Product Information

Product Information

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Options for E5061B

The following list shows available options. Some options can be retrofitted on your E5061B. For upgrade (retrofit) kits, refer to http://www.agilent.com/find/ena_support.

- Test Set Options
- Software Options
- Hard Disk Drive Options
- Timebase Options
- Accessary Options
- Calibration Option
- System Rack Options

Other topics about Product Information

Test Set Options

Option Number	Description
3L5	LF-RF Network Analyzer with DC bias, 5 Hz to 3 GHz.
215	Network Analyzer 100 kHz to 1.5 GHz, S-parameter test set, 50 Ω system impedance
235	Network Analyzer 100 kHz to 3 GHz, S-parameter test set, 50 Ω system impedance
115	Network Analyzer 100 kHz to 1.5 GHz, T/R test set, 50 Ω system impedance
135	Network Analyzer 100 kHz to 3 GHz, T/R test set, 50 Ω system impedance
217	Network Analyzer 100 kHz to 1.5 GHz, S-parameter test set, 75 Ω system impedance
237	Network Analyzer 100 kHz to 3 GHz, S-parameter test set, 75 Ω system impedance
117	Network Analyzer 100 kHz to 1.5 GHz, T/R test set, 75 Ω system impedance

137	Network Analyzer 100 kHz to 3 GHz, T/R test set, 75 Ω system impedance

These options are displayed at the option information.

Software Options

Option Number	Description
005	Impedance Analysis for LF-RF VNA
010	Time Domain/Fault Location Analysis

NOTE Option 005 can be installed with Option 3L5.

These options are displayed at the option information. To activate the software option, refer to Activating Software Option.

Hard Disk Drive Options

Option Number	Description
019	Standard (non-removable) HDD [Discontinued]
020	Standard HDD

These options are displayed at the option information.

Time Base Options

Option Number	Description
1E5	High Stability Time base

These options are displayed at the option information.

Accessary Options

Option Number	Description
720	50 Ω resistor set
810	Add Keyboard

820	Add Mouse

Calibration Option

Option Number	Description
A6J	ANSI Z540 Compliant Calibration
1A7	ISO 17025 Compliant Calibration

System Rack Options

Option Number	Description	Equivalent Agilent Part Number
1CM	Rack Mount Kit	5063-9216
1CN	Front Handle Kit	5063-9229
1CP	Rack Mount and Front Handle Kit	5188-4430

Documentations for E5061B

- Manuals
- Sales Literature

Other topics about Product Information

Manuals

The following documentations are provided with the E5061B.

Name	Description
Help (This file)	Provides the information about the measurement operation, programming, built-in VBA, I/O interface.
Installation Guide	Provides information about start up setup and system recovery information when the Windows cannot be boot up. This is furnished with the E5061B as a hardcopy manual.
Service Guide	Provides information about the parts, troubleshooting, performance test, adjustment and service menu.

Both Installation Guide and Service Guide can be downloaded from http://www.agilent.com/find/e5061b-manual. The latest revision of Help System, Help in PDF and WebHelp formats are also available at the site.

Sales Literature

The following sales literatures are available on http://www.agilent.com/find/ena-lf.

- Brochure
- Data sheet
- Configuration Guide (Ordering information)
- Application notes

Specifications

The Data Sheet (PDF format) shows the E5061B specifications. This is for option 3L5.

The information for options 115/117/135/137/215/217/235/237 is available at http://cp.literature.agilent.com/litweb/pdf/5990-4392EN.pdf

For its history, see the Data Sheet Revision History.

Other topics about Product Information

Customer Contacts

For assistance on E5061B, refer to http://www.agilent.com/find/assist for your regional customer contacts. Click **Select a Country or Area** on the upper right of the web page to select your region.

Other topics about Product Information

Error Messages

Error Messages

An error message is displayed against a red background in the instrument message/warning area in the lower left part of the screen. Pushing a front panel key or executing :DISP:CCL command clears the error message. Errors caused by the operation of a front panel key simply appear on the display. They are not stored in the error queue with some exceptions.

An error with a positive error number is uniquely defined for this instrument. On the other hand, an error with a negative error number is basically defined for common GPIB devices in IEEE488.2.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A

No.	Message	Description
20	Additional standard needed	The GPIB command that turns ON the calibration function has been sent before to all of the data measurements needed to calculate the calibration factor that has been completed. In 1-port calibration, for example, when measurements are completed for OPEN and SHORT standards but not yet for LOAD standard: Try to turn ON the calibration function by calculating 1-port calibration coefficient using SENS:CORR:COLL:SAVE. Be sure to measure all necessary calibration data before sending the commands. This error is not generated by front key operations.
58	Auto port extension not allowed	This message appears when you try to execute the auto port extension when the sweep type is power or DC bias sweep.

B

No.	Message	Description
-168	Block data not allowed	An block-data element has been received at a position where this instrument does not accept one.

C

No.	Message	Description
97	Calculate equivalent parameter failed	This error occurs when the equivalent circuit analysis command SCPI.CALCulate(1-4).EPARameters.EXECute is executed and one or more of the parameters (R1, C1, L1, C0) could not be calculated.
430	Calibration below 100kHz not allowed with AC-couple mode	The calibration cannot be performed. The calibration for s-parameter measurement with AC couple should be performed when the minimum frequency is 100 kHz or above. Check if the frequency setting is correct.
240	Calibration data lost	This error occurs when a file containing the system calibration data is not found or in a damaged state at time of the startup of this instrument, indicating a failure of this instrument. Contact the Agilent Technology sales office or the company from which you bought the instrument.
22	Calibration method not selected	This error occurs when the command for validating the calibration data, SENS:CORR:COLL:SAVE is executed before the command for selecting a calibration type, SENS:CORR:COLL:METH:xxxx, is executed. This error is not generated by front key operations.
-148	Character data not allowed	A character data element (not violating the standard) has been received at a position where this instrument does not accept one. Double quotes (") are omitted where it is necessary to place a parameter in double quotes ("), for example.
-100	Command error	A comprehensive syntax error has occurred showing that this instrument cannot detect a more detailed error. This code simply shows that a command error defined in 11.5.1.1.4, IEEE488.2 has occurred.
90	Compensation required	Compensation is required.
460	Continuous switching may damage source	This error occurs when different power ranges are selected in multiple channel measurement settings to avoid source attenuator damage.

	switch	

D

No.	Message	Description
-222	Data out of range	A data element (not violating the standard) outside the range defined by this instrument has been received. This error occurs when an integer-based command for which the parameter can be rounded exceeds the range of -65536 to +65536 or when a real-number-based command for which the parameter can be rounded exceeds the range of -9.9e37 to +9.9e37, for example. This error occurs also when a numeric value other than a specified one is entered into a command in which the "port number" and "CalKit number" are specified as parameters and hence the parameters are not rounded. Such commands are, for example, SENS:CORR:COLL:ACQ:OPEN, SENS:CORR:COLL:ECAL:SOLT2, SENS:CORR:COLL:CKIT:ORD:LOAD, etc.
-104	Data type error	The parser has recognized a data element that must not exist. Block data is sent instead of numeric value data or character string data that had been expected, for example.
441	DC Bias not allowed (ECal Module Connected)	When an ECal is connected on the E5061B USB port, DC Bias cannot be turned ON. Disconnect the ECal.
440	DC Bias not allowed on Port 1 (S-Param couple AC)	When the port coupling is set to AC, DC bias cannot be turned ON.

E

No.	Message	Description
32	ECal module not in appropriate RF path	This error occurs when an ECal command, SENS:CORR:COLL:ECAL:SOLTn, is executed with the port on the ECal module not connected correctly to the instrument. When the auto-detect function is turned OFF, (SENS:CORR:COLL:ECAL:ORI OFF), however, this

		error does not occur even when the port on the ECal module is not connected correctly to the instrument.
502	Equation runtime error	This error occurs under the following conditions: • The trace number in data(tr)/mem(tr)/xAxis(tr) is out of range # of trace available depends on the maximum number of channel/traces • The port number in Advanced math function is out of range # of port available depends on the model option
95	Equivalent circuit analysis not allowed	The equivalent circuit analysis is only allowed when Option 005 is installed and impedance measurement is selected. Else, the analysis is not allowed, hence error occurs.
-200	Execution error	An error associated with execution has been generated for which this instrument cannot specify the error message. This code shows that an error associated with execution defined in 11.5.1.1.5, IEEE488.2 has occurred. This error also occurs when a calibration measurement is aborted.
-123	Exponent too large	The absolute value of the exponent exceeds 32,000 (see 7.7.2.4.1, IEEE488.2).
-178	Expression data not allowed	An expression-data element has been received at a position where this instrument does not accept one.
-170	Expression error	When the expression data is put to syntactic analysis, an error not corresponding to one of Error Numbers -171 through -179 occurs.

F

No.	Message	Description
31	Failed to configure ECal module	This error occurs when the control of the ECal module fails at the time of executing an ECal command, SENS:CORR:COLL:ECAL:SOLTn. The failure results are from the failure to connect the ECal module to the USB port, failure of the ECal module, etc.

