

Operating Manual – TM40



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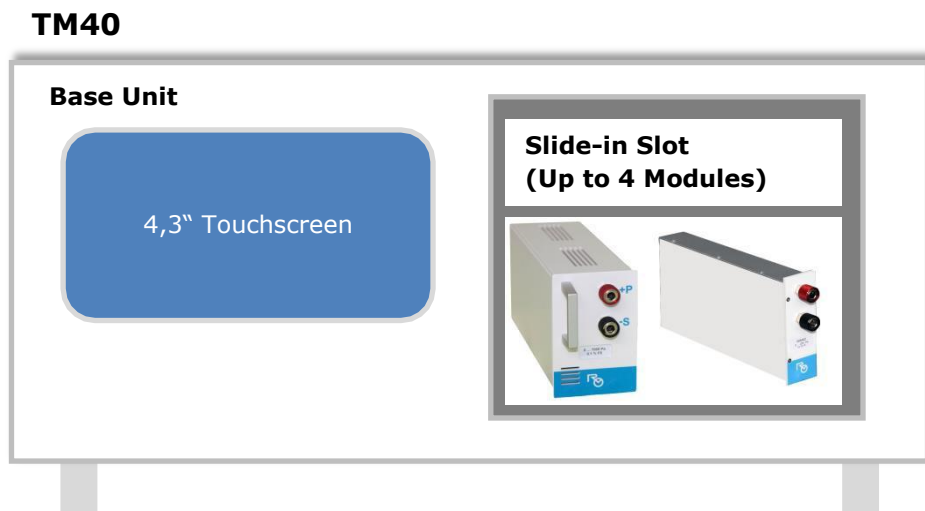
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Introduction

Thank you for choosing a SWISS MADE high-precision pressure measurement instrument, made by HUBER Instrumente AG. In connection with a module, the TM40 is suitable for various adjustment-, verification and calibration- applications with inert or dry gases. The big battery capacity and the independent pressure conditioning will help to make your work more comfortable when using the TM40 for field applications.

The TM40 is a modular built pressure measurement instrument for low pressure ranges and consists of a base device, functioning as an input and display unit, as well as a slide in slot that's capable of picking up four different modules. Up to four measurement modules (MM40) or two generator modules (GM40) can be used. Also a combination of MM40s and GM40s may be used. To be used for measurements, the base unit has to be equipped with minimum one module.

All entries are made on the device, via the 4.3" touchscreen display. The base unit is connected with the modules via a 9Pole-DSub connector that ensures the power supply and the communication between base unit and module. The pneumatic pressure-generation and the pressure-measurement are conducted directly in the modules themselves. The features of the modules are explained in the corresponding manual of the modules.



Figurative representations may differ.

Features

Only in connection with generator module (GM40) available

- Internal pressure generation

In connection with GM40 or MM40

- Differential-, Gauge- and Absolute- pressure measurement.
- Min. / Max. measurement
- Data logger direct to micro SD-card or via USB to PC

Security- and Warning Symbols



Please note the advice symbols in the manual!

- **The TM40 must be operated with the supplied plug-in power supply.**
- **Never use the plug-in power supply in case of a damaged housing or a damaged cable.**
- **Never open or modify the plug-in power supply.**
- **Before plugging in the plug-in power supply, make sure the stated operating voltage on the power supply is in accordance with the line voltage, you're operating with.**

Please read this manual carefully before putting the device into operation. Make sure, the operator of this device has read and understood the manuals and the security information. In case of questions or uncertainties, please contact the supplier or the manufacturer of the device.

CE Declaration of Conformity

- We declare under our sole responsibility, that this product is in conformity with the following standards:
 - IEC 61000-6-1:2005
 - EN 61000-6-3:2006 + A1:2010
 - EN 61326-1:2012

RoHS Declaration of Conformity

We declare herewith, that the TM40 and the corresponding components used for it are in conformity with the rules of the guideline **2011/65/EU** of the European parliament to restrict the usage of certain dangerous substances in electronic devices.

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We reserve the right to make alterations in measures and design of the device.

Disposal



Please ensure a proper disposal of the device, in accordance with statutory regulations for electronic devices or send the device back to the manufacturer with the reference to dispose the unit.

Maintenance / Cleaning and Storage

The GM40 is maintenance-free.

There are no batteries or leaking components built-in.

For cleaning the housing, we recommend using a moist cloth with sparsely applied soap or a suitable plastic cleaner. Do not use solvent-based cleaners.

To ensure the most accurate measurement results, we recommend having the device calibrated periodically at HUBER INSTRUMENTE AG.

Putting Into Operation



Acclimatisation

In the event of a transport from a cold-zone into a warm-zone, condensate may probably have formed into the device and cause malfunctions. Therefore the device should have sufficient time to acclimatise to the new ambient temperature, before putting it into operation

Unboxing

Please carefully keep the original packaging.

