

Multiport RJ-45 Connector Testing Solution



Features

- Support testing methods
 - Balun type fixture
 - No balun type fixture
- Test items includes :
 - Differential mode – Insertion Loss, SDD21 , ...
 - Differential mode – Return Loss, SDD11/SDD22 , ...
 - Mode conversion - SCD11/SCD21/SCD12, ...
- Independence calibration for each LAN and test items
- Data collection for each test item
- Step by Step instruction to make RJ-45 connect/cable testing easier and enhance accuracy & efficiency
- Limit line function available

Features

- Test results in both text and graphic format allow further analysis
- High Performance 20GHz RF switches (terminated)
 - VSWR < 1.5: DC to 10GHz
 - VSWR < 1.7: DC to 18GHz
- High performance RF jumpers for RF switch interconnection
 - Up to 20GHz, semi-rigid cable
- API command support
 - RS-232 interface
 - Easy to integrated with ENA Network Analyzer by external software

The Essentials of Solution

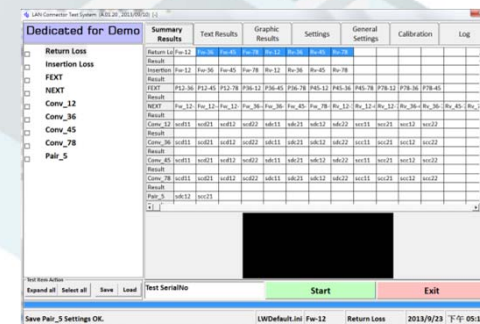
- Keysight E5071C – 4 Ports ENA Network Analyzer
- J2901A Dual 2-to-8 Crossbar Test Set
- **CableWorks Plus** Software
- RF cables and jumper wires
- Calibration Kit (Keysight N4431B 4-port ECal)
- Fixture
- PC or NB



