Gate Trigger Polarity.

Trigger Setup

Supported   E4438C with Option 001/601or 002/602

This softkey accesses the trigger setup menu. This menu enables you to adjust the trigger source, the continuous mode, the retrigger mode (not available for real-time waveform generation), and the gate active polarity.

In the W-CDMA Menu

Supported   E4438C with Option 400

This softkey accesses a menu from which you can select parameters to configure uplink synchronization. Timing offset, slot delay, signal setup, and sync trigger mode are available selections.

Trigger Signal Polarity Setup

Supported   All Models

This softkey accesses the trigger polarity menu. This menu enables you to select positive or negative polarity for the TRIGGER IN and TRIGGER OUT connectors. Positive (Pos) refers to the rising edge and negative (Neg) refers to the falling edge.

Trigger Source

Supported   E4438C with Option 001/601or 002/602

This softkey accesses a menu from which you select a trigger source. From this menu, you also configure the signal generator for an external trigger signal, applied to the PATT TRIG IN or AUX I/O connectors, when **Ext** is the trigger source selection. The following list shows the available trigger sources:

- **Trigger Key**, page 483, selects the front-panel **Trigger** hardkey as the trigger source. Pressing the hardkey provides the trigger.
- **Bus**, page 81, enables the sending of a command through the GPIB, LAN, or AUXILIARY I/O (RS-232) input connector to trigger a waveform.
- **Ext**, page 188, causes a waveform to trigger from an externally applied trigger signal.

For more information on triggering, see the *E4428C/38C ESG Signal Generators User's Guide.*

Trigger Sync Reply (RPS7)

Supported   E4438C with Option 400

This softkey assigns the trigger sync reply to the selected rear panel AUX I/O output connector or BNC.

Remarks   The trigger sync reply can be assigned to several different output connectors. The **(RPS7)** designator refers to the remote SCPI command parameter that corresponds to this softkey

Truncated PN9

Supported   E4438C with Option 406

This softkey enters a truncated PN9 pattern in a Bluetooth setup. The truncated PN9 places the first 216 bits of a PN9 sequence into one packet of a single-packet waveform.

TS

Supported   E4438C with Option 402

This softkey displays the training sequence (TS) softkey menu. The preset TS hexadecimal value (when normal preset is selected) reflects the hexadecimal value stated in the standards for the current format. The TS selection or value appears (appearance of selection or value depends on the TDMA format) in parenthesis under the **TS** softkey, and the TS value appears in the TS field of the display.

In the EDGE (Enhanced Data Rates for GSM Evolution) Format

This softkey displays a menu of predefined TS (TSC0–TSC7) and a **Custom TS** softkey that lets you modify the current TS selection. The **TS** softkey is located in the following Configure menus:

- Normal

- GMSK

Preset   TSC0

In the GSM (Global System for Mobile Communications) Format

This softkey displays a menu of predefined TS (TSC0–TSC7) and a **Custom TS** softkey that lets you modify the current TS selection. The **TS** is located in the following Configure menus:

- Normal

- Dummy

Preset   TSC0

In the TETRA (Trans European Trunked Radio) Format

This softkey displays a menu of softkeys for setting a training sequence. Use the displayed softkeys and the numeric keypad to enter a new TS value. The **TS** is located in the following Configure menus:

- Up Control 1
- Up Control 2
- Up Normal
- Dn Normal Cont
- Dn Normal Disc

Preset   *Up Normal, Dn Normal Cont, & Dn Normal Disc*: 343A74

Up Control 1 & 2: 2743A743

TSC0–TSC7

Supported   E4438C with Option 402

These softkeys select a training sequence code for EDGE or GSM. The hexadecimal values for each training sequence code are shown in .

Table 0-13

Training Sequence Code	EDGE Hexadecimal Value	GSM Hexadecimal Value
TSC0	3F3F9E49FFF3FF3F9E49	0970897
TSC1	3F3C9E49E493FF3C9E49	0B778B7
TSC2	39FFF24F24F3F9FFF24F	10EE90E
TSC3	39FF924F279FF9FF924F	11ED11E
TSC4	3FE4F3C93F9FFFE4F3C9	06B906B
TSC5	39FC93CF27FFF9FC93CF	13AC13A
TSC6	0F3F9249E4FFCF3F9249	29F629F
TSC7	093C927FE7F3C93C927F	3BC4BBC

