

Rohde & Schwarz Drivers under VEE - Installation and Troubleshooting Application Note

Products:

- | Rohde & Schwarz
Instrument Drivers

The use of Rohde & Schwarz instrument drivers under VEE software is not complicated. However, a number of factors are involved and the errors that occur are often difficult to diagnose. This application note provides detailed support for installation and troubleshooting.

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1 Overview

Why instrument drivers from Rohde & Schwarz?

Controlling a sophisticated measuring instrument can be a complex matter. The description of the command set alone comprises a few dozen to several hundred pages. Writing even the commands for a simple application takes up considerable time. Drivers relieve the developer to a great extent of these efforts. Searching the manual for commands is no longer necessary, as it has already been done while developing the drivers and is therefore no longer required.

As a service, Rohde & Schwarz instrument drivers are provided free of charge. For the current Rohde & Schwarz instrument drivers and demo programs see:

http://www2.rohde-schwarz.com/en/service_and_support/Downloads/Drivers/

VISA

All Rohde & Schwarz instrument drivers use Virtual Instrument Software Architecture (VISA) to avoid having to provide an individual driver for every instrument interface. VISA is a standardized software interface library providing input and output functions to communicate with measuring instruments. This standard is defined by the VXIplug&play Systems Alliance. These I/O functions are usually independent of the instrument interface used; VXI-11 (LAN), GPIB, USB and RS-232 are currently supported.

VEE and Instrument Drivers

Although both the Rohde & Schwarz instrument drivers and the graphic programming language VEE are simple to handle on their own, when used in combination the errors that occur are often difficult to diagnose, due to a number of factors are involved. In contrast to the alternative products LabWindows/CVI or LabVIEW, VEE has no stand alone initialization routine. The first call to the instrument causes its implicit initialization, errors which then occur are difficult to identify. They may be due, for instance, to missing or incorrect VISA installation, or incorrect settings of addresses or names in VEE.

To make both the instrument driver installation and possible troubleshooting easy, this application note provides user-friendly and detailed support.

2 Installing and Testing VISA

VISA is a standardized software interface library providing input and output functions to communicate with measuring instruments. An initialization function in the relevant application program defines which instrument interface (VXI-11, USB, GPIB or RS-232) to use. The subsequent program routine is completely independent of the interface used. Rohde & Schwarz recommends the latest VISA revision.

Installing VISA

Problems occur when different VISA versions from different manufacturers are installed on the same computer. This can occur as VISA might have been installed automatically along with application programs. We therefore recommend the following procedure:

Prior to installation:

1. Uninstall your previous VISA versions.
2. Check whether any previous VISA files remain on your computer. Search for VISA32.dll.

Installing National Instruments VISA

Install National Instruments VISA. Observe the installation instructions and particularly those about rebooting the computer.

Testing the VISA Installation

The easiest way to test VISA is by using the *VISA Interactive Control* program. Connect one or more instruments to the GPIB Bus or the LAN/USB interface and start the program.

Start->Programs->National Instruments->VISA->VISA Interactive Control

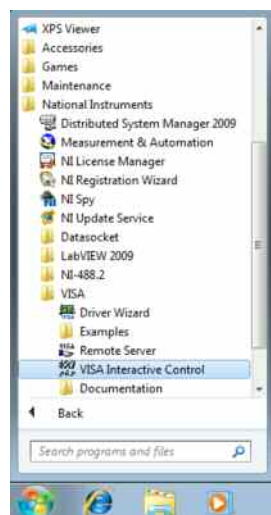


Figure 1: Starting the VISA Interactive Control program.

All connected instruments are recognized and displayed.

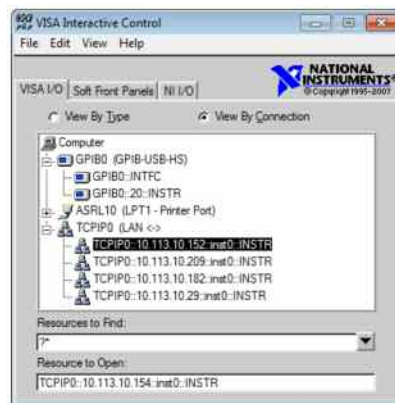


Figure 2: VISA Interactive Control program

If not all instruments are displayed correctly, either VISA has been installed incorrectly or there are connection problems.

In this example the spectrum analyzer FSP7 is found at address 20. The spectrum

analyzer FSV40 is connected at the TCP/IP address 10.113.10.154.

After double-clicking on the instrument addresses you can directly communicate with the instruments via **Basic I/O** as the following screenshots show.

