

Interface technic



INSTRUCTION MANUAL

IBRit-md1 **Interface**

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Messtechnik GmbH & Co. KG



Contents

1. Introduction	3
2. Features	3
3. Delivered Items	3
4. Getting started	3
5. Working with the IBRit-md1	4
5.1 Installation of the ITEC-PC-Software under DOS	4
5.2 Installation of the ITEC-PC-Software under WINDOWS	4
6. Functions of the ITEC-PC-Software	5
6.1 Starting of the ITEC-PC-Software	5
6.2 Programme setup	5
6.3 Test, Initialisation and Adjustment	6
6.3.1 Interface - Test	6
6.3.2 Interface Initialisation	6
6.3.3 Help	7
7. Automatic initialisation with IBRSEND.EXE	7
8. Programming and Controlling the interface	8
8.1 Transmission format and Handshake lines	8
8.2 Data format of measured values	8
8.3 Summary of Command Set	9
8.4 Command responses	9
8.5 Importing measured values into Windows applications	10
8.6 Importing measured values into MS-EXCEL	10
9. Accessories and order information	11
10. Technical data	11
12. Declaration of conformity	12
13. Guarantee	12

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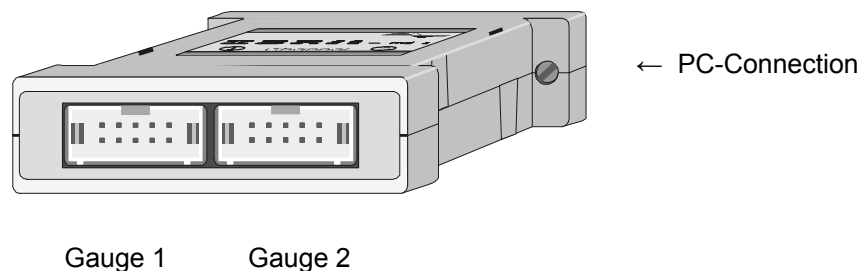


1. Introduction

The IBRit-md1 is an interface system geared to connect 2 gauges with Mitutoyo Digimatic data output to the RS 232 of a PC or computer.

The IBRit-md1 is the result of many years experience in the field of design and manufacture of microprocessor controlled interface systems.

The latest manufacturing and circuit techniques, combined with rapid design methods, allows the introduction of an advanced design offering precision, small size and simple operation.



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 COM-Ports of your PC or to each RS232 (power supply is done by handshake lines.)
- ◆ Extensive command-set to control the data transfer
- ◆ Software is compatible to all IBRit interfaces
- ◆ Request of measured values by software command, by data key on the gauge, permanent 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.

For additional accessories like foot switch, hand switch,... please refer to the delivery note.

Please check that the delivery contains all items and retain the packaging box.

4. Getting Started

1. Turn off your PC or computer

Plug in the IBRit-md1 to the RS232 (COM-Port) of your computer and lock by the screws. By use of 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 is factory-set to 9600 Baud, no parity, 8 data bits and 1 stop bit.

2. Connecting gauges

Connect the gauges to the IBRit-md1 according to your measurement application. Therefore please switch off the gauges before. Note the necessary settings of the gauges to transfer measured values.



5. Working with the IBRit-md1

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

The manual includes a 3,5"-floppy disk containing the PC Software.

This software is necessary to :

- ◆ Make, edit and send a initialisation to the IBRit-md1
- ◆ Test the initialisation / read measured values
- ◆ Transfer a initialisation automatically to the IBRit-md1

The following section explains the installation of the software and gives a survey of the programme-features.

5.1 Installation of the ITEC-PC-Software under DOS

1. Insert the floppy disc into the floppy drive of your computer
2. Select this drive with i.e. **A: <ENTER>**
3. Type **INSTALL <ENTER>** to start the installation

5.2 Installation of the ITEC-PC-Software under WINDOWS

1. Start Windows 3.xx or a 32-Bit Windows version (Windows 95, 98, ME, NT, XP, ...)
2. Insert the floppy disc into the floppy drive of your computer
3. Start file-manager (Windows 3.xx) or windows explorer (Windows 95, 98, ...)
4. Select the drive containing the floppy
5. Select the programme **INSTALL**
6. Go to menu **File** and select **Open**

Running the installation

The installation programme first asks for the destination drive and directory where it will place the software files. Either confirm the suggested directory, **C:\IBRit**, or type in an alternative directory name and path. Pressing the **<ENTER>**-key creates the new directory and starts the installation of the files. At the end of installation the computer automatically change to the new directory and starts the programme **ITEC.EXE**.

The installed software is self explanatory and needs no additional manual. The software essentially consists of following programmes :

ITEC.EXE

Programme to setup and test the IBR-Interface device. This setup, also named initialisation, can be stored on the PC.