TTI

> **Supported**   E4438C with Option 400
>
> This field displays the transport channel transmission time interval (TTI). TTI is the time interval for the product of BLK size and NBlock (BLKsize*NBlock) of data to be transmitted. The field is displayed for uplink and downlink configurations. The TTI indicates over how many consecutive frames the transport layer data is distributed. For example, if set to 40 msecs it indicates that the data is distributed over 4 frames.
>
> Changing the value of this field will change the Bit Rate field value.
>
> **Preset**   Uplink DPCH: 40ms
>
>   *PRACH*:   20ms
>
>   Downlink: 10ms (all)
>
> **Range**   10, 20, 40, or 80 msecs

TTI Frame Pulse (RPS9)

> **Supported**   E4438C with Option 400
>
> This softkey assigns the transmission time interval (TTI) frame pulse to the selected rear panel AUX I/O output connector or BNC.
>
> **Remarks**   The TTI frame pulse can be assigned to several different output connectors. The **(RPS9)** designator refers to the remote SCPI command parameter that corresponds to this softkey.

Turbo

> **Supported**   E4438C with Option 400
>
> Use this softkey to select turbo coding to be used for transport channel error protection coding. Turbo coding has better error rate performance than convolutional encoding.

Turbo Coding

> **Supported**   E4438C with Option 401
>
> This field indicates whether turbo coding is turned off or on. To toggle the current turbo coding operating state, highlight the Turbo Coding field and press the **Edit Item** softkey.
>
> Turbo coding is available with the channel, radio configuration (RC), frame length (FL) and bit rate combinations shown in Table 0-14 on page 489:

Table 0-14

	Forward Link	Reverse Link	
Channel Type	**F-SCH1 F-SCH2**	**R-SCH1 R-SCH2**	
Valid Bit Rates	*RC 3:* 19.2 kbps 38.4 kbps 76.8 kbps *RC 4:* 19.2 kbps 38.4 kbps 76.8 kbps 153.6 kbps *RC 5:* 28.8 kbps 57.6 kbps 115.2 kbps	*FL 20, RC 3:* *FL 20, RC 4:* *FL 40, RC 3:* *FL 40, RC 4:* *FL 80, RC 3:* *FL 80, RC 4:*	19.2 kbps 38.4 kbps 76.8 kbps 153.6 kbps 28.8 kbps 57.6 kbps 115.2 kbps 19.2 kbps 38.4 kbps 76.8 kbps 153.6 kbps 14.4 kbps 28.8 kbps 57.6 kbps 115.2 kbps 19.2 kbps 38.4 kbps 76.8 kbps 7.2 kbps 14.4 kbps 28.8 kbps 57.6 kbps

Preset   Off

Tx Diversity

Supported   E4438C with Option 400

Edit this data field to display a menu of Transmit Diversity types.

Preset   None

Type

Supported   E4438C with Option 400

This softkey accesses a menu enabling you to select the type of channel for insertion into the Edit Channel Setup table editor. The selection can be multiplied by the number set using the **Channels** softkey. Press **Done** to insert the information into the Edit Channel Setup table editor.

Preset   DPCH

Type

Supported   E4438C with Option 400

This data field displays the channel type for each channel in the Edit Channel Setup table editor. This field is displayed for both uplink and downlink setups.

Preset   DPCH for downlink and DPCCH for uplink.

U

UDI 64 kbps

Supported   E4438C with Option 400

This softkey selects unrestricted digital information (UDI) 64 kbps for the uplink reference measurement channel (RMC) as described in the 3GPP Technical Specification (TS) 25.944.

Remarks   This selection is one of several available reference configurations.

UDI ISDN (25.944)

Supported   E4438C with Option 400

This softkey selects unrestricted digital information (UDI) integrated services digital network (ISDN) for the downlink DPCH reference measurement channel as described in the 3GPP Technical Specification (TS) 25.944.

Remarks   This selection affects the channel slot format.

The Data Type field in the highlighted row changes to ISDN when this softkey is pressed.

UE Setup

Supported   E4438C with Option 400

This softkey accesses the uplink table editor from which you can select and modify user equipment (UE) parameters. Highlight the data field you want to change and press the **Edit Item** key. Press a softkey, use the numeric keypad, or front panel knob to change values displayed in the table. Press the appropriate softkey to terminate the entry.

