ROHDE&SCHWARZ

Test and Measurement
Division

Release Notes

R&S LXI Class C Support V1.21 (XP)

for

R&S FSP Spectrum Analyzers

R&S FSU Spectrum Analyzers

R&S FSG Signal Analyzers

R&S FSQ Signal Analyzers

Release Note Revision: 1

Contents

History

Date	Rel Note Rev	Changes
03 May 2008	1	First revision for V1.21.

Supported instruments

Install this driver only on instruments equiped with Windows XP Embedded.

Instrument	Order Number
R&S FSG	1309.0002.xx
R&S FSP	1164.4391.xx
R&S FSQ	1155.5001.xx
R&S FSU	1166.1660.xx

New Features

None.

Modified Functions

The version numbers in brackets indicate the version in which the function was modified.

1. (V1.16) First delivered version.

2. (V1.17) Support for R&S FSG.

Problems Eliminated

The version numbers in brackets indicate the version in which the problem was observed for the first time.
1. (V1.17) LCI does not reset LAN Configuration Parameter Description.
2. (V1.17) PING does not return a message
If the windows XP command "PING.EXE" is not installed on the instrument (older hard disk images) an empty response string is generated.
3. (V1.17) Wrong LXI version number indication corrected.

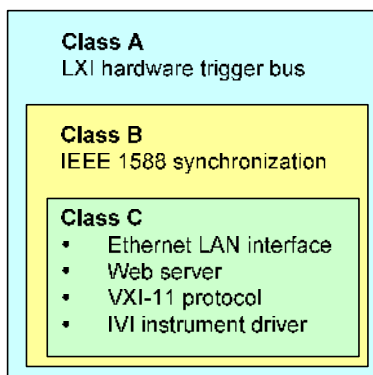**4. (V1.17) Command PING is not installed.**

Known Problems

None

LAN eXtension for Instrumentation (LXI)

LAN eXtensions for Instrumentation (LXI) is an instrumentation platform for measuring instruments and test systems that is based on standard Ethernet technology. LXI is intended to be the LAN-based successor to GPIB, combining the advantages of Ethernet with the simplicity and familiarity of GPIB.

LXI classes and LXI functionality

LXI-compliant instruments are divided into three classes, A, B and C, with the functionality of the classes hierarchically based one upon the other:

> **Class A**
> LXI hardware trigger bus
>
> > **Class B**
> > IEEE 1588 synchronization
> >
> > > **Class C**
> > > * Ethernet LAN interface
> > > * Web server
> > > * VXI-11 protocol
> > > * IVI instrument driver

Class C instruments are characterized by a common LAN implementation, including an ICMP ping responder for diagnostics. The instruments can be configured via a web browser; a LAN Configuration Initialize (LCI) mechanism resets the LAN configuration. The LXI class C instruments shall also support automatic detection in a LAN via the VXI-11 discovery protocol and programming by means of IVI drivers.

Class B adds IEEE 1588 Precision Time Protocol (PTP) and peer-to-peer communication to the base class. IEEE 1588 allows all instruments on the same network to automatically synchronize to the most accurate clock available and then provide time stamps or time-based synchronization signals to all instruments with exceptional accuracy.

Class A instruments are additionally equipped with the eight-channel hardware trigger bus (LVDS interface) defined in the LXI standard.

Instruments of classes A and B can generate and receive software triggers via LAN messages and communicate with each other without involving the controller.

The instrument complies with LXI class C. In addition to the general class C features described above, it provides the following LXI-related functionality:

Integrated *LXI Configuration* dialog for LXI activation and reset of the LAN configuration (LAN Configuration Initialize, LCI).

> For information about the LXI standard refer to the LXI website at http://www.lxistandard.org. See also "News from Rohde & Schwarz, article 2006/II - 190".

LXI Class C Support Package Installation

The LXI Class C support package is pre installed, if the instrument is shipped with version 4.1x or newer. A link *LXI* is visible in the windows start menu.

