Interface technic

INSTRUCTION MANUAL

IBRit-md2 / md2s / md2c
Interface

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Messtechnik GmbH & Co. KG

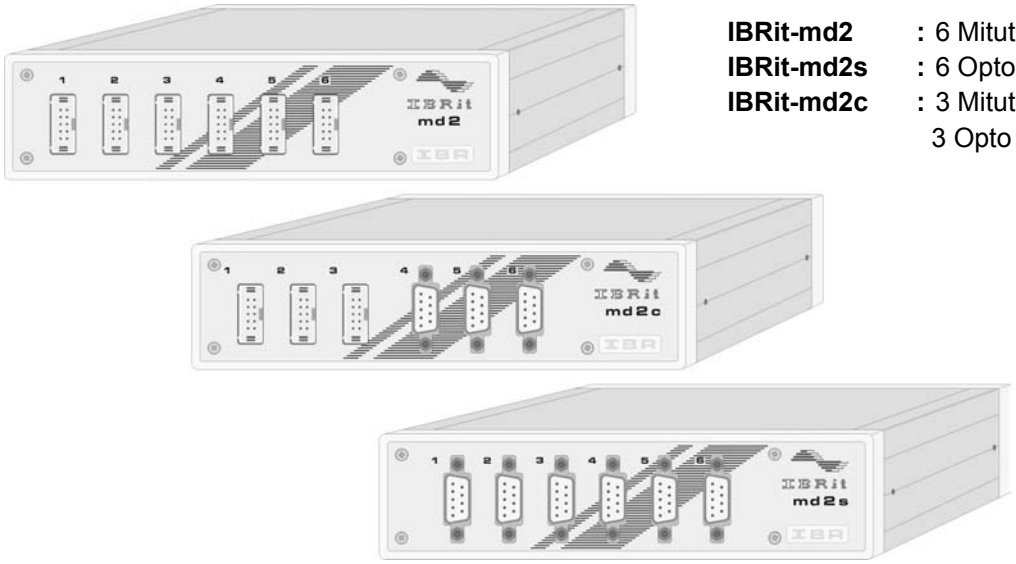
Contents

1. Introduction

The universal gauge interfaces IBRit-md2, IBRit-md2s and IBRit-md2c with 6 gauge inputs enables you to connect different types of measuring instruments and gauges from different manufacturers to a PC or computer.

- ◆ Opto RS232, z.B. Sylvac, Mahr, Mauser, Helios...
- ◆ Tesa gauges
- ◆ Heidenhain counter
- ◆ Compac gauges
- ◆ Mitutoyo Digimatic gauges
- ◆ Mettler, Sartorius balances
- ◆ some gauges from Mecmesin, Erichsen, Kroeplin, Chatillon...

For the gauges that cannot be connected directly by the original cables from the gauge manufacturers to the IBRit-md2/-md2s/-md2c there are several plug-adapters available.



IBRit-md2 : 6 Mitutoyo gauges
IBRit-md2s : 6 Opto RS232 gauges
IBRit-md2c : 3 Mitutoyo gauges
3 Opto RS232 gauges

2. Features

- ◆ Original cables of the gauge manufacturers can be plugged in directly or by plug adapters.
- ◆ Compact in size 163x42x92 mm at the desktop case and 149x43x97 mm at the disk rack case because of highly integrated circuits and SMD-technology.
- ◆ Connection to COM - Ports of your PC or to each RS232 - Connection
- ◆ Extensive command-set to control the data transfer.
- ◆ Conversation of the different gauge data formats to one standard data format
- ◆ Software is compatible to all IBRit-interfaces
- ◆ Request of measured values by software command, via data key on the gauge, permanent or via foot switch (gauge assignment for foot switch request is software controlled).
  An automatic data transfer from the gauge or a data transfer by data key on the gauge is only possible on the first channel and on all Mitutoyo inputs.