102	Failed to copy file	This error occurs when copying a file (MMEM:COPY command) fails.
104	Failed to create directory	This error occurs when creating a directory (MMEM:MDIR command) fails.
103	Failed to delete file	This error occurs when deleting a file (MMEM:DEL command) fails.
100	Failed to read file	This error occurs when the formatted data array (MMEM:LOAD:FDAT command) and limit table (MMEM:STOR:LIM command) for the active trace on the active channel, segment sweep table (MMEM:LOAD:SEGM command) for the active channel, a VBA project file (MMEM:LOAD:PROG command), etc. cannot be read normally.
101	Failed to write file	This error occurs when the formatted data array (MMEM:STOR:FDATcommand) and limit table (MMEM:STOR:LIM command) for the active trace on the active channel, segment sweep table (MMEM:STOR:SEGM command) for the active channel, display image (MMEM:STOR:IMAG command) for the LCD screen, a VBA project file (MMEM:STOR:PROG command), etc. cannot be written normally.
54	Fault location, Gate not allowed	This message appears when you turn ON the fault location/gating function of the time domain feature, while measurement points are set to two, or sweep type is set to other than linear sweep Set the measurement points to three or more and the sweep type to linear sweep, and then turn ON the fault location and/or gating conversion function.
-257	File name error	A file name error. This message appears when an error exists in the file name and hence a command is not executed correctly. This error occurs when you try to copy to an unsuitable file name, for example.
-256	File name not found	The specified file name is not found and hence the command is not executed correctly. This error occurs when you try to read a file that does not exist in a disk or a disk is not correctly inserted into the drive to read or write a file, for example.

107	File transfer failed	This error occurs when writing data into or reading data from a file (MMEM:TRAN command) fails.

G

No.	Message	Description
431	Gain-Phase calibration not allowed at f>30MHz	The calibration cannot be performed. The calibration for gain-phase measurement should be performed when the maximum frequency is 30 MHz and below. Check if the frequency setting is correct.
432	Gain-Phase calibration not allowed with Port 1 DC Bias	The calibration cannot be performed. The calibration for gain-phase measurement should be performed when DC bias is selected at LF port. Select the LF port for DC bias.
421	Gain-Phase measurement not allowed at f>30MHz	The measurement cannot be performed. The maximum frequency for the Gain-Phase measurement is 30 MHz and below. Check if the frequency setting is correct. When this error occurs, the trigger is held for the channel.
422	Gain-Phase measurement not allowed with Port 1 DC Bias	The measurement cannot be performed. When the Gain-Phase measurement is performed, you can not select the port1 for DC bias. Select the LF port for DC bias. When this error occurs, the trigger is held for the channel.
702	Gain-Phase R ch IF overload	The excessive signal has been input on port R. When this error occurs, the attenuator and input impedance settings are set at 20 dB and 1 MΩ, respectively and signal source and DC bias is turned OFF. Check the input signal level on port R.
722	Gain-Phase R ch overload	The excessive signal has been input on port R. When this error occurs, the attenuator and input impedance settings are set at 20 dB and 1 MΩ, respectively and signal source and DC bias is turned OFF. Check the input signal level on port R.
703	Gain-Phase T ch IF overload	The excessive signal has been input on port T. When this error occurs, the attenuator and input impedance settings are set at 20 dB and 1 MΩ, respectively and signal source and DC bias is turned OFF. Check the input signal level on port T.

723	Gain-Phase T ch overload	The excessive signal has been input on port T. When this error occurs, the attenuator and input impedance settings are set at 20 dB and 1 MΩ, respectively and signal source and DC bias is turned OFF. Check the input signal level on port T.
-105	GET not allowed	A group execution trigger (GET) has been received in the program message (see 7.7, IEEE488.2).

H

No.	Message	Description
-240	Hardware error	When hardware error occurs, this error is displayed.
-114	Header suffix out of range	The unit of the header is outside the range. The header is invalid in the unit for numeric parameters following a SCPI command.

I

No.	Message	Description
-224	Illegal parameter value	The parameter value is not suitable. This error occurs when the CALC:PAR:DEF command is used to specify an S-parameter that does not exist in the model (specify S44), for example.
-282	Illegal program name	This error occurs when a nonexistent VBA program name is specified by the PROG:SEL:NAME command.
-213	Init ignored	Because another measurement is in progress, the request for initiating a measurement ("INIT" command) is ignored.
35	Insufficient ECal module memory	This error occurs when the embedded memory is insufficient to save the user property in ECal module during the user definition ECal processing.
-161	Invalid block data	Block data has been expected, but the block data that appears is invalid for some reason (see 7.7.6.2, IEEE488.2). The END message is received before the length of block data has been filled, for example.
28	Invalid calibration	If the type of calibration is not specified or not correct when partial overwrite is executed with the GPIB command, this error occurs. This error does not occur

	method	for operation with front keys.
-101	Invalid character	An invalid character exists in the program message character string.
-141	Invalid character data	An invalid character is found in the character data element, or the parameter received is not valid.
-121	Invalid character in number	A character that is invalid for the data type subject to syntactic analysis has been received. For example, a letter is found in a decimal numeric value or a numeric character "9" in octal data.
500	Invalid equation expression	The equation expression used in Equation Editor is not valid.
501	Invalid equation label	The equation label used in Equation Editor is not valid.
-171	Invalid expression	The expression-data element is invalid (see 7.7.7.2, IEEE488.2). For example, parentheses are not paired, or illegal characters are used.
-232	Invalid Format	A legal program data element was parsed but could not be executed because the data format or structure is inappropriate. For example when loading memory tables or when sending a SYSTem:SET parameter from an unknown instrument.
-103	Invalid separator	The parser (a syntactic analysis program) had been expecting a delimiter, but a character that is not a delimiter has been sent.
-151	Invalid string data	Character string data has been expected, but the character string data that appears is invalid for some reason (see 7.7.5.2, IEEE488.2). The END message is received before the ending quotation mark character appears, for example.
-131	Invalid suffix	The suffix does not comply with the syntax defined in 7.7.3.2, IEEE488.2. Or it does not suit E5061B.

L

No.	Message	Description

713	LF Out source current overload	The current of LF Out signal exceeds the limit. LF Out has been turned OFF automatically.
712	LF Out source voltage overload	The voltage of LF Out signal exceeds the limit. LF Out has been turned OFF automatically.
53	Log sweep requires 2 octave minimum span	The span of sweep range did not satisfy the requirement for logarithmic sweep. The sweep type is automatically changed to linear sweep when this error occurs. For example, this error occurs when, with the start and stop frequency are set 1 MHz and 2 MHz respectively, the sweep type is changed to logarithmic sweep. Set the stop frequency to more than four times as many as the start frequency. And then select logarithmic sweep.

M

No.	Message	Description
420	Measurement below 100kHz not allowed with AC-couple mode	The measurement can not be performed. The minimum frequency for the S-parameter measurement with AC couple is 100 kHz and above. Check if the frequency setting is correct. When this error occurs, the trigger is held for the channel.
-109	Missing parameter	The number of parameters is less than that required for the command, or the parameter has not been entered. For example, the command SCPI.SENSe(Ch).SWEep.POINts (SENS:SWE:POIN) requires one more parameter. Therefore, when a message "SENS:SWE:POIN" is sent, this error is returned.
96	Must be more than 2 points for analysis	The number of points are not sufficient. At least 2 points are required to perform the equivalent circuit analysis.

N

No.	Message	Description

52	No valid memory trace	This error occurs when you have executed either DISP:WIND:TRAC:MEM ON command to display memory trace, or any other command to enable data calculation using memory trace (CALC:MATH:FUNC command with other than NORM is specified), though no valid data exists in memory trace. This error is not generated by front key operations.
80	Not enough points for connector model	Insufficient points for the connector model
-120	Numeric data error	An error resulting from the numeric value data (including numeric value data having no decimal point representation) has occurred. A numeric value error other than Errors -121 through -129 has occurred.
-128	Numeric data not allowed	An numeric-value-data element (not violating the standard) has been received at a position where this instrument does not accept one.

O

No.	Message	Description
200	Option not installed	The received command has been ignored because of the mismatch between the contents of an option for this instrument and the command. It also occurs when you try to enable the fault location function in a model not having the fault location option. This holds true for the SRL (Structural Return Loss) option. This error is not generated by front key operations.
-225	Out of memory	Insufficient memory is available in this instrument to perform the required operation.

P

No.	Message	Description
-220	Parameter error	When a parameter-related error other than Errors -221 through -229 occurs, that error is displayed.
-108	Parameter not allowed	The number of parameters exceeds the one required for the command.