UN3/4 GSM Gaussian

Supported   E4438C with Option 001/601or 002/602

Use this softkey to select an Option UN3/4 delay-compatible GSM filter in the Select filter menu. This is a Gaussian filter with a fixed BbT of 0.300.

Remarks   Options UN3 and UN4 are obsolete options that were offered for previous models of ESG. This filter remains in the current ESG firmware for backward compatibility.

Uncoded

Supported E4438C with Option 402

Use this softkey to select an uncoded channel which is a normal EDGE burst that carries only PN9 or PN15 bits.

Undefined

Supported E4438C with Option 400

This field entry, in the Compressed Mode Setup menu, indicates there is only one transmission gap within the transmission gap start distance (TGD).

Remarks This selection is used with the TGD.

Undefined

Supported E4438C with Option 400

This softkey selects one transmission gap within the transmission gap pattern. The transmission gap start distance (TGD) field, in the Compressed Mode Setup menu, displays the selection.

Remarks This selection is one of several reference configurations available.

Up Control 1

Supported E4438C with Option 402

Use this softkey to select the uplink control subslot 1 as the timeslot type for the active timeslot.

You cannot mix uplink and downlink timeslots. If a timeslot is designated as downlink, it changes to uplink if you designate any other timeslot as uplink. The following table shows the timeslot type interchange to a frame designated as downlink when uplink is selected.

From Continuous Downlink Timeslot	From Discontinuous Downlink Timeslot	To Uplink Timeslot
Dn Custom Cont	Dn Custom Disc	Up Custom
Dn Normal Cont	Dn Normal Disc	Up Normal
Dn Sync Cont	Dn Sync Disc	Up Custom

When you select **Up Control 1** for a timeslot, the visual representation of the timeslot pattern updates.

Up Control 2

Supported   E4438C with Option 402

Use this softkey to select uplink control subslot 2 as the timeslot type for the active timeslot.

You cannot mix uplink and downlink timeslots. If a timeslot is designated as downlink, it changes to uplink if you designate any other timeslot as uplink. The following table shows the timeslot type interchange to a frame designated as downlink when uplink is selected.

From Continuous Downlink Timeslot	From Discontinuous Downlink Timeslot	To Uplink Timeslot
Dn Custom Cont	Dn Custom Disc	Up Custom
Dn Normal Cont	Dn Normal Disc	Up Normal
Dn Sync Cont	Dn Sync Disc	Up Custom

When you select **Up Control 2** for a timeslot, the visual representation of the timeslot pattern updates.

Up Custom

Supported   E4438C with Option 402

Use this softkey to select an uplink 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. Uplink timeslots cannot be mixed with downlink timeslots. If you already have any timeslots designated as downlink, they will be changed to uplink when any other timeslot is designated as uplink. The custom timeslot is provided for users' flexibility; it is not a standard timeslot type.

From Continuous Downlink Timeslot	From Discontinuous Downlink Timeslot	To Uplink Timeslot
Dn Custom Cont	Dn Custom Disc	Up Custom
Dn Normal Cont	Dn Normal Disc	Up Normal
Dn Sync Cont	Dn Sync Disc	Up Custom

When you select **Up Custom** for a timeslot, the displayed representation of the timeslot pattern updates.

Up Normal

Supported   E4438C with Option 402

Press this softkey to select uplink normal as the timeslot type for the active timeslot.

You cannot mix uplink and downlink timeslots. If a timeslot is designated as downlink, it changes to uplink if you designate any other timeslot as uplink. The following table shows the timeslot type interchange to a frame designated as downlink when uplink is selected.

From Continuous Downlink Timeslot	From Discontinuous Downlink Timeslot	To Uplink Timeslot
Dn Custom Cont	Dn Custom Disc	Up Custom
Dn Normal Cont	Dn Normal Disc	Up Normal
Dn Sync Cont	Dn Sync Disc	Up Custom

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

Upper Case Off On

Supported   E4438C with Option 400

This softkey toggles between upper and lower case letters.

Up TCH

Supported   E4438C with Option 402

Use this softkey to select uplink traffic channel (mobile to base station) as the timeslot type for the active timeslot. Uplink timeslots cannot be mixed with downlink timeslots. If you already have any timeslots designated as downlink, they will be changed to uplink when any other timeslot is designated as uplink.

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

Up TCH All Models

Supported   E4438C with Option 402

Use this softkey to select uplink traffic channel (mobile to base station) as the timeslot type for all timeslots. When you select **Up TCH**, the frame pattern is bursted with RF power turning off during off timeslots.