3. Gauge connection table

3.1 Gauge connection table of IBRit-md2 / md2c (on md2c on the first three connectors)

Gauge Manu-facturer	Gauge type	Gauge output	Handover Dre*	Handover Dtbg*	IBR-cable adapter*	Gauge connection cable*	IBR Gauge driver*
Mitutoyo	All Digimatic	Digimatic	YES	n.a*	---	Mitutoyo	0041
Kroeplin	Indicator EM25	Digimatic	YES	YES	---	Kroeplin	
	Gauge head ELI/ELO	Digimatic	YES	YES	---	Kroeplin	
	Gauge head EID/EOD	Digimatic	YES	---	---	Kroeplin	
Mecmessin	Push/pull gauge MFG	Digimatic	YES	---	---	IBR-F150 087	
	Push/pull gauge AFI,AFG,ATG	Digimatic	YES	---	---	IBR-F150 135	
	Push/pull gauge AFG MKII	Digimatic	YES	YES	---	IBR-F150 191	
Elektrophysik	Minitest 4100, 3100	Digimatic	YES	YES	---	Elektrophysik	
	Minitest 2100, 1100	Digimatic	YES	YES	---	Elektrophysik	
Erichsen	Push-pull gauge 708	Digimatic	YES	YES	---	IBR-F150 168	
Chatillon	Push-pull gauge DFGS50	Digimatic	YES	YES	---	IBR-F150 159	
	Push-pull gauge DFIS	Digimatic	YES	YES	---	IBR-F150 159	
Mark	Forquetester Mark-10	Digimatic	YES	YES	---	Mark	
Marposs	Marposs column	Digimatic	YES	YES	---	Marposs	
Sylvac	Caliper Opto RS232	Opto RS Simplex	YES	YES	F152 175	Sylvac 926.5521	0901
	Caliper Opto RS232	Opto RS Duplex	YES	YES	F152 247	Sylvac 926.6521	
	Indicator PM201,PM213	Opto RS Simplex	YES	YES	F152 175	Sylvac 926.5521	
	Indicator 213	Opto RS Duplex	YES	YES	F152 247	Sylvac 926.6521	
	Indicator 229	Opto RS Simplex	YES	YES	F152 175	Sylvac 926.5521	
	Display D80	Opto RS Simplex	YES	YES	F152 175	Sylvac 926.5521	
	Display D100S	Opto RS Duplex	YES	YES	F152 247	Sylvac 926.6521	
	Micrometer S225/S235	Opto RS Simplex	YES	YES	F152 175	Sylvac 926.5521	
	Micrometer Microcal	Opto RS Simplex	YES	YES	F152 175	Sylvac 926.5521	
	Angle gauge S239	Opto RS Duplex	YES	YES	F152 247	Sylvac 926.6521	
	Vertical gauge Z_CAL150/300	Opto RS Duplex	YES	YES	F152 247	Sylvac 926.6521	
TESA	Micrometer Micromaster	Opto RS Simplex	YES	YES	F152 175	TESA 47.61046	
	Caliper Digit CAL, ETALON	Opto RS Simplex	YES	YES	F152 175	TESA 47.61046	
	Indicator Digico 10/11/Min/Max	Opto RS Simplex	YES	YES	F152 175	TESA 47.61046	
	Indicator Digico 20	Opto RS Duplex	YES	YES	F152 247	TESA 47.61049	
	Vertical gauge Micro Hite 100	Opto RS Duplex	YES	YES	F152 247	TESA 47.61052	
	Vertical g. Micro Hite 350/600/900	Opto RS Simplex	YES	YES	F152 175	TESA 47.61046	
	Vertical gauge µ-Hite	Opto RS Duplex	YES	YES	F152 247	TESA 47.61052	
	Vertical gauge Tesa Hite plus	Opto RS Simplex	YES	YES	F152 175	TESA 47.61046	
	Vertical gauge ETALON ET1	Opto RS Simplex	YES	YES	F152 175	TESA 46.39008	
	Vertical gauge ETALON EG	Opto RS Simplex	YES	YES	F152 175	TESA 47.61023	
	Vertical gauge TESA TG-C10/C11	Opto RS Duplex	YES	YES	F152 247	TESA 47.61052	
	Bore gauge IMICRO	Opto RS Duplex	YES	YES	F152 247	TESA 47.61049	
	Column TT300	Opto RS Simplex	YES	YES	F152 175	IBR-F150 244	
	Tesatronic TTD60	Opto RS Simplex	YES	YES	F152 175	TESA 47.61023	
	Tesatronic TT10	Opto RS Simplex	YES	YES	F152 175	IBR-F150 174	
	Tesatronic TT20 & TT60	Opto RS Simplex	YES	YES	F152 175	TESA 47.61046	
Mahr	Indicator Millitast 1075	Opto RS Simplex	YES	YES	F152 175	Mahr 410.2410	
	Indicator Millitast 1082	Opto RS Simplex	YES	YES	F152 175	Mahr 410.2510	
	Indicator Millitast 1083/1085	Opto RS Simplex	YES	YES	F152 175	request Mahr	
	Indicator Extramess 2000/2001	Opto RS Simplex	YES	YES	F152 175	Mahr 434.6020	
	Bore gauge 44YE	Opto RS Simplex	YES	YES	F152 175	Mahr 410.2510	
	Vertical gauge DigimarM814N/G/Y	Opto RS Simplex	YES	YES	F152 175	Mahr 410.2510	
	Vertical gauge 27ES	Opto RS Simplex	YES	YES	F152 175	Mahr 410.2510	
	Micrometer 40EX/46EX	Opto RS Simplex	YES	YES	F152 175	Mahr 410.2410	
	Caliper 16EX/18EX/30EXN	Opto RS Simplex	YES	YES	F152 175	Mahr 410.2410	
	Caliper 30ESD/30ND	Opto RS Simplex	YES	YES	F152 175	Mahr 410.2510	
	Caliper 31ES/32ES	Opto RS Simplex	YES	YES	F152 175	Mahr 410.2510	
	Caliper 25ES	Opto RS Simplex	YES	YES	F152 175	Mahr 410.2410	
Bowers	Caliper BDC150X	Opto RS Simplex	YES	YES	F152 175	Sylvac 926.5521	
	Caliper SNAPMIC Serie EIM	Opto RS Duplex	YES	YES	F152 247	Sylvac 926.6521	
	Indicator Dialmatic Serie DI…	Opto RS Duplex	YES	YES	F152 247	Sylvac 926.6521	
	Indicator Serie BDIL…/BDI…	Opto RS Duplex	YES	YES	F152 247	Sylvac 926.6521	
	Depthmatic SerieEDG	Opto RS Duplex	YES	YES	F152 247	Sylvac 926.6521	
	Millitron Serie CBAC	Opto RS Duplex	YES	YES	F152 247	Sylvac 926.6521	
	BS Mark II Serie BSE…	Opto RS Duplex	YES	YES	F152 247	Sylvac 926.6521	
	BS Holematic Serie SHM…	Opto RS Duplex	YES	YES	F152 247	Sylvac 926.6521	
	Bore gauge Serie CBAC…	Opto RS Simplex	YES	YES	F152 175	Sylvac 926.5521	
	Bore gauge MAG…	Opto RS Simplex	YES	YES	F152 175	Sylvac 926.5521	
	Gauge head Serie TEA…/TLEA	Opto RS Simplex	YES	YES	F152 175	Sylvac 926.5521	

