

M40119.V01 torque measuring unit

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1. Functions

The torque measuring unit stores the start-torque and the torque value on a manually operated test bench.

Features of the measuring software:

- Representation of measuring results as bar graph, number or single value chart

- Classification: start-torque UL, torque UL, LL

- Internal storage of measuring values

 - (textfile, 1 measurement per line: start-torque;torque)

- Export of stored measuring values to USB-mass storage media

- Selection of measuring range of the torque sensor

- Selection of display range of the bar graph

- Selection of torque measuring mode (same or opposite direction of start-torque measuring)

2. Components

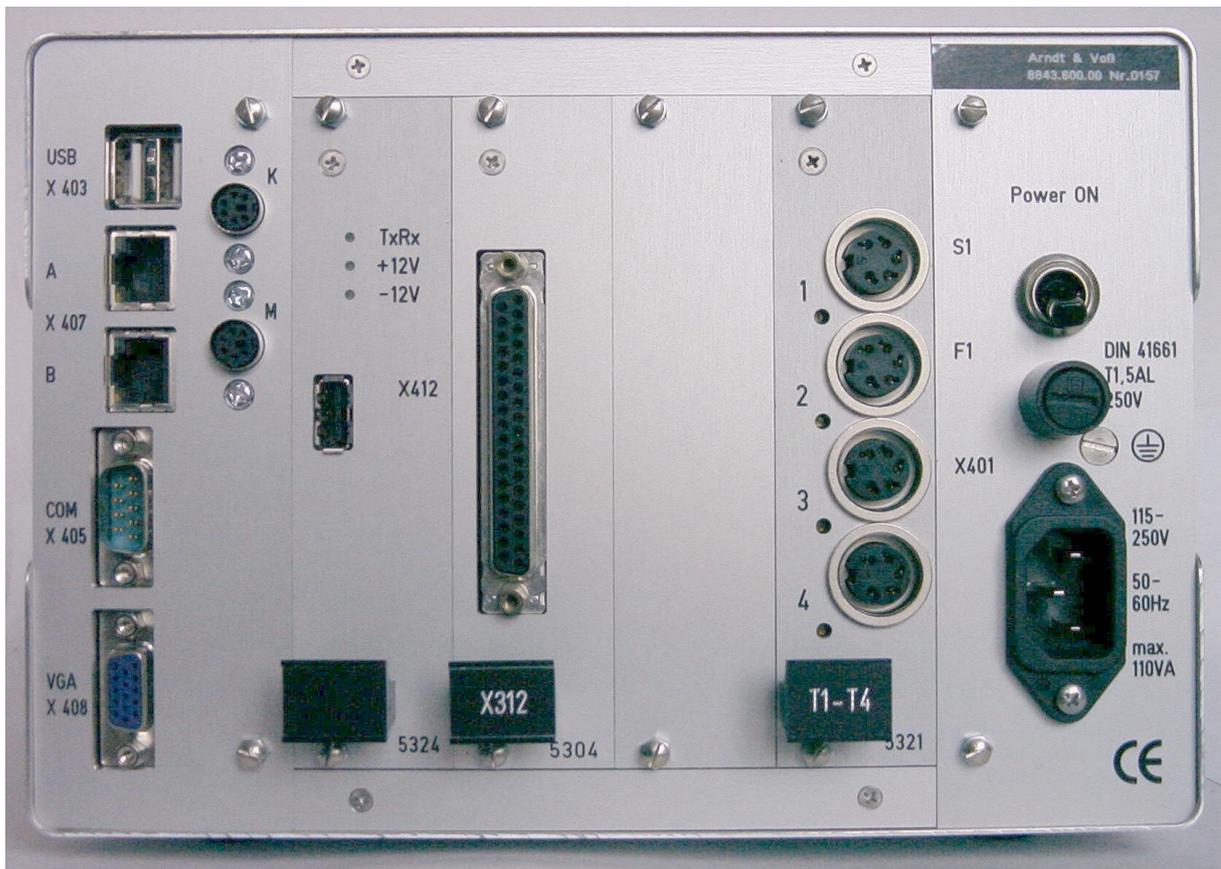
- MiniMeasuring computer 8843: Power supply 115/230VAC 50/60Hz
table case 230mmx165mmx270mm, weight 4kg, IP20
USB-Interface for storage media
8" VGA Colour screen with touch panel
16 I/O Optocoupler, 1x torque sensor input