		For instance, when a program message ":SENS1:SWE:TYPE LIN, SEGM" is sent instead of a correct program message with a command ":SENS1:SWE:TYPE LIN" which requires a parameter, the instrument receives the message as the number of parameters is invalid. See the command reference to confirm the required number of parameters.
41	Peak not found	This error occurs when, after specifying a peak and executing the CALC:MARK:FUNC:EXEC and CALC:FUNC:EXEC commands, the specified peak is not found in the marker search analysis.
220	Phase lock loop unlocked	This error occurs when the PLL circuit of this instrument becomes unlocked while the measurement is in progress. The measurement value is not correct. This error may occur when an external reference out of specification is connected to this instrument. Should an error occur with an external reference not connected, this instrument is faulty. Contact an Agilent Technology sales office or the company from which you bought the instrument.
400	Port 1 DC Bias not enabled	Port 1 DC BIAS can not be enabled
700	Port 1 receiver IF overload	The excessive signal has been input on port 1. When this error occurs, signal source and DC is turned OFF. Check the input signal level on port 1.
720	Port 1 receiver overload	The excessive signal has been input on port 1. When this error occurs, signal source and DC is turned OFF. Check the input signal level on port 1.
711	Port 1 source current overload	The current of Port 1 signal exceeds the limit. Signal source and DC is turned OFF automatically.
710	Port 1 source voltage overload	The voltage of Port 1 signal exceeds the limit. Signal source and DC is turned OFF automatically.
701	Port 2 receiver IF overload	The excessive signal has been input on port 2. When this error occurs, signal source is turned OFF. Check the input signal level on port 2.

721	Port 2 receiver overload	The excessive signal has been input on port 2. When this error occurs, signal source is turned OFF. Check the input signal level on port 2.
241	Power on test failed	This error occurs when the power-on test fails, indicating a failure of this instrument. Contact an Agilent Technology sales office or the company from which you bought the instrument.
61	Power unleveled	The out power level exceeds available range. For example, if the level after correction exceeds the power level that can be outputted when correcting the power level with the power slope feature, this error occurs. Check that the power level is set correctly and the correction value of the power slope is set correctly.
121	Print failed	This error occurs when printing fails for reasons other than Error 120, Printer error.
120	Printer error	This error occurs when the previous printing is still in progress or the printer fails (offline, short of paper, etc.) at the time of outputting the display image on the LCD screen to the printer (SCPI.HCOPy.IMMediate command).
-284	Program currently running	This error occurs when the PROG:SEL:STAT RUN command is executed with the VBA program in the Run state.
-112	Program mnemonic too long	The length of the header exceeds 12 characters (see 7.6.1.4.1, IEEE488.2).
-286	Program runtime error	An error occurring when VBA is executed.

Q

No.	Message	Description
-430	Query DEADLOCKED	The state that generates a "DEADLOCKED" Query error (see 6.3.1.7, IEEE488.2). This error occurs when both input and output buffers have become full, preventing the instrument from continuing processing, for example.

-400	Query error	A comprehensive query error has occurred showing that this instrument cannot detect a more detailed error. This code simply shows that a query error defined in 11.5.1.1.7 and 6.3, IEEE488.2 has occurred.
-410	Query INTERRUPTED	The state that generates a "INTERRUPTED" Query error (see 6.3.2.3, IEEE488.2). This error occurs when data bytes (DAB) or GET are received before the transmission of the response when a query is not completed, for example.
-420	Query UNTERMINATED	The state that generates an "UNTERMINATED" Query error (see 6.3.2, IEEE488.2). This error occurs when this instrument is designated as the talker and an incomplete program message is received, for example.
-440	Query UNTERMINATED after indefinite response	After a query asking for an indefinite response has been run, another query is received in the same program message (See 6.5.7.5.7, IEEE488.2).
-350	Queue overflow	The queue contains a specific code in place of the code which caused this error. The code indicates that the error occurred because of no space is available in the queue, but the error is not recorded.

R

No.	Message	Description
105	Recall failed	This error occurs when reading an instrument status file (State01.sta, etc.) (MMEM:LOAD:STAT command) fails.
45	Reference tracking not allowed with Log-Y scale	Reference tracking is not allowed with Log-Y scale.

S

No.	Message	Description
106	Save failed	This error occurs when writing an instrument status file (State01.sta, etc.) (MMEM:STOR:STAT command)

		fails.
33	Selected parameter not valid for confidence check	This error occurs when the parameter except S-parameter has been selected, while using the confidence check function for calibration coefficient. Select S-parameter (S11, S21, S12 or S22).
57	SnP request not valid	This error occurs when you try to save data to a Touchstone file but no measurement has been executed. This error also occurs when you try to save a Touchstone file with power sweep measurement specified.
50	Specified channel hidden	This error occurs when an attempt is made to activate a channel not on display using the DISP:WIND:ACT command. This error is not generated by front key operations.
23	Specified error term does not exist	The error occurs when the calibration coefficient type of the parameter specified in the read/write command of the calibration coefficient (SENS:CORR:COEF) is invalid for the calibration type selected by the calibration type selection command (SENS:CORR:COEF:METH:xxxx.) This error is not generated by front key operations.
21	Specified ports overlapped	This error occurs when a port number is duplicated in a command requiring two or more port numbers as parameters. Such commands are, for example, SENS:CORR:COLL:THRU 2,2. Specify port setup correctly to avoid duplication of ports. This error is not generated by front key operations.
51	Specified trace dose not exist	This error occurs when CALC:PAR:SEL command is executed to activate more traces than specified by CALC:PAR:COUN command. This error is not generated by front key operations.
455	Specified Z Conversion not allowed with Gain-Phase Port	This error occurs when SCPI.SENSe(1-4).Z.METHod command is executed and the selected method does not match the defined Gain-Phase port.
456	Specified Z	This error occurs when SCPI.SENSe(1-4).Z.METHod

	Conversion not allowed with S-Param Port	command is executed and the selected method does not match the defined S-Parameter port.
-150	String data error	When a character-string-data element is put to syntactic analysis, an error not corresponding to one of Error Numbers -151 through -159 occurs.
-158	String data not allowed	A character-string-data element has been received at a position where this instrument does not accept one.
-138	Suffix not allowed	A suffix is attached to a numeric value element to which a suffix is not allowed to be attached.
-134	Suffix too long	The unit is too long. The unit is expressed in 12 or more characters (see 7.7.3.4, IEEE488.2).
-102	Syntax error	A command or data type that is not recognized exists.
-310	System error	One of the errors designated as "system errors" in this instrument has occurred.

T

No.	Message	Description
40	Target value not found	This error occurs when the target is not found during the marker search analysis after specifying the target and executing the CALC:MARK:FUNC:EXEC and CALC:FUNC:EXEC commands. This error occurs also when the bandwidth is not found after executing the bandwidth marker command, CALC:MARK:BWID:DATA?
-124	Too many digits	The number of digits of the argument of the decimal numeric-value-data element exceeds 255 with the preceding 0 removed (see 7.7.2.4.1, IEEE488.2).
-223	Too much data	The block-, expression-, or character-string-type program data that has been received conforms with the standard. But it exceeds the amount that can be processed under the condition of the memory or conditions specific to memory-related devices. In this instrument, this error occurs when the number of characters exceeds 254 in a character-string parameter.

-211	Trigger ignored	This instrument receives and detects a trigger command ("TRIG") or an external trigger signal. But it is ignored due to the timing condition (This instrument is not in the wait-for-trigger state, for example). Change the setup so that a trigger command or an external trigger signal can be sent after the instrument has entered the wait-for-trigger state.

U

No.	Message	Description
-113	Undefined header	A command not defined in this instrument, though not illegal in the syntactic structure, has been received. For example, when a message ":DISP:WIND1:TABL:MEM ON" is sent to a correct program message ":DISP:WIND1:TRAC1:MEM ON," the message sent is received as an undefined command by this instrument. See the command reference and use correct commands. This error occurs also when a port that does not exist in this model is specified in a command specifying a port number as an index. Such commands are SENS:CORR:EXT:AUTO:PORTn, SENS:CORR:COLL:ADAPn:xxxx, CALC:SRL:CONNn:xxxx, and SENS:CORR:EXT:PORTn:xxxx; they include "n" as a part.
34	User characterization not found in module	This error occurs when the selected user profile is not detected in the ECal memory, while reading it from the ECal module, written by the user definition ECal.

V

No.	Message	Description
30	Valid Ecal module not found	This error occurs when a required ECal module is not connected on the E5061B. This error occurs, for example, when the Ecal characterization is executed with 4 port Ecal. Use 2 port Ecal in this case.

Warning Message

A warning message is displayed in the instrument message/Warning area in the lower left part of the display against a gray background. Pushing a front panel key or executing :DISP:CCL command clears the message.

This message simply appears on the display, being not known to a remote environment such as a GPIB. This message is not displayed when another error (against a red background) is already displayed in the instrument message/Warning area.

Warning Messages during Measurement

Messages	Description
Calibration data lost ([parameter])/	One or more of the below calibration data is lost. The lost parameter is indicated in the message, for example, calibration data lost (band information): (nominal value), (band information), (frequency reference), (synthesizer gain), (source output power), (DC bias level), (mixer offset), (receiver IF range), (port characteristics), (gain phase ratio), (absolute gain), (distortion), (src dc offset), (constants for sweep controller)
Invalid key code	The key code entered to enable or disable an option is incorrect. Enter the correct key code to proceed.
Load VBA project error	This warning message is displayed when the attempt to upload a VBA project fails. Check the validity of the VBA project file.
Peak not found	This warning message is displayed when, with the tracking turned ON, the peak specified by the marker search has not been found by the time the sweep is finished (with the tracking executed).
Target value not found	This warning message is displayed when, with the tracking turned ON, the target specified by the marker search has not been found by the time the sweep is finished (with the tracking executed). This warning message is displayed also when, with the bandwidth marker displayed, the setting for the bandwidth marker is changed at the end of the sweep, or when, with the active marker changed or moved, the bandwidth is not found.