Gauge Manu-facturer	Gauge type	Gauge output	Handover Dre*	Handover Dtbg*	IBR-cable adapter*	Gauge connection cable *	IBR Gauge driver*
IBR	Column C100	Opto RS Simplex	YES	YES	F152 175	IBR-F150 210	0901
	Digital gauge B100	Opto RS Simplex	YES	YES	F152 175	IBR-F150 210	
Cary	Indicator cary shop	Opto RS Simplex	YES	YES	F152 175	Sylvac 926.5521	
Diatest	Digitron	Opto RS Simplex	YES	YES	F152 175	Sylvac 926.5521	
Blankenhorn	Caliper dico	Opto RS Simplex	YES	YES	F152 175	Sylvac 926.5521	
Mauser	Indicator	Opto RS Simplex	YES	YES	F152 175	Sylvac 926.5521	
Helios	Caliper Opto RS	Opto RS Simplex	YES	YES	F152 175	Sylvac 926.5521	
	Indicator Opto RS	Opto RS Duplex	YES	YES	F152 247	Sylvac 926.6521	
	Bore gauge Matic integral	Opto RS Simplex	YES	YES	F152 175	Sylvac 926.5521	
	Bore gauge Matic Uhr	Opto RS Simplex	YES	YES	F152 175	Sylvac 926.5521	
Trimos	Vertical gauge TVM301/601	Opto RS Duplex	YES	YES	F152 175	Sylvac 926.6521	
TESA	Micrometer Tesadigit	Pseudo RS	YES	YES	F152 179	TESA 06.000009	0181
	Caliper Digit-Cal SI/SM	Pseudo RS	YES	YES	F152 179	TESA 49.60006	
	Indicator Digico 1 / 2	Pseudo RS	YES	YES	F152 179	TESA S47.9012	
	Micro Hite02/04	Pseudo RS	YES	YES	F152 179	TESA S60.60002	
	Micro Hite 06	Pseudo RS	YES	YES	F152 176	IBR-F150 077	
	Bore gauge Triomatic	Pseudo RS	YES	YES	F152 179	TESA 60.60002	
Compac	Indicator Mesco	Pseudo RS	YES	YES	F152 179	IBR-F150 144	
Mauser	Caliper Digital 2	Opto RS Simplex	YES	YES	F152 175	Sylvac 926.5521	
Wolpert	Indicator Digico	Pseudo RS	YES	YES	F152 179	TESA S47.9012	
Mettler	Option 11	RS232	---	YES	F152 176	IBR-F150 054	0211
	Option 12	RS232	YES	YES	F152 176	IBR-F150 054	
	Option 82	RS232	YES	YES	F152 176	IBR-F150 104	
	Option 03,05	RS232	YES	YES	F152 176	IBR-F150 091	
	Option 16, unidirectional	RS232	---	YES	F152 176	IBR-F150 029	
	Option 18	RS232	YES	YES	F152 176	IBR-F150 029	
	Data PacM, AT-balances	RS232	YES	YES	F152 176	IBR-F150 029	
	PG-balances, MT-SICS (CAN Bus)	CAN-Bus	YES	YES	F152 176	IBR-F150 169	
	PG-balances, MT-SICS (RS232)	RS232	YES	YES	F152 176	IBR-F150 217	
	Balances PM, AM, SM	RS232	YES	YES	F152 176	IBR-F150 029	
	Balances PJ	RS232	YES	YES	F152 176	IBR-F150 029	
	Balances PC, AC Option 03	RS232	YES	YES	F152 176	IBR-F150 091	
	Balances CL Interface	RS232	YES	YES	F152 176	IBR-F150 140	
Sartorius	Balances MP8-4, MP8-4 plus, mc1	RS232	YES	YES	F152 176	IBR-F150 094	0441
	Balances MP8, MP8-1, MP8-2,	RS232	YES	YES	F152 176	IBR-F150 094	
	Balances MP6, BL3100	RS232	YES	YES	F152 176	IBR-F150 094	
	RS232 counter 705317	RS232	YES	YES	F152 176	IBR-F150 094	
	Balances A200-S, E1200S	RS232	YES	YES	F152 176	IBR-F150 094	
	Balances BP-/U-/I-/F-/A-/L-Serie	RS232	YES	YES	F152 176	IBR-F150 094	
	Balance Basic Plus	RS232	YES	YES	F152 176	IBR-F150 094	
	Balance QS4000/QS8000	RS232	YES	YES	F152 176	IBR-F150 094	
	Balance QS16000	RS232	YES	YES	F152 176	IBR-F150 094	
Heidenhain	VRZ 210, ND 291	RS232	YES	---	F152 176	IBR-F150 063	0451
	VRZ 480, 403, ND 281	RS232	YES	---	F152 176	IBR-F150 063	
	VRZ 403, VD281	RS232	YES	---	F152 176	IBR-F150 063	
	VRZ 405, 406	RS232	YES	---	F152 176	IBR-F150 063	
	VRZ 720B,760B,ND920,ND960	RS232	YES	---	F152 176	IBR-F150 063	
	VRZ 735, 775	RS232	YES	---	F152 176	IBR-F150 063	
	Positip 850	RS232	YES	---	F152 176	IBR-F150 063	
	ND 221, ND 261	RS232	YES	---	F152 176	IBR-F150 063	
TESA	Hite	Opto RS Simplex	YES	YES	F152 175	TESA 47.61046	1371

Dre* : Option of external measurement data request by foot or hand-switch, software-command (DAS) or permanent request by software-command (DAP)
(Data request extern)

Dtbg* : Option of measurement data output control by the gauge. Data output triggered by a button on the gauge or automatically on end of a measurement cycle.
(Data trigger by gauge)

n.a.* : Not available on all gauges.

IBR cable adapter* : IBR-order number. The gauge connection cable requires an adapter if there is a number.

Gauge connection cable * : Manufacturer of the cable and order number or connection type.

IBR gauge driver * : The driver-number address of the programme module in the library for the different gauge types.