IBRSEND.EXE

Programme to transfer a initialisation (created with ITEC) automatically to the IBRit interface device.



6. Functions of the ITEC-PC-Software

The ITEC-PC-Software is an universal programme for testing, calibrating and setting of all IBRit interfaces and measuring instruments. Designed to SAA-standards the programme can select different language versions.

The user is led through the programme by a menu bar at the top of the screen. By selecting these menu items, windows open leading on to other software functions. Easy to follow text in the windows explains every user function.

Every screen lists the possible key functions along the bottom line (hotkeys).

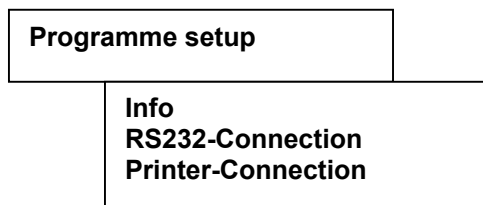
6.1 Starting the ITEC-PC-Software

Windows : Please start the Windows Explorer and change to the folder which you have entered on the installation (i.e. : **C:\IBRit**). Select the application **ITEC.EXE** and start it with the menu : **File / Open**.

MS-DOS : Change at first to the directory (i.e. with the command **cd IBRit <ENTER>**). After that please start the programme with the input **ITEC <ENTER>**.

The start-up window display information about the software version and revision status and waits for any key pressed by the user. The language version can be changed by pressing the F1-key now and also later in the main menu. After pressing a key you are already in the main menu. The main menu-bar with the windows and the instruction line at the bottom of the screen are now leading you through the various functions.

6.2 Programme setup



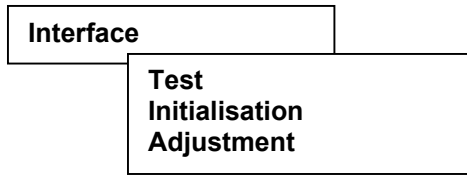
This part of the programme is very important, because in the sub menu **RS232-Connection** you select the interface (COM 1...4) where the interface IBRit-md1 is connected. In the sub-menu **Printer-Connection** you select the interface (LPT1...3) for prints. These settings are absolutely necessary and they have to be done, one time, on first starting of the software, or, if connections are changed at any time.-

The programme stores these settings.-

In the sub-menu **Info** you will get the latest information not yet included in the operating manual and also a survey of all programme-features (if the operating manual is not available.)

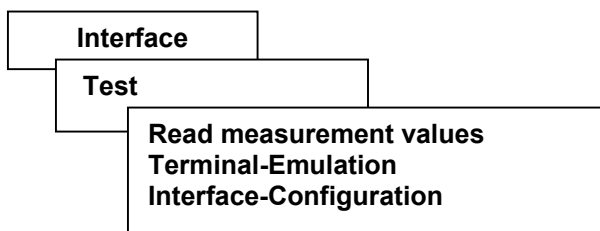


6.3 Test, Initialisation and Adjustment



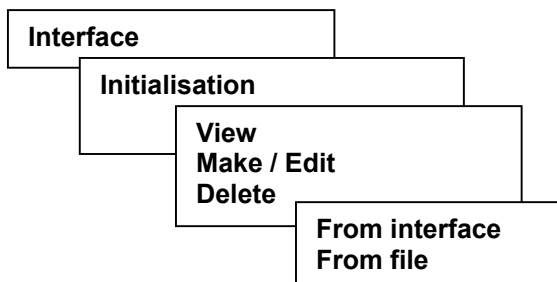
In this part of the program you are able to test and initialise your interface, if necessary. For clarity these tasks are handled in separate menus (see para. 2.1 to 2.2).

6.3.1 Interface - Test



- a.) In the sub-menu **Read measurement values** the IBRit-md1 is tested and measurement are read.
- b.) In the sub-menu **Terminal-Emulation** you are in possession of an extended terminal-emulator directly communicating to the interface. This is very helpful for software engineers to developing driver routines or programs for the IBRit-md1. They can test their command sequences manual. The emulator may also be used to connect measuring instruments with RS232 data output. The helpful for developing new driver routines.
- c.) The sub menu **Interface-Configuration** is used for analysis of the interface system, if an error occur. You should select this sub-menu, if an error has occurred. Print out the configuration data by pressing the <F1>-key at the end of the analysis. The print contains all technical details about the hard- and software and is the pre-requisite for any technical support or help.

6.3.2 Interface Initialisation



The sub-menu **Initialisation** enables you to **View**, **Make/Edit** or **Delete** the initialisation of your instrument, if necessary. Please note, that a IBRit-md1 has no non-volatile memory to store the initialisation. The IBRit-md1 has to be initialised on every start up. Therefore you must work **From file**, if you want to view or make / edit a initialisation on the screen. You should store a created / modified initialisation first to file to use it later to initialise the IBRit interface on start-up.



