

# M-Box xx USB Operating Instructions

## Interface Configuration

### Interface Classes

The M-Box recognizes four different interface classes: Digimatic, MultiRS232, OptoRS232, RS232C, and TTL-RS232. They set the electric signals of certain measuring devices to the right level so that the M-Box can process them.

The operating software of the M-Box then recognizes and converts the measured data into a uniform data format. The M-Box only needs to know which measuring device is used. This is communicated by transferring the company number contained in the command string before a value is measured.

The company number always consists of three ASCII numbers.

The evaluation software, i.e. the program which requests and processes the measured data coming from the interface box, has to be set up correctly to transfer the correct company number to the interface box according to the measuring device so that the box can process the measured data correctly.

A measuring device should be connected only to an interface of the appropriate class. Otherwise the interface box or the measuring device might be damaged. An exception is the MultiRS232 interface class as it unites the classes OptoRS232, RS232C, and TTL-RS232 on one interface connector, but on different pins.

**Important:** Make sure that you use the correct measuring device cable to ensure correct interface functionality. See the measuring device table.

### Digimatic Interface

The Digimatic interface is supported by Mitutoyo, PAV and Kröplin. You can connect the following measuring devices:

Measuring Device	Function	Company No.	Data Cable (Order No.)
Mitutoyo Hand Measuring Instrument	Measured value	001	Original cable
Marposs/Digimatic	Measured value	001/002	Original cable
Mahr (6Exd Caliper and Extramess 2000)	Measured value	001	Original cable
Kröplin/PAV Measuring Device	Measured value	001	Original cable

### OptoRS232 Interface

The OptoRS232 interface is supported by all leading European measuring device manufacturers. However, almost every manufacturer uses a different transfer protocol. This forces the interface box to use different company numbers to process the measuring devices. You can connect the following measuring devices:

Measuring Device	Function	Company No.	Data Cable (Order No.)
Helios 'Universal' Digital Indicator	Normal value	300	Original cable Sylvac <b>Simplex</b> 926.5521
Helios 'Universal' Digital Indicator	MIN value	301	
Helios 'Universal' Digital Indicator	MAX value	302	
Helios 'Universal' Digital Indicator	DEL value	303	
Helios 'Universal' Digital Indicator	CLEAR	304	
Helios 'Universal' Digital Indicator	PRESET +0	305	
Mahr 1082 Digital Indicator	Measured value	179	Cable BOBE <b>ESY 2.2 Simplex</b> (9 pins)
Mahr 1085 Digital Indicator	Measured value	276	
Mahr 1085 Digital Indicator	Zeroes	327	
Mahr 1085 Digital Indicator	Max	328	
Mahr 1085 Digital Indicator	Min	329	
Mahr 1085 Digital Indicator	Diff.	330	
Mahr 1085 Digital Indicator	Extrem.	331	Cable BOBE/Mahr <b>ESY 2.4</b> (4 pins)
Mauser Digital 6	Measured value	274	
Sylvac Hand Measuring Instrument	Measured value	179	
Sylvac Microcal Caliper	Measured value	275 or 179	
Tesa DigitCal OptoRS232	Measured value	209	
Tesa Digico 10 Digital Indicator	Measured value	179	
Tesa Hite Height Gauge	Measured value	298 <sup>1</sup>	
Tesa Digit-Cal Capa System	Measured value	274	
Tesa Micromaster Capa System	Measured value	274	
Tesa TTD20/60 OptoRS232	Measured value	323	
Default OptoRS232	Measured value	179	Helios, Mahr, Tesa, Preisser

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<sup>1</sup> You cannot ask Tesa Hite to send data via the interface, but you have to press the trigger button on the measuring device. We recommend a Data Direction option without time-out to avoid error messages when the measured value transfer was not triggered within the time-out interval.

### RS232C Interface

The RS232C interface is the most common interface in the PC category. Therefore many measuring devices support this interface class. You can connect the following measuring devices:

Measuring Device	Function	Company No.	Data Cable (Order No.)
Heidenhain VRZ Counter	Measured value	017	B0016
Heidenhain ND Counter	Measured value	292	B0016
Helios Unitron Counter	Measured value	293	B0020
Kern 510	Instantaneous value	270	B0037
Kern 510	Calm value	271	see above
Kern 510	Temperature	272	see above
Kern 510	Tare	273	see above
Mahr Millitron 1240/150x	Measured value	299	B0014
Mahr 817 CI Height Gauge	Measured value	298 <sup>2</sup>	B0022
Mettler PM 3000	Instantaneous value	205	B0007
Mettler PM 3000	Calm value	206	see above
Mettler PM 3000	Tare	207	see above
Precisa Series 300	Instantaneous value	279	B0008
Precisa Series 300	Calm value	280	see above
Precisa Series 300	Tare	281	see above
Accu Force	Measured value	067	B0052
Sartorius MC 1	Measured value	067 <sup>1</sup>	B0006
Sartorius MC 1	Tare	204	see above
Sony U12/U30/U60/LZ51-C	Display value	059	B0002
Sony U12/U30/U60/LZ51-C	Clear	060	see above
Sony LZ51-C	Min value	057	see above
Sony LZ51-C	Max value	058	see above
Sylvac 80/100	Measured value	275	B0050
Trimos Height Gauge	Measured value	298 <sup>2</sup>	B0022
Tesa MicroHite PowerPanel	Measured value	298 <sup>2</sup>	B0022
Tesa MicroHite Series 10/11	Measured value	298 <sup>2</sup>	B0022
Tesa MicroHite 06 Height Gauge Series 06	Measured value	316 <sup>2</sup>	B0015
Tesa MicroHite 04 Height Gauge Series 06	Measured value	067	B0034
Tesa MicroHite 1D with 1200 baud	Measured value	314 <sup>2</sup>	B0026
Tesa MicroHite 1D with 4800 baud	Measured value	315 <sup>2</sup>	B0026
Tesa MicroHite 1D/2D	Measured value	316 <sup>2</sup>	B0026
Tesa TT10	Measured value	324	B0045
Tesa TTD20	Measured value	323	B0017
Tesa TTD60	Measured value	289	B0017
<i>Only for special versions</i>			
<i>Entry for special devices (modified M-Box version number _____)</i>			

**Note that devices of equal design can be allocated.**

<sup>1</sup> For the Sartorius MC1 balance you have to use the balance setup to determine if the instantaneous weight value or the calm value (the weight value after the balance has calmed) is transferred.

<sup>2</sup> You cannot ask Tesa MicroHite and Mahr 817 CI Tesa Hite to send data via the interface, but you have to press the trigger button on the measuring device. We recommend a Data Direction option without time-out to avoid error messages when the measured value transfer was not triggered within the time-out interval.

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These measuring devices can be modified using the transfer parameters. As far as possible the interface box is set to the factory settings of the measuring device. If your measuring device does not interact with the interface box, it could be that the transfer parameters are wrongly set. Check if your measuring device is set according to the following table.

Heidenhain ND	9600 baud, even parity, 7 data bits, 2 stop bits, 0 line feeds, no handshake
Heidenhain VRZ	2400 baud, even parity, 7 data bits, 2 stop bits, 0 line feeds, no handshake
Helios Unitron	4800 baud, even parity, 7 data bits, 1 stop bit, no handshake
Kern 510	9600 baud, no parity, 8 data bits, 1 stop bit, no handshake
Mettler PM 3000	2400 baud, even parity, 7 data bits, 1 stop bit, no handshake
Precisa Series 300	9600 baud, no parity, 8 data bits, 1 stop bit, no handshake
Sartorius MC-1	1200 baud, odd parity, 7 data bits, 1 stop bit, no handshake
Sony LZ51-C	2400 baud, no parity, 8 data bits, 1 stop bit, no handshake
Tesa MicroHite 04	1200 baud, odd parity, 7 data bits, 1 stop bit, no handshake
Tesa MicroHite PowerPanel	4800 baud, even parity, 7 data bits, 1 stop bit, no handshake
Tesa MicroHite 1D/2D/06	4800 baud, even parity, 7 data bits, 1 stop bit, no handshake
Tesa TTD 60	4800 baud, even parity, 7 data bits, 1 stop bit, no handshake
Tesa Digico 1/2 & Compac	1200 baud, even parity, 8 data bits, 1 stop bit

### **SY4 Interface (M-Box 27 and M-Box 29)**

The SY4 interface was very popular in the past, but has been largely replaced by OptoRS232 interface. Different manufacturers used different transfer protocols, which necessitated the implementation of several company numbers. The following measuring devices are supported:

- Sylvac Digimet calipers
- Mauser micrometers
- Blankenhorn hand measuring instruments
- FMS hand measuring instruments
- Helios hand measuring instruments
- Mahr hand measuring instruments
- Preisser hand measuring instruments
- Import calipers from China

### **TTL-RS232 Interface**

<i>Measuring Device</i>	<i>Function</i>	<i>Company No.</i>	<i>Data Cable (Order No.)</i>
Tesa Digit Micrometer Screw Gauge	Measured value	028	B0004
Tesa DigitCal	Measured value	028	B0005
Tesa Digico 1 & 2 /Compac	Measured value	028 <sup>1</sup>	B0010 without request B0074 with request B0079 with request + mains connector <sup>1</sup>

<sup>1</sup> Not all boxes can ask Tesa Digico 1 & 2 to send data via the interface, but you have to press the 'PRINT' button on the measuring device. We recommend a Data Direction option without time-out to avoid error messages when the measured value transfer was not triggered within the time-out interval. Boxes that can ask the device to send data via the interface require the cable B0074 or B0079 (with mains connector).

### **MultiRS232 Interface**

The MultiRS232 interface is a summary of the interface classes **OptoRS232**, **RS232C**, **TTL-RS232**. All measuring devices listed for these interface classes can be connected to interface boxes with MultiRS232 interface.