Front view:



3. Connection and control elements

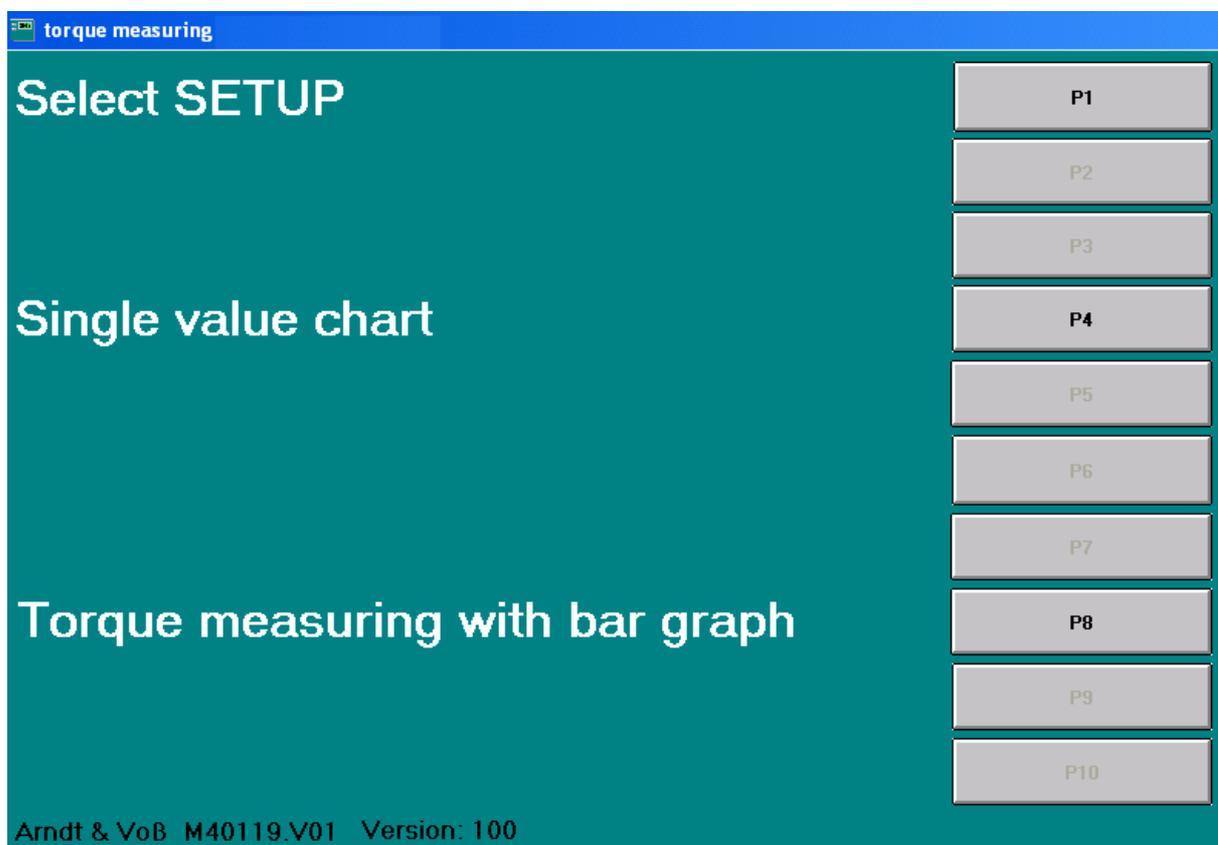
Backside:



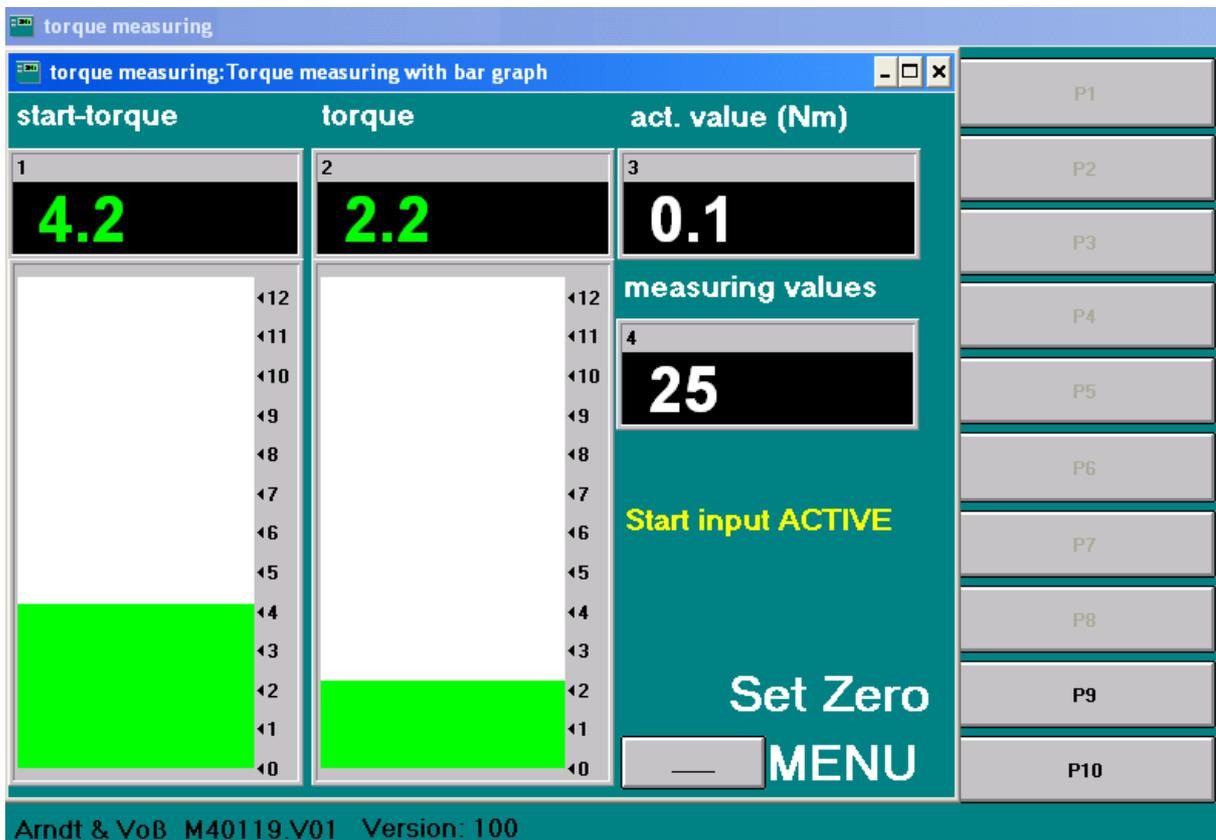
X401	Input power supply 115-230VAC/50Hz
X403 2x 4p. female	USB interface
X405 9pol. male Sub D	COM 1
X407 2x 8p. female	ETHERNET interface
X408 15p. female Sub D	Output VGA monitor
K 6pol. female MINI DIN	PS2 Keyboard
M 6pol. female MINI DIN	PS2 Mouse
X412 4p. male	Testpins
T1-4/1 5pol. female 680	Input torque sensor
X312 37pol. female Sub D	Control inputs/outputs

4. Operating Mode

Switch the power ON. After loading the program the unit will be in Operating Mode showing the screen Torque measuring with bar graph and will be ready for operation. When touching the fields F1 to F10 the selected screen will be displayed. The following selection of the next function will be done by touching the fields UP or DOWN. The measuring, displaying, classification and storing of the torque is possible ONLY when the screen Torque measuring with bar graph is selected.



