OPERATING INSTRUCTIONS

T-Mux N 3+1
T-Mux N 5+1

KEYBOARD MULTIPLEXER

General

5 Mitutoyo measuring instruments and 1 measuring device with RS232C data interface can be connected to the interface T-Mux N 5 + 1.
3 Mitutoyo measuring instruments and 1 measuring device with RS232C data interface can be connected to the interface T-Mux N 3 + 1.

The measured values are transmitted like a keyboard input via the USB interface to the PC. There, the measured values are transferred to the Windows programs. Windows uses system-specific drivers. No additional driver installation is required.

The measured values are entered for the PC program as by manual input.

Data input by:

- Load button of the multiplexer
- Data button of the Digimatic meters
- Foot switch

The termination of the measurement data string as well as the output "POINT" or "COMMA" can be set with coding switches.

Assignment of the transmission channels

	T-Mux N 5+1	T-Mux N 3+1
Channel 1	Mitutoyo measuring device	Mitutoyo measuring device
Channel 2	Mitutoyo measuring device	Mitutoyo measuring device
Channel 3	Mitutoyo measuring device	Mitutoyo measuring device
Channel 4	Mitutoyo measuring device	Measuring device with RS232C-output.
Channel 5	Mitutoyo measuring device	
Channel 6	Measuring device with RS232C-output.	

The RS232 connection can be set with the coding switches COD 2 and COD 3 to different measuring instruments.

The T-Mux N has to be defined as a manual input in QS software packages.

Caution: When using the T-Mux N, the NUM-Lock key must be activated on the PC (NUM Lock ON). The multiplexer uses the characters of the numeric input field!

Scope of delivery:
1 Multiplexer T-Mux N 3 + 1 or T-Mux N 5 + 1
1 Connection cable USB-B / USB-A
1 Instruction manual

Preparation:

Connect measuring instruments to the interface:
Plug the Mitutoyo measuring instrument with the original cable to channel 1-5.
Select another measuring device on channel 6 with coding switches 2 and 3, using a screwdriver to set the corresponding positions on the coding switches 2 and 3. See the selection list on the bottom of the housing.

Connect the foot switch to the interface

Switch on the measuring instruments

Connect Interface with the USB cable to the PC

Start the application program on the PC

Carrying out measurements:

Select one or more connection channels on the interface:

Press the channel key on the interface. The channel LED is ON.

Position cursor in input field.

To transfer data from the measuring instruments: Press the foot switch or the Load key at the interface or the Load key at the measuring device.

If several channels are selected at the same time, the measured values are transmitted with HTAB or ENTER according to the setting of coding switch COD 1 one after the other.

Error message -999.99 if the measuring instrument is not connected correctly or if it is not switched on.