Unable to find help file	This warning message appears when Help file could not be executed when you press the **Help** key. The file is either corrupted or unavailable.
Unable to find help id file	This warning message appears when Help file could not be executed when you click a button at the menu bar and press the **Help** key to execute a help topic related to the button. The help id file is either corrupted or unavailable.

Default Conditions

Analysis

Key Operation			Default Value	Preset	Backup	Save/Recall
Gating	**Gating**		OFF	←		√
	Start		-10 ns	←		√
	Stop		10 ns	←		√
	Center		0 s	←		√
	Span		20 ns	←		√
	Type		Bandpass	←		√
	Shape		Normal	←		√
	Unit		Seconds	←		√
Fault Location	**Fault Location**		OFF	←		√
	Start		-10 ns	←		√
	Stop		10 ns	←		√
	Center		0 s	←		√
	Span		20 ns	←		√
	Type		Bandpass	←		√
	Window		Normal	←		√
		Impulse Width	650.3957 psec	←		√
		Step Rise	328.6776 psec	←		√

		Kaiser Bata	6	←		√
	Reflection Type		Round Trip	←		√
	Cable Loss		0 dB/μs	←		√
	Unit		Seconds	←		√
SRL	**SRL**		OFF	←		√
	Port 1/2 Connector	**Length**	0 m	←		√
		Capacitance	0 F	←		√
	Auto Z		ON	←		√
	Z Cutoff Freq		210 MHz	←		√
	Manual Z		50 Ω	←		√
Conversion	**Conversion**		OFF	←		√
	Function		Z:Reflection	←		√
Limit Test	**Limit Test**		OFF	←		√
	Limit Line		OFF	←		√
	Clip Lines		ON	←		√
	Limit Line Offsets	**Stimulus Offset**	0 Hz	←		√
		Amplitude Offset	0 dB	←		√
	Fail Sign		ON	←		√

Ripple Limit	**Ripple Limit Test**	OFF	←		√
	Ripple Limit	OFF	←		√
	Ripple Value	Off	←		√
	Ripple Band	1	←		√
	Fail Sign	ON	←		√
Bandwidth Limit	**BW Test**	OFF	←		√
	BW Display	OFF	←		√
	BW Marker	OFF	←		√
	N dB Points	3 dB	←		√
	Min Bandwidth	10 kHz	←		√
	Max Bandwidth	300 kHz	←		√
	Fail Sign	ON	←		√
Equivalent Circuit	**Select Circuit**	A	←		
	Display	OFF	←		

Avg

Key Operation	Default Value	Preset	Backup	Save/Recall
Avg Factor	16	←		√
Averaging	OFF	←		√
Avg Trigger	OFF	←		√
SMO Aperture	1.5 %	←		√
Smoothing	OFF	←		√
IF Bandwidth	30 kHz	←		√
IFBW Auto	OFF	←		√
IFBW Auto Limit	30 kHz	←		√

Cal

Key Operation				Default Value	Preset	Backup	Save/ Recall
Correction				OFF	←		√
Calibrate	Response (Open)	Select Port		1	←		
	Response (Short)	Select Port		1	←		
	Response (Thru)	Select Ports		2-1 (S21)	←		
	Enhanced Response	Select Ports		2-1 (S21)	←		
	1-Port Cal	Select Port		1	←		
	Adapter Removal	Port 1/2	Length	Auto (0 s)	←		
		Cal Kit		85032B /E	←		
	Impedance Calibration	Open		Open (f)	←		√
		Short		Short (f)	←		
		Load		Broad Band	←		
ECal	Enhanced Response			2-1 (S21 S11)	←		√
	Isolation			OFF	←		√
	Characterization			Factory	←		√
	Orientation			Auto	←		√
Property				OFF	←		√
Cal Kit				85032B /E	←		√
Modify Cal Kit	Define STDs			Define STDs	←		√

	Label Kit			85032B /E			
Port Extensions	**Extensions**			OFF	←		√
	Auto Port Extension	**Select Ports (Port 1/Port 2)**		ON	←		√
		Method		Current Span	←		√
		Method	**User Span Start**	5 Hz	←		√
		Method	**User Span Stop**	3 GHz	←		√
		Include Loss		OFF	←		√
		Adjust Mismatch		OFF	←		√
	Extension Port 1/Port 2	**Extension**		0 s	←		√
		Loss 1		OFF	←		√
		Loss 1		0 dB	←		√
		Freq1		1 GHz	←		√
		Loss 2		OFF	←		√
		Loss 2		0 dB	←		√
		Freq2		1 GHz	←		√
		Loss at DC		0 dB	←		√
Velocity Factor				1	←		√
Set Z0				50 Ω	←		√
Fixture Compensation	**Fixture Compensation**			OFF	←		√
		Compen Open		OFF	←		√

		Compen Short	OFF	←		√
		Compen Load	OFF	←		√
	Compen STDs	**Open Ls**	0	←		√
		Open Gs	0	←		√
		Open Cp	0	←		√
		Short Ls	0	←		√
		Short Rs	0	←		√
		Short Cp	0	←		√
		Load Ls	0	←		√
		Load Rs	50	←		√
		Load Cp	0	←		√
	Fixture		None	←		
	Modify User Fxt.		0	←		
	Z Port Extension		0	←		

Center

Key Operation	Default Value	Preset	Backup	Save/Recall
	1.50005 GHz	←		√

Display

Key Operation	Default Value	Preset	Backup	Save/Recall
Allocate Channels	x1	←		√
Number of Traces	1	←		√
Allocate Traces	x1	←		√
Display	Data	←		√
Data Math	OFF	←		√
Equation	OFF	←		√
Edit Title Label	""	←		√
Title Label	""	←		√
Graticule Label	ON	←		√
Invert Color	OFF	←		√
Frequency	ON	←		√
Update	ON	←		√

Format

Key Operation	Default value	Preset	Backup	Save/Recall
	Log Mag	←		√

Macro Setup

Key Operation	Default Value	Preset	Backup	Save/Recall
Echo Window	OFF	←		√

Marker Fctn

Key Operation		Default Value	Preset	Backup	Save/Recall
Discrete		OFF	←		√
Couple		ON	←		√
Marker Table		OFF	←		√
Statistics		OFF	←		√
Flatness		OFF	←		√
RF Filter Status		OFF	←		√
Annotation Options	**Marker Info X Pos**	1 %	←		√
	Marker Info Y Pos	1 %	←		√
	Align	ON	←		√
	Active Only	ON	←		√

Marker Search

Key Operation		Default Value	Preset	Backup	Save/Recall
Peak	Peak Excursion	3 dB	←		√
	Peak Polarity	Positive	←		√
Target	Target Value	0 dB	←		√
	Target Transition	Both	←		√
Multi Peak	Peak Excursion	3 dB	←		√
	Peak Polarity	Positive	←		√
Multi Target	Target Value	0 dB	←		√
	Target Transition	Both	←		√
Tracking		OFF	←		√
Search Range	Search Range	OFF	←		√
	Start	0 Hz	←		√
	Stop	0 Hz	←		√
	Couple	ON	←		√
Bandwidth		OFF	←		√
Bandwidth Value		-3 dB	←		√
Notch		OFF	←		√
Notch Value		-3 dB	←		√

Marker

Key Operation	Default Value	Preset	Backup	Save/Recall
Marker1	OFF (Marker 1 is turned ON immediately after the marker softkey menu is displayed)	←		√
Ref Marker Mode	OFF	←		√

Meas

Key Operation			Default value	Preset	Backup	Save / Recall
Measurement Port			S-Param	←		√
			S11	←		√
Gain-Phase			T/R	←		√
Gain-Phase Setup	**T Input Z / R Input Z**		1M Ω	←		√
	T Attenuator / R Attenuator		20 dB	←		√
DC Monitor Setup	**Function**		Vdc Bias	←		√
	DC Monitor On Sweep End	**Monitor**	OFF	←		√

Save / Recall

Key Operation		Default Value	Preset	Backup	Save / Recall
Save Type		State & Cal	←		√
Channel/Trace		Disp Only	←		√
Save SnP	**SnP Format**	Auto	←		√

Scale

Key Operation		Default value	Preset	Backup	Save/Recall
Divisions		10	←		√
Scale/Div		10.000 dB/div	←		√
Reference Position		5 Div	←		√
Reference Value		0 dB	←		√
Reference Tracking	**Tracking**	Off	←		√
	Track Frequency	0 Hz	←		√
Electrical Delay		0 s	←		√
Phase Offset		0 °	←		√
Y-Axis		Linear	←		√
Log Y-Axis	**Top Value**	1000 dB	←		√
	Bottom Value	0.001 dB	←		√

