Interface technic

INSTRUCTION MANUAL

IBRit-md1-232
Interface

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Contents

1. Introduction

The IBRit-md1 is an interface system designed to connect 2 gauges with Mitutoyo Digimatic data output to an RS232-interface of a PC.
The IBRit-md1 is the result of many years experience in the field of design and production of microprocessor controlled interface systems and takes into account the demands for size reduction and easy handling.

← PC - Connection

↑ Gauge 1 ↑ Gauge 2

2. Features

- The original cables of the gauge manufacturer can be plugged in without any modification.
- Small case with highly integrated SMD devices.
- Connection to a COM-Port of your PC (RS232-interface / power supply is done by handshake lines.).
- Extensive command-set to control the data transmission.
- Request of measured values by software command, by data key on the gauge, permanently or via foot switch (gauge assignment for foot switch request is software controlled.)

3. Delivered Items

IBRit-md1, 9 to 25 pin connection cable, operating manual and software CD..
For additional accessories please refer to the delivery note.
Please check that the delivery contains all items and retain the packaging box.

4. Getting Started

1. **Connecting the IBRit-md1 to the PC**
   Switch off the PC, connect the IBRit-md1 to an RS232-interface (COM-port) of your PC and lock by the screws. When using a foot switch or hand switch the adapter connector of the switch must be first plugged and then the IBRit-md1. The power supply is done by the handshake lines..
   The transmission format of the RS232-interface is factory-set to 9600 Baud, no parity, 8 data bits and 1 stop bit.

2. **Connecting gauges**
   Switch off the gauges. Connect the gauges to the IBRit-md1 according to your measurement application. Note the gauge settings that are necessary in order to transmit measurement data. Finally switch on the PC and the gauges.

5. Working with the IBRit-md1

The IBRit-md1 provides an extensive command set, to realize various measurement applications and to setup the interface.

The following sections give you the information needed for driver installation and use of the IMB_Test software for hardware testing.

5.1 Using the IMB_Test software for hardware testing

The free of charge software IMB_Test is included in the delivery of the IBRit-md1 and can be found on the CD. It can also be downloaded from our Homepage ***www.IBRit.com***. The installation is self explanatory.

Hardware settings in IMB_Test :

After starting the IMB_Test software you must at first press the **Setup** - button.
Now, please select the entry of the *used COM-port* as setting for the **PC-Connection**.
Afterwards please select the entry *IBRit-md1* as setting for the **IBR-Instrument**.
Now confirm the settings by pressing the **OK** - button.

Testing the connected hardware using IMB_Test :

Press the **Start Test** - button in the main menu of the IMB_Test software.
You can now read the measurement data of the connected gauges by pressing one of the assigned function keys (**F1** or **F2**).

6. Programming and controlling the interface

This section of the instruction manual is intended for programmers and software engineers. It is not intended for production line or laboratory use.

The IBRit-md1 uses a versatile command set enabling all required controlling and setting of the hardware by PC.

The most important functions of the command-set :

1. **Determine instrument identity and configuration**
2. **Control measurement data transmission**

The PC sends the commands to the interface system via a serial interface (e.g. COM 1...4). After each transmission of a command the interface system replies by sending a command-response. If the command is successfully executed the acknowledgement is **OK**. In case of an undefined command an error code is returned. If a data request command is sent, the IBRit-md1 answers with a command-response and also returns the requested data. Several commands may be written on one line, but if so they must be separated by a colon ":". A command line is terminated by a <cr>.

6.1 Transmission format and handshake lines

The transmission format is factory-set to 9600 Baud, no parity, 8 Data bits and 1 stop bit.
The handshake lines **DTR** and **RTS** are the supply sources and must be set to high levels.

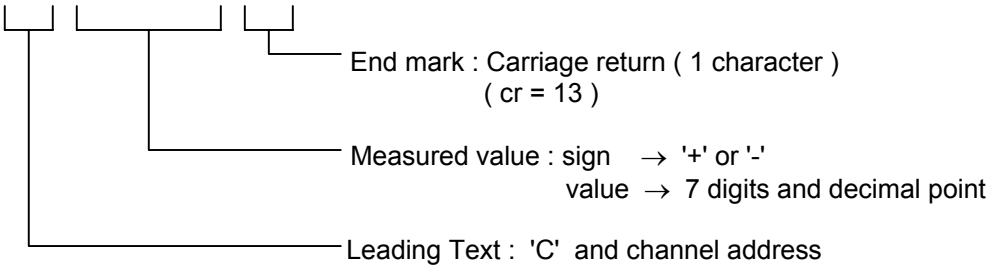
6.2 Data format of measured values

The format of the measurement data strings at the data output of IBRit-md1 is always the same and independent of the connected gauges.
A measurement data string consists of three elements :

1. **Leading text for channel identification**
   The leading text consists of three characters. A '***C***' as address identifier and the actual channel address ('**10**' – channel 1; '**20**' – channel 2)
2. **Measured value with sign and decimal point**
   The measured value always consists of 9 characters. The first character is the sign ('+' or '-'), followed by a 7-digit value with floating point. The 7-digit value is always filled up with leading zeros.
3. **Concluding text or End of line marker**
   The end of line mark of a string is a <carriage return> (ASCII-character → 13)

Format of measurement data (standard) :

C20 – 0129.631 <cr> e.g. : negative value from channel 2



It is also possible to receive a '***TO***' message instead of a measured value. This message appears, if no gauge is connected or the gauge is not ready to operate.