When you select **Up TCH All Models**, the visual representation of the timeslot pattern updates.

Up VOX

Supported   E4438C with Option 402

Use this softkey to select uplink voice activated transmission channel as the timeslot type for the active timeslot.

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

Update Display Cycle End Cont

Supported   E4438C with Option UN7

Use this softkey to set the display update mode for BER measurement results.

Cycle End   This selection displays the results of the measurement when the cycle is completed.

Cont   This selection displays the intermediate results of the measurement in addition to results when the cycle is completed.

Preset   Cont

Update in Remote Off On

Supported   All Models

This softkey turns display updating on and off. The signal generator's display updates and displays the results of remote commands when this softkey is set to on. However, command processing time is faster when the softkey is set to off.

On   When on, remote commands update the signal generator's display.

Off   When off, remote commands will not update the display.

Remarks   This key is not affected by a preset. However, it resets to off when the power is cycled. This mode affects the signal generator when it is in remote mode.

Up/Down

Supported   E4438C with Option 400

This softkey sets the transport power control (TPC) pattern to repeatedly send consecutive up and consecutive down commands. The number of successive down and up commands is defined in the TPC Pat Steps field of the **PhyCH Setup** menu.

Uplink MCS-1

Supported   E4438C with Option 402

This softkey displays a selection of PN sequences that you can use as the data for an uplink 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 mulitframe 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

Uplink MCS-5

Supported   E4438C with Option 402

This softkey selects an uplink 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 mulitframe 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

Uplink MCS-9

Supported   E4438C with Option 402

This softkey selects a uplink 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 mulitframe 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

Uplink Timing Advance

Supported   E4438C with Option 300

This softkey enables you to set the uplink timing advance. Setting the uplink timing advance allows you to compensate for the insertion of equipment, such as fading simulators, into the uplink RF path.

Preset   0

Range   *GSM*: −500 to 10000 bits

                      EDGE: −500 to 10000 symbols

User File

Supported   E4438C with Option 001/601or 002/602

Use this softkey to display the catalog of binary/bit files stored in the signal generator's memory. You can select a custom file from this catalog for the data pattern or burst shape.

User files should exactly fill the data fields in a framed transmission (create the files to fill an integer number of frames). If the end of a user file does not coincide with the end of a frame, data is truncated. For more information, see the on the rear panel AUX I/O connector configuration, refer to chapter 1 of the *E4428C/38C ESG Signal Generators User's Guide*.

User FIR

Supported   E4438C with Option 001/601or 002/602

Use this softkey to display the catalog of user-defined FIR filter files stored in the signal generator's memory, and to access a menu for selecting a file.

User Flatness

Supported   All Models

This softkey enables you to specify that only user flatness correction files be listed in the catalog of files currently displayed.

User FSK

Supported   E4438C with Option 001/601or 002/602

Use this softkey to display the catalog of frequency shift keying (FSK) files stored in the signal generator's memory. You can select a custom file from this catalog for an FSK modulation by scrolling through the listed files, highlighting the desired file, and pressing the **Select File** softkey.

The selected file name and type is displayed under the **Select** softkey.

User I/Q

Supported   E4438C with Option 001/601or 002/602

Use this softkey to display the catalog of I/Q files stored in the signal generator's memory. You can select a custom file from this catalog for an I/Q modulation by scrolling through the listed files, highlighting the desired file, and pressing the **Select File** softkey.

The selected file name and type is displayed under the **Select** softkey.

Utility

Supported   All Models

Use this softkey to access a menu of choices that enables you to view and erase error messages, access the GPIB/RS-232 LAN menu, adjust the display, access a menu of adjustments for the signal generator, set the help mode and power on state, and access the memory catalog menu.

UW

Supported   E4438C with Option 400

Use this softkey to select the unique word (UW) as the active function. The preset hexadecimal value (when normal preset is selected) for UW reflects the PHS format, and the current value for UW is displayed in the UW field near the bottom of the text area of the display.

Preset   *TCH (downlink)*: 3D4C

                 TCH (uplink): E149

                 SYNC (downlink): 050EF2993

                 SYNC (uplink): 6B899AF0

Remarks   **UW** is also located in the uplink Configure TCH menu and in the downlink and uplink Configure SYNC menus.