3.2 Gauge connection table of IBRit-md2s / md2c (on md2c on the last three connectors)

Gauge Manu-facturer	Gauge type	Gauge output	Handover Dre*	Handover Dtbg*	IBR-cable adapter*	Gauge connection cable*	IBR Gauge driver*
Sylvac	Caliper Opto RS232	Opto RS Simplex	YES	YES	---	Sylvac 926.5521	0901
	Caliper Opto RS232	Opto RS Duplex	YES	YES	F152 245	Sylvac 926.6521	
	Indicator PM201,PM213	Opto RS Simplex	YES	YES	---	Sylvac 926.5521	
	Indicator 213	Opto RS Duplex	YES	YES	F152 245	Sylvac 926.6521	
	Indicator 229	Opto RS Simplex	YES	YES	---	Sylvac 926.5521	
	Display D80	Opto RS Simplex	YES	YES	---	Sylvac 926.5521	
	Display D100S	Opto RS Duplex	YES	YES	F152 245	Sylvac 926.6521	
	Micrometer S225/S235	Opto RS Simplex	YES	YES	---	Sylvac 926.5521	
	Micrometer Microcal	Opto RS Simplex	YES	YES	---	Sylvac 926.5521	
	Angle gauge S239	Opto RS Duplex	YES	YES	F152 245	Sylvac 926.6521	
	Vertical gauge Z_CAL150/300	Opto RS Duplex	YES	YES	F152 245	Sylvac 926.6521	
TESA	Micrometer Micromaster	Opto RS Simplex	YES	YES	---	TESA 47.61046	
	Caliper Digit CAL, ETALON	Opto RS Simplex	YES	YES	---	TESA 47.61046	
	Indicator Digico 10/11/Min/Max	Opto RS Simplex	YES	YES	---	TESA 47.61046	
	Indicator Digico 20	Opto RS Duplex	YES	YES	F152 245	TESA 47.61049	
	Vertical gauge Micro Hite 100	Opto RS Duplex	YES	YES	F152 245	TESA 47.61052	
	Vertical g. Micro Hite 350/600/900	Opto RS Simplex	YES	YES	---	TESA 47.61046	
	Vertical gauge µ-Hite	Opto RS Duplex	YES	YES	F152 245	TESA 47.61052	
	Vertical gauge Tesa Hite plus	Opto RS Simplex	YES	YES	---	TESA 47.61046	
	Vertical gauge ETALON ET1	Opto RS Simplex	YES	YES	---	TESA 46.39008	
	Vertical gauge ETALON EG	Opto RS Simplex	YES	YES	---	TESA 47.61023	
	Vertical gauge TESA TG-C10/C11	Opto RS Duplex	YES	YES	F152 245	TESA 47.61052	
	Bore gauge IMICRO	Opto RS Duplex	YES	YES	F152 245	TESA 47.61049	
	Column TT300	Opto RS Simplex	YES	YES	---	IBR-F150 244	
	Tesatronic TTD60	Opto RS Simplex	YES	YES	---	TESA 47.61023	
	Tesatronic TT10	Opto RS Simplex	YES	YES	---	IBR-F150 174	
	Tesatronic TT20 & TT60	Opto RS Simplex	YES	YES	---	TESA 47.61046	
Trimos	Vertical gauge TVM 301/601	Opto RS Duplex	YES	YES	---	Sylvac 926.6521	
Mahr	Indicator Millitast 1075	Opto RS Simplex	YES	YES	---	Mahr 410.2410	
	Indicator Millitast 1082	Opto RS Simplex	YES	YES	---	Mahr 410.2510	
	Indicator Millitast 1083/1085	Opto RS Simplex	YES	YES	---	request Mahr	
	Indicator Extramess 2000/2001	Opto RS Simplex	YES	YES	---	Mahr 434.6020	
	Bore gauge 44YE	Opto RS Simplex	YES	YES	---	Mahr 410.2510	
	Vertical gauge DigimarM814N/G/Y	Opto RS Simplex	YES	YES	---	Mahr 410.2510	
	Vertical gauge 27ES	Opto RS Simplex	YES	YES	---	Mahr 410.2510	
	Micrometer 40EX/46EX	Opto RS Simplex	YES	YES	---	Mahr 410.2410	
	Caliper 16EX/18EX/30EXN	Opto RS Simplex	YES	YES	---	Mahr 410.2410	
	Caliper 30ESD/30ND	Opto RS Simplex	YES	YES	---	Mahr 410.2510	
	Caliper 31ES/32ES	Opto RS Simplex	YES	YES	---	Mahr 410.2510	
	Caliper 25ES	Opto RS Simplex	YES	YES	---	Mahr 410.2410	
Helios	Caliper Opto RS	Opto RS Simplex	YES	YES	---	Sylvac 926.5521	
	Indicator Opto RS	Opto RS Duplex	YES	YES	F152 245	Sylvac 926.6521	
	Bore gauge Matic integral	Opto RS Simplex	YES	YES	---	Sylvac 926.5521	
	Bore gauge Matic Uhr	Opto RS Simplex	YES	YES	---	Sylvac 926.5521	
Bowers	Caliper BDC150X	Opto RS Simplex	YES	YES	---	Sylvac 926.5521	
	Caliper SNAPMIC Serie EIM	Opto RS Duplex	YES	YES	F152 245	Sylvac 926.6521	
	Indicator Dialmatic Serie DI…	Opto RS Duplex	YES	YES	F152 245	Sylvac 926.6521	
	Indicator Serie BDIL…/BDI…	Opto RS Duplex	YES	YES	F152 245	Sylvac 926.6521	
	Depthmatic SerieEDG	Opto RS Duplex	YES	YES	F152 245	Sylvac 926.6521	
	Millitron Serie CBAC	Opto RS Duplex	YES	YES	F152 245	Sylvac 926.6521	
	BS Mark II Serie BSE…	Opto RS Duplex	YES	YES	F152 245	Sylvac 926.6521	
	BS Holematic Serie SHM…	Opto RS Duplex	YES	YES	F152 245	Sylvac 926.6521	
	Bore gauge Serie CBAC…	Opto RS Simplex	YES	YES	---	Sylvac 926.5521	
	Bore gauge MAG…	Opto RS Simplex	YES	YES	---	Sylvac 926.5521	
	Gauge head Serie TEA…/TLEA	Opto RS Simplex	YES	YES	---	Sylvac 926.5521	
IBR	Column C100	Opto RS Simplex	YES	YES	---	IBR-F150 210	
	Digital gauge B100	Opto RS Simplex	YES	YES	---	IBR-F150 210	
Cary	Indicator cary shop	Opto RS Simplex	YES	YES	---	Sylvac 926.5521	
Diatest	Digitron	Opto RS Simplex	YES	YES	---	Sylvac 926.5521	
Blankenhorn	Caliper dico	Opto RS Simplex	YES	YES	---	Sylvac 926.5521	
Mauser	Indicator	Opto RS Simplex	YES	YES	---	Sylvac 926.5521	
TESA	Hite	Opto RS Simplex	YES	YES	---	TESA 47.61046	1371

