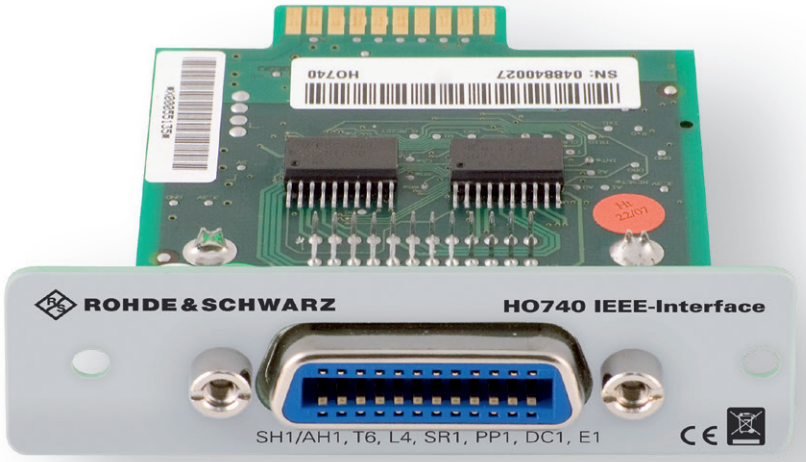
R&S®HO740
IEEE-488 (GPIB) Interface
Installationsanleitung
Installation Guide



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Test & Measurement

Installationsanleitung
Installation Guide

Version 01

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北京海洋兴业科技股份有限公司（证券代码：839145）

北京市西三旗东黄平路19号龙旗广场4号楼（E座）906室　邮编：100096

电话：010-62176775　62178811　62176785　传真：010-62176619

企业QQ：800057747　维修QQ：508005118　邮箱：market@oitek.com.cn

企业官网：www.hyxyyq.com　购线网：www.gooxian.com

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1 General Information

1.1 Safety hints

Fitting or exchanging of an interface must not be made unless the instrument is switched off and not connected to line (mains).

During operation the interface opening must be closed.

All interface connections are galvanically isolated from the instrument to avoid so called "hum" loops by multiple earthing (in this case by the PC).

Measurement at high potentials is prohibited and endangers the instrument, the interface and all equipment connected to the interface.

If the safety rules are disregarded, any damage to we will not take any responsibility for damage to people or equipment of other make.

1.2 Interface Description

The R&S®HO740 is an IEEE-488.2 (GPIB) interface enabling the integration of HAMEG CombiScopes HM1008(-2), HM1508(-2), HM2008, the Mixed Signal Oscilloscopes of the R&S®HMO series, the Arbitrary Function Generators of the R&S®HMF series, the Power Supplies of the R&S®HMP series, as well as the spectrum analyzer series R&S®HMS(-X) into automatic test systems.

The interface has an IEEE-488 socket. To establish a connection to an IEEE-488 controller (control unit of an IEEE-488 bus system) a IEEE-488 cable is required. A PC can be used as IEEE-488 controller, which is equipped with a corresponding plug-in card. If an IEC-625 cable is used, a suitable plug adapter is required.

The R&S®HO740 interface operates in „device" mode. It receives commands from a controller, delivers them to the instrument and transmits signal data to the controller. The data is transferred bidirectionally in parallel form.

Fig. 1.1: HO740 Interface

The NI-USB-GPIB HS adapter from National Instruments is recommended as GPIB-USB adapter.

1.3 Firmware CombiScope

For CombiScopes [HM1008 (-2), HM1508 (-2), HM2008] it is absolutely necessary to check the oscilloscope firmware version before fitting the Interface R&S®HO740. The firmware version already on the scope is displayed after switching on if Quick Start is off. The Quick Start function can be changed after pressing the SETTINGS pushbutton and calling Misc..

If the firmware version is 05.105-yy.yyy or higher, continue the interface fitting as described under item 2 (HO740 fitting instruction). In case firmware versions below 05.105-yy.yyy, R&S®HO740 will not be recognized and a firmware update is required. If the firmware version is below 05.105-yy.yyy, please download the latest firmware at www.hameg.com and update the oscilloscope.

1.4 Firmware for other instruments

With the other instruments (R&S®HMO, R&S®HMS(-X), R&S®HMP, R&S®HMF series) the interface will be recognized by the firmware.

Please refer to the instrument user manual for detailed information about activating the GPIB interface and interface parameters.

2 Fitting Instruction

The following fitting instruction shows a CombiScope, but the interface fitting is also the same for the other compatible instruments.

The following procedure has only to be carried out, if the mains (line) power cable is not connected to the instrument. All test leads have be removed from the measuring inputs.

To avoid interface damage during removing and fitting by electrostatic discharge, please link a metal part of the instrument to equalise potentials between instrument and your body. Maintain this connection during the fitting/removing.

Only touch the interface at its mounting panel and remove the fastening screws. Pull out the interface via mounting panel or connected interface cable. Insert the interface card via the visible guide bars into the interface card slot and push it in completely.

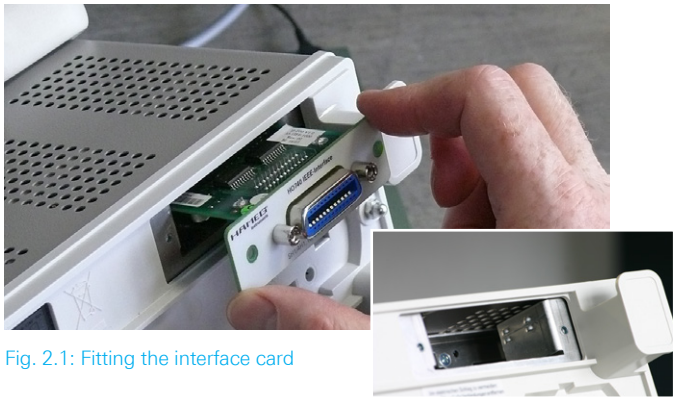

Fig. 2.1: Fitting the interface card

Fit the interface with the fastening screws previously removed.