In order to ensure a secure transport and to preserve the warranty of the device, we kindly ask to use the original packaging or a suitable packaging with sufficient padding for shipment purposes.

Placement

Protect the device of direct sunlight. Ideally, a location should be chosen, where no significant temperature changes or any strong draft can interfere you measurements.

Connections and Functions

Right of the display

- ON / OFF button

Left of the display

- Socket for SD-card (FAT32)
- USB Interface
- Connector for plug-in power supply 9 VDC / 1A max.



Turn Device / ON-OFF

ON

- Press **ON/OFF** shortly.

OFF

- Press **ON/OFF** for 2 seconds

RESET

- Press **ON/OFF** for 7 seconds



Symbols and Meaning

Display top right

- Local time / date
- Charge condition of battery
(If no battery is inserted, symbol won't be displayed)
- Plug- in power supply
(If no supply is connected, symbol won't be displayed)

Display middle

- Module specific information
(Please refer to the corresponding manual of the module)



Module Detection after Switching ON and Module Specific Information

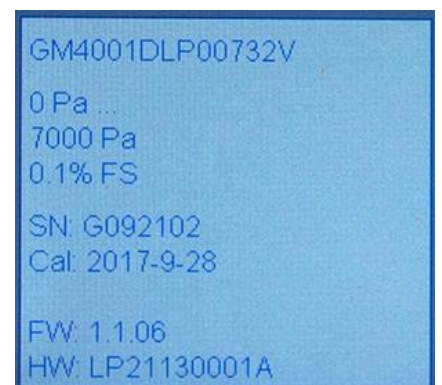
At start-up, the base unit searches for available modules.
Afterwards a module can be selected by typing on the corresponding field.

The modules are detected once at the start-up of the TM40.
The TM40 has to be turned off in case a module is connected or disconnected, in accordance to recognise it.
The slide in slot can be selected randomly.

Depending on the module, the start screen will provide the user

with different information about the module

(Please refer to the corresponding manual of the module)



Settings for Base Unit TM40

Open settings

The menu is only accessible through the module selection screen. Press the **R**- symbol on the upper left corner to make the settings for the module.



The following parameters can be adjusted:

- Time / date
- Language
- Backlight
- Buzzer

Exit settings

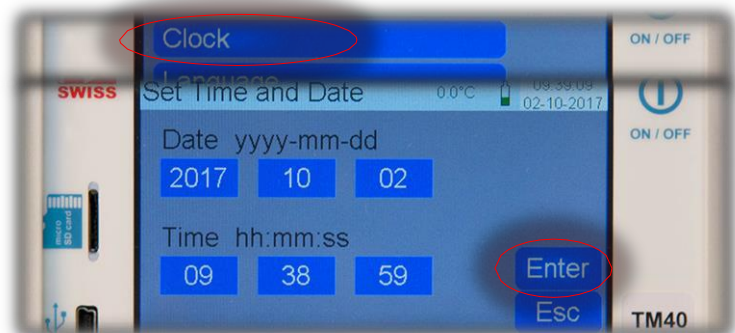
Press OK.



Set time and date

Set time and date and press Enter to confirm.

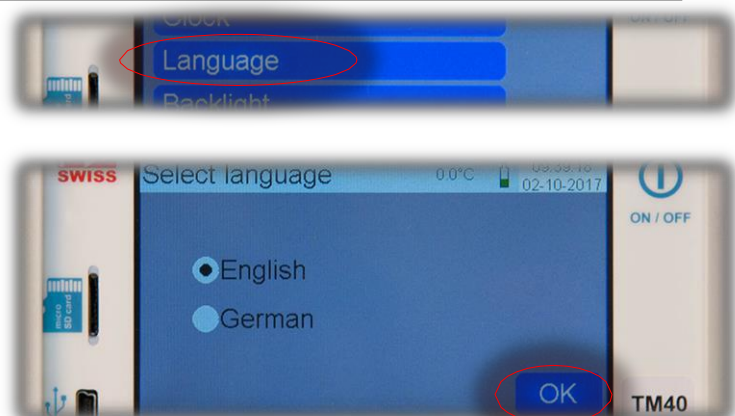
Exit the settings by pressing Esc without saving the settings.



Setup language

Select the language.

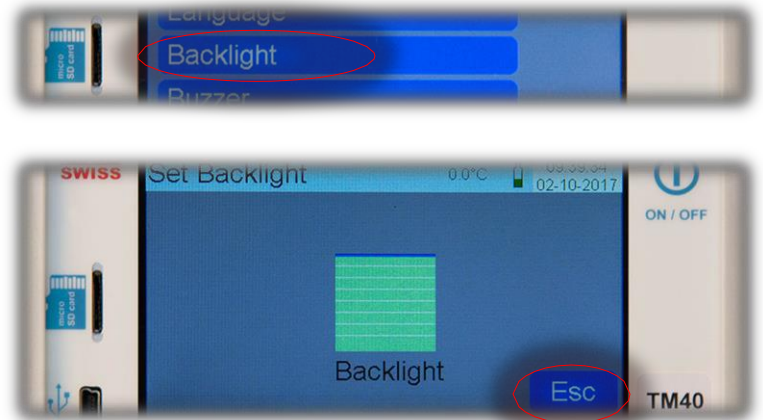
Confirm by pressing OK.