Output format Measured value:

```
SZZZZZZZZE
I    I   I
I    I   I--- Termination character(s)
I    I------- Measured value n Digits
I             floating point or comma
I------------ „+“ prefix "-" if negative
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Technical specifications

Power Supply
The power supply of the multiplexer is from the PC via the supplied USB cable, max current < 100mA.

Dimensions and weight
Width 135mm x Height 54mm x Depth 175mm (excluding cables)
Weight: 0,6 kg
Housing:Aluminium anodized, plastic frame with integrated rubber stands

Scope of delivery:
1 piece T-Mux N, Version 3+1 or 5+1 channel as ordered
1 piece USB Cable A-B, 1,8m

Connector:
USB-B (USB keyboard interface to computer)

Pin	Signal
1	VBus
2	D-
3	D+
4	0V

Reset key: When the system stops, i.e. if no data is read or transmitted, the system can be restarted by pressing the reset button (on the back).

After changing the coding switches, the reset key on the multiplexer must be pressed.

The following applies: The channel number of the measuring device connection also corresponds to the respective key on the front panel of the multiplexer.
If several measuring devices are enabled, the measured values are transmitted one after the other, starting with the connection 1, 2, 3, etc.

Coding switch COD 1

Set the measured value string and "COMMA" or "POINT" with a screwdriver.

Settings * Factory setting:

COD 1	Codierschalter 1
0	HTAB; Komma
1	CR; Komma
2	HTAB; Punkt
3	CR; Punkt
4	HTAB, letzter Wert mit CR u. Pos 1; Komma
5	HTAB, letzter Wert mit CR u. Pos 1; Punkt
6	PFEILTASTE CURSOR abwärts; Komma
7	PFEILTASTE CURSOR abwärts; Punkt

Channels 1 to 5 (connections of the Mitutoyo devices)

Pin	Designation
1	0V
2	DATA
3	CLOCK
4	READY
5	REQUEST

Connection of RS232C measuring devices to channel 6:

Various measuring instruments with RS232C interface can be connected. For the connection of these measuring instruments always use the original cable from Brecht Elektronik GmbH, only then technical assistance for the connection will be provided.

(9 pin Sub-D connector on the back panel of the housing):

Pin	Signal
2	RxD
3	TxD
4	DTR
5	0V
7	RTS
8	CTS

Coding switch COD2 + COD 3

Selection of measuring instruments with RS232C data output:

COD 3	COD 2	Codierschalter 2 + 3
0	0	Mitutoyo EF/?
0	1	Sylvac Opto RS, Simplex Kabel
0	2	Sylvac Opto RS, Duplex Kabel, Trigger mit „?“
0	3	Mahr Meßuhr 1085 mit Duplexkabel
0	4	Mettler AB-S/FACT, HOST, PNM, S.CONT, 2400Bd, 8B,N0,HS OFF
0	5	Mettler SICS Level 0 Befehlssatz, bd2400, 8N1, Hsoff
0	6	Heidenhain Zähler P50=2400, 7Bit, gerade Parität, 2StopBit, P51=1
0	7	Fischer MMS PC, QC300, HC1/HD1, Zwick: 9600Bd, 8N1, kein HS;
0	8	Kernwaage 440-47N, 9600Bd, 8N1, HS keiner
0	9	Digimahr 816CL
0	A	Sony Messuhr U30B
0	B	Laser Mike 1200Baud; Datenübernahme mit Load oder Fußtaste
0	C	Alluris-FMI-210A 5 Peak-Wert
0	D	Alluris FMI210A 5 Normal
0	E	Quadra-Check 200
0	F	n. C.
1	0	Schmitter SPE660
1	1	Durchflussmessgerät Auftrag Schwan Stabilo
1	2	Fischer MP30
1	3	Fischer Betascope
1	4	Mitutoyo KA-Counter
1	5	Mitutoyo EF-Counter
1	6	Nicht Belegt
1	7	Mitutoyo PJ-A3000
1	8	

At the time of printing, the current list is to be found on the bottom of the device!

1. Sylvac Opto RS Simplex interface

(With Simplex cable)
Connection with original Simplex data cable (9-pin sub-D socket, for PC connection), the triggering from the multiplexer to the measuring device is carried out with a pulse (approx. 120 msec).
Data transfer: Press the foot switch or the load button on the interface.

2. Sylvac Opto-RS Duplex interface

(With duplex cable)
Connection with the original Duplex data cable (9-pin sub-D socket, for PC connection), the multiplexer is triggered by sending "?".
Data transfer: Press the foot switch or the load button on the interface.

3. Mahr dial gauge 1085 with opto interface

(Duplex cable)

Connection with original Manufacturer data cable (duplex).
Data transfer: Press the foot switch or the load button on the interface.

4. Connection of Mettler-balance

Connection of AB-S / FACT & PM balances with RS232C data output.

Default setting: 2400 baud, 1 stop bit, 8 bits per character No parity check is performed. The balance must be set to S.CONT, HS OFF & Send the "stable value". To load data from the balance, the Load key must be pressed.

Scales with the Mettler interface adaptor LC-RS9 can be connected directly to the multiplexer.

Settings on Mettler interface adapter LC-RS9 or LC-RS25