The following initialisation and settings are possible :

- ◆ Select input (channel) 1,2
- ◆ You can switch the channels with **<PgUp>** and **<PgDn>**
- ◆ Switch ON/OFF the selected channel
- ◆ Switch ON/OFF the different data transfer
 - Data transfer from gauge (with gauge key or automatic transfer).
 - Data request by foot switch on the IBRit-md1
- ◆ With the function key **<F2>** there is a buffer available for special commands available, used for technical support purposes.
- ◆ Newly created or modified initialisation files are stored on leaving (quitting) the menu. Then the old initialisation will be overwritten. The initialisation is stored inside the IBRit-md1 as long as the interface is switched on.

6.3.3 Help



In the sub - menu **I/O-catalogue** the IBR - I/O - catalogue is available to show the range and give the information for the connection of different gauges.

In the sub - menu **Command-Set** the software developer gets more information about the commands for IBR - interfaces.

7. Automatic initialisation with IBRSEND.EXE

The interface IBRit-md1 has to be initialised on every start-up, if there are special settings necessary. This initialisation and communication test can be done with **IBRSEND**. On starting IBRSEND, the initialisation (created with ITEC) will be transferred to the IBRit interface device. It is possible to create different initialisation for special applications. Therefore the files may be created with **ITEC** and stored under different names. Later the filename (without extension) has to be specified for the **IBRSEND** programme. With that it is possible to load different initialisation for several IBRit interface faces out of one directory (i.e. on applications in a network)

i.e.: **"IBRSEND INIT1" <ENTER>**
"IBRSEND INIT2" <ENTER>



8. Programming and Controlling the interface

This section of the operating 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 PC control of hardware, zero and calibration adjustment.

The most important function of the command-set:

1. Interrogate instrument identity and configuration
2. Control measurement data transfer

The PC compatible computer sends the commands via a serial interface (i.e. COM 1...4) to the instrument. After the transmission of one command the interface system gives a reply by sending a command-response. When the IBRit-md1 receives a command from the PC, it responds with an acknowledgement. If the command is successful the acknowledgement is **OK**. Otherwise an error code is returned. See table on page 10 for details. When the IBRit-md1 acknowledgements a data format, it also returns the data requested. 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>.

8.1 Transmission format and Handshake lines

This 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.

8.2 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 measuring range or the measurement device.

A string of a measured value consists of three parts:

1. Leading text meant to identify the channel

The leading text consists of three characters. A **C** and the channel address
(**10** – channel 1; **20** – channel 2)

2. Value measured with sign and decimal point

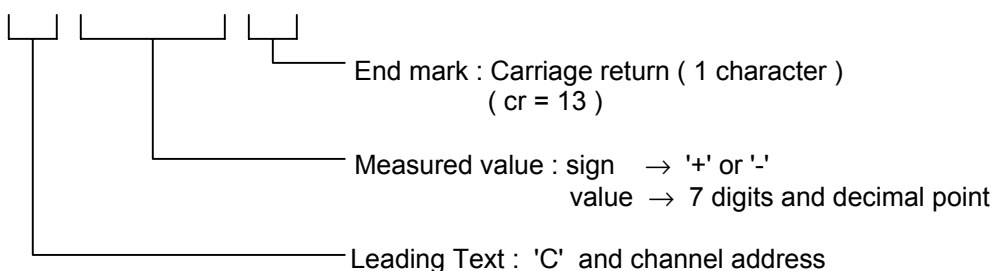
A measured value always contains 9 characters. The first character is the sign (+ or -), after that follows a 7-digit value with floating point.

3. Concluding text and End of line marker

The end of line mark of a string is a <carriage return> (ASCII-character → 13)

Format of measured values (standard) :

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





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

8.3 Summary of Command Set

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

Command line syntax :

- **kn** – channel (1...2), **ukn** – sub-channel (1...2)
- () and []-indicate optional parameters

Communication Command Group

Control of data request :

- | | |
|----------------------------|--|
| DAD (kn[.ukn]) <cr> | - General disable of all measurement requests |
| DAE (kn[.ukn]) <cr> | - General enable of all measurement requests |
| DAF (kn[.ukn]), ON/OFF<cr> | - Control requests for measured values with an external trigger switch |
| DAG (kn[.ukn]),ON/OFF <cr> | - Control 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> | - Admit/stop permanent request of measured values |

External Trigger Switch :

- | | |
|------------------|---|
| FTRG <cr> | - Request the external trigger switch status |
| FTRG ON/OFF <cr> | - Turn the automatic answers on pressed external trigger switch on /off |

Inquiry of identity and types of modules attached / Reset :

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

For detailed description of the command-set with some examples of programming please refer to the floppy disk in the appendix (see programme ITEC in the menu "HELP")

8.4 Command responses

All initial commands and other statements received are checked and acknowledged by the interface system. Undefined and invalid commands are trapped and indicated to the user by an error code.

