

## M-Box xx USB Operating Instructions

### The BOBE Interface Box Command String

Rev. 8

A command string is a string sent to the interface box to perform actions such as reading measuring devices. The command parameters consists of one to three digit ASCII numbers and result in a 13 ASCII characters long command string. The parameters are transferred without separator and are terminated by a CARRIAGE RETURN.

All BOBE boxes with firmware version 8.00 and above support the new command string options.

**CAUTION:** The command string should not be terminated with an additional LINE FEED as the BOBE boxes interpret it as a cancellation character, cancel the current measuring process and issue the cancellation message E,1110.

Parameter	1	2	3	4	5	6	7	Terminator
Name	Data Direction	Channel Number	String Window	End Channel	Foot Switch	Company Number	Series	
Example:	<b>1</b>	<b>01</b>	<b>1</b>	<b>10</b>	<b>0</b>	<b>001</b>	<b>001</b>	<b>[CR]</b>

#### 1<sup>st</sup> Parameter Data Direction

Length:	1 ASCII character	
Options:	0	Not used.
	1	Input with time-out: When the measuring device does not respond within a certain time limit, an error message is issued, and the measuring series is cancelled.
	2	Input without time-out: The box waits until the measuring device responds or until it receives a cancellation character via the host interface.
	3	As option 1. In addition to the measured value string the address of the card is transferred. If the measuring series is cancelled, no cancellation message will be issued.
	4	As option 3, but without time-out.
	5	Not used.
	6	Multi-channel measuring. It allows to read several measuring channels via a command string. You use parameter 2 to specify the measuring channel where the multi-channel measuring starts and you use parameter 4 to specify the measuring channel where the multi-channel measuring ends. Multi-channel measuring also gives you the channel number following the measured value string.
Note:		Multi-channel measuring is only possible for measuring devices which can be addressed via an identical company number (see parameter 6).

#### 2<sup>nd</sup> Parameter Measuring Device Address

Length:	2 ASCII characters	
Options:	00	Identification and software reset. The interface box is reset to its on-position.
	01	The measuring is read at channel 1 and processed.
	.	.
	.	.
	31	The measuring is read at channel 31 and processed.
Note:		For Data Direction option 6 (1 <sup>st</sup> parameter) the measuring device channel specifies the channel where the multi-channel measuring starts. The parameters 1, 4, 6 (except for company number 000 as it is superior and cancels the 2 <sup>nd</sup> parameter) and 7 are ignored for measuring device channel 00.

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### 3<sup>rd</sup> Parameter    Start of the String Window

Length:	1 ASCII character	
	0	Ignored, but has to be specified.
Note:	This parameter is for testing purposes only.	

### 4<sup>th</sup> Parameter    End Channel

Length:	2 ASCII Characters	
Options:	01	Only the measuring device at channel 1 is read.
	.	.
	.	.
	31	All measuring devices from the first channel (Parameter 2) to channel 31 are read.
Note:	This parameter is evaluated only for Data Direction option 6 (1 <sup>st</sup> parameter) and specifies the channel where the measuring is to end.	

### 5<sup>th</sup> Parameter    Foot Switch

Length:	1 ASCII character	
Options:	0	The measured value is transferred immediately once the command string has been sent.
	1	The measured values are only processed and transferred once the foot switch has been pressed.
	2	A measured value of a measuring series is processed and transferred once the foot switch has been pressed.
	3	As option 2, but the measuring series (parameter 7) is set to 000 (which corresponds to endless measuring). Foot switch actions that occurred before the command string was sent are not deleted.
	4	As option 0, but when you press the foot switch the following measured value is marked by 'T' instead of 'M' in the measured value string. The measuring series continues. Foot switch actions that occurred before the command string was sent are not deleted.
	5	As option 4, but the measuring series will be completed.
	6	As option 2. Foot switch actions that occurred before the command string was sent are not deleted.
	7	As option 0. The following measured value is or measured values of a measuring series are marked by the measured value ID 'T'.
	8	As option 2. The following measured value is or measured values of a measuring series are marked by the measured value ID 'T'. Foot switch actions that occurred before the command string was sent are not deleted.
Note:	For the foot switch options 1, 2, 3, 6 and 8 the box waits for a foot switch action. You can cancel this wait state by sending a single ASCII character. The box then sends the error message E,1101. You can also send a new command string immediately. Make sure that the time period between the first two characters is not bigger than 10ms. Otherwise the first character will be recognized as a cancellation character.	

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### 6<sup>th</sup> Parameter    Company Number

Length:	3 ASCII characters	
Options:	000	Identification.
	001	Measured data of a Mitutoyo Digimatic device are expected.
	.	
	.	
	999	Production date.
Note:	The parameters 1, 2, 4, 5, and 7 are ignored for the company number 000.	