Gauge Manu-facturer	Gauge type	Gauge output	Handover Dre*	Handover Dtbg*	IBR-cable adapter*	Gauge connection cable *	IBR Gauge driver*
Compac	Indicator Mesco	Pseudo RS	YES	YES	F152 180	IBR-F150 144	0181
Mauser	Caliper Digital 2	Opto RS Simplex	YES	YES	---	Sylvac 926.5521	
Wolpert	Indicator Digico	Pseudo RS	YES	YES	F152 180	TESA S47.9012	
TESA	Micrometer Tesadigit	Pseudo RS	YES	YES	F152 180	TESA 06.000009	
	Caliper Digit-Cal SI/SM	Pseudo RS	YES	YES	F152 180	TESA 49.60006	
	Indicator Digico 1 / 2	Pseudo RS	YES	YES	F152 180	TESA S47.9012	
	Micro Hite02/04	Pseudo RS	YES	YES	F152 180	TESA S60.60002	
	Micro Hite 06	Pseudo RS	YES	YES	F152 178	IBR-F150 077	
	Bore gauge Triomatic	Pseudo RS	YES	YES	F152 180	TESA 60.60002	
Mitutoyo	All Digimatic	Digimatic	YES	n.a*	F152 177	Mitutoyo	0041
Kroeplin	Indicator EM25	Digimatic	YES	YES	F152 177	Kroeplin	
	Gauge head ELI/ELO	Digimatic	YES	YES	F152 177	Kroeplin	
	Gauge head EID/EOD	Digimatic	YES	---	F152 177	Kroeplin	
Mecmessin	Push/pull gauge MFG	Digimatic	YES	---	F152 177	IBR-F150 087	
	Push/pull gauge AFI,AFG,ATG	Digimatic	YES	---	F152 177	IBR-F150 135	
	Push/pull gauge AFG MKII	Digimatic	YES	YES	F152 177	IBR-F150 191	
Elektrophysik	Minitest 4100, 3100	Digimatic	YES	YES	F152 177	Elektrophysik	
	Minitest 2100, 1100	Digimatic	YES	YES	F152 177	Elektrophysik	
Erichsen	Push-pull gauge 708	Digimatic	YES	YES	F152 177	IBR-F150 168	
Chatillon	Push-pull gauge DFGS50	Digimatic	YES	YES	F152 177	IBR-F150 159	
	Push-pull gauge DFIS	Digimatic	YES	YES	F152 177	IBR-F150 159	
Mark	Forquetester Mark-10	Digimatic	YES	YES	F152 177	Mark	
Marposs	Marposs column	Digimatic	YES	YES	F152 177	Marposs	
Mettler	Option 11	RS232	---	YES	F152 178	IBR-F150 054	0211
	Option 12	RS232	YES	YES	F152 178	IBR-F150 054	
	Option 82	RS232	YES	YES	F152 178	IBR-F150 104	
	Option 03,05	RS232	YES	YES	F152 178	IBR-F150 091	
	Option 16, unidirectional	RS232	---	YES	F152 178	IBR-F150 029	
	Option 18	RS232	YES	YES	F152 178	IBR-F150 029	
	Data PacM, AT-balances	RS232	YES	YES	F152 178	IBR-F150 029	
	PG-balances, MT-SICS (CAN Bus)	CAN-Bus	YES	YES	F152 178	IBR-F150 169	
	PG-balances, MT-SICS (RS232)	RS232	YES	YES	F152 178	IBR-F150 217	
	Balances PM, AM, SM	RS232	YES	YES	F152 178	IBR-F150 029	
	Balances PJ	RS232	YES	YES	F152 178	IBR-F150 029	
	Balances PC, AC Option 03	RS232	YES	YES	F152 178	IBR-F150 091	
	Balances CL Interface	RS232	YES	YES	F152 178	IBR-F150 140	
Sartorius	Balances MP8-4, MP8-4 plus, mc1	RS232	YES	YES	F152 178	IBR-F150 094	0441
	Balances MP8, MP8-1, MP8-2,	RS232	YES	YES	F152 178	IBR-F150 094	
	Balances MP6, BL3100	RS232	YES	YES	F152 178	IBR-F150 094	
	RS232 counter 705317	RS232	YES	YES	F152 178	IBR-F150 094	
	Balances A200-S, E1200S	RS232	YES	YES	F152 178	IBR-F150 094	
	Balances BP-/U-/I-/F-/A-/L-Serie	RS232	YES	YES	F152 178	IBR-F150 094	
	Balance Basic Plus	RS232	YES	YES	F152 178	IBR-F150 094	
	Balance QS4000/QS8000	RS232	YES	YES	F152 178	IBR-F150 094	
	Balance QS16000	RS232	YES	YES	F152 178	IBR-F150 094	
Heidenhain	VRZ 210, ND 291	RS232	YES	---	F152 178	IBR-F150 063	0451
	VRZ 480, 403, ND 281	RS232	YES	---	F152 178	IBR-F150 063	
	VRZ 403, VD281	RS232	YES	---	F152 178	IBR-F150 063	
	VRZ 405, 406	RS232	YES	---	F152 178	IBR-F150 063	
	VRZ 720B,760B,ND920,ND960	RS232	YES	---	F152 178	IBR-F150 063	
	VRZ 735, 775	RS232	YES	---	F152 178	IBR-F150 063	
	Positip 850	RS232	YES	---	F152 178	IBR-F150 063	
	ND 221, ND 261	RS232	YES	---	F152 178	IBR-F150 063	

Dre* : Option of external measurement data request by foot or hand-switch, software-command (DAS) or permanent request by software-command (DAP)
(Data request extern)

Dtbg* : Option of measurement data output control by the gauge. Data output triggered by a button on the gauge or automatically on end of a measurement cycle.
(Data trigger by gauge)

n.a.* : Not available on all gauges.

IBR cable adapter* : IBR-order number. The gauge connection cable requires an adapter if there is a number.

Gauge connection cable * : Manufacturer of the cable and order number or connection type.

IBR gauge driver * : The driver-number address of the programme module in the library for the different gauge types.

4. Delivered Items

Delivered Items of a desk top Instrument :

IBRit-md2/-md2s/-md2c includes plug in power-source, 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.

5. Getting started

1. **Connecting to the PC or Computer**
   Plug the RS232 data cable into the PC serial port and the **RS232** socket on the IBRit-md2/-md2s/-md2c-bt rear panel.
   The transmission format of the RS232 interface is set fix to 9600 Baud, no parity, 8 Data bits and 1 stop bit.

2. **External Trigger Switch**
   Connect the foot switch or press switch to the **TRIGGER** socket on the rear panel of the IBRit-md2/-md2s/-md2c-bt.

3. **Connecting to the Mains**
   Connect the plug-in power source to the socket **AC** on the rear panel of the IBRit-md2/-md2s/-md2c-bt. Use only the delivered plug-in power source. Check the supply voltage before connecting the plug-in source to the mains. Note the type plate of the plug-in power source.

4. **Connecting Gauges**
   Connect the gauges to the IBRit-md2/-md2s/-md2c-bt according to your measurement application. Therefore switch off the gauges and the interface before. Note the necessary settings of the gauges to transfer measured values.

5. **Switching on**
   Switch on the supply and the power-on lamp illuminates. The IBRit-md2/-md2s/-md2c-bt enters a self check routine. If no errors are detected the IT-lamp shows 4 short flashes and the system is ready for work. If errors are detected they are signalled with a sequence of long and short flashes.

   The table on page 9 shows the meanings of the flash sequences.

5.1 Self Check Routine

The IBRit-md2/-md2s/-md2c self check routine is invoked at power-on and on receipt of a *RESET* command. All system components are checked. The test result is signalled by the IT-lamp on the rear panel. Four short flashes indicate no errors were found. A sequences of long and short flashes indicate errors. The table gives the meanings of the error signals. The IBRit-md2/-md2s/-md2c remains in the self test mode until the fault is cleared and cannot be used for gauging. The self-check cycle takes 3 to 4 seconds.