Span

Key Operation	Default Value	Preset	Backup	Save/Recall
	2.9999 GHz	←		√

Start

Key Operation	Default Value	Preset	Backup	Save/Recall
	100 kHz	←		√

Stop

Key Operation	Default Value	Preset	Backup	Save/Recall
	3 GHz	←		√

Sweep Setup

Key Operation			Default Value	Preset	Backup	Save/Recall
Power	**Power**		0 dBm	←		√
	Port Couple		ON	←		√
	Port Power	**Port 1 Power**	0 dBm	←		√
		Port 2 Power	0 dBm	←		√
		LF OUT Power	0 dBm	←		√
	Slope [xx dB/GHz]		0 dB/GHz	←		√
	Slope [ON/OFF]		OFF	←		√
	RF Out		ON	←		√
CW Freq			100 kHz	←		√
Sweep Time AUTO			ON	←		√
Sweep Delay			0 s	←		√
Points			201	←		√
Sweep Type			Lin Freq	←		√
Edit Segment Table	**Freq Mode**		Start/Stop	←		√
	List IFBW		OFF	←		√
	List Power		OFF	←		√
	List Delay		OFF	←		√
	List Time		OFF	←		√
Segment Display			Order Base	←		√
DC Bias			OFF	←		
DC Bias Port			LF Out	←		√
DC Bias Level			0 V	←		√

System

Key Operation					Default Value	Preset	Back up	Save/ Recall
Invert Image					ON	←		√
Misc Setup	**Beeper**	**Beep Complete**			ON	←		√
		Beep Warning			ON	←		√
	GPIB Setup	**Talker/Listener Address**			17	Non-changing	√	
	Network Setup	**Telnet Server**			OFF	Non-changing	√	
		SICL-LAN Server			OFF	Non-changing	√	
		SICN-LAN Address			17	Non-changing	√	
		Web Server			ON	Non-changing	√	
	Clock Setup	**Show Clock**			ON	←		√
	Key Lock	**Front Panel & Keyboard Lock**			OFF	←		
		Touch Screen & Mouse Lock			OFF	←		
	Display Setup	**Color Setup**	**Normal** (**Invert** is the same)	**Data Trace 1**	Red:5 Green:5 Blue:0	←		√
				Data Trace 2	Red:0 Green:5 Blue:5	←		√

				Data Trace 3	Red:5 Green:0 Blue:5	←		√
				Data Trace 4	Red:0 Green:5 Blue:0	←		√
				Mem Trace 1	Red:3 Green:3 Blue:0	←		√
				Mem Trace 2	Red:0 Green:3 Blue:3	←		√
				Mem Trace 3	Red:3 Green:0 Blue:3	←		√
				Mem Trace 4	Red:0 Green:3 Blue:0	←		√
				Graticule Main	Red:3 Green:3 Blue:3	←		√
				Graticule Sub	Red:1 Green:1 Blue:1	←		√
				Limit Fail	Red:5 Green:0 Blue:0	←		√
				Limit Line	Red:3 Green:0 Blue:0	←		√
				Backgrou nd	Red:0 Green:0 Blue:0	←		√
		Magnification			Normal		√	
	Preset Setup	**State**			Factory	Non-changing	√	
		Confirm			ON	Non-changing	√	
Backlight					ON	←		

S-Param Port Couple				DC	←		
Overload Recovery	**RF Out**			ON	←		√
	DC Bias			OFF	←		
	S-Param Port Couple			DC	←		√
	T Input Z			1M Ω	←		√
	R Input Z			1M Ω	←		√
	T Attenuator			20 dB	←		√
	R Attenuator			20 dB	←		√
Service Menu	**DC Bias Range**			Auto	←		√
	Init Src Ctrl	**RF Out**		ON	←		√
		DC Bias		ON	←		√
	Security Level			None	←		√
	Band Wait			0 sec	←		√
	Service Functions	**Distortion cal**		ON	←		

Trigger

Key Operation	Default Value	Preset	Backup	Save/Recall
Continuous	Continuous (Ch1) Hold (Other Ch)	←		√
Trigger Source	Internal	←		√
Trigger Event	On Sweep	←		√
Trigger Scope	All Channel	←		√
Ext Trig Input	Negative Edge	←		√
Trigger Delay	0 sec	←		√
Ext Trig Output	OFF	←		√
Polarity	Positive Pulse	←		√
Position	After Point	←		√
Pulse Width	1 µs	←		√

Troubleshooting

Troubleshooting

Troubleshooting

This section describes the steps you should take when you believe that the Agilent E5061B is operating improperly. The results of these simple investigative procedures may help you avoid the down-time and inconvenience of repair service. The troubleshooting instructions are divided into three categories.

When all troubleshooting measures are taken but it does not work. Contact Agilent Technology's Customer Contact.

- Troubleshooting during Startup
- Troubleshooting during Operation
- Troubleshooting for External Devices

Troubleshooting during Startup

Symptom	Solution
Turning ON (|) the standby switch does not start up the system.	• Confirm that the power cable is properly plugged in. • Confirm that the line switch on the rear panel is turned ON.
Standby switch color is red and does not start up the system.	There is some trouble on the fan. Turn OFF and ON the line switch once, then turn ON this standby switch.
The system starts up, but it automatically shuts down immediately.	Execute the system recovery.
The system starts up, but it enters the service mode (The instrument status bar in the lower right part of the screen displays SVC in red).	Execute the system recovery.
The measurement screen appears after startup, but the date and time displayed on the instrument status bar in the lower right part of the screen differ greatly from the previous settings.	Execute the system recovery.
The measurement screen appears after startup, but the power-on test fails, with Error Message 241 appearing against the red background in the instrument message/warning area in the lower left part of the screen.	Execute the system recovery.

Troubleshooting during Operation

Symptom	Solution
The Error Message "Port N receiver overload" (N denotes a port number) is Displayed. During the measurement of an amplifier, Error Messages 720 through 721 "Port N receiver overload" (N denotes a port number) are displayed. This error occurs when the input to a test port exceeds the maximum input level in the measurement of an amplifier. The measurement value obtained in such cases is not correct. In the worst case, a failure (damage to the receiver) may occur.	• Disconnect any cable and adapter in the test ports. • Change the measurement condition so that the input to the test port does not exceed the maximum input level.
A clearly abnormal measurement value The measurement value is not reproducible, or clearly abnormal.	• Confirm that the DUT, connection cables, and other parts are connected correctly. • Confirm that the connectors and cables used to connect the DUT are free from damage and poor contact. • Confirm that the calibration has been executed correctly. If you have not acquired a correct error correction factor, you cannot obtain a correct measurement value. • Confirm that the calibration kit is selected correctly. • Confirm that the calibration kit is defined correctly. • Confirm that if the stimulus signal output is turned ON.
The system cannot operate manually (Front Panel Keys, Keyboard, Touch Screen and Mouse) The keyboard or mouse becomes inoperable.	• Confirm that the keyboard or mouse is connected correctly. When it is connected correctly, turn OFF the power once, and restart the system.
The front panel key or keyboard becomes inoperable.	• Using the mouse, turn **System > Key Lock > Front Panel & Keyboard Lock OFF.**
The touch screen becomes inoperable.	• Using the front panel keys, press **System** > **Key Lock** > **Touch Screen & Mouse Lock**

	OFF to turn OFF the lock. • Execute the calibration of the touch screen.
The mouse becomes inoperable.	• Using the front panel keys, press **System** > **Key Lock** > **Touch Screen & Mouse Lock** to turn OFF the lock.
All of the front panel keys, keyboard, and mouse become inoperable.	• Confirm that the keyboard or mouse is connected correctly. When it is connected correctly, turn OFF the power once, and restart the system.
The keyboard and mouse have been connected after power-on.	• Turn OFF the power once, and restart the system. When taking all these measures does not recover operability, there is a possibility of a failure.
The screen freezes and all operations become impossible. The measurement in progress or screen update is stalled and all of the front panel keys, keyboard, mouse, and touch screen are inoperable.	• Press the standby switch to turn OFF the power once, and restart the system.
The system freezes while in operation.	• Press the standby switch to turn OFF the power once, and restart the system.
The rear cooling fan does not operate.	• There is a possibility of a failure.
The sweep action stops during measurement or is not executed. An error or warning message appears.	• There is a possibility of a failure.
An error or warning message is displayed on the instrument message/warning area in the lower part of the screen	• Refer to Error Messages and Warning Messages.

Troubleshooting for External Devices

Symptom	Solution
Cannot output to a printer Cannot output a measurement screen or	• Confirm that the power to the printer is turned ON and that the line cable

data to a printer. Attempting to output to a printer causes Error Messages 120 and 121 to appear.	is connected correctly. • Confirm that the connector cable of the printer is connected correctly. • Confirm that the printer is online. • Confirm that the printer has not run out of paper. • Confirm that the printer has not run out of ink.
Does not respond to an external controller/fails to function normally A GPIB device does not respond to the external controller, or fails to function normally.	• Confirm that the GPIB address is defined correctly. • Confirm that the GPIB cable is connected. • Confirm that another instrument connected by the GPIB cable has the same GPIB address. • Confirm that the GPIB cable connection forms a loop.

Maintenance

Maintenance

- Backing Up the Data
- Cautions Applicable to Requesting Repair, Replacement, Regular Calibration, etc.
- Cleaning this Instrument
- Replacement of Parts with Limited Service Life
- System Recovery
- Updating Firmware
- Service Functions
- Removing Log Data

Backing Up the Data

Be sure to regularly back up your important data (including program) files in this instrument to a CD-R or other backup medium. Agilent Technologies shall not be liable for any data damages caused by improper functin of this instrument.