E5071C



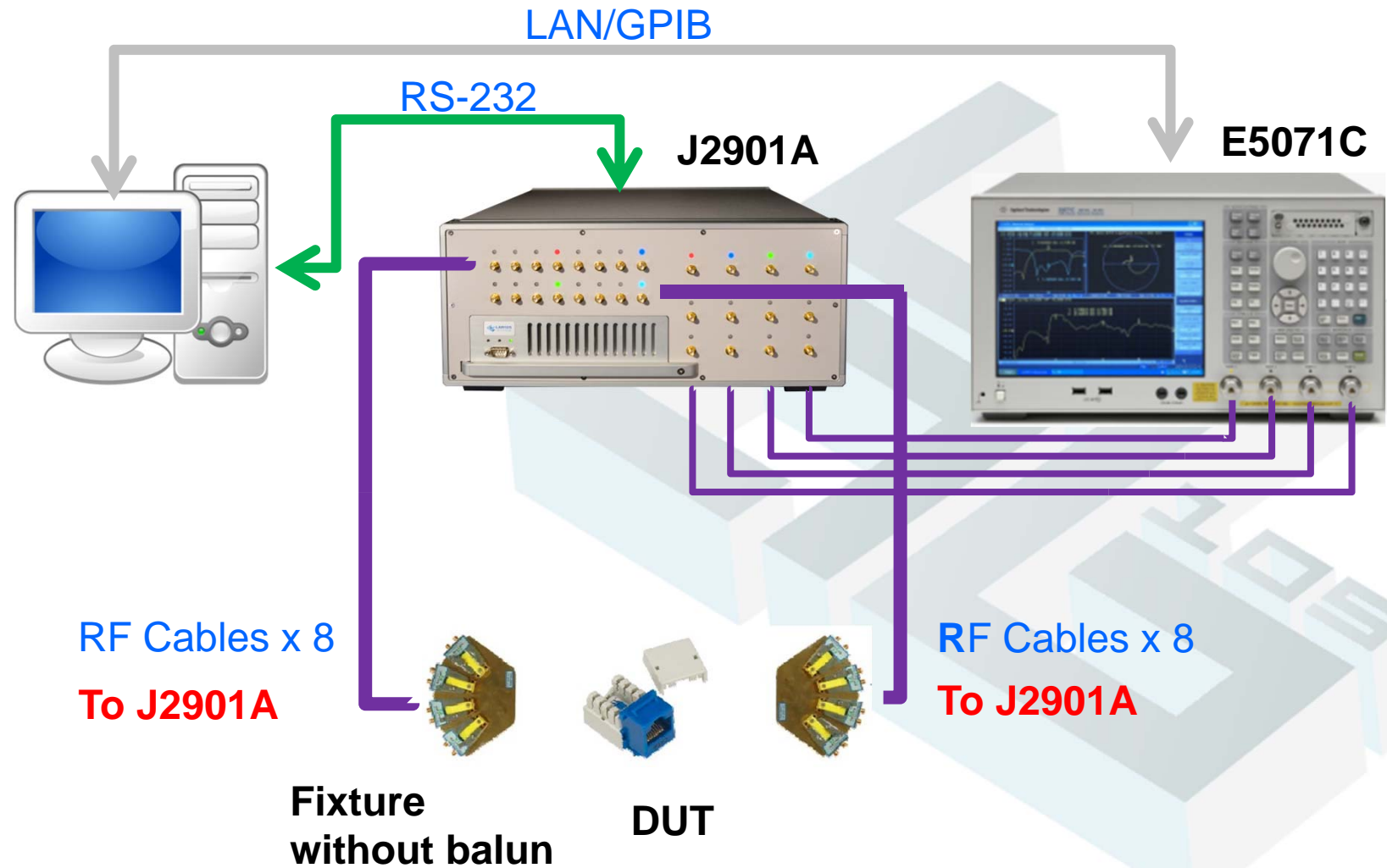
J2901A



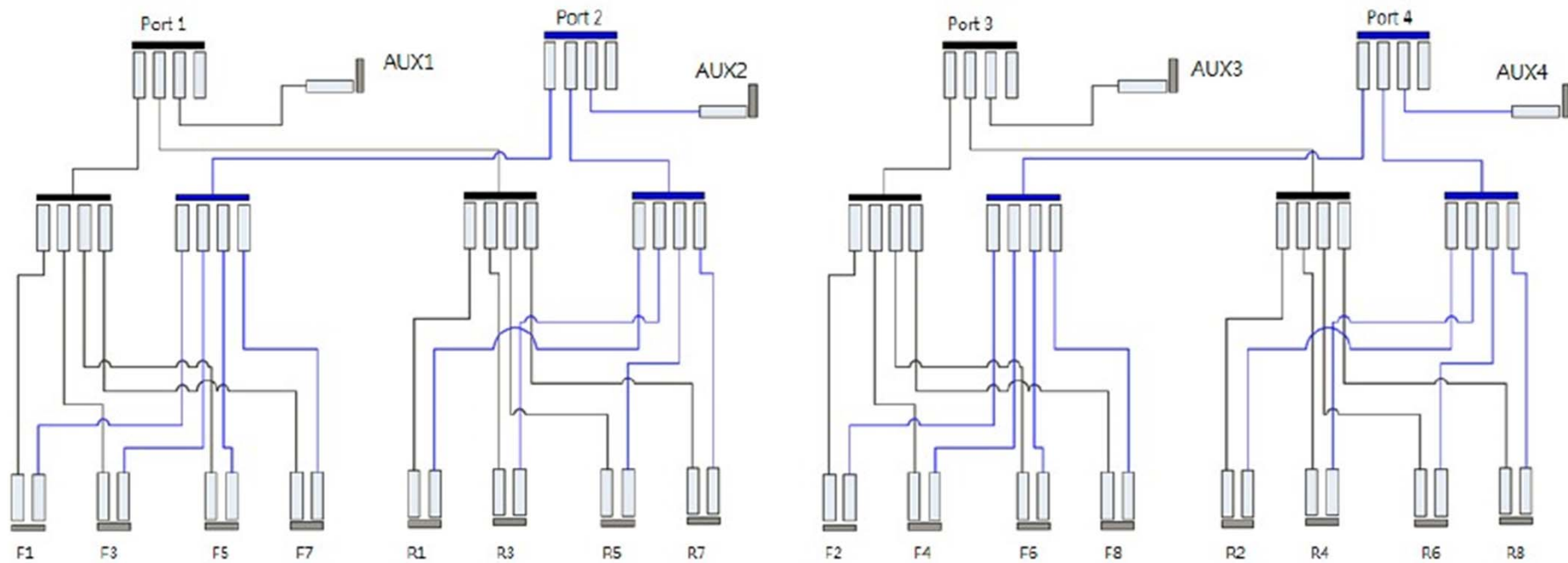
CableWorks Plus

Configuration

Fixture without Balun

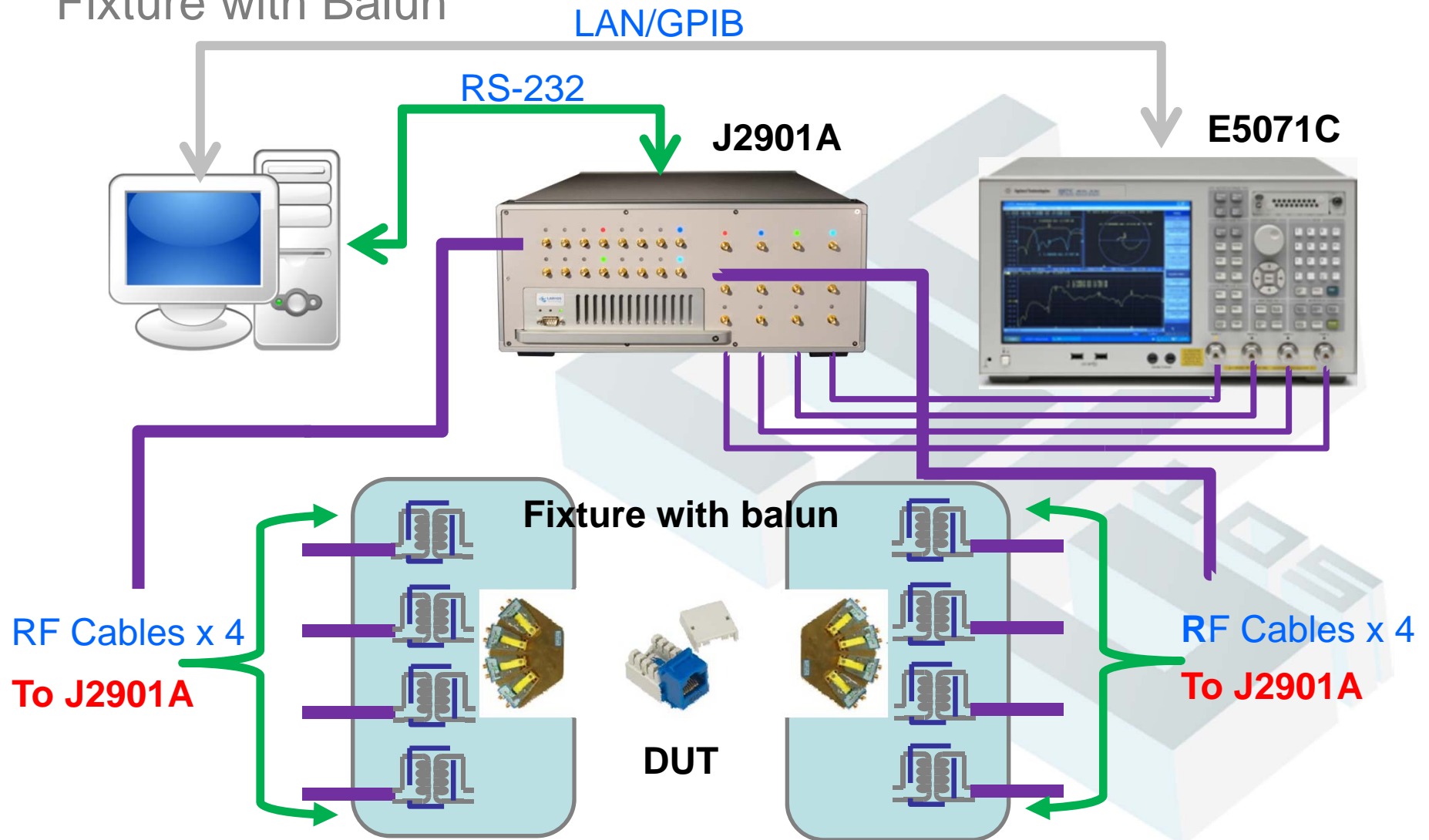


Wiring for Fixture without Balun

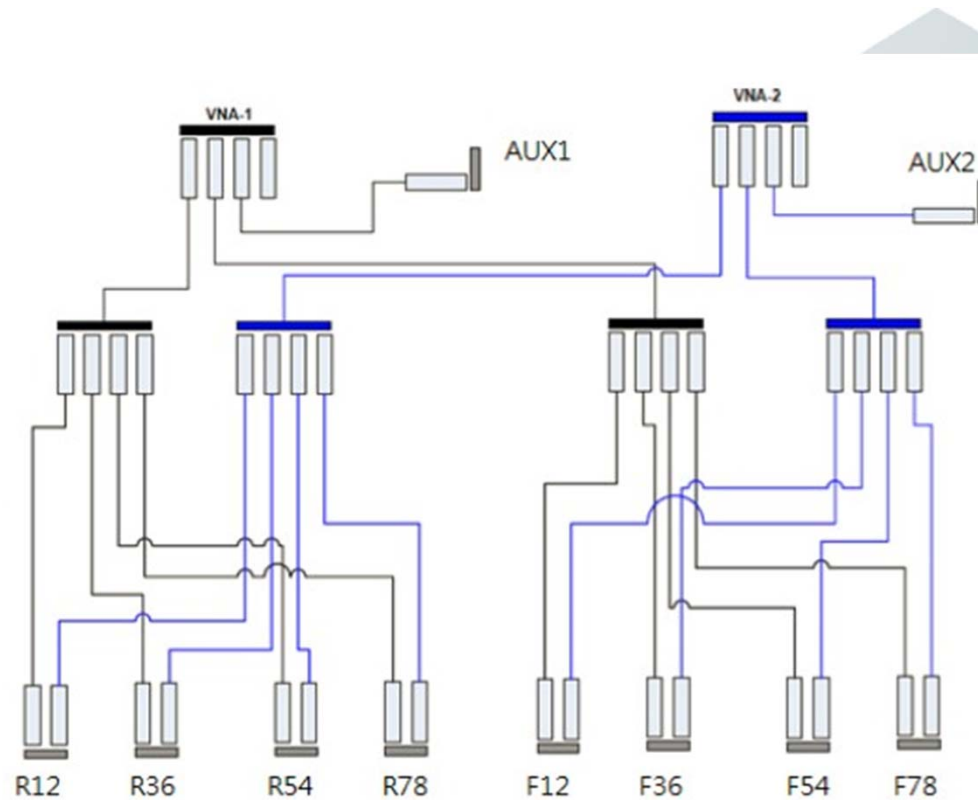


Configuration

Fixture with Balun



Wiring for Fixture with Balun

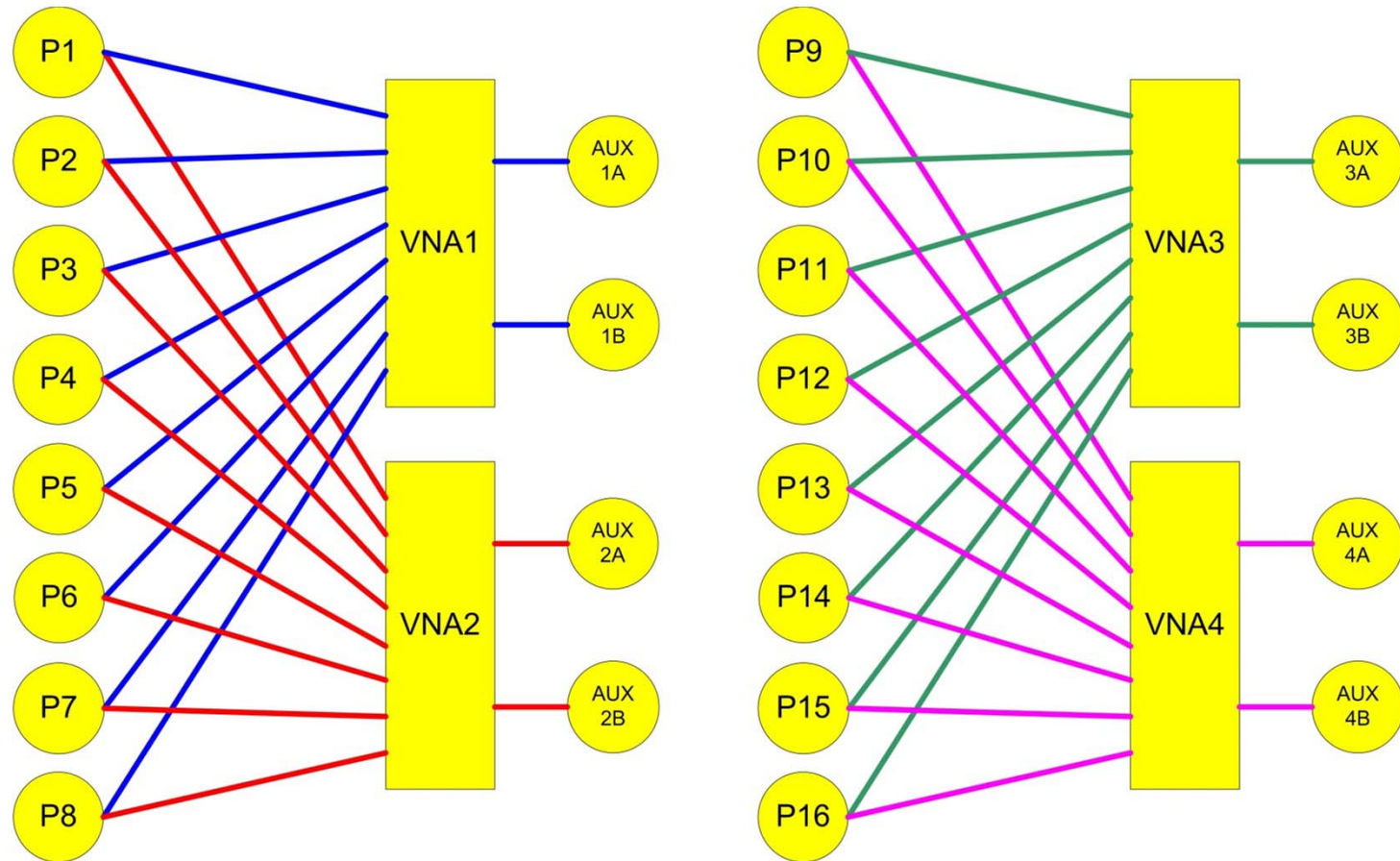


RF Signal Routing Paths

VNA1~4	E5071C Port 1~4
AUX1A~ AUX4A	Auxiliary Port Set A 1~4
AUX1B~ AUX4B	Auxiliary Port Set B 1~4
P1~16	RF Port 1~16



RF Signal Routing Paths (cont'd)



Software Screenshot

Calibration



LAN Connector Test System (A.01.20, 2013/09/10) [-]