Self-check Error Flash Sequence :

Test result :	Flash sequence :	Error :
---	**S S S S**	**No errors detected, self-check complete**
Error 1	L S S S	Error in programme memory
Error 2	S L S S	Error in working memory

Notice : S - short flash (0,5 seconds)
L - long flash (1 second)

6. Working with the IBRit-md2/-md2s/-md2c

The IBRit-md2/-md2s/md2c 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-md2/-md2s/-md2c
- Test the initialisation / read measured values
- Transfer a initialisation automatically to the IBRit-md2/-md2s/-md2c

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

6.1 Starting 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

6.2 Starting 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 computer.

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

7. 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 function. Easy to follow text in the windows explains every user function.
Every screen lists the possible key functions along the bottom line (hotkeys).

7.1 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.

7.2 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-md2/-md2s/-md2c 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.

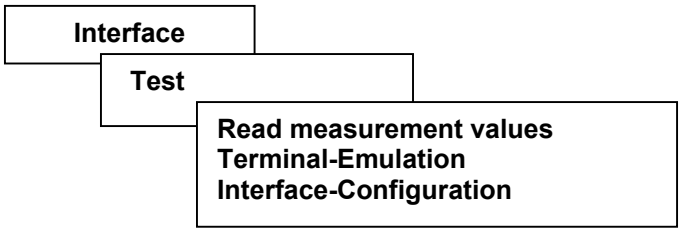
- The programme stores these settings. -

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.)

7.3 Test, Initialisation and Adjustment

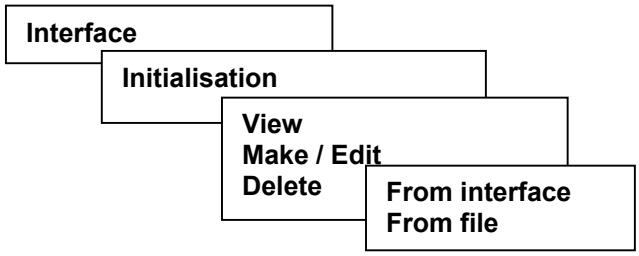
In this part of the programme you are able to test and initialise your interface, if necessary. For clarity these tasks are handled in separate menus (see para. 2.1 to 2.2).

7.3.1 Interface - Test



a.) In the sub-menu **Read measurement values** the IBRit-md2/-md2s/-md2c is tested and measurements 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 programmes for the IBRit-md2/-md2s/-md2c. They can test their command sequences manual. The option <**record data**> allows the recording of transferred data.
c.) The sub menu **Interface-Configuration** is used for analysis of the measuring instrument, 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.

7.3.2 Interface Initialisation

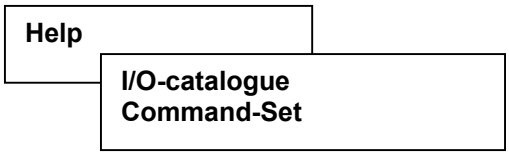


The sub-menu **Initialisation** enables you to **View, Make/Edit** or **Delete** the initialisation of your instrument, if necessary. Please note, that a IBRit-md2/-md2s/-md2c has no non-volatile memory to store the initialisation. The IBRit-md2/-md2s/-md2c has to be initialised on every start up. Therefore 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...6
  The different channels 1...6 can be selected by **<PgUp>** and **<PgDn>**
- Switch ON/OFF the selected channel
- Switch ON/OFF the different data transfers
  → Data transfer from gauge (with gauge key or automatic transfer).
  → Data request by foot switch on the interface device
- With the function key **<F3>** different gauge types can be selected. You will find a table of possible gauges in section :
  „Gauge connection table of IBRit-md2/-md2s/-md2c“ in this manual
- With the function key **<F2>** there is a buffer available for special commands 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.

7.3.3 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.
Please note that only measurement gauges which are signed with “md” at the I/O-catalogue column ”I-Typ” can be connected to the IBRit - md2 / - md2s / - md2c.

8. Automatic initialisation with IBRSEND.EXE

The interface IBRit-md2/-md2s/-md2c 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>

9. Simple check of the IBRit interface

After the installation of a IBRit-md2/-md2s/md2c at the free COM port of your computer and the self check routine has finished successfully, a simple check of the device functions can be done with the installed software.
Please take care that all gauges are connected and switched on.

- Start the **ITEC** programme.
  Change the directory to **cd\IBRIT<cr>**, if necessary type **ITEC <cr>** to start the programme and go to the menu programme setup. Now check in the sub-menu **RS232 connection** the selected COM-port „COM1-4“ and change it to your connected port if necessary.
  You can go now to the menu **Interface** select the sub-menu **Test** and there **Interface-Configuration**. The programme now tries to communicate with the IBRit interface. If you get the message **„Interface not found“,** please check the RS232 connection between computer and IBRit interface. Please check the selected COM-Port (COM1-4) and whether the ON-LED is shining on the IBRit interface.
  Now you can see on the screen the identity of your IBRit interface, the data transfer format and the mounted module types.
  Leave now the menu with the ESC-key.

- Before testing the data transfer please check again the following points :
  1. Is there a gauge connected on input 1 (channel C10) of the IBRit-md2/-md2s/- md2c ?
  2. Is the gauge switched on and ready to operate ?
  3. Is this gauge suited to transfer measured values to the IBRit-md2/-md2s/-md2c without any initialisation ?

- With a IBRit-md2 it is possible to receive measured values on all inputs, where gauges with Mitutoyo **Digimatic** output are plugged in (please refer to chapter **Gauge connection table of IBRit-md2**).

- With a IBRit-md2s it is possible to receive measured values on all inputs, where gauges with **Opto RS**(232) output and Sylvac transfer are plugged in (please refer to chapter **Gauge connection table of IBRit-md2s**).

- With a IBRit-md2c it is possible to receive measured values on all inputs, where 3 gauges with Mitutoyo **Digimatic** output and 3 gauges with **Opto RS**(232) output and Sylvac transfer are plugged in (please refer to chapter **Gauge connection table of IBRit-md2**).

10. 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-md2/-md2s/-md2c uses a versatile command set enabling PC control of hardware.
The most important function of the command-set:

1. **Interrogate instrument identity and configuration**
2. **Control measurement data transfer**
3. **Initialisation of the gauge connection channels**

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-md2/.md2s/-md2c 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-md2/-md2s/-md2c acknowledges 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>.

10.1 Transmission format

This transmission format is factory-set to 9600 Baud, no parity, 8 Data bits and 1 stop bit.