6.3 Summary of command set

The command set of the IBRit-md1 is used for communicating with the user programme during measurement.

Explanation of command line syntax :
- **kn** – channel (1...2), **ukn** – sub-channel (1...2)
- **( )** and **[ ]**-brackets indicate optional parameters

Communication command group

Control of data request :

DAD (kn[.ukn]) <cr>	-	Generally disables all measurement requests
DAE (kn[.ukn]) <cr>	-	Generally enables all measurement requests
DAF (kn[.ukn]), ON/OFF<cr>	-	Enables / disables requests for measured values with a foot or hand switch
DAG (kn[.ukn]),ON/OFF <cr>	-	Enables / disables requests for measured values with the integrated data key on the gauge

Commands for request of measured values :

DAS (kn[.ukn]) <cr>	-	Request for measured values via software command
DAP kn[.ukn],ON/OFF <cr>	-	Enables / disables permanent transmission of measured values

Foot or hand switch communication :

FTRG <cr>	-	Request the foot or hand switch status
FTRG ON/OFF <cr>	-	Turn the automatic supervision of foot or hand switch on /off

Determination of identity and configuration / reset :

PSP <cr>	-	Request the identity and programme version of the device
IOC <cr>	-	Request for inserted modules
RESET <cr>	-	Reset of the device with following self-check

A detailed description of the command-set is available on request.

6.4 Command responses

All commands received by the IBRit-md1 are checked and acknowledged. Undefined and invalid commands are not executed and are indicated to the user by an error code.

OK - The command has been identified and executed
E1 - undefined command (syntax error)
E2 - The command has been identified and executed, but the command separator or end of command is not defined (allowed : ":“ and <cr>)
E3 - Undefined numeric value or separator
E4 - Channel number too low
E5 - Channel number too high
E6 - ON/OFF not identified
E7 - Separator ',' not identified
E8 - Undefined option

6.5 Importing measured values into Windows applications

For taking over measured values in 32 Bit- Windows-applications the **IBR_Device Driver Kit = IBR_DDK.DLL** is available for programmers.
The free of charge IBR_DDK.DLL offers an API-interface and a COM-interface (ActiveX) and can be downloaded from our Homepage ***www.IBRit.com***.

Features of the IBR_DDK.DLL

- Parallel operation of up to 8 interfaces (COM or USB)
- Universal interface to all IBR-Interface- and measuring instruments
- Examples for VB, VC++ and Delphi

7. Accessories and ordering information

Designation		Article-Number
IBRit-md1	**Interface to connect 2 gauges with Mitutoyo Digimatic output** to an RS232-interface (COM-port) of a PC. IBR-command set, connector for foot switch. Incl. Adapter cable, manual and software CD	F101 001
Foot switch md1	Foot switch, protection IP32	F101 003
Foot switch md1	Foot switch, protection IP65	F101 004
IBR_DDK.DLL	Device Driver Kit for 32 Bit Windows applications (incl. samples for C, C++, VB, Delphi)	F710 010
IBREXDLL	Programme for data collection of measured values and statistical process control in MS-EXCEL ...	F710 001

8. Technical data

Mechanical characteristics

Case	Aluminium, epoxy powder coated
Dimensions W x H x D / Weight	54 x 17 x 61 mm / approx. 35 g

Electrical characteristics

The supply voltage for the IBRit-md1 will be taken out of the handshake lines ***DTR*** and ***RTS***	
Input current	< 5 mA
Data output	EIA RS232C

Environmental conditions

Working temperature range	0...60°C
Storage temperature range	-30...+70°C
Relative humidity	For dry premises only

Electromagnetic compatibility (EMC)

Electromagnetic compatibility (EMC)	Interference emission according to EN50081-2 Interference resistance according to EN50082-2

9. Declaration of conformity

Thank you very much for your confidence in purchasing this product. We herewith certify that it was manufactured and inspected in our works.

We declare under our sole responsibility that this product is in conformity with technical data as specified in this instruction manual.

Furthermore, we certify that the measuring equipment used to check this product refers to national master standards. The traceability of measuring values is guaranteed by our Quality Assurance System.

10. Guarantee

The quality of this instrument is guaranteed for a period of 12 months from the date of delivery. This guarantee covers all material and manufacturing defects.
Our liability is limited to product repair services or, should we deem it necessary, replacing or crediting the goods.
This guarantee does not include the batteries or damage due to:

- *Disregard of operating instructions*
- *Incorrect handling*
- *Tampering by unauthorised staff*
- *Attempts by any unauthorised person to repair the instrument.*

We are not to be held liable for any subsequent damage caused by, directly or indirectly, the instrument or its use.

Notice : If you are returning the instrument under guarantee, please use the original packaging.

Should you detect an irregularity of any kind, please contact one of our authorised distributors or our service department.

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