Dedicated for Demo

Summary Results | Text Results | Graphic Results | Settings | General Settings | **Calibration** | Log

Check | RL / IL / Conv. | FEXT | NEXT

Pair - 12 | Pair - 36 | Pair - 45 | Pair - 78 | Pair 5

P1-Open	P2-Open	P3-Open	P4-Open
P1-Short	P2-Short	P3-Short	P4-Short
P1-Load	P2-Load	P3-Load	P4-Load
P1-P2	P1-P3	P1-P4	P2-P3
	P2-P4	P3-P4	

Copy Cal | **E-CAL** | Done | Cancel

Test Item Action: Expand all | Select all | Save | Load

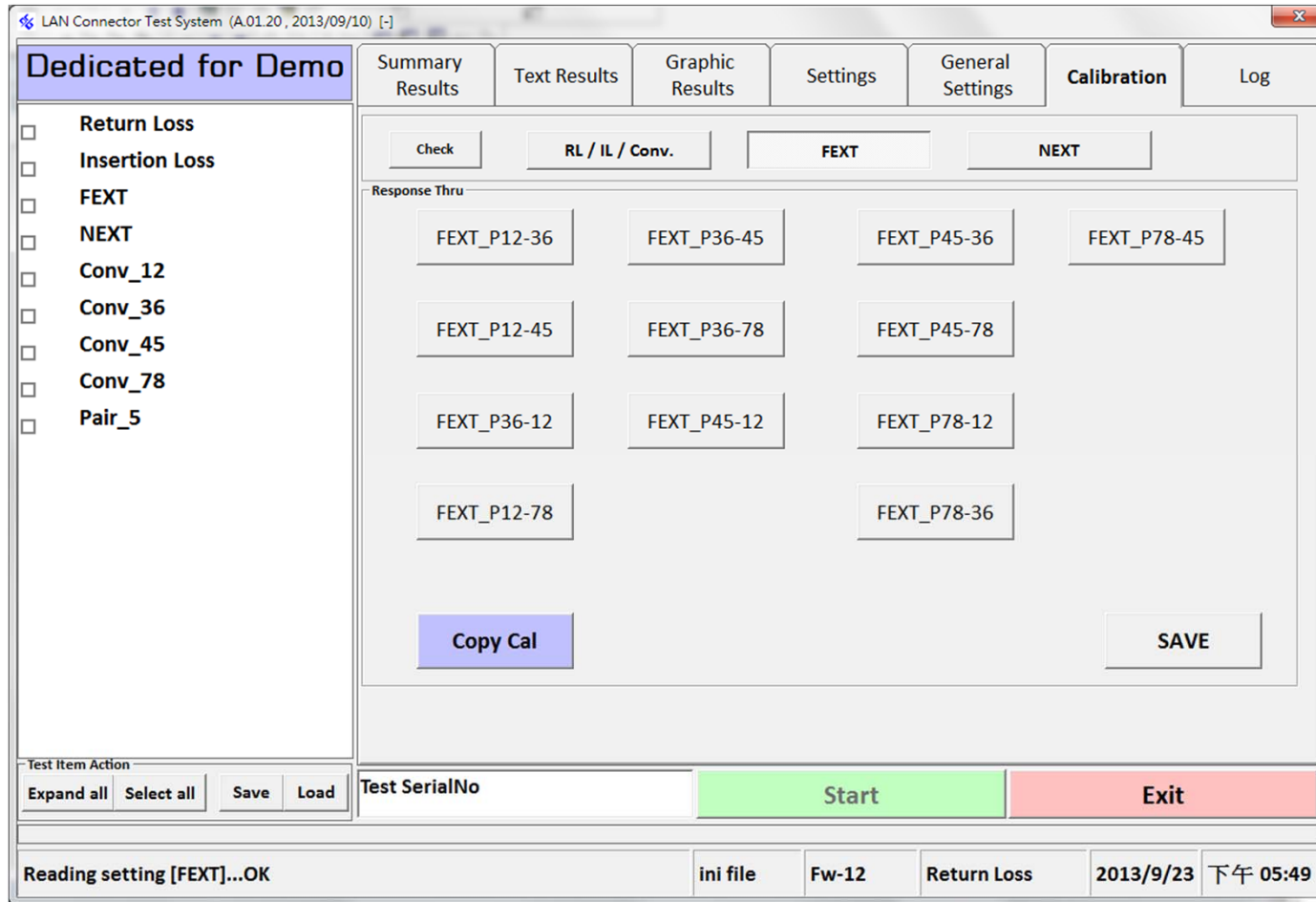
Test SerialNo: []

Start | Exit

Reading setting [RL / IL / Conv.]...OK | LWDefault.ini | Fw-12 | Return Loss | 2013/9/23 下午 05:23

Software Screenshot (cont'd)