Making Backup Files

You can make backup files on the hard disk of an external PC using following methods.

You can access to drive D: of the E5061B from an external PC via LAN, and copy your important data files on the drive D: to the external PC. See Accessing Hard Disk of E5061B from External PC for details.

You can transfer your important data files on the drive D: of the E5061B to the external PC using :MMEM:TRAN command via GPIB.

CAUTION Do not modify any files and folders in drives other than drive D:. Doing so will cause malfunction.

Other topics about Maintenance

Cautions Applicable to Requesting Repair, Replacement, Regular Calibration, etc.

- Backing Up Data in the Hard Disk
- Devices to be Sent Back for Repair or Regular Calibration

Other topics about Maintenance

Backing Up Data in the Hard Disk

The user is requested to back up the stored programs and data into external media by using the instrument's storing function before requesting the Company's Service Center to repair the instrument or replace hard disks.

See Making Backup Files for how to make backup files.

Please take note that the Company will not be held liable to any extent for potential erasure or change of stored programs or data due to the repair or replacement of hard disks performed by the Company. When a hard disk itself fails, the programs and data stored in it cannot be recovered.

Devices to be Sent Back for Repair or Regular Calibration

If it is necessary to send the unit to the Service Center of Agilent Technologies for repair or regular calibration, please follow the instructions below.

Equipment to be Sent

When requesting repair or regular calibration of the unit by our Service Center, send only the E5061B main unit without any installed option you may have ordered. Unless specifically instructed, it is not necessary to send accessories and calibration kits.

Packing

Use the original package and shock absorbers, or equivalent anti-static packing materials, when sending the unit.

Shipping Address

For the location of the nearest Agilent Technologies Service Center, contact the Customer Contact.

Recommended Calibration Period

The recommended calibration period for this instrument is one year. The user is recommended to request the Company's Service Center to perform regular calibration every year.

Cleaning this Instrument

- Cleaning an LCD
- Maintenance of Test Ports and Other Connectors/Ports
- Cleaning Parts Other than the LCD, Test Ports, and Other Connectors/Ports

Other topics about Maintenance

This section describes how to clean the instrument.

To protect yourself from electrical shock, be sure to unplug the power cable from the outlet before cleaning the instrument.

Never clean the internal components of the instrument.

Cleaning an LCD

Use one of the following methods to clean the display surface regularly.

- For normal cleaning, rub the surface gently with a dry, soft cloth.
- When stains are difficult to remove, gently wipe the surface with cloth damped with a small amount of dehydrated ethanol.
  You can clean the standard LCD (no touch screen function) with a cloth dipped in water and then wrung tightly.

  NOTE Do not use chemicals other than dehydrated ethanol to wet the cleaning cloth. To clean the touch screen LCD, do not wet the cloth with water.

Maintenance of Test Ports and Other Connectors/Ports

The ports of the E5061B are fitted with BNC and N Types connectors. Stains or other damage to these connectors would significantly affect the accuracy in measurements. Always pay attention to the following precautions.

- Always keep the connectors free from stains and dust.
- Do not touch the contact surface on the connectors.
- Do not plug damaged or scratched connectors into the test ports.
- Use compressed air for cleaning connectors. Do not use abrasives under any circumstance.

The above precautions must also be observed in maintaining connectors and ports other than these test ports.

Cleaning Parts Other than the LCD, Test Ports, and Other Connectors/Ports

To remove stains on parts other than the LCD, test ports, and other connectors/ports of the instrument, wipe them gently with a soft cloth that is dry or wetted with a small amount of water and wrung tightly.

Replacement of Parts with Limited Service Life

This instrument incorporates parts with limited service life as shown in the following table. Using the recommended replacement time as a guide, request the Agilent Service Center to replace these parts. However, a part may need to be replaced at an earlier time than that listed in the table, depending on conditions such as location, frequency of use, and where it is stored.

NOTE Each service life and recommended replacement time listed below is for reference only and does not imply a guarantee of the part's service life.

Part Name	Service Life (Parts supplier reference value)	Recommended replacement time
Hard Disk Drive (HDD)	5 years or 20,000 operating hours, whichever comes earlier. Exchanging hard disk drives causes the contents written after shipment from the factory (LAN setup, etc.)to be initialized to the state at the time of shipment. The programs and data stored in Drive D (user directory) are erased.	3 years
Main fan	50,000 operating hours. The service life may be significantly shorter when used in a dusty and dirty environment.	5 years
CPU fan		
Battery on Mother board	50,000 operating hours. The service life may be shorter if E5061B power has not been turned on for long time.	5 years
Power supply	50,000 operating hours (Depends on the service life of the power supply cooling fun) The service life may be significantly shorter when used in a dusty and dirty environment.	5 years
LCD screen backlight	50,000 operating hours. When the unit is used for automatic measurements in a production line and the on-screen information is not required, the life of the LCD backlight can be saved by turning it OFF. As for the method of turning the backlight OFF, refer to Turning OFF the LCD Screen Backlight.	5 years
Touch screen	One million times (dotting life)	5 years

(function)		
USB receptacle	1,500 cycles insertion/extraction. The service life may be shorter when used in a dusty and dirty environment. In case that the insertion/extraction is in heavy usage such as Ecal in the production line, using USB extension cable may save the USB receptacle life.	N/A

Other topics about Maintenance

System Recovery

By executing system recovery, you can return the Windows operating system of the E5061B to the factory state or the user state at the setting the user performed save user state.

The procedure of system recovery is described in both Installation Guide and Service Guide.

Other topics about Maintenance

Updating Firmware

- Overview
- Procedure

Other topics about Maintenance

Overview

User can update E5061B firmware by themselves. The latest firmware can be downloaded from the http://www.agilent.com/find/ena_support.

Updating firmware does not include the following software update.

- Windows Operating System
- VBA (Visual Basic for Application)
- Driver for Windows
- Calibration Constant Data

Procedure

NOTE User should log in as "Instruments", and user should have administrator authority to perform firmware update.

1. Download the latest firmware from the download site. It is prepared as execution file (**E5061B_xx.xx.exe**).
2. Run the **E5061B_xx.xx.exe** to extract the **E5061B.msi**.

   If you use your local PC to download, save the file to a USB mass storage device in order to move it to E5061B, then connect the USB mass storage device into the front USB port of the E5061B.
3. Press **System** > **Service Menu** > **Update Firmware**. Then, the password dialog box appears.
4. Type **e506xa** as the password, then click **OK**.
5. In Open dialog box, select **E5061.msi**, then press **Open**. Then the windows installer appears.
6. Follow the instruction of windows installer.
7. After the installation is finished, the instrument restarts.
8. Press **System** > **Firmware Revision** to confirm the firmware revision you have just installed.

Service Functions

This menu (**System** > **Service Menu** > **Test** and **Service Functions**) provides information about various test related to the E5061B.

For more information about any test related to the E5061B, like System Test, please refer to the E5061B Service manual which is available at www.agilent.com/find/e5061b-manual.

Under the service menu, the following topic is described in this help.

Other topics about Maintenance

Removing Log Data

The E5061B creates automatic log of data for troubleshooting purpose. For security reasons, if this data needs to be deleted, then SCPI.SERVice.LOGGing.CLEar command can be used to clear the log recorded by the E5061B.

The log file stores data related to:

- Power ON time
- Number of times of power ON
- Result of power ON test
- Number of switching times of internal mechanical relay
- Number of times of overload
- Event Log

Measurement Accessories

Measurement Accessories

- Calibration Kits
- System Accessories

Agilent Technologies provides various probes, cables and adapters. Refer to http://www.agilent.com/find/na_accessories and E5061B Configuration Guide for more information.

Calibration Kits

- Overview
- Mechanical Calibration Kit
- ECal

Other topics about Measurement Accessories

Overview

Calibration kits are used to improve the accuracy of the analyzer in various measurements.

The electronic calibration kit reduces the time required for calibration, misconnections, and wear and tear on connectors since it requires fewer changes of connection than the mechanical type.

Specifications for calibration kits and the availability of particular calibration kits are subject to change without prior notice.

Refer to http://www.agilent.com/find/na_accessories for more information.

