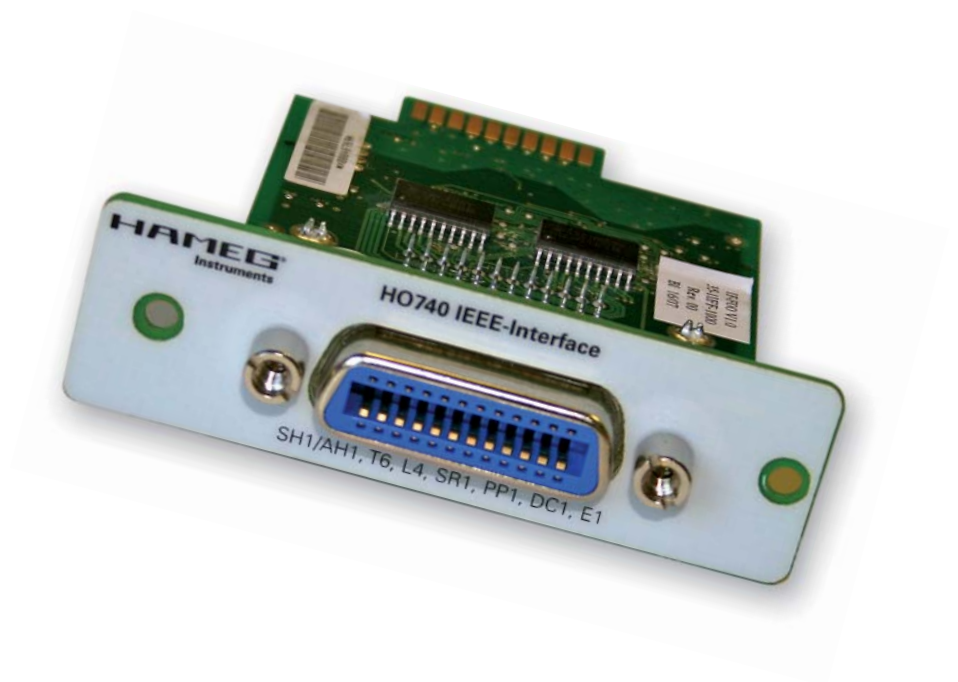


IEEE-488 (GPIB) INTERFACE H0740

Fitting Instruction

English





**KONFORMITÄTSERKLÄRUNG
DECLARATION OF CONFORMITY
DECLARATION DE CONFORMITE
DECLARACIÓN DE CONFORMIDAD**

Hersteller / Manufacturer / Fabricant / Fabricante:
HAMEG Instruments GmbH · Industriestraße 6 · D-63533 Mainhausen

Die HAMEG Instruments GmbH bescheinigt die Konformität für das Produkt
The HAMEG Instruments GmbH herewith declares conformity of the product
HAMEG Instruments GmbH déclare la conformité du produit
HAMEG Instruments GmbH certifica la conformidad para el producto

Bezeichnung: IEEE-488 Interface
Product name: IEEE-488 Interface
Designation: Interface IEEE-488
Descripción: Interfaz IEEE-488

Typ / Type / Type / Tipo: HO740

mit / with / avec / con: HM1008, HM1508, HM1508-2, HM2008
Optionen / Options / Options / Opciones: -

mit den folgenden Bestimmungen / with applicable regulations /
avec les directives suivantes / con las siguientes directivas:

EMV Richtlinie 89/336/EWG ergänzt durch 91/263/EWG, 92/31/EWG
EMC Directive 89/336/EEC amended by 91/263/EWG, 92/31/EEC
Directive EMC 89/336/CEE amendée par 91/263/EWG, 92/31/CEE
Directiva EMC 89/336/CEE enmendada por 91/263/CEE, 92/31/CEE

Niederspannungsrichtlinie 73/23/EWG ergänzt durch 93/68/EWG
Low-Voltage Equipment Directive 73/23/EEC amended by 93/68/EEC
Directive des équipements basse tension 73/23/CEE amendée par 93/68/CEE
Directiva de equipos de baja tensión 73/23/CEE enmendada por 93/68/EWG