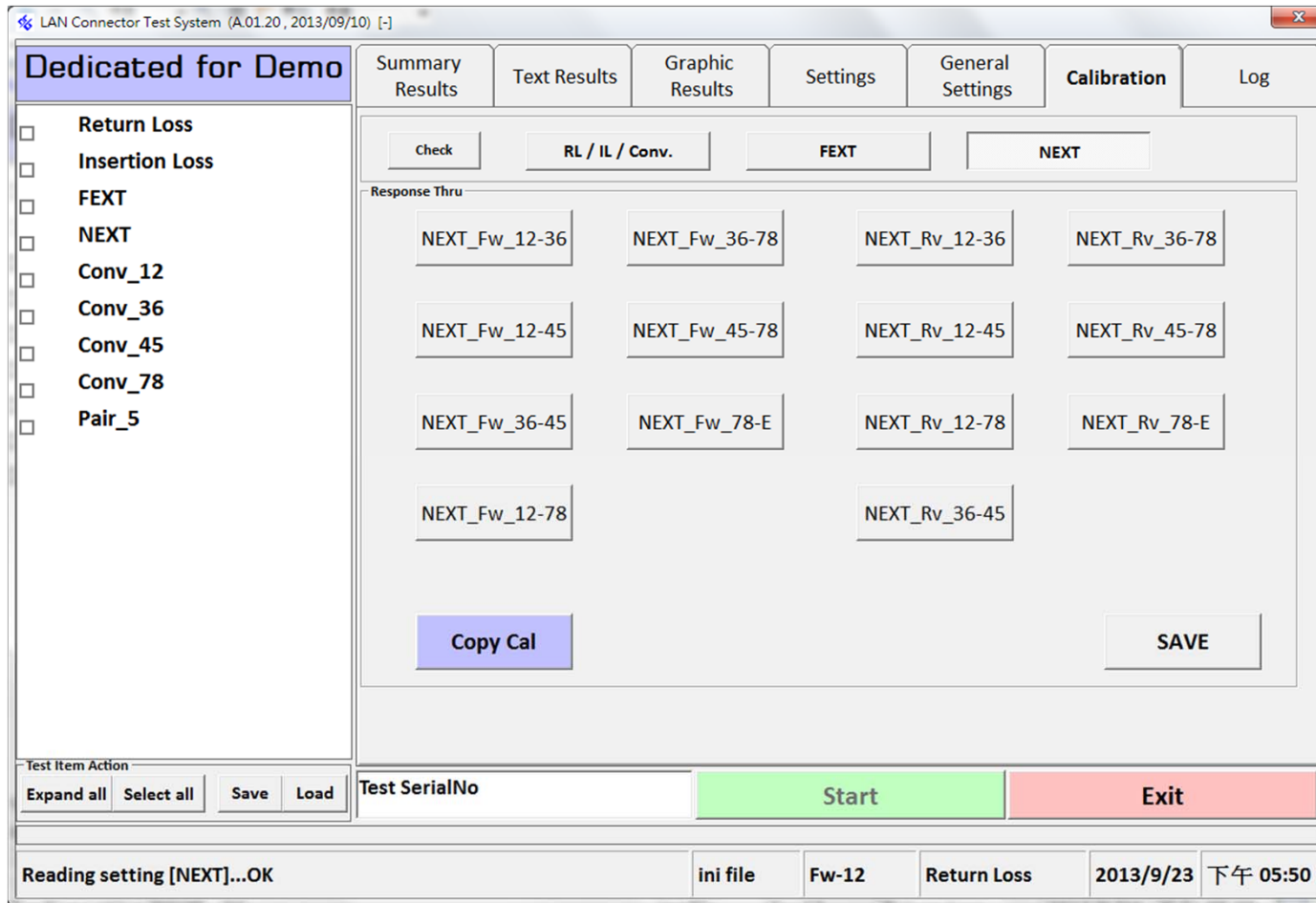
Calibration - FEXT



The screenshot displays the 'LAN Connector Test System' software interface, specifically the 'Calibration' tab. The window title is 'LAN Connector Test System (A.01.20, 2013/09/10) [-]'. The interface includes a menu bar with 'Summary Results', 'Text Results', 'Graphic Results', 'Settings', 'General Settings', 'Calibration', and 'Log'. The 'Calibration' tab is active, showing a 'Check' button, 'RL / IL / Conv.', 'FEXT', and 'NEXT' buttons. Below these is a 'Response Thru' section with a grid of buttons for various FEXT measurements: FEXT_P12-36, FEXT_P36-45, FEXT_P45-36, FEXT_P78-45, FEXT_P12-45, FEXT_P36-78, FEXT_P45-78, FEXT_P36-12, FEXT_P45-12, FEXT_P78-12, FEXT_P12-78, and FEXT_P78-36. A 'Copy Cal' button is located at the bottom left of the grid, and a 'SAVE' button is at the bottom right. At the bottom of the window, there is a 'Test Item Action' section with 'Expand all', 'Select all', 'Save', and 'Load' buttons. Below this is a 'Test SerialNo' field, a green 'Start' button, and a red 'Exit' button. The status bar at the very bottom shows 'Reading setting [FEXT]...OK', 'ini file', 'Fw-12', 'Return Loss', '2013/9/23', and '下午 05:49'.

Software Screenshot (cont'd)

Calibration - NEXT



The screenshot shows the 'LAN Connector Test System' software interface. The window title is 'LAN Connector Test System (A.01.20, 2013/09/10) [-]'. The interface is divided into several sections:

- Navigation Tabs:** Summary Results, Text Results, Graphic Results, Settings, General Settings, Calibration (selected), Log.
- Left Panel:** A list of test items with checkboxes: Return Loss, Insertion Loss, FEXT, NEXT, Conv_12, Conv_36, Conv_45, Conv_78, and Pair_5.
- Calibration Section:** Contains buttons for 'Check', 'RL / IL / Conv.', 'FEXT', and 'NEXT'. Below these are 'Response Thru' buttons for various test configurations: NEXT_Fw_12-36, NEXT_Fw_36-78, NEXT_Rv_12-36, NEXT_Rv_36-78, NEXT_Fw_12-45, NEXT_Fw_45-78, NEXT_Rv_12-45, NEXT_Rv_45-78, NEXT_Fw_36-45, NEXT_Fw_78-E, NEXT_Rv_12-78, NEXT_Rv_78-E, NEXT_Fw_12-78, and NEXT_Rv_36-45. There are also 'Copy Cal' and 'SAVE' buttons.
- Test Item Action:** Buttons for 'Expand all', 'Select all', 'Save', and 'Load'.
- Test SerialNo:** A field for entering the test serial number.
- Start/Exit:** A green 'Start' button and a red 'Exit' button.
- Status Bar:** Displays 'Reading setting [NEXT]...OK', 'ini file', 'Fw-12', 'Return Loss', '2013/9/23', and '下午 05:50'.

Software Screenshot (cont'd)

Settings

LAN Connector Test System (A.01.26, 2013/09/26) [E5071C-MY46107702]

Dedicated for Demo

Summary Results | Text Results | Graphic Results | **Settings** | General Settings | Calibration | Log

Load Config ... | Config SaveAs ... | Save Setting | Copy Setting

Basic Setting [Return Loss / Insertion Loss / CONV_12]

Start(MHz) 1 | Stop(MHz) 1601 | Points 201

Power(dbm) 0 | IF BW (kHz) 10 | Format Type MLOG

Limit Line [Return Loss_Fw-12]

Upper Limit Lower Limit | Limit Points(Max=10) 10

Point#	1	2	3	4	5	6	7	8	9	10
LH_Freq(MHz)	200	220	240	260	280	300	320	340	360	380
LH_Mag(dB)	0	0	-20	0	0	0	-20	0	0	0
LL_Freq(MHz)	200	220	240	260	280	300	320	340	360	380
LL_Mag(dB)	-20	-20	-40	-20	-20	-20	-40	-20	-20	-20

Test Item Action: Expand all | Select all | Save | Load

Test SerialNo: [] Start [] Exit []

msg | ini file | Fw-12 | Return Loss | 2013/9/27 上午 11:25

Software Screenshot (cont'd)

General Settings

LAN Connector Test System (A.01.20, 2013/09/10) [-]

Dedicated for Demo

- Return Loss
- Insertion Loss
- FEXT
- NEXT
- Conv_12
- Conv_36
- Conv_45
- Conv_78
- Pair_5

Summary Results | Text Results | Graphic Results | Settings | **General Settings** | Calibration | Log

Save Report Save setting Clear

* Report Info		* Station Info	
Report Name		Start Time	
Report Date	20130923	Temperature(°C)	
* Product Info		Humidity(%)	
Part Number		Test Parameters	
Production Order		OP Name	
Serial Number		SW. Ver.	A.01.20
Length (m)		NA Model NO.	
Wire AWG / Brand		NA SN	
Compliance		NA FW Ver.	
Configuration File	LWDefault.ini	Test Fixture Name	
De-embedded file	---	Testing following	
Equilization File	---	* Customer Info	
Report Directory	D:\V8\prj-RJ45\RJ45.vb\Report\20130923\	Address	
Report FileName	_xlsx	Customer NO.	
Tested Pairs	1,2,3,4,5,6,7,8,	Name	
-	-	TEL	
-	-	FAX	
-	-	Email	
-	-	Quantity	
-	-	PO.	

Test Item Action:

Test SerialNo:

msg ini file Fw-12 Return Loss 2013/9/23 下午 05:14

Software Screenshot (cont'd)

Test Items

LAN Connector Test System (A.01.26, 2013/09/26) [E5071C-MY46107702]

Dedicated for Demo

- Return Loss
- Insertion Loss
- FEXT
- NEXT
- Conv_12
- Conv_36
- Conv_45
- Conv_78
- Pair_5

Summary Results | Text Results | Graphic Results | **Settings** | General Settings | Calibration | Log

Load Config ... | Config SaveAs ... | Save Setting | Copy Setting

Basic Setting [Return Loss / Insertion Loss / CONV_12]

Start(MHz) 1 | Stop(MHz) 1601 | Points 201

Power(dBm) 0 | IF BW (kHz) 10 | Format Type MLOG

Limit Line [Return Loss_Fw-12]

Upper Limit Lower Limit | Limit Points(Max=10) 10

Point#	1	2	3	4	5	6	7	8	9	10
LH_Freq(MHz)	200	220	240	260	280	300	320	340	360	380
LH_Mag(dB)	0	0	-20	0	0	0	-20	0	0	0
LL_Freq(MHz)	200	220	240	260	280	300	320	340	360	380
LL_Mag(dB)	-20	-20	-40	-20	-20	-20	-40	-20	-20	-20