The installation of the LXI Class C support package requires an external keyboard and/or a mouse.
To install the LXI Class C support package please:
- Download the installer file from the R&S download area.
- Select windows start menu (Windows key or CTRL ESC) and start the windows explorer
- Create the sub directory **D:\LXI**, if this directory does not exist.
- Copy the installer file to this directory via LAN or USB stick.
- Start the installation by double click on the MSI file (e.g. LxiClassC-1.17_FSx.msi for version 1.17).

LXI Activation and Deactivation:

After the successful packet installation the LXI support has to be activated:
- Connect the instrument to the LAN.
- Select windows start menu (Windows key or CTRL ESC)
- Select *LXI*.
  Note: An additional installation process will be done if the instrument is provided with Windows XP SP1. Reselect LXI after reboot in that case.
- Select *LXI Config*. An LXI configuration dialog will be opened.
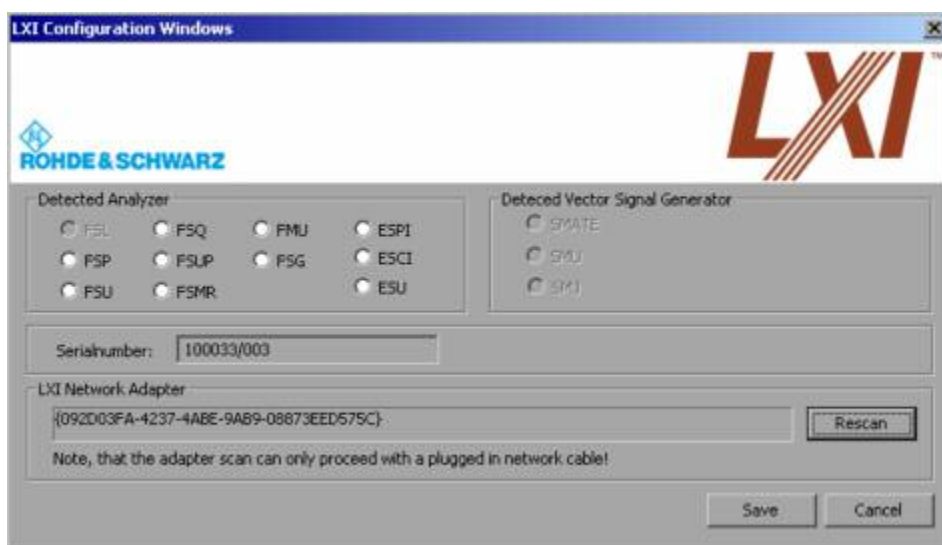
- Select the correct instrument.
- Select *Rescan*. The current IP address will be visible in the bottom line.
- Select Save, after successful rescan operation.

To switch LXI off, use again the LXI entry from the start menu and select the LXI TURN OFF button.

The LAN settings are configured using the instrument's LXI Browser Interface.

LXI Browser Interface

The instrument's LXI browser interface works correctly with all W3C compliant browsers. Typing the instrument's host name or IP address in the address field of the browser on your PC, e.g.