Angewendete harmonisierte Normen / Harmonized standards applied /
Normes harmonisées utilisées / Normas armonizadas utilizadas:

Sicherheit / Safety / Sécurité / Seguridad:

EN 61010-1:2001 / IEC (CEI) 1010-1:2001
Überspannungskategorie / Overvoltage category / Catégorie de surtension /
Categoría de sobretensión: II

Verschmutzungsgrad / Degree of pollution / Degré de pollution / Nivel de
polución: 2

Elektromagnetische Verträglichkeit / Electromagnetic compatibility /
Compatibilité électromagnétique / Compatibilidad electromagnética:

EN 61326-1/A1: Störaussendung / Radiation / Emission: Tabelle / table /
tableau 4; Klasse / Class / Classe / classe B.

Störfestigkeit / Immunity / Imunitee / inmunidad:
Tabelle / table / tableau / tabla A1.

EN 61000-3-2/A14: Oberschwingungsströme / Harmonic current emissions
/ Émissions de courant harmonique / emisión de corrientes armónicas:
Klasse / Class / Classe / class D.

EN 61000-3-3: Spannungsschwankungen u. Flicker / Voltage fluctuations
and flicker / Fluctuations de tension et du flicker / fluctuaciones de tensión
y flicker.

Datum / Date / Date / Fecha
26. 04. 2007

Unterschrift / Signature / Signatur / Signatura

Holger Asmussen
Manager

General information regarding the CE marking

HAMEG instruments fulfill the regulations of the EMC directive. The conformity test made by HAMEG is based on the actual generic- and product standards. In cases where different limit values are applicable, HAMEG applies the severer standard. For emission the limits for residential, commercial and light industry are applied. Regarding the immunity (susceptibility) the limits for industrial environment have been used.

The measuring- and data lines of the instrument have much influence on emission and immunity and therefore on meeting the acceptance limits. For different applications the lines and/or cables used may be different. For measurement operation the following hints and conditions regarding emission and immunity should be observed:

1. Data cables

For the connection between instruments resp. their interfaces and external devices, (computer, printer etc.) sufficiently screened cables must be used. Without a special instruction in the manual for a reduced cable length, the maximum cable length of a dataline must be less than 3 meters and not be used outside buildings. If an interface has several connectors only one connector must have a connection to a cable. Basically interconnections must have a double screening. For IEEE-bus purposes the double screened cables HZ73 and HZ72L from HAMEG are suitable.

2. Signal cables

Basically test leads for signal interconnection between test point and instrument should be as short as possible. Without instruction in the manual for a shorter length, signal lines must be less than 3 meters and not be used outside buildings. Signal lines must be screened (coaxial cable - RG58/U). A proper ground connection is required. In combination with signal generators double screened cables (RG223/U, RG214/U) must be used.


3. Influence on measuring instruments.


Under the presence of strong high frequency electric or magnetic fields, even with careful setup of the measuring equipment an influence of such signals is unavoidable. This will not cause damage or put the instrument out of operation. Small deviations of the measuring value (reading) exceeding the instruments specifications may result from such conditions in individual cases.


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Declaration of conformity	2
General information regarding the CE marking	2
2. Safety hints	4
3. Interface Description	4
4. Oscilloscope Firmware	4
5. Interface Fitting Instruction	5
6. Functions and settings	6
7. Appliance	7

2. Safety hints

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

 **Attention!**
During operation the interface opening must be closed.

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

Measurement at high potentials is prohibited. It would endanger scope and operator.

If the safety rules are disregarded any damage to HAMEG Instruments GmbH products will void the warranty. Neither will HAMEG Instruments GmbH take any responsibility for damage to people or gear of other make.

3. Interface Description

HO740 is an IEEE-488.2 (GPIB) Interface enabling the integration of the oscilloscopes HM1008, HM1508 and HM2008 in automatic test systems. The interface has an IEEE-488 socket, in which an IEEE-488 cable can be inserted.

HO740 is a device that receives commands from a controller, delivers them to the scope and if required transmits signal data to the controller.