Mechanical Calibration Kit

Model Name	Description	Connector Type	Frequency Range
85032B/E	Calibration Kit	Type-N, 50 Ω	DC to 6 GHz
85032F	Mechanical Calibration Kit	Type-N, 50 Ω	DC to 9 GHz
85033D	Calibration Kit	3.5 mm	DC to 6 GHz
85033E	Mechanical Calibration Kit	3.5 mm	DC to 9 GHz
85036B/E	Calibration Kit (Economy Calibration Kit)	Type-N, 75 Ω	DC to 3 GHz
85038A/F/M	Calibration Kit	7-16	DC to 7.5 GHz
85039B	Calibration Kit	Type F , 75 Ω	DC to 3 GHz
85052D	Economy Mechanical Calibration Kit	3.5 mm	DC to 26.5 GHz

For more information on the definition of calibration kit, refer to http://na.tm.agilent.com/pna/caldefs/stddefs.html

ECal (electronic calibration) kit

The ECal supported by E5061B are defined below:

Model Name	Connector Type	Frequency Range
85091B	7 mm	300 kHz to 9 GHz
85091C	7 mm	300 kHz to 9 GHz
85092B	Type N	300 kHz to 9 GHz
85092C	Type N	300 kHz to 9 GHz
85093B	3.5 mm	300 kHz to 9 GHz
85093C	3.5 mm	300 kHz to 9 GHz
85096B	Type N, 75 Ω	300 kHz to 3 GHz
85096C	Type N, 75 Ω	300 kHz to 3 GHz
85098B	7-16	300 kHz to 7.5 GHz
85098C	7-16	300 kHz to 7.5 GHz
85099B	Type F	300 kHz to 3 GHz
85099C	Type F	300 kHz to 3 GHz
N4431A	3.5 mm, Type N	300 kHz to 9 GHz
N4431B	3.5 mm, Type N	9 kHz to 13.5 GHz
N4432A	Type N	300 kHz to 18 GHz
N4433A	3.5 mm	300 kHz to 20 GHz
N4690A	Type N	10 MHz to 18 GHz
N4690B	Type N	300 kHz to 18 GHz
N4691A	3.5 mm	10 MHz to 26.5 GHz
N4691B	3.5 mm	300 kHz to 26.5 GHz
N4692A	2.92 mm	10 MHz to 40 GHz
N4696A	7 mm	10 MHz to 18 GHz
N4696B	7 mm	300 kHz to 18 GHz

NOTE The 4-ports Ecal module such as the N4431A/B, N4432A, and N4433A does not support the user-characterized Ecal VBA macro program. When the user-characterized ECal program is executed, use the 2-ports ECal module.

System Accessories

- USB/GPIB Interface
- GPIB Cables
- Agilent IO Libraries

Other topics about Measurement Accessories

82357A/B USB/GPIB Interface

The 82357A/B can be used to control external GPIB devices by the E5061B. It can also be used to control E5061B by PC with USB. See "82357B USB/GPIB Interface High-Speed USB 2.0" in http://www.agilent.com/find/gpib for more information.

GPIB Cables

The following GPIB cables can be used to connect the analyzer with an external device such as a computer.

Product Number	Length
10833A	1.0 m (3.3 ft)
10833B	2.0 m (6.6 ft)
10833C	3.0 m (9.9 ft)
10833D	0.5 m (1.6 ft)

Agilent IO Libraries

Agilent IO Libraries is a collection of libraries that gives you the ability to use your instruments as a test and measurement program, and utilities that help you quickly and easily connect your instruments to your PC.

See the IO libraries manual for more information. The latest revision of IO Libraries can be downloaded from http://www.agilent.com/find/iolib.

CAUTION Do not update Agilent IO Library on E5061B besides Agilent recommends to do so. Refer to http://www.agilent.com/find/ena_support for more information.

General Principles of Operation

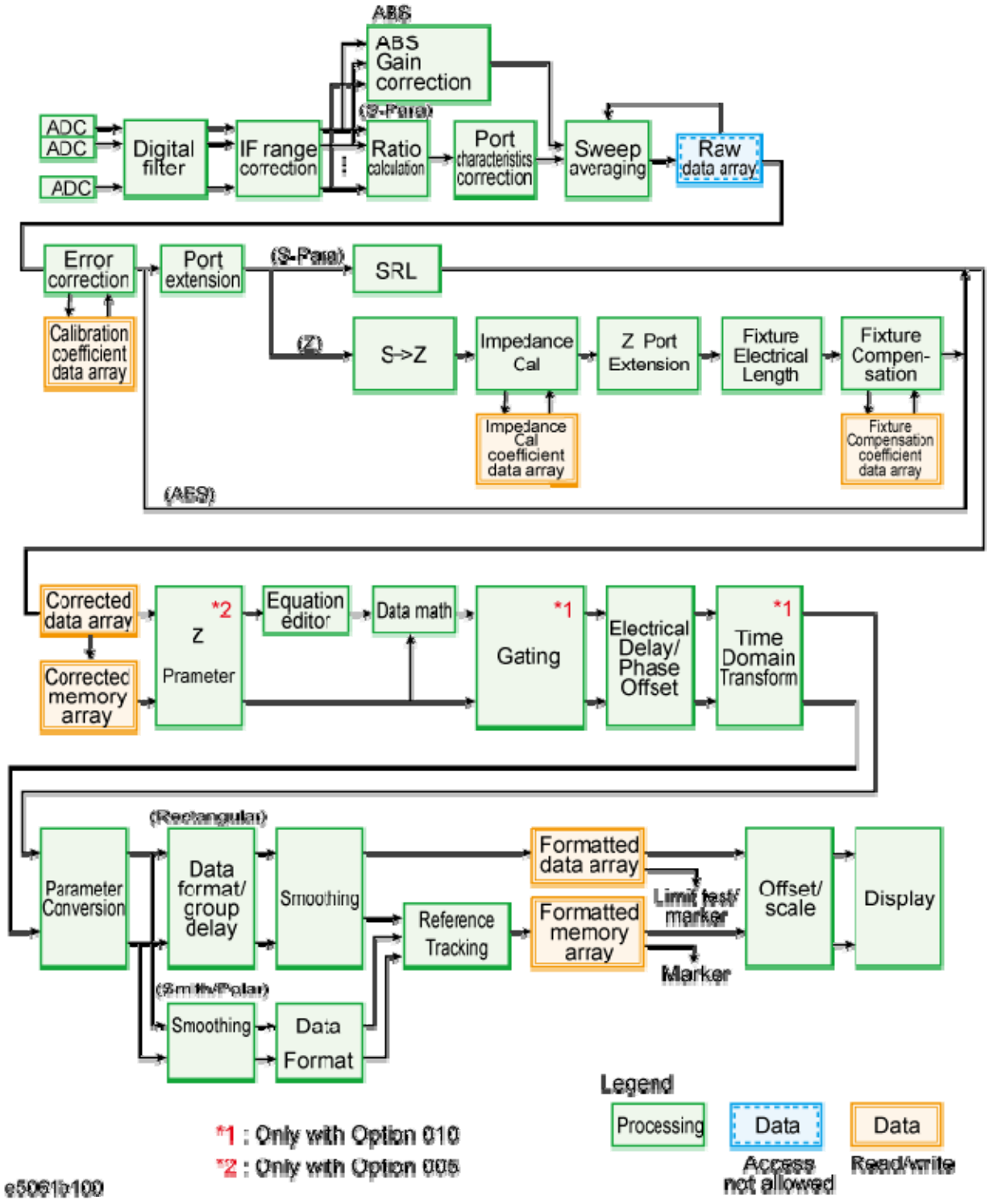
General Principles of Operation

- Data Processing
- System Description

Data Processing

The internal data processing flowchart for the E5061B is shown in the following figure.

Data Processing Flowchart



ADC

The ADCs (analog-to-digital converters) convert analog signals. One ADC is available for each signal and the conversion takes place simultaneously.

Digital Filter

The digital filter performs a discrete Fourier transformation (DFT) and picks up IF signals. Each IF signal is then converted into a complex number that has a real part and an imaginary part. The IF bandwidth of the analyzer is equivalent to the bandwidth of the DFT filter.

IF Range Correction

Input signals that went through ranging at the receiver are reverted (corrected) to previous values before the ranging.

Ratio Calculation

The ratio between two signals is determined by performing divisions on complex numbers. In the case of absolute measurements, the ratio of complex number cannot be calculated.

Port Characteristics Correction

The equivalent source match error, the directivity error, and the tracking error of each test port bridge are corrected. In the case of absolute measurements, the gain of each test port is corrected.

Sweep Averaging

The average of complex indices is determined based on data obtained from multiple sweep measurements. Sweep averaging is effective in reducing random noise in measurements.

Raw Data Array

The results from all data processing done up to this point are stored in this array as raw data. All prior data processing is performed as each sweep takes place. The user is not allowed to access (read/write) this raw data array.

Error Correction/Calibration Coefficient Data Array

When error correction is enabled, the process eliminates the system errors that are reproducible and stored in the calibration coefficient data array. It accommodates everything from the simple vector normalization to the full 12-term error correction. The user is allowed to access (read/write) this calibration coefficient data array. Gain correction is performed in absolute measurement.

Port Extension

This process carries out a simulation of adding or eliminating a variable length transmission path on each test port so that the reference plane of

calibration is moved. The port extension is defined by an electrical delay (sec).

SRL

This process calculates Structural Return Loss. This is available only when option 010 is installed.

S -> Z

This process converts from S-parameter to impedance

Impedance Calibration / Impedance Calibration Coefficient Data Array

Impedance calibration provides the error correction for the impedance parameters. The impedance calibration does not apply for S-Parameter. The impedance calibration and error correction can not be applied in the same time.

Z Port Extension

This is basically same as the port extension. The Z port extension can not have loss.

Fixture Electrical Length

Fixture electrical length is another compensation method to eliminates a length transmission path of the coaxial cable. The electrical length is defined by meter.

Fixture Compensation / Fixture Compensation Coefficient Data Array

Fixture compensation eliminates the error factor of fixture. Open, short and load compensation can be performed independently.