http://10.114.10.197

opens the *Instrument Home Page* (welcome page).
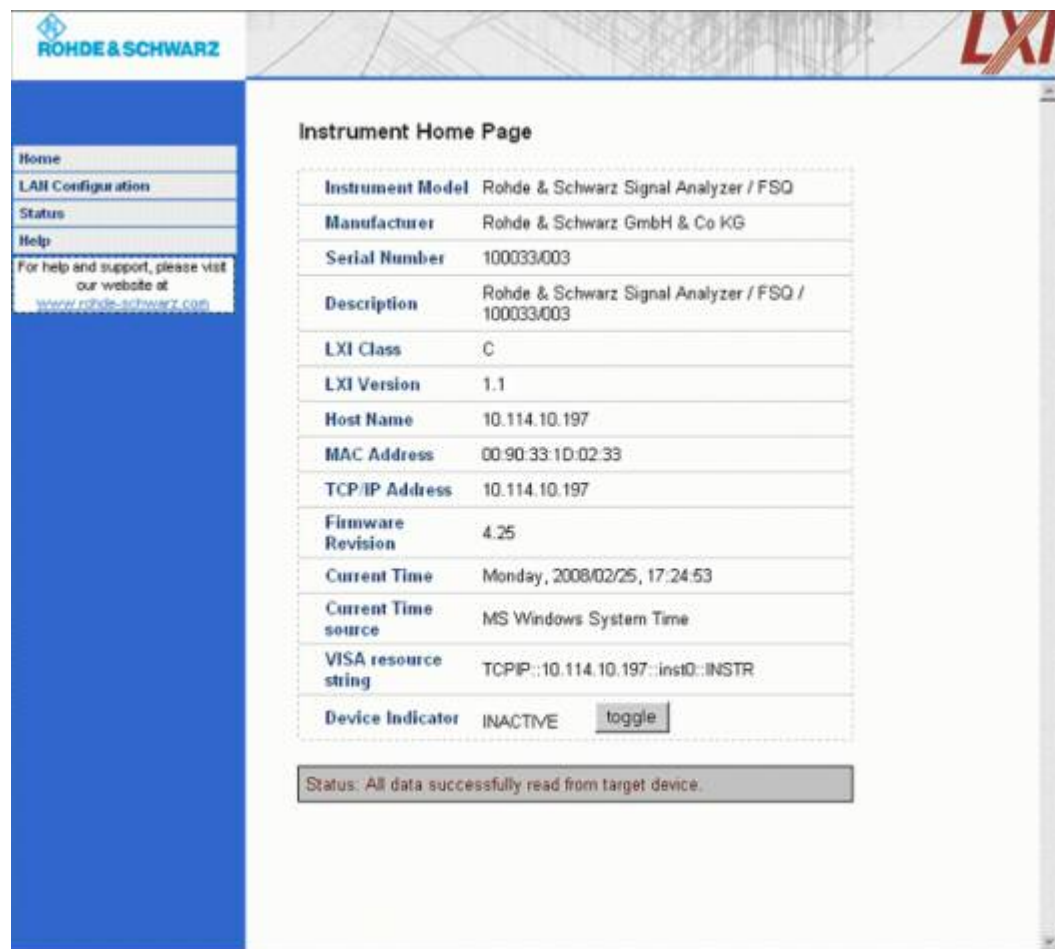
The instrument home page displays the device information required by the LXI standard including the VISA resource string in read-only format.

The *Device Indicator* toggle button causes the LXI logo in the LXI Observer window of the instrument to blink (if active). A green LXI status symbol indicates that a LAN connection has been established; a red symbol indicates that no LAN cable is connected or a LAN error is occured. The *Device Indicator* setting is not password-protected.

The navigation pane of the browser interface contains the following control elements:

LAN Configuration opens the LAN Configuration page.

LXI Glossary opens a document with a glossary of terms related to the LXI standard.

Status displays information about the LXI status of the instrument.

LAN Configuration

The *LAN Configuration* web page displays all mandatory LAN parameters and allows their modification.

The *TCP/IP Mode* configuration field controls how the IP address for the instrument gets assigned. For the manual configuration mode, the static IP address, subnet mask, and default gateway are used to configure the LAN. The automatic configuration mode uses DHCP server or Dynamic Link Local Addressing (Automatic IP) to obtain the instrument IP address.

> **NOTE**
>
> *Changing the LAN configuration is password-protected. The password reads* `LxiWeb` *(notice upper and lower case characters). This password cannot be changed in the current firmware version.*

The links across the bottom of the *LAN Configuration* page open other pages:

Ping Client provides the ping utility to verify the connection between the instrument and other devices.

Advanced LAN Configuration provides LAN settings that are not declared mandatory by the LXI standard.

The *Advanced LAN Configuration* parameters are used as follows:

The *Negotiation* configuration field provides different Ethernet speed and duplex mode settings. In general, the *Auto Detect* mode is sufficient.

ICMP Ping must be enabled to use the ping utility.

VXI-11 is the protocol that is used for discovery of the instrument in the LAN. According to the standard, LXI devices must use VXI-11 to provide a discovery mechanism; other additional discovery mechanisms are permitted.