switch left		**switch center**		**switch right**	
Pos	Device	Pos		Pos	
7	Other devices	3	2400 Baud	4	Continuous

5. Connection of Mettler-PB-Balances

Connect PB scales to RS232C data output (e.g. PB600).
The scale must respond to the Mettler **MT-SICS Level 0** command set.

Settings on Mettler balance:

Default setting: 2400 baud, 1 stop bit, 8 bits per character
There is no parity check.
Peripheral device (HoSt)
Protocol no handshake, (HS OFF)

To load the value from the scale display, press the Load key or the foot switch. To connect the balance to the multiplexer, please use the original cable from Brecht GmbH, only then technical assistance will be provided when the scale is connected.

6. Heidenhain Counter (ND221, ND281)

Connection possibility via original cable from Brecht Elektronik GmbH, only then technical assistance for connection of the measuring instrument will be provided.

Default: 2400 baud, 2 stop bits, 7 bits per character, even parity. To transfer data from the counter, the foot switch must be pressed.

Settings at the counter device:

Parameter	Definition	Setting
P50	Baudrate	2400
P51	Line Feed	1

7. Trimos Vectra Touch

Connection possibility via original cable of the manufacturer or cable from Brecht Elektronik GmbH, only then technical assistance for connection of the measuring instrument will be provided.

Default: 4800 baud, 2 stop bits, 7 bits per character, even parity.

The height measuring device must be configured that the output of the value is without numbering and without measuring unit via the RS232C interface after the measurement. This value is transferred to the PC without pressing the foot switch or pressing the Load key.

8. Connection of Fischer FERITSCOPE MP30 with RS232C-interface

Setting MP30: 9600 baud, 8 bit, 1 stop bit, no parity.

The meter automatically sends the measured value after the measurement, it is then transferred to the PC without foot switch operation. The data is output with 4 places after the decimal point.

9. Zwick

Setting Zwick:

9600 Baud, 8 Bit, no parity, 1 Stop

Zwick's data is output via the RS232C interface after measurement. When channel 6 is enabled, the measured value transmission to the PC is carried out without pressing the foot switch or the LOAD key. The data string transmitted by Zwick can contain several values, which must be replaced by "; "(Semicolon). The data string is terminated with CR & LF. A pause of 1 second is programmed between the value outputs to the PC.

Example:
Data string with multiple values: 22.58;6.334;6.256;11.166;11.168 CR LF

B. Connection Brabender humidity measuring device with RS232C-interface

Setting Brabender:
The meter sends a measured value in ¼ sec.

9600 baud, 8 bits, no parity, 1 stop

Data is transferred by pressing the foot switch or the Load button on the multiplexer.

C. Mahr Height measuring device Digimar CX1/ Hoffmann HC 1/HD 1 / Zwick

The meter automatically sends the measured value via the RS232C interface after scanning. Settings on the height measuring device: PC RS232 = 5, 9600 baud, 8 bit, no parity, computer.
Connection possibility via original cable from Brecht Elektronik GmbH, only then technical assistance for connection of the measuring instrument will be provided.

D. NORBAR (TST 10 Part No. 43213)

Connection possibility via original cable from Brecht Elektronik GmbH, only then technical assistance for connection of the measuring instrument will be provided.

Default setting: 1200 baud, 2 stop bits, 7 bits per character, no parity. In order to transfer data from the measuring device, the PRESSURE button must be pressed when the printout is activated.

The meter must be set to:

Parity = OFF
Baud rate = 1200
Data bits = 8
Stop bits = 2
First character = + / -
Output units = NO
Output date & time = NO
Output line feed = YES
Handshake = X-ON / OFF
Line delay = 0.5 sec

E. Connection ATEQ with RS232C-interface

Setting Pretec:

9600 Baud, 7 Bit, even Parity, 1 Stopbit.

Data transmission is initiated on the Pretec device. Only channel 6 may be enabled. The meter is connected to the multiplexer using the original ATEQ data cable >> 9pol PC.

F. Connection Pretec 5000 with RS232C-Interface

Setting Pretec: 4800 Baud, 8 Bit, no Parity, 2 Stopbit.

Data transmission is initiated on the Pretec device. Only channel 6 may be enabled. The meter is connected to the multiplexer using the original ATEQ data cable >> 9pol PC.

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