Torque measuring with bar graph



start-torque (bar graph and number)

During measuring of start-torque both displays are showing the actual maximum value of the torque input. If out of tolerance limit the display colour will change from GREEN to RED. After the start-torque measuring has finished, both displays will be stored until the next measurement will be done.

torque (bar graph and number)

During measuring of torque both displays are showing the actual maximum value of the torque input value. If out of tolerance limits the display colour will change from GREEN to RED. After the torque measuring has finished, both displays will be stored until the next measurement will be done.

act. value (Nm) (number)

actual value from torque sensor input.

measuring values shows count of measurements. This value will be set to Zero after deleting the stored measured values in setup mode.

Start input ACTIVE After starting the next measuring by activating the external start input this message will be shown. **During measuring the background of the displays 1 + 2 are GREY.**

ATTENTION: A new measuring will be done only after switching off the start input when the previous measurement has been finished.

Set Zero

The actual torque value will be set to Zero. This correction will be stored after leaving this screen until a new zero setting will be done.

Description of the start-torque and torque measurement

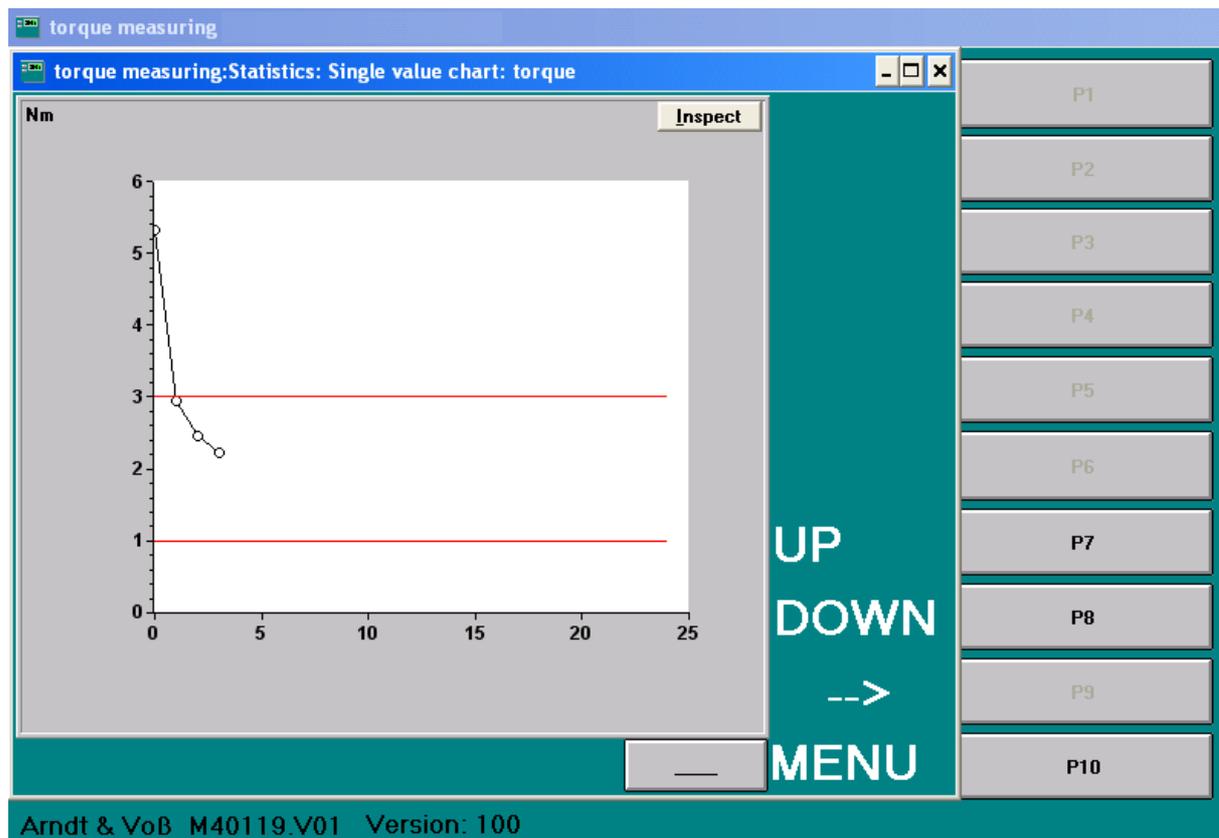
After the external start input is active the unit is waiting for the first movement, no matter if it is pushing or pulling. The unit recognizes the first movement as start-torque and is looking for the maximal value. After changing the direction of the movement, for instance from pulling to pushing the measuring of the start-torque stops. During the following Pull-Push (or Push-Pull) movements the unit is looking for the maximal value of the torque. Every complete movement restarts the torque measuring and deletes the previous. Only after the movement has stopped in the start position the measurement will be finished and the results will be stored.