Ping Client

Ping is a utility that verifies the connection between the LXI-compliant instrument and another device. The ping command uses the ICMP echo request and echo reply packets to determine whether the LAN connection is functional. Ping is useful for diagnosing IP network or router failures.
The ping utility is not password-protected. To initiate a ping between the LXI-compliant instrument and a second connected device,

1. Enable *ICMP Ping* on the *Advanced LAN Configuration* page (enabled after an LCI).
2. Enter the IP address of the second device **without the ping command and without any further parameters** into the *Destination Address* field (e.g. *10.113.10.203*).
3. Click *Submit*.

Ping Client

Destination
Address [   ]

[Submit] [Reset]

Result

```
Pinging 10.114.10.61 with 32 bytes of data:

Reply from 10.114.10.61: bytes=32 time<1ms TTL=128
Reply from 10.114.10.61: bytes=32 time<1ms TTL=128
Reply from 10.114.10.61: bytes=32 time<1ms TTL=128
Reply from 10.114.10.61: bytes=32 time<1ms TTL=128

Ping statistics for 10.114.10.61:
    Packets: Sent = 4, Received = 4, Lost = 0 (0%
loss),
```

Ping successfully executed on target device.

LXI Specific Instrument Softkeys

Menu SETUP – GENERAL SETUP – NEXT

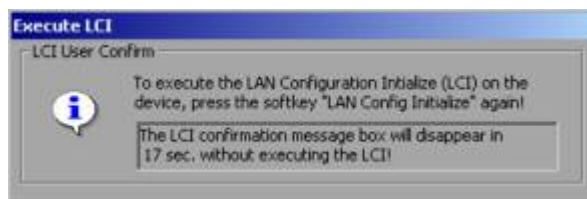| SETUP	GENERAL SETUP	LXI	DISPLAY ON OFF
			LCI

DISPLAY ON OFF   The LXI menu offers some functions for LXI Class C.

LCI   **Note:** This menu is only available, if the LXI package is installed and activated (see: LXI Installation).

The DISPLAY ON/OFF softkey switches the LXI Observer window on and off.

LXI Observer

ROHDE&SCHWARZ   LXI

LAN Configuration Initialize (LCI) Reset Values   Status LEDs

LCI sets the following values: LAN Status

Negotiation: Auto detect
DCHP: On
ICMP Ping: Enabled
Web Password: Factory default
Dynamic DNS: Enabled

Error and Warnings

LXI observer

Pressing LCI will initiate the network configuration reset mechanism (LCI) for the instrument.

The LCI softkey has to be pressed twice to confirm the reset.

Default state of the network settings

According to the LXI standard, an LCI must place the following parameters to a default state.

Parameter	Value
TCP/IP Mode	DHCP + Auto IP Address
Dynamic DNS	Enabled
ICMP Ping	Enabled
Password for LAN configuration	`LxiWeb`

The LCI for the instrument also resets the following parameters:

Parameter	Value
Hostname	<Instrument-specific host name>
Description	Rohde & Schwarz ... / <instrument> / <serial number>
Negotiation	Auto Detect
VXI-11 Discovery	Enabled

Appendix: Contact to our hotline

Any questions or ideas concerning the instrument are welcome by our hotline:

USA & Canada

Monday to Friday (except US public holidays)
8:00 AM – 8:00 PM Eastern Standard Time (EST)

Tel. from USA	888-test-rsa (888-837-8772) (opt 2)
From outside USA	+1 410 910 7800 (opt 2)
Fax	+1 410 910 7801
E-mail	Customer.Support@rsa.rohde-schwarz.com

East Asia

Monday to Friday (except Singaporean public holidays)
8:30 AM – 6:00 PM Singapore Time (SGT)

Tel.	+65 6 513 0488
Fax +	65 6 846 1090
E-mail	Customersupport.asia@rohde-schwarz.com

Rest of the World

Monday to Friday (except German public holidays)
08:00 – 17:00 Central European Time (CET)

Tel. from Europe	+49 (0) 180 512 42 42
From outside Europe	+49 89 4129 13776
Fax	+49 (0) 89 41 29 637 78
E-mail	CustomerSupport@rohde-schwarz.com