UWCDMA

Supported   E4438C

Press this softkey to set the current catalog type to uplink W-CDMA (UWCDMA) and display the catalog of UWCDMA files.

V

View Different Header

Supported   E4438C with Option 001/601or 002/602

This softkey accesses a menu from which you can select another header file to view.

View Details

Supported   All Models

This softkey enables you to view detailed information about the highlighted test. For more information, refer to the Troubleshooting chapter of the *E4428C/38C ESG Signal Generators Service Guide*.

Remarks   This is intended for use by service personnel.

View Next Error Message

Supported   All Models

Use this softkey to display the next error message in the queue. (The first error message is the oldest error.) There may be more than one error message in the queue; the number of error messages is displayed along with the first message. Press any key to exit the Error Info menu.

View Previous Error Message

Supported   All Models

Use this softkey to display the newest error message first. Continue pressing this key to view additional error messages in order of newest to oldest. Press any key to exit the Error Info menu.

View Test Info

Supported   All Models

Use this softkey to display details of the self tests. Refer to the calibration guide for more information.

Remarks   This is intended for use by service personnel.

W

Walsh

Supported   E4438C with Option 401

This field displays the current Walsh code (orthogonal code) for the selected channel. To change the Walsh code, highlight the `Walsh` field, press the **Edit Item** softkey and enter a new code number. If the text is grayed out in this field, you cannot change the Walsh code.

Table 0-15 lists the CDMA2000 Walsh code ranges and preset values by channel type, radio configuration (RC) and bit rate.

Table 0-15

Channel Type	Walsh Code		Comment
	Preset	Range	
Forward Link			
F-PICH	0	–	Not editable
F-SYNCH	32	0–63	
F-FCH	10	RC 1,2,3,5: 0–63 RC 4: 0–127	
OCNS	61	0–63	
F-PCH	1	0–63	

Table 0-15

Channel Type	Walsh Code		Comment
	Preset	**Range**	
F-SCH1	12	RC3 19.2 kbps: 0–31 38.4 kbps: 0–15 76.8 kbps: 0–7 153.6 kbps: 0–3 RC4 19.2 kbps: 0–63 38.4 kbps: 0–31 76.8 kbps: 0–15 153.6 kbps: 0–7 307.2 kbps: 0–3 RC5 28.8 kbps: 0–31 57.6 kbps: 0–15 115.2 kbps: 0–7 230.4 kbps: 0–3	
F-SCH2	14	RC3 19.2 kbps: 0–31 38.4 kbps: 0–15 76.8 kbps: 0–7 153.6 kbps: 0–3 RC4 19.2 kbps: 0–63 38.4 kbps: 0–31 76.8 kbps: 0–15 153.6 kbps: 0–7 307.2 kbps: 0–3 RC5 28.8 kbps: 0–31 57.6 kbps: 0–15 115.2 kbps: 0–7 230.4 kbps: 0–3	
F-QPCH	80	0–127	
Reverse Link			
R-PICH	0	–	Not editable
R-DCCH	8	–	Not editable

Table 0-15

Channel Type	Walsh Code		Comment
	Preset	Range	
R-FCH	4	–	Not editable
R-SCH1	1	1, 2	
R-SCH2	2	2, 6	
R-CCCH	2	–	Not editable
R-EACH	2	–	Not editable

Preset   Refer to Table 0-15

Range   Refer to Table 0-15

Walsh Code

Supported   E4438C with Option 401

This softkey selects the Walsh code as a column by which the table will be sorted.

Waveform Catalog Types

Supported   E4438C

This softkey accesses a menu from which you can select an ARB waveform file type.

Waveform Length

Supported   E4438C with Option 403

This softkey opens a menu of waveform length choices. The longer the waveform, the more accurate the statistics (at the expense of memory usage and time taken to generate the waveform).

Preset   524288 points

Remarks   The current waveform length is displayed under the **Waveform Length** softkey.

Waveform Length *n* Short Codes

Supported   E4438C with Option 401

This softkey adjusts the waveform length for CDMA modulation. The upper limit is adjusted based on the oversample ratio to fit the signal within the available memory.

Preset   1 short code

Range   1−16 short codes (depends on oversample ratio and available memory)

Waveform Licenses

Supported   E4438C with Option 001/601or 002/602

This softkey, returns a list of Arb-based licenses (including demo) 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.

The response format is a series of comma-separated entries enclosed in quotation marks. The first field is the waveform type number and the second is a text description of the license.