4. Oscilloscope Firmware

4.1 It is absolutely necessary to check the oscilloscope firmware version before fitting the Interface HO740. The firmware version already on the scope is displayed after switching on if "QuickStart" is off. The "QuickStart" function can be changed after pressing the SETTINGS pushbutton and calling "Misc..".

4.2 If the firmware version is 05.105-yy.yyy or higher, continue the interface fitting as described under item 5 (HO740 Fitting Instruction). In case firmware versions below 05.105-yy.yyy, HO740 will not be recognised and a firmware update is required as described under item 4.3.

4.3 In case of a firmware version below 05.105-yy.yyy, please download the current firmware at www.hameg.com from the Internet and actualise the oscilloscope. The firmware can be found and download under: Products > Oscilloscopes > [oscilloscope type] > Software/Firmware (below the oscilloscope picture) > Firmware_HMxxx_Vxxx.zip.

After receiving the current firmware and its installation instruction, the firmware installation must be done via the present interface (HO710, HO720 or HO730).

5. Interface Fitting Instruction

Safety!

The following procedures must only be carried out on condition that the mains (line) power cable is not connected to the oscilloscope and no connection is made at the measurement inputs.



Attention!

To avoid damage of the interface during removing and fitting by electrostatic discharge, please touch a metal part of the oscilloscope for potential equalisation between oscilloscope and your body. Abide this connection during the fitting/removing!

Only handle the interface by its IEEE-488 socket!!

5.1 Removing of the actually inserted interface.



5.1.1 Remove both fastening screws



5.1.2 Pull out the interface.

5.2 Fitting the interface H0740



5.2.1 Insert the interface H0740 in the opening in such a way, that the PCB will be inserted in the guidance - visible on both sides - and push it in completely.



5.2.2 Fit the interface with the previously (item 5.1.1) removed fastening screws.

6. Functions and settings

6.1 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.

6.2 Transmission and reception of data (T6, L4)

The instrument is able to transmit and receive data if the corresponding 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.

“Talk Only” and “Listen Only” modes cannot be activated.

6.3 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.

6.4 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.

6.5 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 (note SCPI programming commands).

6.6 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.

6.7 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)

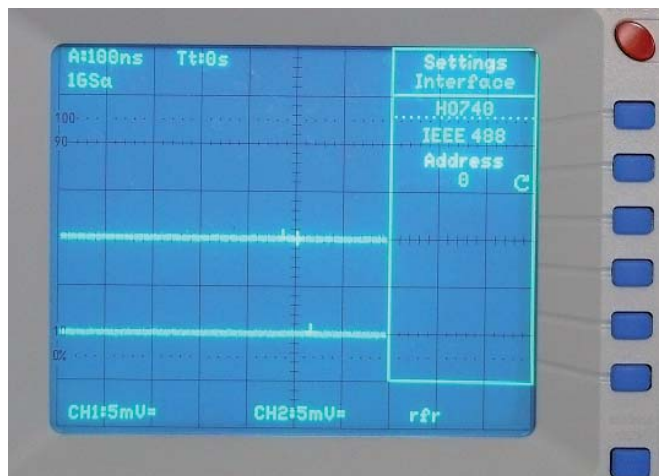
Secondary addresses (coding: 60h).

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

6.8 Selection of Primary Address

The selection of an address is only possible if, as described under item 4 (Oscilloscope Firmware) a firmware version 05.105-yy.yyy or higher is present in the scope and the interface HO740 is fitted.

Pressing the SETTINGS pushbutton calls the “Settings” menu. The function key “Interface” opens the submenu “Settings Interface” causing “IEEE-488” and highlight “Address x” to be displayed. The address (x) can be changed between 0 and 30 by turning the INTENS knob. Please note that the selected address must not used by any other instrument on the bus.



7. Appliance

The SCPI programming commands list will be provided in the Internet under **www.hameg.com**: Service&Support > Downloads > Software/Firmware: Software Commands for Oscilloscopes HM1008, HM1508 and HM2008.

Mainhausen, Germany

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Oscilloscopes



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