### 7<sup>th</sup> Parameter    Measuring Series

Length:	3 ASCII Characters	
Options:	000	Endless measuring.
	001	1 measuring.
	.	.
	.	.
	999	999 measurings.
Note:	<p>You can cancel the measuring series by sending a single ASCII character. All ASCII characters are acceptable, except CARRIAGE RETURN and CONTROL-C.</p> <p>The cancellation is confirmed by the error message E,1110.</p>	

## Data Format

### Host Interface

The BOBE box can be operated at any USB socket type A after the installation of the driver provided. The virtual COM port (VCP) which is installed in the process has the following interface parameters:

Transfer rate:                **9600 baud**  
 Start bits:                    **1**  
 Data bits:                    **8**  
 Stop bits:                    **1**  
 Parity:                        **none**

### Measured Value Strings

The measured value string consists of:

Measured value ID:        'M' or 'T'  
 Measured value:           Sign  
                                   8 digits  
                                   Decimal point  
                                   6 digits  
 Measuring unit  
 Measuring device channel (optional)  
 Terminator sequence:    carriage return  
                                   line feed

The measured value ID, measured value, measuring unit, and measuring device address are separated from each other by comma!

#### Example 1:

You want to read a single measured value of a Mitutoyo Digimatic measuring device at channel 1 without foot switch action.

Command string: 1011100001001{CR}

Measured value string:                M1,+12345678.123456,mm\_{CR}{LF}

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### Example 2:

You want to read a single measured value and the channel number of a Mitutoyo Digimatic measuring device at channel 2 without foot switch action.

Command string: 3021100001001{CR}

Measured value string: M1,+12345678.123456,mm\_,\_2{CR}{LF}

### Identification

If you specify the channel number 000 in the command string, the box responds with its identification string.

Example:

Command string: 1011100000001{CR}

Identification string: A,BOBE M-Box16 V8.00{CR}{LF}

### Identification with Software Reset

If you specify the channel number 00 in the command string, the box responds with its identification string and is reset to its on-position.

Example:

Command string: 1001100001001{CR}

Identification string: A,BOBE M-Box16 V8.00{CR}{LF}

### Error Messages

If an error occurs, the box will issue an error message. In contrast to the EAI 488 interface system the error number is not followed by an error text. The error number indicates a certain type of error (see the following table).

Example: E,1101{CR}{LF}

The error number always consists of 4 digits. Leading zeroes are not suppressed.

E,0xxx	Format Error	Error numbers below 1000 indicate a format error. The data format of the measuring devices does not correspond to the specification which is expected for the company number indicated by xxx.
E,1101	Wrong Input	The length or parameter setting of the command string does not correspond to the definition
E,1103	Not Allocated	The interface box cannot process measuring devices with this company number.
E,1104	Device Missing	The measuring device that is invoked in the command string is not connected or set. Time-out occurred.
E,1110	New Input	A measuring process was cancelled. (This is a confirmation message.)

### Command String Examples

Here are some examples of what command strings could look like and what effect they have on the measured value transfer. All examples can be tried at a PC using a terminal program (e.g. Windows Terminal). You only have to adapt the company number to the connected measuring device.

1. You want to read the Mitutoyo Digimatic measuring device (company number 001) at channel 1 once without waiting for a foot switch action:

Command string: 1011100001001{CR}

Measured value string: M1,+12345678.123456,mm\_{CR}{LF}

2. You want to read the Sylvac OptoRS232 measuring device (company number 179) 365 times at channel 4. You want to trigger every single measured value by pressing the foot switch. You can cancel the measuring series by sending a new command.

Command string: 1041102179365{CR}

Measured value string: M1,+12345678.123456,mm\_{CR}{LF}  
(365 times after every foot switch action)

Cancellation command: (e.g.): 1011100001001{CR}

Cancellation message: M1,+12345678.123456,mm\_{CR}{LF} (no cancellation message, but a new measured value string)

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3. You want to read the Tesa DigitCal caliper with OptoRS232 interface (company number 209) at channel 7 endlessly. You want to trigger the measuring series by pressing the foot switch. You want to transfer the measured value with its channel number, and when the measuring series is cancelled you do not want to issue any cancellation message.

Command string: 3071101209000{CR}

Measured value string: M1,+12345678.123456,mm\_,\_1{CR}{LF}  
(continued up to cancellation)

Cancellation character: (e.g.): A

Cancellation message: (no cancellation message displayed)

4. You want to read measuring device 1 and measuring device 2 together without waiting for a foot switch action. You want to transfer the channel number of the measuring device.

Command string: 6011020001001{CR}

Measured value string: M1,+12345678.123456,mm\_,\_1{CR}{LF}  
M1,+12345678.123456,mm\_,\_2{CR}{LF}

5. If a measuring device does not respond within the default response time (maximum of approx. 2 seconds), the interface will generate the error message E,1104. For some measuring devices (e.g. balances) the response time can be considerably longer.

To be able to process also such measuring devices this error generation can be switched off for BOBE boxes for version 3.00 and above via the Data Direction option in the command string. The box then waits until the measuring device responds or it receives a cancellation character via the host interface.

Example:

You want to read a Sartorius MC1 balance (company number 067) at channel 6 and stop the interface box from canceling this process if the balance does not respond after approx. 2 seconds.

Command string: 2061110067001{CR}

Measured value string: M1,+12345678.123456,kg\_{CR}{LF}