Test Item Action

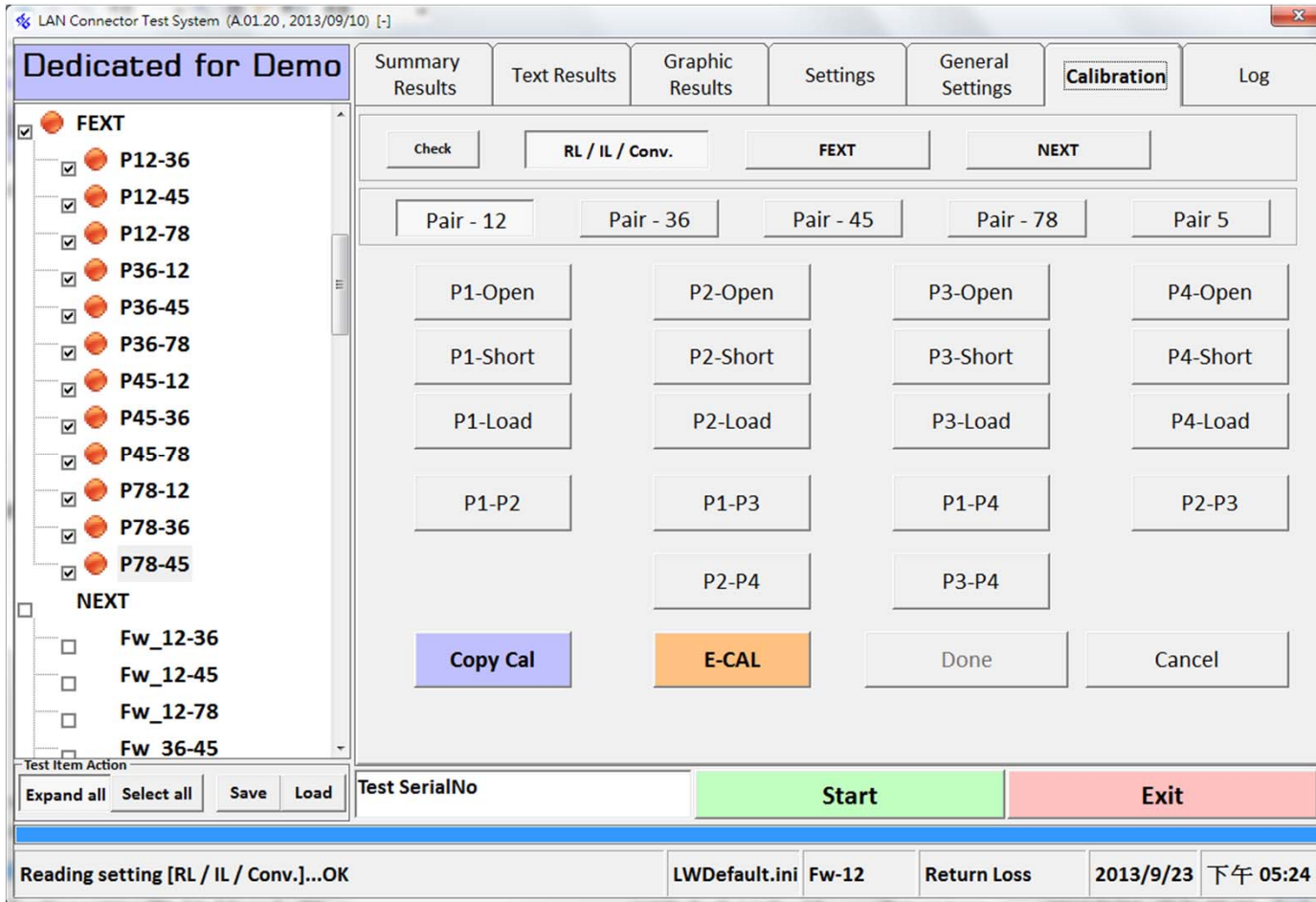
Expand all | Select all | Save | Load

Test SerialNo | **Start** | **Exit**

msg | ini file | Fw-12 | Return Loss | 2013/9/27 上午 11:25

Software Screenshot (cont'd)

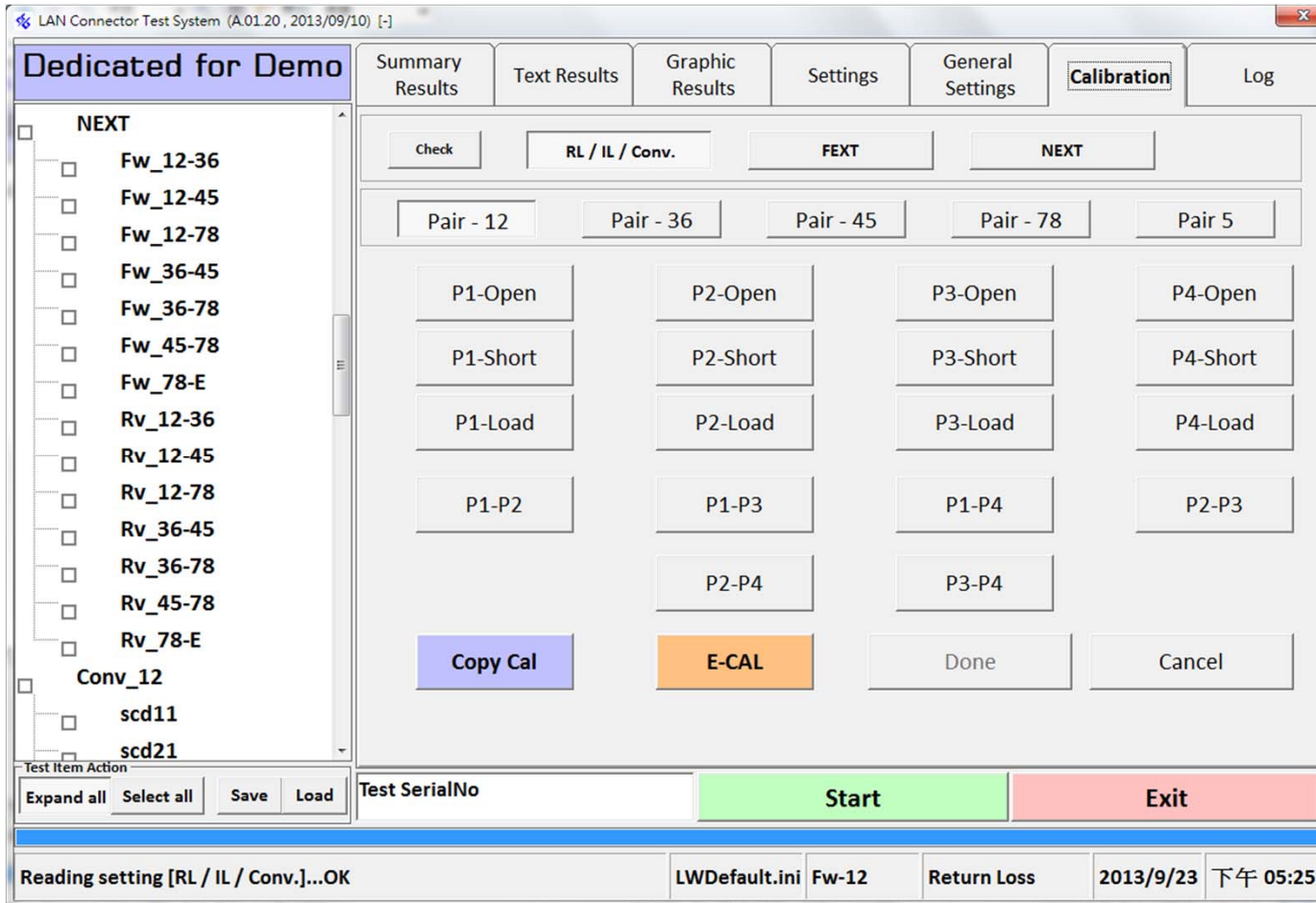
Test Items



The screenshot shows the 'LAN Connector Test System' software interface. The window title is 'LAN Connector Test System (A.01.20, 2013/09/10) [-]'. The main area is titled 'Dedicated for Demo' and contains several tabs: Summary Results, Text Results, Graphic Results, Settings, General Settings, Calibration (selected), and Log. The Calibration tab is active, showing a grid of test items and buttons. The test items are organized into two main sections: FEXT and NEXT. The FEXT section includes items like P12-36, P12-45, P12-78, P36-12, P36-45, P36-78, P45-12, P45-36, P45-78, P78-12, P78-36, and P78-45. The NEXT section includes items like Fw_12-36, Fw_12-45, Fw_12-78, and Fw_36-45. The main area also features buttons for 'Check', 'RL / IL / Conv.', 'FEXT', 'NEXT', 'Pair - 12', 'Pair - 36', 'Pair - 45', 'Pair - 78', 'Pair 5', 'P1-Open', 'P2-Open', 'P3-Open', 'P4-Open', 'P1-Short', 'P2-Short', 'P3-Short', 'P4-Short', 'P1-Load', 'P2-Load', 'P3-Load', 'P4-Load', 'P1-P2', 'P1-P3', 'P1-P4', 'P2-P3', 'P2-P4', 'P3-P4', 'Copy Cal', 'E-CAL', 'Done', and 'Cancel'. At the bottom, there are buttons for 'Expand all', 'Select all', 'Save', 'Load', 'Test SerialNo', 'Start', and 'Exit'. The status bar at the bottom shows 'Reading setting [RL / IL / Conv.]...OK', 'LWDefault.ini', 'Fw-12', 'Return Loss', '2013/9/23', and '下午 05:24'.