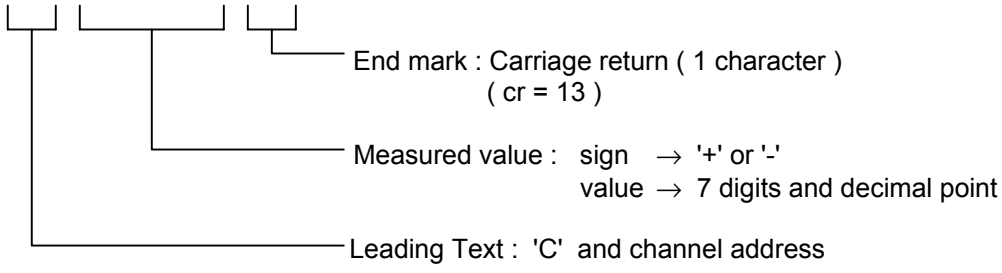
10.2 Data format of measured values

The format of the measurement data strings at the data output of IBRit-md2/-md2s/md2c 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 there characters. A **„*C*“** and the channel address (10 – channel 1; 20 – channel 2 ... 60 – channel 6)
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*** or ***NC*** message instead of a measured value. This message appears, if no gauge is connected or the gauge is not ready to operate.
If interface driver 0137 (Tesa Hite) is selected the error messages *DU* or *OV* may also appear on undefined measured values transferred by the gauge.

10.3 Summary of Command Set

The command set of the IBRit-md2/-md2s/-md2c is divided into two groups.
The first is used for communicating with the user programme during measurement, and the second group is used by the **ITEC** programme for the setup of the interface system. These commands are not normally used by software engineers of user programmes.

Command line syntax :
- **kn** – instrument address (1...6)
- **( )** and **[ ]**-indicate optional parameters

1. Communication Command Group

Control of data request :

DAD (kn[.0]) <cr>	- General disable of all measurement requests
DAE (kn[.0]) <cr>	- General enable of all measurement requests
DAF (kn[.0]), ON/OFF<cr>	- Control requests for measured values with an external trigger switch
DAG (kn[.0]),ON/OFF <cr>	- Control request for measured values with the integrated data key on the gauge

Commands for requests of measured values :

DAS (kn[.0]) <cr>	- Request for measured values via software command
DAP kn[.0],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 (Attention !!! – Initialisation will be deleted)

2. Command group for initialisation

Programming the gauge inputs

SNR kn[.0], sn <cr> - Programming of gauge inputs
sn = interface number SN-xxxx-xxxx-xx-x
i.e. : SNR2, SN-0451-0633-01-20 → init. Of Heidenhain gauges on channel 2

Programming the RS232-interface

SSD 0,*format* <cr> - Programming the transmission format of the RS232
format → Baudrate, Parity, Data bits Stop bits
default setting → 9600, N, 8, 1

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")***

10.4 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 - Instrument address too low
E5 - Channel number too high
E6 - ON/OFF not identified
E7 - Separator ',' not identified
E10 - Undefined output – wrong type of module
E20 - Format of interface number undefined
E26 - Input buffer overflow - String >32 characters

10.5 Importing measured values into Windows applications

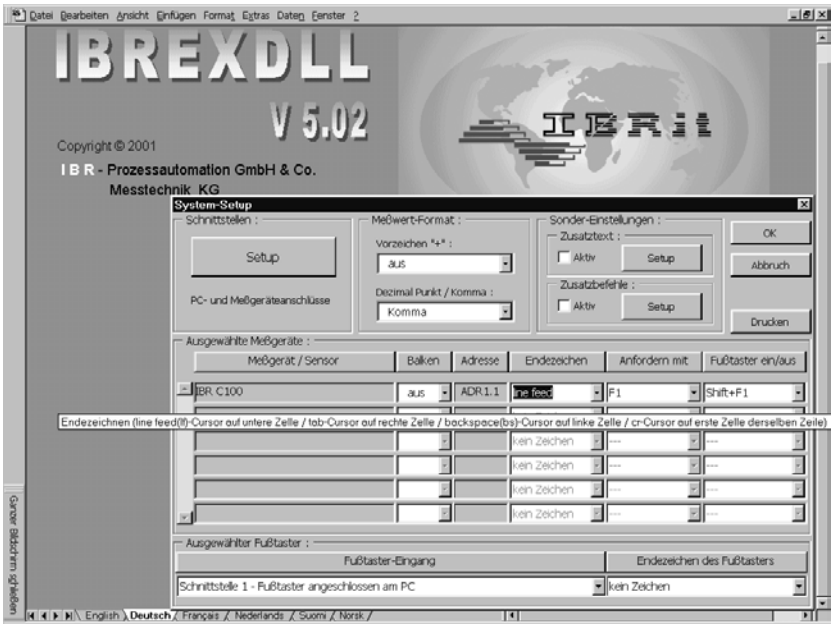
For taking over measured values in 32 Bit- Windows-applications the **IBR_Device Driver Kit** = **IBR_DDK.DLL** is available for programmers.
The IBR_DDK.DLL offers a API-interface and a COM-interface (ActiveX) and can be downloaded without cost from the Home Page ***www.IBRit.com***.

Features of the IBR_DDK.DLL

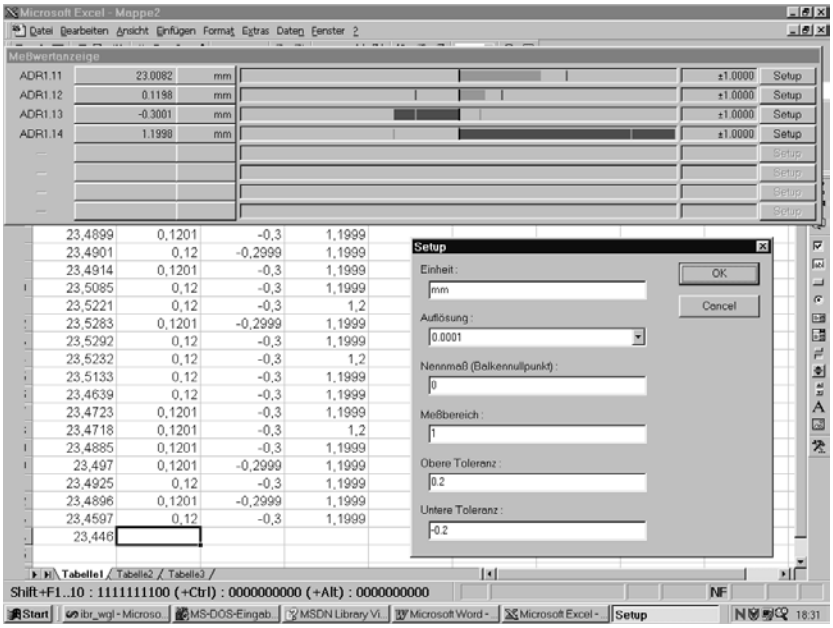
- Parallel operation of up to 8 devices (COM or USB)
- Universal interface to all IBR-interface- and measuring instruments
- Examples for VB, VC++ and Delphi