Set backlight

Use the slider to adjust the backlight brightness.

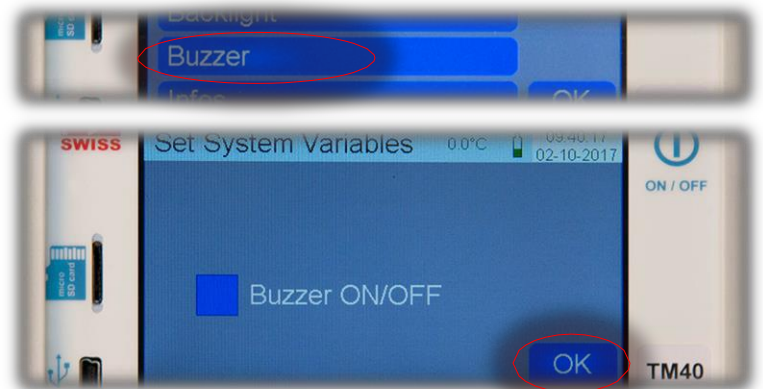
By pressing Esc, the settings will be saved and the menu left.



Set buzzer

The buzzer makes a sound at various situations. (For ex. when exceeding the nominal pressure range of the corresponding module by 10%).

Select whether to turn it on or off by ticking / unticking the box. Confirm by pressing OK.



Information

General information in regard to the base unit TM40 is to find here.

The following information is provided:

- Type
- Firmware- and hardware version
- Input voltage U_{in}
- Battery voltage U_{bat}
- SD-card inserted or not
- Manufacturers address

Exit by pressing Esc.



Communication

The TM40 has a USB 2.0 (Mini-B) interface on its front. This interface serves, inter alia, as a transmitter of logged data. The interface is designed as a VCP. VCP stands for virtual COM port. For applications that support a serial interface, a serial interface is accordingly emulated. The access on application level happens like on a physical present interface. Most operating systems will install the VCP-driver automatically, once the computer is connected.

If the selected module supports a data logger function and output channel of the measured data is set to „USB“, the measured data will be permanently sent from the TM40 to the connected pc. A terminal program is needed. Various terminal programs are suitable (for ex. Docklight, HTerm or HyperTerminal).

Eventually the VCP-driver has to be installed manually. We're pleased to advise you in this case.

Transfer Protocol / Coding

The characters are transferred, as ASCII-characters.

Warning Messages and Errors

Störung / Anzeige	Mögliche Ursache	Abhilfe
Device doesn't start	<ul style="list-style-type: none">• No power supply	<ul style="list-style-type: none">• Make sure the plug-in power supply is plugged correctly
Modul not detected	<ul style="list-style-type: none">• Modul not inserted correctly	<ul style="list-style-type: none">• Insert module correctly• Tighten locking screws• Use different socket
Display doesn't respond	<ul style="list-style-type: none">• Polluted display• Isolating gloves• Display has to be adjusted freshly	<ul style="list-style-type: none">• Clean front• Operate without gloves• Turn off device. At start up hold your finger pressed on the display until the procedure of recalibration appears• Send instrument to manufacturer
No or bad communication	<ul style="list-style-type: none">• USB not installed correctly	<ul style="list-style-type: none">• Re-install driver• Contact the manufacturer
Battery won't be charged	<ul style="list-style-type: none">• No power supply• Input voltage too low• Too much charging cycles	<ul style="list-style-type: none">• Insert power plug correctly• Replace plug-in power supply• Send instrument to manufacturer
Data logger doesn't save any measured values	<ul style="list-style-type: none">• SD-card not inserted correctly• SD-card formatted falsely	<ul style="list-style-type: none">• Insert card correctly• Formatt to FAT32

Technical Data

Display:	4,3" resistive Touchscreen 480x270
Sockets:	max. 4
Internal battery:	Li-Ion 7.4V/34Wh
Battery runtime:	up to 8h (depending on operation mode)
Operation temperature:	15...35 °C (optional 0 ... 50 °C)
Storage temperature:	-20...70 °C
Air humidity:	< 95%, not condensing
Protection class:	IP20
Supply voltage:	9V DC, max. 1A (external plug-in power supply included) (Voltage range 100 - 240 Vac, 50 - 60 Hz)
Power consumption:	9 W (VA)
Interface:	USB 2.0 (VCP)
Dimensions:	390 x 290 x 155 mm (LxWxH)
Net weight:	4500 g

For further technical data, please refer to the data sheet.

Accessories

Hard Case – TM 40

The TM40 hard case is the ideal companion for the mobile use of the TM40.
This case ensures the TM40 and its accessories are well protected when using the TM40 in the field.