The selection of the torque measuring mode (system settings in SETUP mode) will let the torque measuring be done in the same or the opposite moving direction as the start-torque measuring.

Single value chart

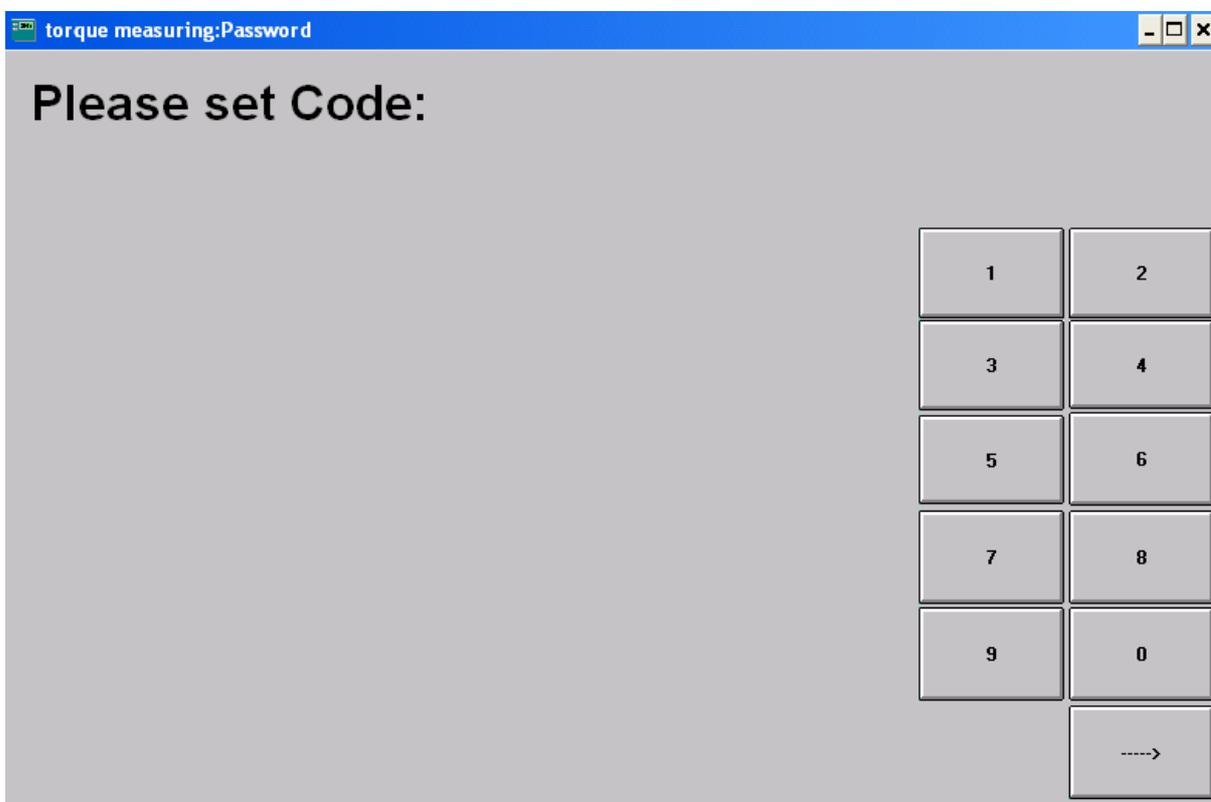
This chart shows the latest 25 measurings of start-torque and torque for easy process controlling.