Send `*IDN?` to the instrument with `viWrite`:

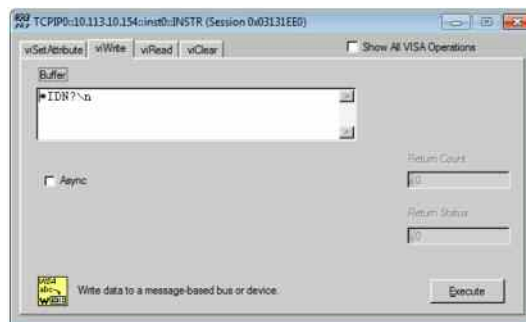


Figure 3: Interactive control I/O window `viWrite`

Read the instrument response with `viRead`:

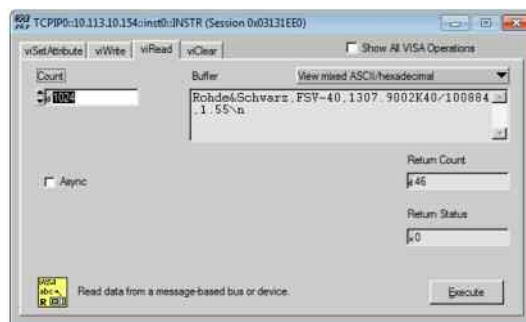


Figure 4: Interactive control I/O window `viRead`

3 Installing Rohde & Schwarz Instrument Drivers

The Rohde & Schwarz instrument drivers are available as executable files.

1. Download the VXIplug&play instrument driver
2. Start the executable file with Administrator privileges

The installation routine installs the driver according to the VXIplug&play specification.

4 Settings and Tests in VEE

Before using the instrument driver from VEE, set the instrument addresses, the instrument names and the VXIplug&play driver name in VEE.

The instrument addresses and instrument names can be set:

- Using settings via "Find Instrument"
- Setting with the aid of demo programs for measuring instruments with secondary addresses (e.g. R&S CMU200A example programmes)

The first method is explained below.

Settings for Measuring Instruments via "Find Instruments"

1. Open the *IO / Instrument Manager / Find Instruments* menu in VEE.

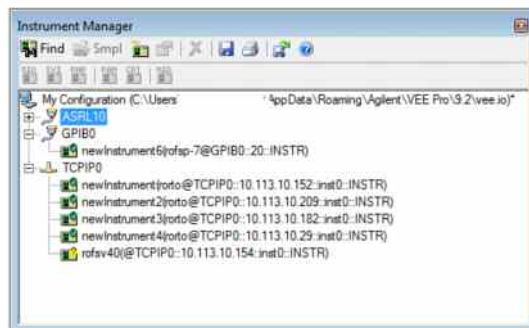


Figure 5: VEE Instrument Manager

All measuring instruments connected are displayed. In this example the spectrum analyzer FSP7 connected to the GPIB bus is found at address 20 on the National Instruments GPIB card. The spectrum analyzer FSV40 is found at TCP/IP address 10.113.10.154.

2. Edit *Add Instrument*

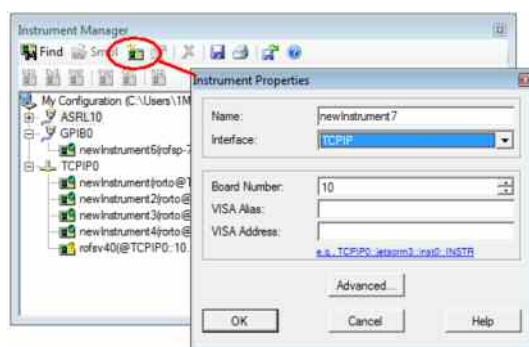


Figure 6: VEE Instrument Properties

Notes regarding Instrument Properties:

The *Interface* specifies the type of the communication channel. The *Board Number* identifies the actual used interface. By the *VISA Address* the instrument's resource is specified. In case of a GPIB connection for the FSP7 this is set to *GPIB::20::INSTR*, for the LAN connection to the FSV40 the value is set to *TCPIP::10.113.10.154::INSTR*.

Tips for troubleshooting:

These settings are sufficient only when Direct I/O functions of VEE are used. Please test with the Direct I/O function. The Rohde & Schwarz instrument drivers, however, require further settings. If Direct I/O works, but errors occur during driver initialisation, the problem is caused by the following settings.

Note: Be sure that VISA was tested correctly before.

3. Click on the *Advanced...* button to open the other settings in the *Plug&play Driver* tab.

Note: It is possible to use GPIB instead of GPIB0.

The use of a GPIB card number other than 0 requires explicit specification (e.g. GPIB1) otherwise GPIB0 will be accessed.

All of the installed instrument drivers are listed in a drop down list in *Plug&play Driver Name*. Section 3 describes how to perform the installation.