Software Screenshot (cont'd)

Test Items

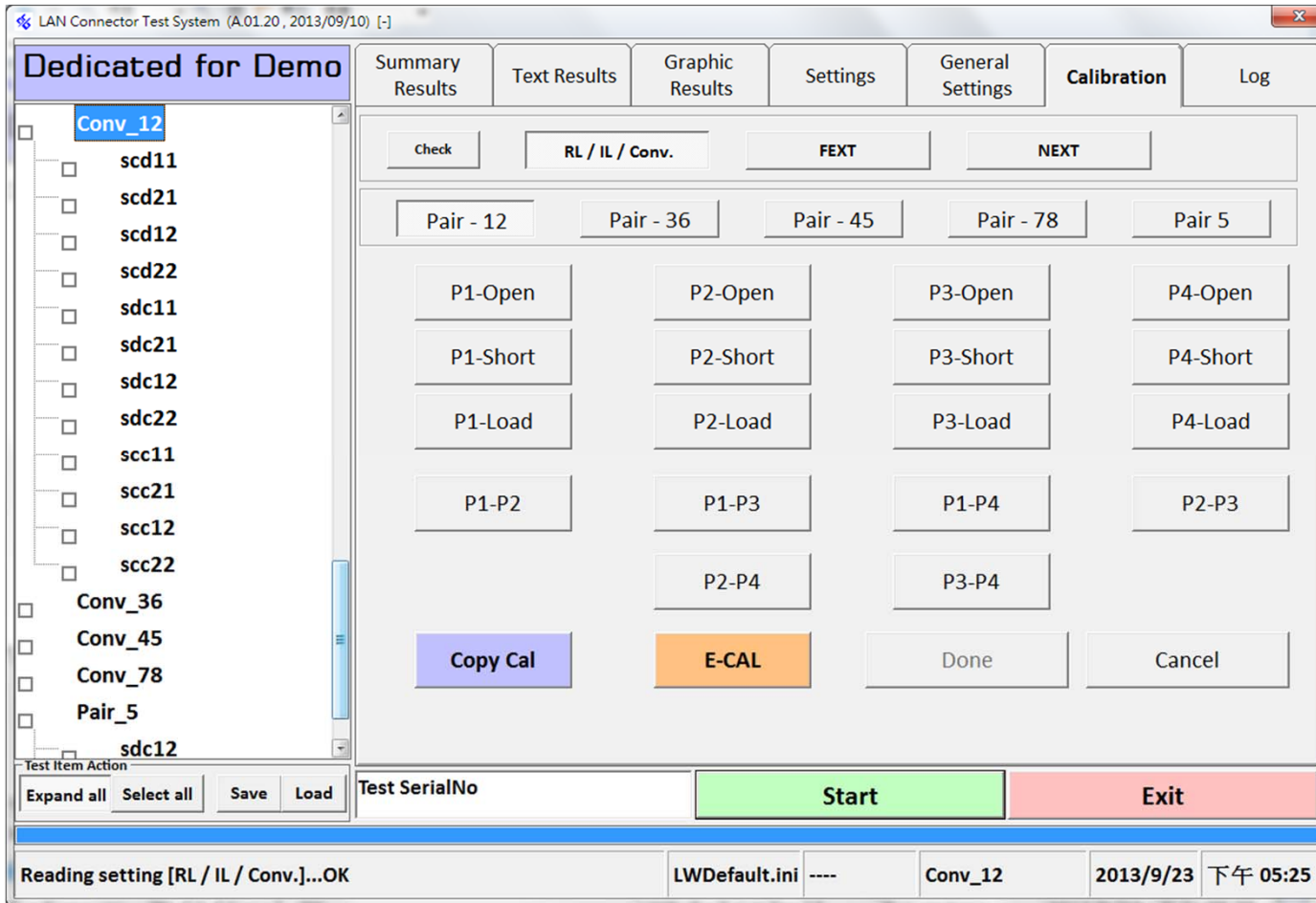


The screenshot shows the 'LAN Connector Test System' software interface. The window title is 'LAN Connector Test System (A.01.20, 2013/09/10) [-]'. The interface is divided into several sections:

- Navigation Tabs:** Summary Results, Text Results, Graphic Results, Settings, General Settings, **Calibration** (selected), and Log.
- Left Panel:** A tree view under 'Dedicated for Demo' showing test items: NEXT, Fw_12-36, Fw_12-45, Fw_12-78, Fw_36-45, Fw_36-78, Fw_45-78, Fw_78-E, Rv_12-36, Rv_12-45, Rv_12-78, Rv_36-45, Rv_36-78, Rv_45-78, Rv_78-E, Conv_12, scd11, and scd21.
- Top Action Bar:** Check, RL / IL / Conv., FEXT, NEXT.
- Pair Selection:** Pair - 12, Pair - 36, Pair - 45, Pair - 78, Pair 5.
- Test Parameters:** P1-Open, P2-Open, P3-Open, P4-Open; P1-Short, P2-Short, P3-Short, P4-Short; P1-Load, P2-Load, P3-Load, P4-Load; P1-P2, P1-P3, P1-P4, P2-P3, P2-P4, P3-P4.
- Bottom Action Bar:** Copy Cal, E-CAL, Done, Cancel.
- Footer:** Test Item Action (Expand all, Select all, Save, Load), Test SerialNo, Start, Exit, Reading setting [RL / IL / Conv.]...OK, LWDefault.ini, Fw-12, Return Loss, 2013/9/23 下午 05:25.

Software Screenshot (cont'd)

Test Items

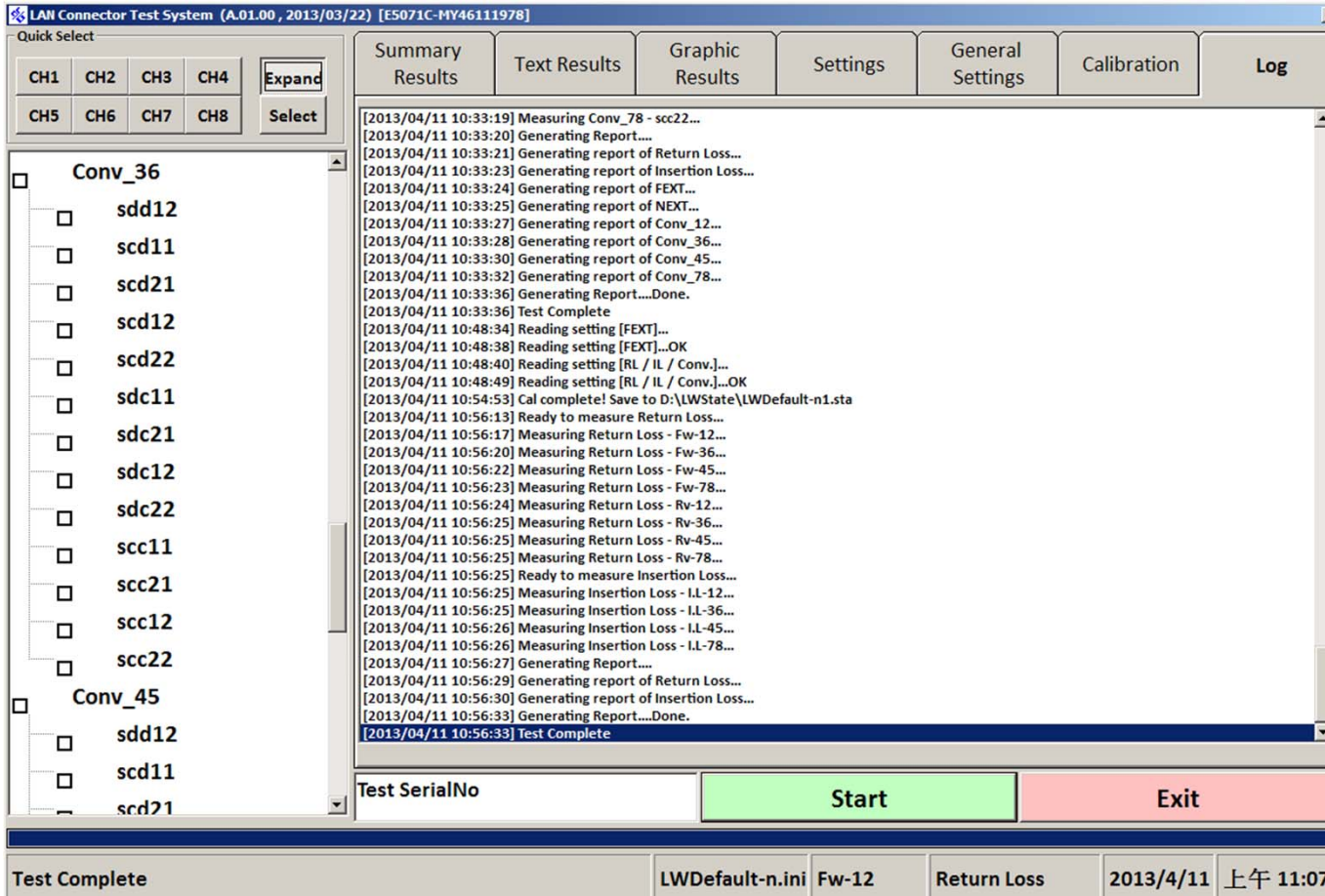


The screenshot shows the LAN Connector Test System (A.01.20, 2013/09/10) interface. The window title is "LAN Connector Test System (A.01.20, 2013/09/10) [-]". The interface is divided into several sections:

- Left Panel:** A tree view under "Dedicated for Demo" showing test items: Conv_12 (selected), scd11, scd21, scd12, scd22, sdc11, sdc21, sdc12, sdc22, scc11, scc21, scc12, scc22, Conv_36, Conv_45, Conv_78, Pair_5, and sdc12.
- Top Menu:** Summary Results, Text Results, Graphic Results, Settings, General Settings, Calibration, Log.
- Buttons:** Check, RL / IL / Conv., FEXT, NEXT, Pair - 12, Pair - 36, Pair - 45, Pair - 78, Pair 5, P1-Open, P2-Open, P3-Open, P4-Open, P1-Short, P2-Short, P3-Short, P4-Short, P1-Load, P2-Load, P3-Load, P4-Load, P1-P2, P1-P3, P1-P4, P2-P3, P2-P4, P3-P4, Copy Cal, E-CAL, Done, Cancel.
- Bottom Section:** Test Item Action (Expand all, Select all, Save, Load), Test SerialNo, Start, Exit.
- Status Bar:** Reading setting [RL / IL / Conv.]...OK, LWDefault.ini ----, Conv_12, 2013/9/23 下午 05:25.

Software Screenshot (cont'd)

Test Items



The screenshot displays the LAN Connector Test System interface. On the left, a tree view shows test items under 'Conv_36' and 'Conv_45'. The main window shows a log of test results with various measurements and timestamps. At the bottom, there are buttons for 'Start' and 'Exit', and a status bar showing 'Test Complete' and system information.

Test SerialNo	Start	Exit

Test Complete	LWDefault-n.ini	Fw-12	Return Loss	2013/4/11	上午 11:07
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Software Screenshot (cont'd)

Test Result Summary

LAN Connector Test System (A.01.00, 2013/03/22) [E5071C-MY46111978]

Quick Select

CH1	CH2	CH3	CH4	Expand
CH5	CH6	CH7	CH8	Select

- Return Loss
 - Fw-12
 - Fw-36
 - Fw-45
 - Fw-78
 - Rv-12
 - Rv-36
 - Rv-45
 - Rv-78
- Insertion Loss
 - I.L-12
 - I.L-36
 - I.L-45
 - I.L-78
- FEXT
- NEXT
- Conv_12
- Conv_36

Summary Results	Text Results	Graphic Results	Settings	General Settings	Calibration	Log							
Return Lo	Fw-12	Fw-36	Fw-45	Fw-78	Rv-12	Rv-36	Rv-45	Rv-78					
Result	Fail	Fail	Fail	Fail	Fail	Fail	Fail	Fail					
Insertion	I.L-12	I.L-36	I.L-45	I.L-78									
Result	Fail	Fail	Fail	Fail									
FEXT	P12-36	P12-45	P12-78	P36-12	P36-45	P36-78	P45-12	P45-36	P45-78	P78-12	P78-36	P78-45	
Result													
NEXT	Fw_12-3	Fw_12-4	Fw_12-7	Fw_36-4	Fw_36-7	Fw_45-7	Rv_12-3	Rv_12-4	Rv_12-7	Rv_36-4	Rv_36-7	Rv_45-7	
Result													
Conv_12	sdd12	sdc11	sdc21	sdc12	sdc22	sdc11	sdc21	sdc12	sdc22	scc11	scc21	scc12	scc22
Result													
Conv_36	sdd12	sdc11	sdc21	sdc12	sdc22	sdc11	sdc21	sdc12	sdc22	scc11	scc21	scc12	scc22
Result													
Conv_45	sdd12	sdc11	sdc21	sdc12	sdc22	sdc11	sdc21	sdc12	sdc22	scc11	scc21	scc12	scc22
Result													
Conv_78	sdd12	sdc11	sdc21	sdc12	sdc22	sdc11	sdc21	sdc12	sdc22	scc11	scc21	scc12	scc22
Result													

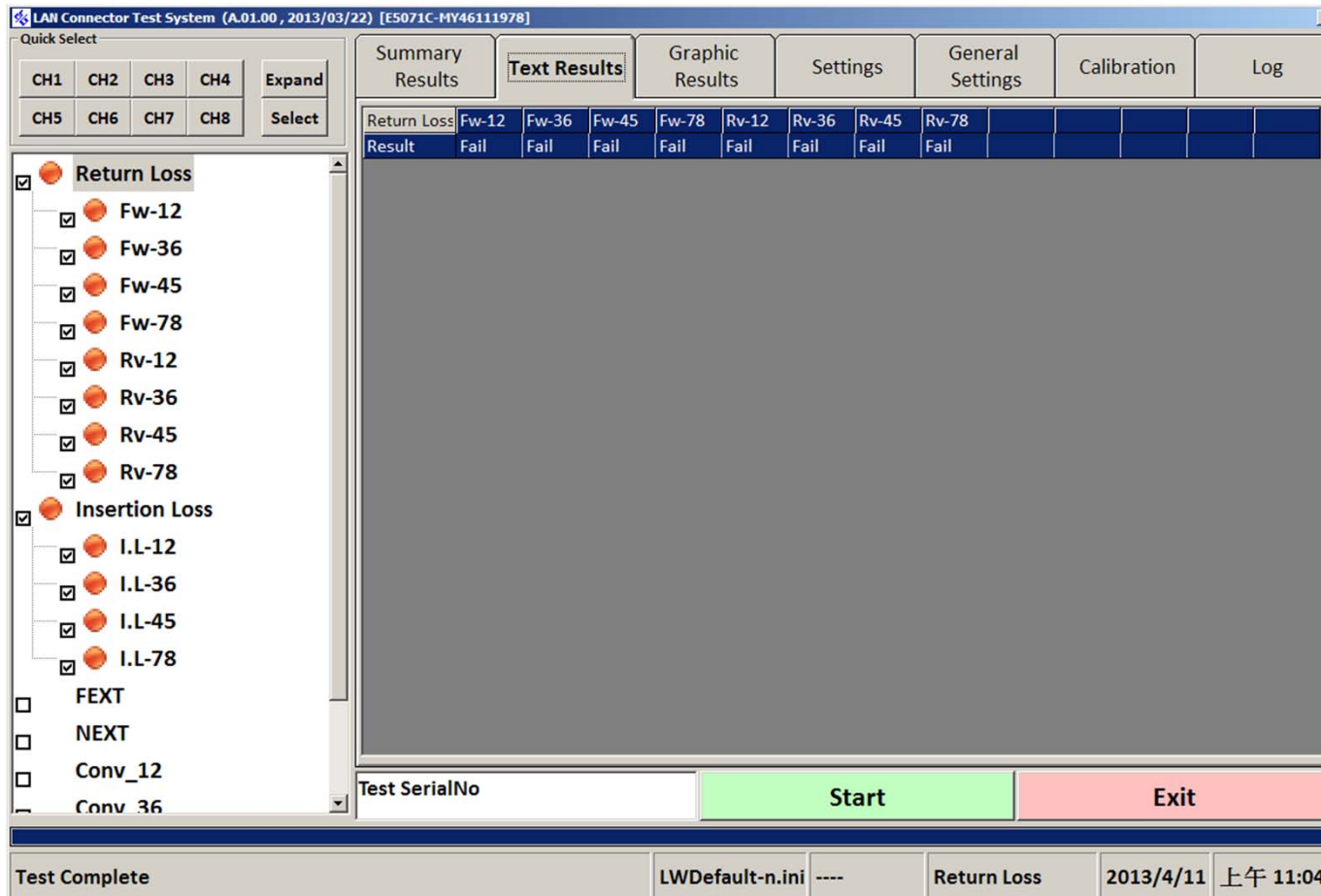
FAIL

Test SerialNo: _____ Start Exit

Test Complete LWDefault-n.ini I.L-12 Insertion Loss 2013/4/11 上午 11:02

Software Screenshot (cont'd)