When touching the UP/DOWN fields start-torque or torque chart is selected.



5. Selection of Setup mode

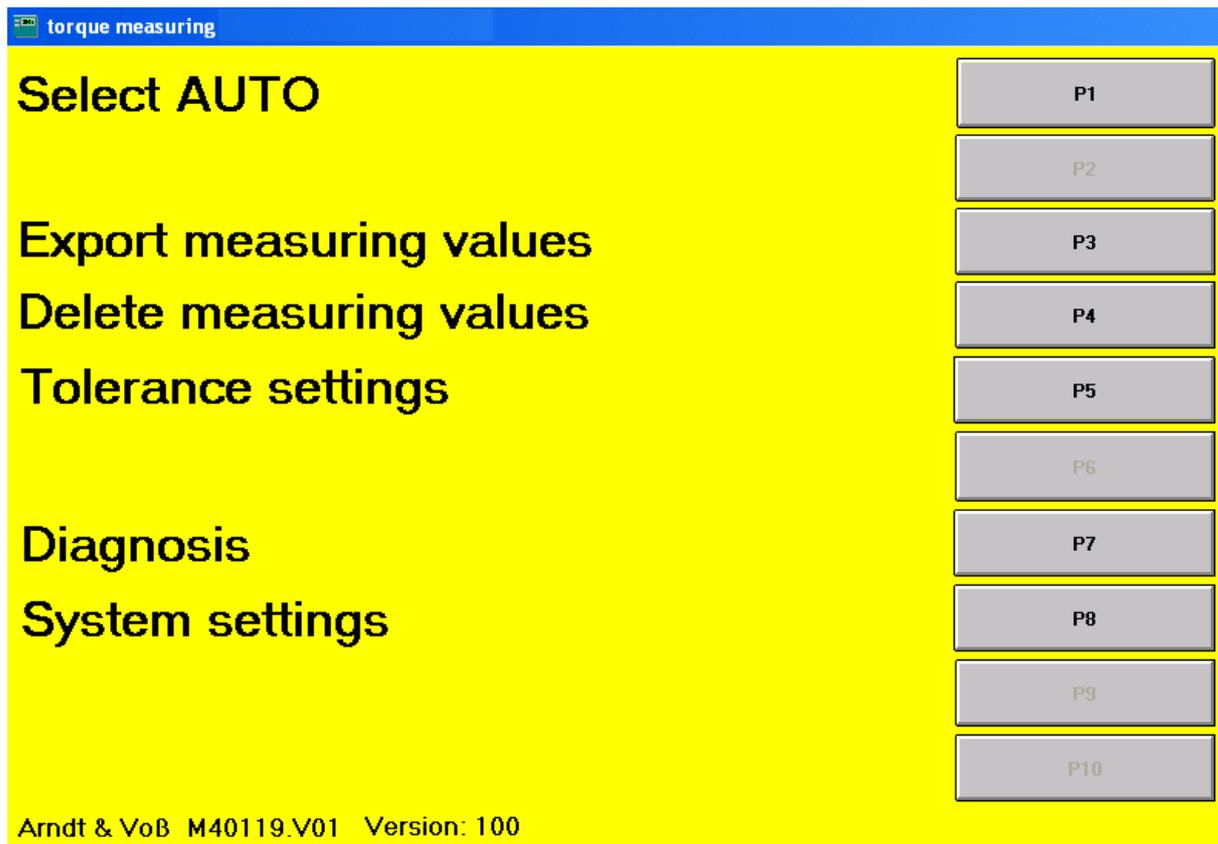
The password screen is shown. Only after entering the right code the SETUP mode is active.