10.6 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***

11. Accessories and Order Information

Designation		Article-Number
IBRit-md2-bt	**Interface to connect 6 gauges with Mitutoyo Digimatic output, gauges from other manufacturers (Sylvac, Tesa, Mauser, Sartorius, Mettler, Heidenhain...) with connection adapters.**	F102 001
IBRit-md2s-bt	**Interface to connect 6 gauges with Opto RS232 output, Sartorius, Mettler, Heidenhain...) with connection adapters.**	F102 003
IBRit-md2c-bt	**Interface to connect 3 gauges with Mitutoyo Digimatic output, 3 gauges with OPTO RS232 output, gauges from other manufacturers (Tesa, Mauser, Sartorius, Mettler, Heidenhain...) with connection adapters.** IBR-command set, connector for foot switch. Incl. power plug, manual and initialisation disc.	F102 007
PC-RS232 cable	Connection cable for RS232 with adapter 9/25 pin. (COM1...COM4)	F601 001
PC-USB cable	Connection cable for PC USB with driver software to emulate COM 1…127 ..	F601 020
Foot switch	Foot switch protection IP32	F602 001
	Foot switch protection IP65	F602 002
Hand switch	Hand switch protection IP65	F602 010
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

12. Technical Data

Mechanical characteristics

Case	Aluminium with plastic frame (plastic ABS, RAL 7035)
Dimensions W x H x D / Weight	163 x 42 x 92 mm / IBRit-md2-bt - approx. 360 g IBRit-md2s-bt - approx. 410 g IBRit-md2c-bt - approx. 380 g

Electrical characteristics

Power block	Plug-in power source with integrated 2-prong Euro plug. Fully isolated, regarding VDE-regulations.
Input voltage / Input frequency alternative : Extraneous supply voltage	230 V AC, + 10 %, -15 % / 40…65 Hz 7 – 9 V AC oder DC
Input current	< 50 mA
Data output	EIA RS232C

Environmental conditions

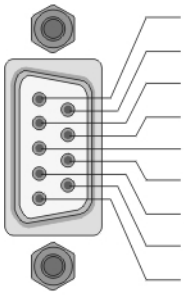
Working temperature range	0...60°C
Storage temperature range	-30...+70°C
Relative humidity	For dry premises only

Electromagnetic compatibility (EMC)

Electromagnetic compatibility (EMC)	Generation of interference according to EN50081-2 Resistance to interference according to EN50082-2

13. Pin assignments of connectors

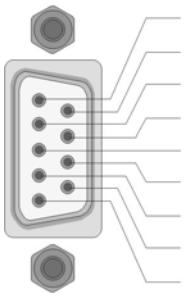
IBR - RS232



1 - n.c.
6 - n.c.
2 - RxD (Input)
7 - RTS (Output)
3 - TxD (Output)
8 - CTS (Input)
4 - DTR (Output)
9 - VCC (+5V,Imax 20mA)
5 - GND (Ground)

Sub - D - Connector 9 pin , female

Trigger



1 - Trig (Input).
6 - n.c.
2 - coded pin
7 - n.c.
3 - n.c.
8 - n.c.
4 - n.c.
9 - VCC (+5V,Imax 20mA)
5 - GND (Ground)

Sub - D - Connector 9 pin , female

Phone Jack 3,5 mm

Supply voltage 7
7 – 9 AC or DC

Input current : < 50 mA

14. Error Solutions

If there are problems come up on operating the IBRit interface, you will get now some information on possible errors and how to solve them.

Problem	Possible Error
No interface detected	**- Wrong COM-port** Compare the setting of the COM-port in the ITEC-programme (programme setup / RS232-connection) with the COM-port selected on the PC. **- COM-port defective** Check the function of the IBRit interface on another computer or choose another COM-port. **- Mouse installed on the same port** Please take care, that no mouse driver is started on a port where a interface is plugged on. **- Error on interface** The ON-LED must shine on a desk top interface after switch on. Check also the result of the self check routine. There must be 4 short flashes of the “IT”-LED when interface is switched on.
No measurement data transfer	**- Wrong initialisation** Compare the programmed initialisation with your requirements. Print out the interface configuration by selecting the menu “Interface” and then “Test”. **- Wrong settings on the gauge** Check the setup of the gauge according to the parameters on the from “IBRit-Gauge connection”. This form will be delivered together will the cable, if special setting have to be done on the gauge.
Work with Windows 3.11	**- Windows-driver SERIAL.386** According to the information of “Microsoft Data news” there is an error inside the driver revision from 01.11.93. For information ask your Microsoft distributor.

15. Safety Instructions

The present instrument is state-of-the-art design and complies with the current safety standards. It is nevertheless mandatory to observe the following instructions in order to prevent personal injuries or accidental death of staffmembers and other persons.

1. All operators must read the present instructions and this manual very carefully **before starting operation.**
2. The instrument may be used only **in errorless technical condition.** Disruptions which may be a danger to operational safety must be removed immediately.
3. The device may be used only as stated in these instructions. The manual must be kept near at hand at the place of operation.
4. Before connecting the device to the power outlet, make sure that the voltage indicated on the label corresponds to the voltage of the local power net. If this is not the case, the device should under no circumstances be connected to the power outlet.
5. The instrument must be connected to the power supply through a properly grounded safety socket. Extension cables, where required, must comply with the VDE safety standards.
6. Any modification and procedures concerning the instrument are permitted only with the prior written consent of **IBR Messtechnik GmbH & Co. KG** and must be carried out by competent staff. Opening the case or tampering with the device without prior permission will lead to the loss of the guarantee and free the producer from all liabilities. Before opening the instrument, make sure to effectively cut the power supply, e.g. by disconnecting the power cable.
7. Before cleaning, disconnect the instrument from the power supply. No liquids should ever be allowed to leak inside the instrument. Strictly avoid the use of cleaners that attack plastic.
8. Replace faulty fuses only with fuses of identical amperage and current characteristics following the instructions given in this manual.
9. Corporate guidelines and safety regulations enforced by the industrial trade associations for the prevention of industrial accidents must be strictly observed. Make sure to consult the safety officer at your company.
10. Do not operate the instrument in an environment containing explosive gases, because an electric spark can cause an explosion.

16. 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.

17. 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

I B R Messtechnik GmbH & Co. KG

A. Schneider
Quality Assurance Manager