OK - The command has been identified and carried out

- E1 - undefined command (syntax error)
- E2 - The command has been identified and carried out, but the command separator or end of command is not defined (excepting ":" and <cr>)

- E3 - Undefined separator
- E4 - Channel number too low
- E5 - Channel number too high
- E6 - ON/OFF not identified
- E7 - Separator ',' not identified
- E8 - Undefined option





8.5 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.

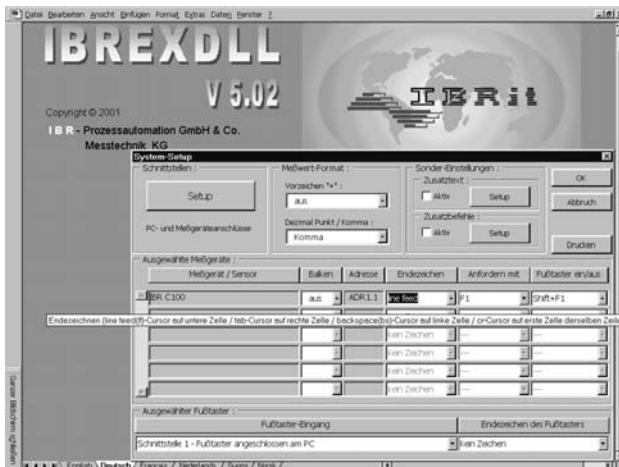
The IBR_DDK.DLL offers a API-interface and a COM-interface (ActiveX) and can be downloaded without cost from the Home Page www.IBRit.com.

Features of the IBR_DDK.DLL

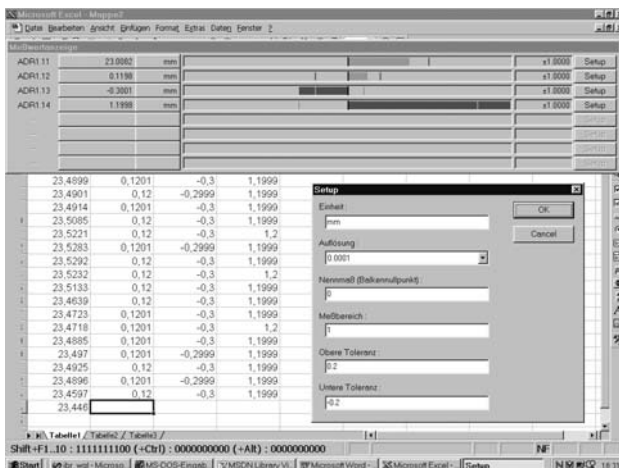
- ◆ Parallel operation of up to 8 devices (COM or USB)
- ◆ Universal interface to all IBR-interface- and measuring instruments
- ◆ Examples for VB, VC++ and Delphi

8.6 Importing of measured values into MS-EXCEL

The **IBREXDLL.XLS** is an EXCEL workbook for the component- or characteristic depending data collection into Excel tables. Therefore extensive possibilities for data collection, formatting and organisation in a table without limitation of the standard Excel functions are supplied.



The **IBREXWGL.DLL** is an expansion module for the **IBREXDLL.XLS** and supplies a display window for measured values in Excel. Up to 8 measuring inputs with numeric and column displays with tolerance observation are shown.



More information as well as the manual **IBREXDLL** you get from our Homepage : www.IBRit.com





9. Accessories and order information

Designation		Article-Number
IBRit-md1	Interface to connect 2 gauges with Mitutoyo Digimatic output to a PC or a RS232. IBR-command set, connector for foot switch. Incl. Adapter cable, manual and initialisation disc	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 taking measured values from C100 gauges into MS-EXCEL	F710 001
IBREXWGL	Gauge Window in MS-EXCEL (Expansion module to IBREXDLL)	F710 002

10. 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)	Generation of interference according to EN50081-2 Resistance to interference according to EN50082-2
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12. 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.

On addition, we certify that the measuring equipment used to check this product refers to national master standards. The trace ability of measuring values is guaranteed by our Quality Assurance.

13. Guarantee

The quality of this instrument is guaranteed for a period of 12 months from the date of delivery. This guarantee covers all materials and manufacturing defects. Our liability is confined to repair, or should we deem it necessary, replacing or crediting the goods.

The following are not covered by the guarantee :

- ◆ *Damages due to incorrect handling,*
- ◆ *Disregard of operating instructions,*
- ◆ *Tampering by unauthorised staff,*
- ◆ *Attempts by any unauthorised person to repair the instrument.*

In no case any consequences are covered by the guarantee which are connected either directly or indirectly to the instrument or its use.

Notice : If 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.

D-36166 Haunetal, 05.03.2002

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A. Schneider
Quality Assurance Manager