6. Setup

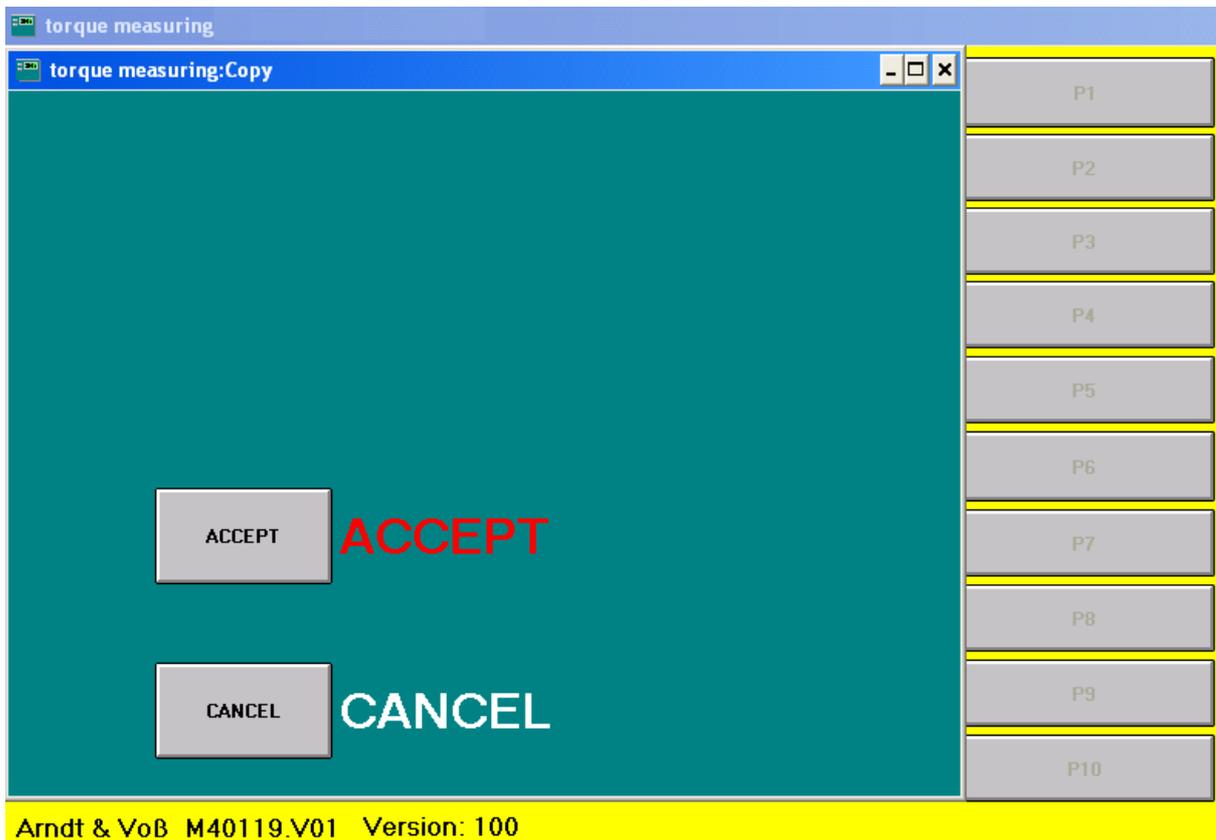
This mode is shown with a yellow background colour.