Corrected Data Array

Unlike the raw data array, this array stores the results obtained after error corrections, port extensions, or the fixture simulator functions are applied. The user is allowed to read/write data from/to the corrected data array.

Corrected Memory Array

By pressing **Display** > **Data -> Mem**, the contents of the corrected data array is copied to this array. The user is allowed to read/write data from/to the corrected memory array.

Z Parameter

In option 005 Impedance Analysis, impedance parameter such as |Z| and Cp is calculated from impedance complex data.

Equation Editor

Equation Editor allows users to use a custom equation to display data in the E5061B. Equation Editor can be accessed through **Display** > **Equation Editor**.

Data Math

Data processing is carried out using the corrected data array and the corrected memory array. Four types of data processing addition, subtraction, multiplication, and division are available.

Electrical Delay / Phase Offset

An electrical delay and a phase offset are applied to each trace. By setting an electrical delay, a linear phase that is proportional to the frequency will be added or subtracted. On the other hand, setting a phase offset adds or subtracts a phase that is constant throughout the frequency range. Incidentally, data processing performed from this point on in the flowchart is applied to both the data array and the memory array.

Data Format / Group Delay

Complex data consisting of the real parts and the imaginary parts are converted into scalar data according to the data format of user's choice. Group delays are also calculated here.

Smoothing

By enabling the smoothing function, each point in a sweep measurement is replaced by a moving average of several measurement points nearby. The number of points used in calculating a moving average is determined by the smoothing aperture set by the user. The smoothing aperture is defined by a percentage against the sweep span.

Formatted Data Array / Formatted Memory Array

All results from data processing are stored in the formatted data array and the formatted memory array. The marker functions are applied to these arrays. The limit test is applied to the formatted data array. The user is allowed to read/write data from/to these arrays.

Offset / Scale

Each set of data is processed so that traces can be drawn on the screen. Particular scaling depending on the data format is applied using the position of the reference line, the value of the reference line, and the scale/graticule settings.

Display

The results obtained after data processing are displayed on the screen as traces.

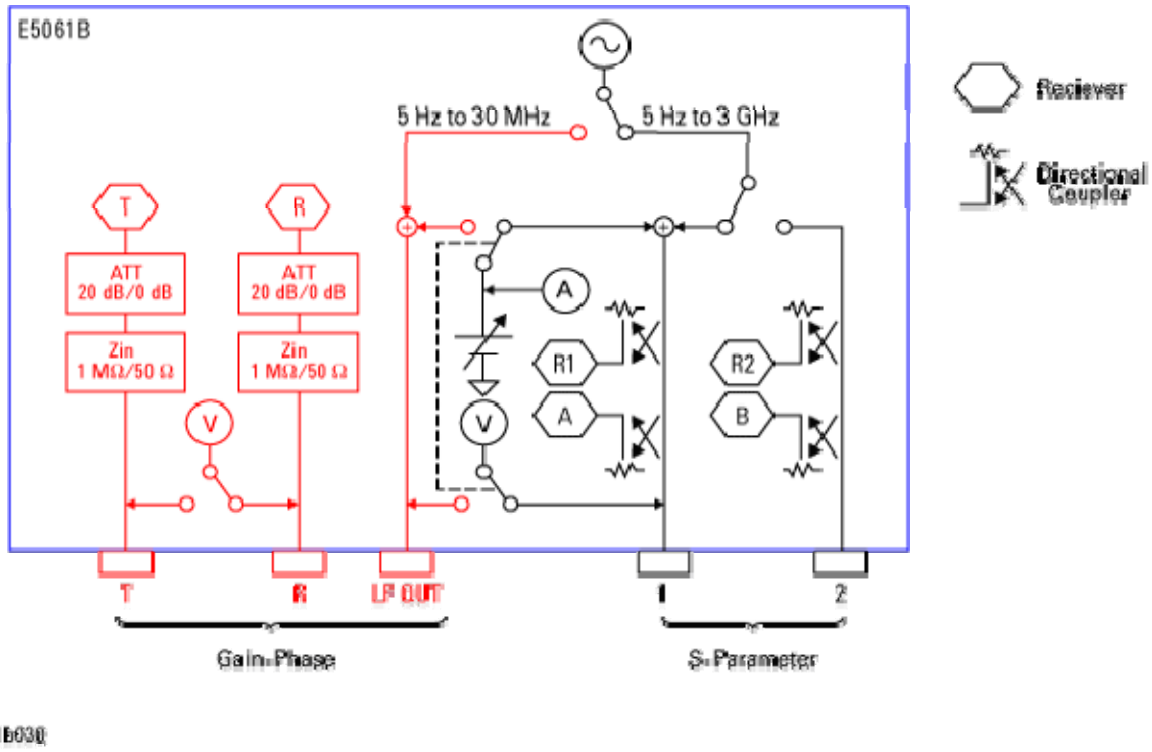
System Description

- Synthesized Source
- Source Switcher
- Signal Separator
- Receiver
- DC Bias Source
- DC Monitor

Other topics about General Principles of Operation

A network analyzer supplies a sweep signal to a DUT, measures its transmission and reflection, and displays the results as ratios against the input signal from the signal source. The E5061B network analyzer consists of the circuit modules shown in the following figure.

System Diagram for the E5061B Network Analyzer (Optoin 3L5)



e5061b030

System Diagram for the E5061B Network Analyzer (Besides Option 3L5)

Synthesized Source

The synthesized source generates a sweep signal in the specified frequency range.

The signal source is phase-locked to a highly reliable quartz crystal oscillator to maintain a high level of accuracy in its frequency as well as to achieve precise phase measurements.

Source Switcher

The source switchers are used to switch test ports to which the signal is supplied from the source. The source switcher always set at the port1 in T/R test set option (options 115, 135, 117 and 137)

Signal Separator

The signal separator consists of directivity couplers that detect input and output signals at the test ports. On a test port to which a signal is output, the output signal and the reflection from the DUT are detected as the reference signal (R1) and the test signal (A), respectively. On the other ports, the signal that is transmitted through the DUT is detected as the test signal (B). All signals are then sent to the receiver.

Receiver

Each signal that is sent to the receiver is first converted into an IF signal by a mixer and then converted into a digital signal by an ADC (analog to digital converter). These processes are applied to each signal independently. The digital data is then analyzed by a micro processor and measurement results are displayed on the screen. The receiver R2 is not available in T/R test set option (options 115, 135, 117 and 137)

DC Bias Source (Option 3L5)

Built in DC bias source can apply -40 V to +40 V DC on the signal of LF out and Port 1. The switcher for DC bias can be changed independently from the Source switcher.

DC Monitor (Option 3L5)

Voltage and current meters are equipped to monitor DC on received and DC biased source. DC voltage can be measured at LF out, R, T and Port 1. DC current can be measured at LF out and Port 1 .

Revision History

Revision History

- Firmware Revision History
- HDD Revision History
- Data Sheet Revision History

Other topics about Product Information

Firmware Revision History

- A.02.0x
- A.01.1x
- A.01.00

Other topics about Revision History

A.02.0x

- Options 115, 135, 215, 235, 117, 137, 217 and 237 support
- Impedance Analysis (Option 005) support
- State File Converter
- The windows icon for minimize, maximize and close are replaced with resize.
- Log for Service Support

A.01.1x

- Segment Sweep: IFBW Auto function does not work in the Segment Table even if IFBW AUTO is ON.
- Initial Source Port Control function: The DC bias and RF/LF source can be set on/off independently.
- Overload Recovery: **Clear Overload Protection** function is added. The measurement is aborted when overload is detected.
- SCPI.SYSTem.ISPControl.STAT: This commands turn on/off the initial source port contron for RF signal only.
- The following commands have been added:
  - SCPI.SERVice.POWer.OVERload.PROTect.CLEar
  - SCPI.SERVice.POWer.OVERload.PROTect.STATe
  - SCPI.SYSTem.ISPControl.DCBias.STATe

A.01.00

The first revision of E5061B firmware. This revision is for DEMO unit only.

HDD Revision History

HDD revision is based upon a number of factors such as windows OS and driver upgrade patch which are installed at the factory shipment. Firmware revision denotes E5061B measurement software. To know about the E5061B HDD revision, refer to Checking the product information. ELxxx is shipped only with E5061B option 3L5. KYxxx is shipped with both E5061B options 3L5 and 115/135/117/137/215/235/217/237.

- KY20x
- EL20x
- EL120/140
- EL110
- EL100

Other topics about Revision History

KY20x

- Windows License is changed from Windows Vista Business to Windows XP Pro for Embedded Systems (Windows task bar is not displayed).
- System Recovery procedure is changed.

EL20x

- LXI is changed to version 1.3.
- Internet Explore is changed to version 8 .
- Windows Media Player is changed to version 11.

EL140/EL120

- No functionally change

EL110

- The E5061 Network Analyzer Service in Windows Firewall is on at factory shipment

EL100

The first revision. This revision is for DEMO unit only.

Data Sheet Revision History

The data sheet revision history is shown below. The print date is used to define the revision. See the last page of the data sheet for its print date.

- November 6, 2009
- September 11, 2009

Other topics about Revision History

November 6, 2009

The foot note 2 of System dynamic range has been changed.

September 11, 2009

The first edition