Remarks   If a license appears in this list, this means that you can transfer waveform files between signal generators that have the same type of license.

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

The list duplicates the Arb-based software applications displayed with **Auxiliary Software Options**, page 58 softkey.

Waveform Runtime Scaling

Supported   E4438C with Option 001/601or 002/602

This softkey appears in two menus:

- **Dual ARB** > **ARB Setup**
- **Multitone** > **More (1 of 2)** > **ARB Setup**

This feature enables you to apply the scaling value to a currently playing waveform. Unlike scaling a waveform file in the Dual ARB Player, which has permanent and cumulative effects, Waveform Runtime Scaling enables you to make continual real-time adjustments. This is because the scaling value is always relative to the original waveform data, not the playing data. Scaling can be used to get the best dynamic range without overflowing the I and Q digital-to-analog converters

For best results, only scale a waveform enough to achieve the best dynamic range without overflowing the I and Q digital-to-analog converters. This maintains the integrity of the waveform. Scaling a waveform too much can cause it to lose bits of resolution. With runtime scaling, bit resolution is easily

recovered by increasing the scaling value.

For more information about scaling, refer to the E4428C/38C ESG Signal Generators User's Guide. To permanently scale the data in a Dual ARB waveform file, see Scale Waveform Data on page 405.

Preset	70.00%
Range	1.00–100.00%
Remarks	This scaling function does not change the data in the waveform file.

Waveform Segments

Supported	E4438C with Option 001/601or 002/602

This softkey accesses a menu and table editor from which you can store and load waveform segments to or from the non-volatile waveform memory (NVWFM) and perform various waveform utilities such as markers, scaling, and clipping.

Waveform Sequences

Supported	E4438C with Option 001/601or 002/602

This softkey accesses a menu and table editor from which you can build waveform sequences, edit existing sequences, and/or delete sequences.

Remarks	The **Edit Selected Waveform Sequence** and **Show Waveform Sequence Contents** softkeys are active only when a sequence is highlighted.

Waveform Statistics

Supported	E4438C with Option 001/601or 002/602

Use this softkey to access a menu for viewing the CCDP (Complementary Cumulative Distribution Plot) for an Arb waveform file that is currently playing.

In addition, for the dual ARB player, this softkey lets you view the CCDP for any waveform listed in the Catalog of WFM1 Files.

Remarks	To activate the softkey, the selected dual arbitrary (dual ARB) waveform generator option (such as, AWGN, Multitone, Digital Modulation, and so forth) must be turned on.

Waveform Utilities

Supported	E4438C with Option 001/601or 002/602

This softkey accesses a menu of operations that can be applied to the selected waveform segment.

Waveform utilities include: scaling, clipping, and view waveform statistics.

Remarks   Viewing waveform statistics is not available for all modulation formats.

W-CDMA

Supported   E4438C with Option 400

This softkey appears in more than one location.

Selecting the WCDMA Filter

This softkey selects the WCDMA pre-modulation filter in the Select (filter) menu. Pressing the **WCDMA** softkey selects this FIR filter and returns you to the Filter menu.

Preset   WCDMA

Remarks   If the **I/Q Mod Filter Manual Auto** softkey is set to 2.1 MHz, the WCDMA filter will include compensation for droop and phase of the 2.1 MHz hardware filter. If the **I/Q Mod Filter Manual Auto** softkey is set to 40.0 MHz or Through, the compensation is removed, and the WCDMA filter becomes identical to a root-raised cosine filter with an alpha of 0.22.

In the Catalog of Files

Press this softkey to set the current catalog type to WCDMA and display the catalog of WCDMA files.

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

W-CDMA

Supported   E4438C with Option 400

Use this softkey to select a menu of W-CDMA personalities.

W-CDMA Define

Supported   E4438C with Option 400

This softkey displays the W-CDMA Define menu for the uplink or downlink. This menu allows you to define a W-CDMA signal. With the **Multicarrier Off On** softkey set to On, this softkey is replaced with the **Multicarrier Define** softkey.

Remarks   Refer to "Multicarrier Define" on page 304 for more information.

W-CDMA Off On

Supported   E4438C with Option 400

This softkey selects the operating state of the wideband CDMA (W-CDMA) waveform generator.

Off   This selection turns off the W-CDMA waveform generator.