Test Result in Text Format

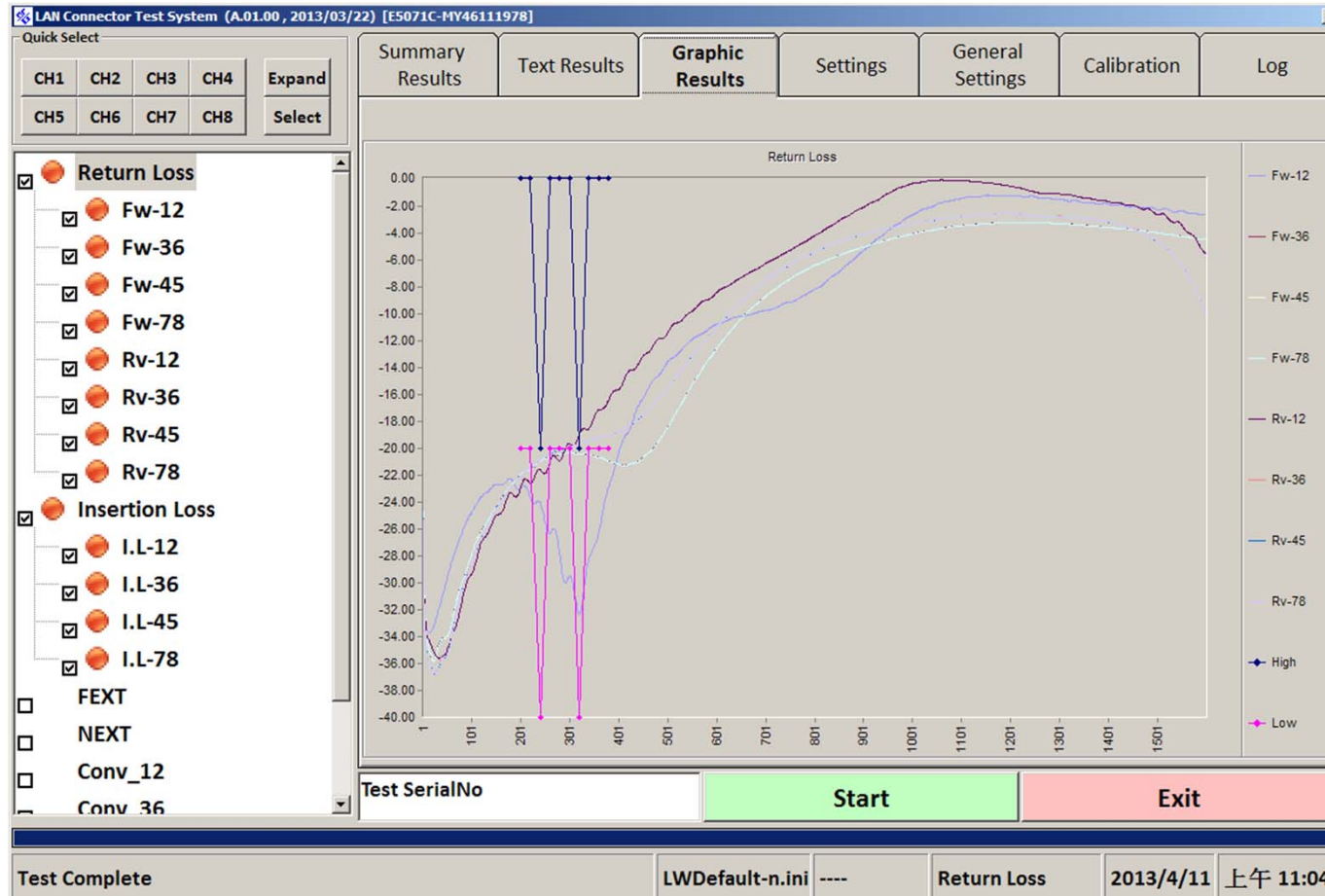


The screenshot displays the LAN Connector Test System interface. The main window is titled "LAN Connector Test System (A.01.00, 2013/03/22) [E5071C-MY46111978]". The interface includes a "Quick Select" panel on the left with buttons for "Expand" and "Select", and a list of test parameters: Return Loss (Fw-12, Fw-36, Fw-45, Fw-78, Rv-12, Rv-36, Rv-45, Rv-78), Insertion Loss (I.L-12, I.L-36, I.L-45, I.L-78), FEXT, NEXT, Conv_12, and Conv_36. The "Text Results" tab is active, showing a table of results. The table has columns for "Return Loss" and "Result". The "Result" column shows "Fail" for all tested parameters. At the bottom of the window, there are buttons for "Start" and "Exit", and a status bar at the very bottom showing "Test Complete", "LWDefault-n.ini", "----", "Return Loss", "2013/4/11", and "上午 11:04".

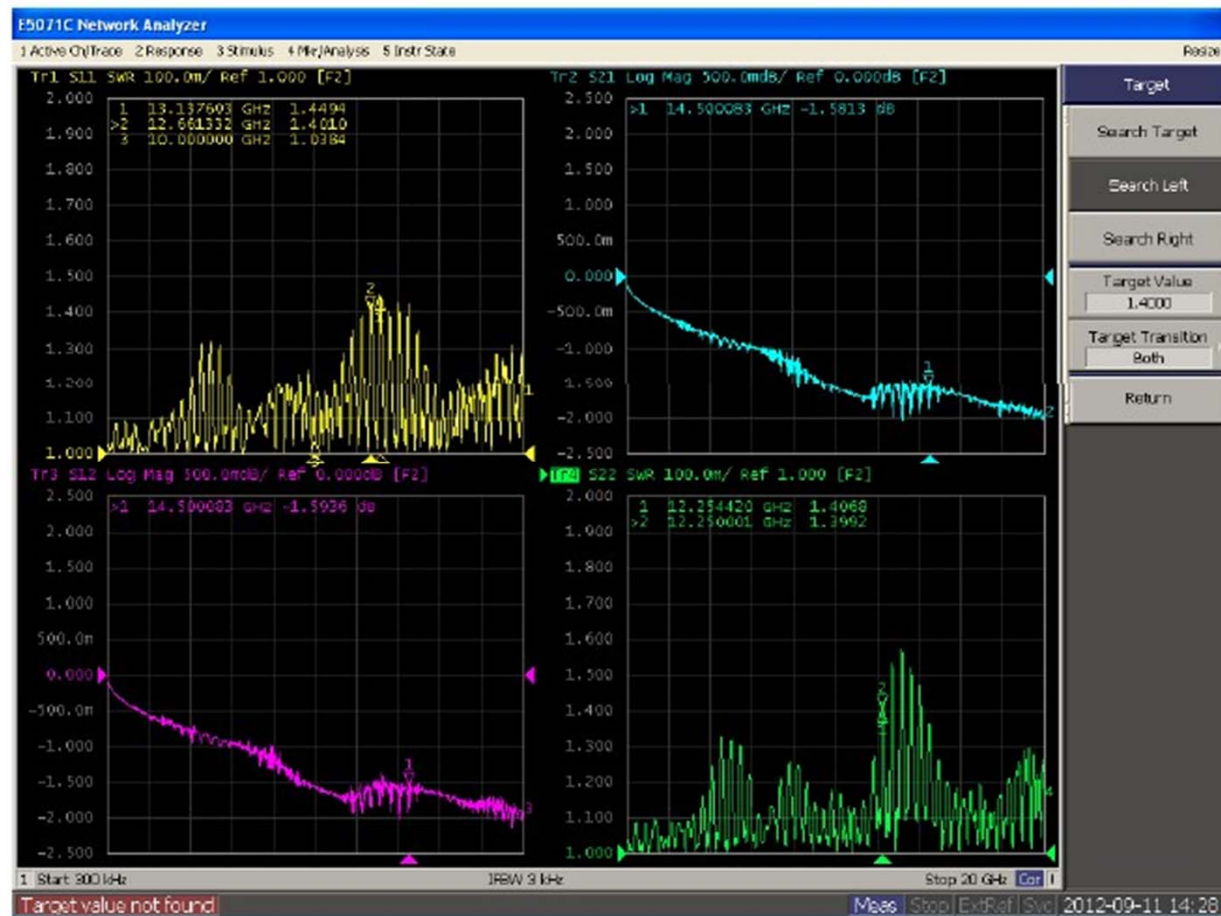
Return Loss	Fw-12	Fw-36	Fw-45	Fw-78	Rv-12	Rv-36	Rv-45	Rv-78				
Result	Fail	Fail	Fail	Fail	Fail	Fail	Fail	Fail				

Software Screenshot (cont'd)

Test Result in Graphic Format



RF Performance



Contact Information

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