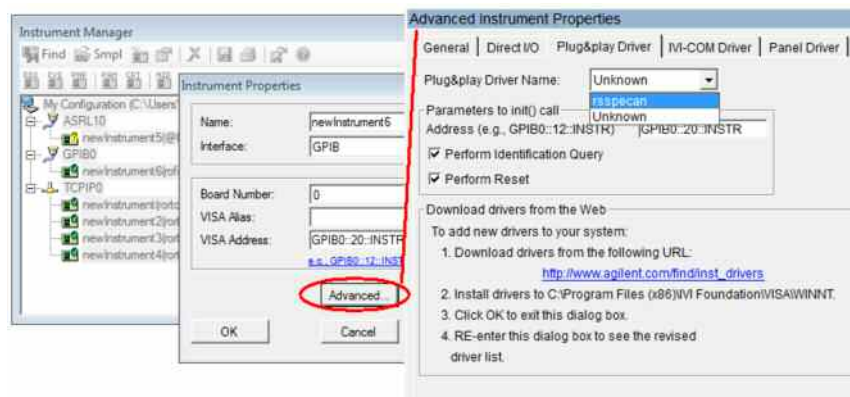


Figure 7: VEE Advanced Instrument Properties

4. Select the appropriate driver for the FSP7 (rsspecan) and click *OK*.

Via *I/O / Instrument Manager / Plug&play Driver*, you can now use the Rohde & Schwarz driver functions.

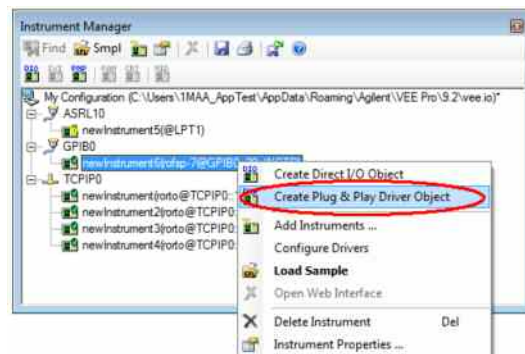


Figure 8: Creating a Plug & Play Driver Object

This function can be accessed via the *Plug & Play Function Panel*.

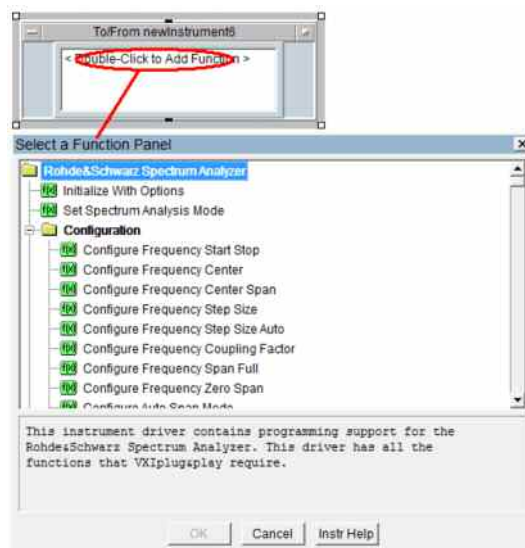


Figure 9: Plug & Play Function Panel

VEE initializes the measuring instruments when a driver function is first called. In contrast to other programs (LabWindows/CVI, LabVIEW, Visual C++, Visual Basic .NET etc.) dynamic management of secondary addresses in the program is therefore not possible. The Universal Radio Communication Tester R&S CMU200A features different functional groups, each with their own secondary addresses. The names of the functional groups and their secondary addresses must be defined before program start.

Make the settings with the demo programs in case you are connected to the CMU. You can easily check if everything is correct by using the demo programs. In the examples available on the Rohde & Schwarz website, first the CMU Base Module I/O is configured, then the GSM module, and finally additional modules.

5 Download Information

For the current Rohde & Schwarz VXIplug&play instrument drivers see:

http://www2.rohde-schwarz.com/en/service_and_support/Downloads/Drivers/?driverType=VXIplug%26play&driverTypeButton=Go&query=#

Download National Instruments VISA from National Instruments ftp:

<ftp://ftp.ni.com/support/softlib/visa/NI-VISA/>

About Rohde & Schwarz

Rohde & Schwarz is an independent group of companies specializing in electronics. It is a leading supplier of solutions in the fields of test and measurement, broadcasting, radiomonitoring and radiolocation, as well as secure communications. Established more than 75 years ago, Rohde & Schwarz has a global presence and a dedicated service network in over 70 countries. Company headquarters are in Munich, Germany.

Environmental commitment

- Energy-efficient products
- Continuous improvement in environmental sustainability
- ISO 14001-certified environmental management system



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