Fig. 2.2: Fastening screws

3 Interface Functions and Settings

3.1 Flow control (SH1, AH1)

The flow control is for both transmitter and receiver (SH = Source Handshake / AH = Acceptor Handshake) is required for all further functions incl. the transmission of bus specific control data and therefore supported. Extended flow control with the possibility of a simplified indication is not implemented.

3.2 Transmission and reception of data (T6, L4)

The instrument is able to transmit and receive data if the corres-ponding function (T = Talker / L = Listener) has been activated by the control device. For addressing of both functions the same primary basic address has to be used. Secondary addresses are not supported. The modes Talk Only and Listen Only cannot be activated.

3.3 State information (SR1, PP1)

Interface state information can be polled in sequential mode (Serial Poll) as well as simultaneously from several devices (PP = Parallel Poll) from the bus. All required interface settings for parallel polling are made by the control device via the IEEE488-BUS. If the configuration of the device enable register is applicable (note SCPI programming commands) the interface indicates the control device internal state changes (SR = Service Request). This avoids waiting time for the instrument's reply or the recurrent query for the instrument state. The required device settings must be made each time the device is switched on.

3.4 Communication initialisation (DC1)

Bus specific control commands DCL (Device Clear) and SDC (Selected Device Clear) will be processed by the internal management, independent of other SCPI commands still to be processed (DC = Device Clear). Within the instrument the SCPI command processing will be newly initiated, the execution of current commands will be interrupted, and the data buffer will be deleted. The flow control cannot indicate the acceptance for new data transmission until these data have been completely processed.

3.5 Not supported functions (RL0, DT0, C0, CF0)

The following functions are not supported:

- Switch over between local and remote with the opportunity to lock local controls (RL = Remote Local)
- External start of the instruments basic functions (DT = Device Trigger)
- Bus controller operation (C = Controller)
- Considering the control device IEEE-488 BUS cable length (CF = Configuration)

Local controls can be locked by SCPI commands depending on the instrument type (please refer to the SCPI commands).

3.6 BUS driver (E1)

The IEEE-488 BUS data and control lines are controlled by drivers with open collector outputs. As to be seen in IEEE-488.1 standard, this enables a data rate of up to 250000 Bytes per second.

3.7 Addressing of IEEE-488 devices

The IEEE-488 standard specifies the address structure for transmitter and receiver functions of a device. It allows you to assign separate addresses for different device functions such as transmission and receiving functions or for several different transmission and receiving functions as appropriate. These addresses can consist of a primary and a secondary part. Both have a variable part (5 bit) for the real address and a fixed group allocation (2 bit). The 8th bit is not used. Thus instrument addresses in the range from 0 to 30 (00h to 1Eh) are available. The address 31 (1Fh) has a special function. It is used to deactivate the function of an addressed group on the bus (UNL = Unlisten / UNT = Untalk).

The following address groups are specified:

- Primary addresses for receiver function (coding: 20h)
- Primary addresses for transmitter function (coding: 40h)
- Secondary addresses (coding: 60h).

E.g. the complete primary address of the receiver function of a device with the basic address 8 will be 40 (28h).

3.8 Selection of Primary Address

CombiScopes

The selection of an address is only possible if, as described under Chap. 1.3: Firmware CombiScope a firmware version 05.105-yy.yyy or higher is present in the scope and the interface HO740 is fitted. Pressing the SETTINGS push-button calls the Settings menu. The function key Interface opens the submenu Settings Interface, which displays IEEE-488 and highlights Address x. The address (x) can be selected from 0 to 30 by turning the INTENS knob. It is important to ensure that this address is not used by any other device on the bus.

R&S®HMS, R&S®HMP, R&S®HMF, R&S®HMO series

After pressing the SETUP resp. MENU button and choosing the menu item INTERFACE the interface menu is displayed. The interface IEEE 488 is already selected. With the menu PARAMETER (resp. SETTINGS with R&S®HMP series) the GPIB adress can be selected from 0 to 30 with the knob (R&S®HMO series with the knob in the CURSOR/MENU area) on the front panel. It is important to ensure that this address is not used by any other device.

4 Applications

4.1 CombiScopes

The interface R&S®HO740 can be used with the application software HMExplorer in oder to transfer data, setups and screenshots (in digital mode of the combiscope only).

4.2 R&S®HMO series

For the R&S®HMO series the HMExplorer software is available for free on the Rohde & Schwarz website. Please refer to the software manual concerning the necessary settings and the offered feature. (e.g. transfer of settings, data and screenshots, command line for sending remote commands). The SCPI remote commands manual you can find on www.hameg.com.

4.3 R&S®HMS(-X) series

For the R&S®HMS(-X) series the HMExplorer software is available for free on the Rohde & Schwarz website. Please refer to the software manual concerning the necessary settings and the offered feature. (e.g. EMC PreCompliance measurements, transfer of screenshots, command line for sending remote commands). The SCPI remote commands manual you can find on the Rohde & Schwarz homepage.

4.4 R&S®HMF / R&S®HMP Serie

For the R&S®HMF / R&S®HMP series the HMExplorer software is available for free on the Rohde & Schwarz website. Please refer to the software manual concerning the necessary settings and the offered feature. (e.g. generate and transfer of arbitrary waveforms, transfer of screenshots, command line for sending remote commands). The SCPI remote commands manual you can also find on the Rohde & Schwarz homepage.