On   This selection turns on the W-CDMA waveform generator and a waveform based on the current settings is generated. This waveform resides in volatile memory.

Preset   Off

W-CDMA Select

Supported   E4438C with Option 400

This softkey accesses a menu of channel selections that can be used to configure the signal generator for W-CDMA. The menu will change, depending on whether uplink or downlink has been selected. In downlink, 1 DPCH channel is the default selection. The **Multicarrier Off On** softkey will change the menu selections for downlink. In uplink, a DPPCH channel is the default selection.

NOTE   The **Multicarrier Off On** softkey and related functions are accessed only when using the W-CDMA downlink setup.

Preset   1 DPCH

Remarks   Refer to for more information.

Multicarrier Off

Supported   E4438C with Option 400

The **W-CDMA Select** softkey menu displays selections for a pre-defined channel setup, stored custom state or test models.

Preset   1 DPCH

Remarks   This is the default condition when downlink is selected.

Multicarrier On

Supported   E4438C with Option 400

Displays the multicarrier W-CDMA Select menu, where you can select a 2, 3, or 4 multicarrier setup or a stored custom W-CDMA multicarrier setup.

Remarks   With multicarrier on, the W-CDMA Select softkey will automatically show **2 Carriers** as the selection.

WFM1

Supported   All Models with Option 001,002

Press this softkey to specify that only ARB waveform files be listed in the catalog of files.

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

White Pixels Screen Test

Supported   All Models

This softkey enables you to set all of the pixels on the display to white. Press the **Local** hardkey to return the display to normal operation.

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

Window

Supported   E4438C with Option 001/601or 002/602

Use this softkey to access a menu for applying a windowing function to the selected filter. The default is to use no windowing which optimizes the passband response (EVM). Several windowing selections are provided in this menu which can be applied to smooth the filter's transition to zero. Windowing improves out of band performance (ACP) but simultaneously degrades EVM.

The selected window type is displayed under the **Window** softkey.

Preset   None

Wireless Networking

Supported   E4438C with Option 406

This softkey enables you to access a menu of installed wireless LAN standards.

Word Alignment

Supported   E4438C with Option 003 or 004

This softkey, for the N5102A module, enables you to align bits when the word size is less than 16 bits. When MSB is selected, the MSB of the data will always be on the same data line and the LSB will move depending on the number of bits in the word. When LSB is selected, the LSB of the data will always be on the same data line and the MSB will move depending on the number of bits in the word. This feature is only available in parallel modes.

Preset   MSB

Word Size

Supported   E4438C with Option 003 or 004

This softkey, for the N5102A module, sets the number of bits in each sample transmitted through the N5102A module. A word is defined as an integer number of bits from 4 to 16. For parallel and parallel interleaved data, Word is synonymous with sample. Any unused data lines are driven low.

Preset   16

Range   4–16

Y

Yig Pretune Calibration

Supported   E4438C with Option UNJ

Use this softkey to perform a Yitrium-Iron-Garnet (Yig) oscillator pre-tune calibration routine. This calibration routine is performed as part of the signal generator's regular calibration check. The routine optimizes the Yig oscillator pre-tune voltage so that minimal correction is needed by the phase lock loop to achieve phase lock.

NOTE   This function should be performed by trained personnel or under direction from the Agilent Service Center. Refer to the *E4428C/38C ESG Signal Generators User's Guide* for information on contacting the Agilent Service Center.

Z

Zoom In

Supported   E4438C with Option 001/601or 002/602

This softkey decreases the range of waveform sample points shown on the marker display. Each press of the softkey reduces the sample range by approximately a factor of two.

Remarks   The marker display shows a maximum of 460 points. Displayed waveforms with a sample range greater than 460 points may not show the marker locations.

Zoom Out

Supported   E4438C with Option 001/601or 002/602

This softkey increases the range of waveform sample points shown on the marker display. Each press of the softkey increases the sample range by approximately a factor of two.

Remarks   Displayed waveforms with a sample range greater than 460 points may not show the marker locations.

Zoom in Max

Supported   E4438C with Option 001/601or 002/602

This softkey decreases the waveform sample range to 28 samples as shown on the marker display.

Zoom out Max

Supported   E4438C with Option 001/601or 002/602

This softkey increases the waveform sample range to its maximum as shown on the marker display.

Remarks   Displayed samples in excess of 460 may not show the active marker locations. When this occurs, use the zoom in feature to display the active markers.

Z