When touching the fields F1 to F10 the selected screen will be displayed. The following selection of the next function will be done by touching the fields UP or DOWN.



Export measuring values

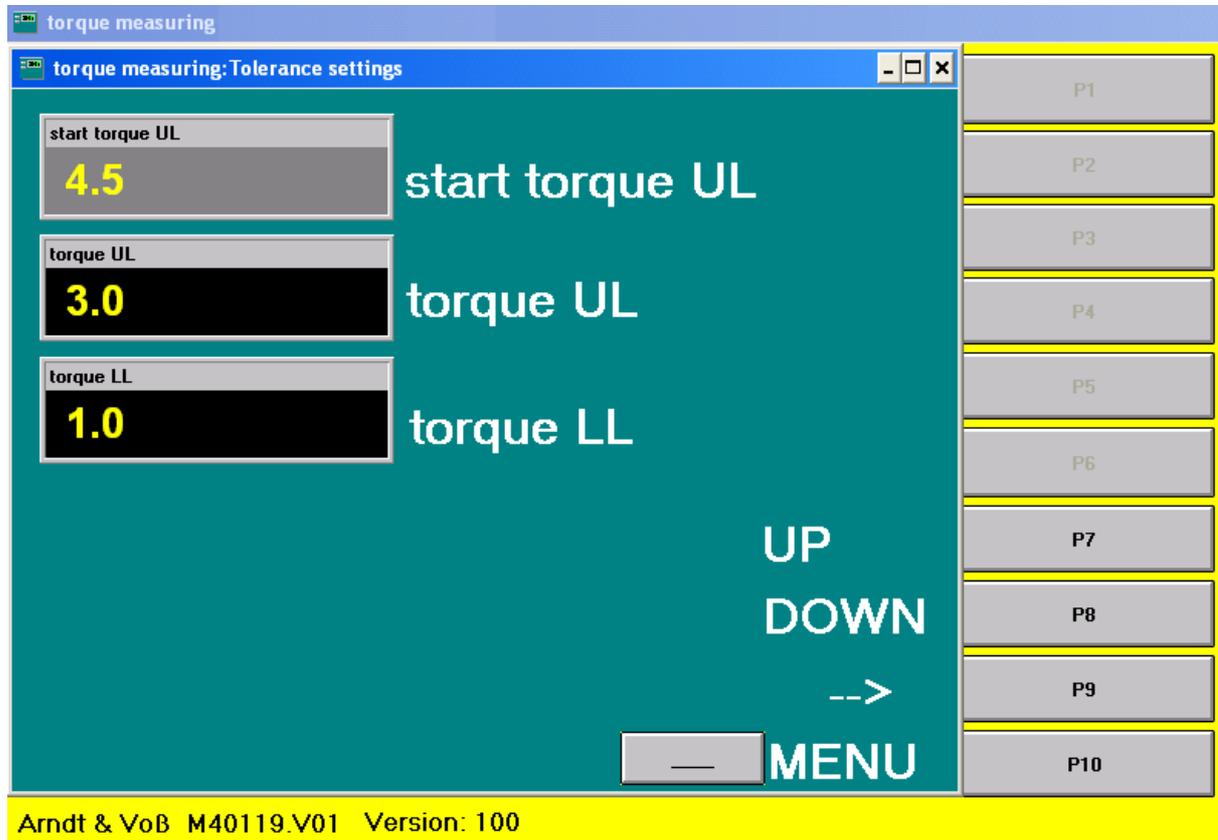
After accepting the security step the unit checks if a storage media is available at the USB port. If not, an error message will be displayed. If everything is allright the internal stored measuring values will be transferred to the USB storage media. If there are already values on the storage media they will be overwritten.



Delete measuring values

After accepting the security step the stored measuring values will be deleted. If there is a storage media available at the USB port, the values on it will NOT be deleted.

Tolerance settings



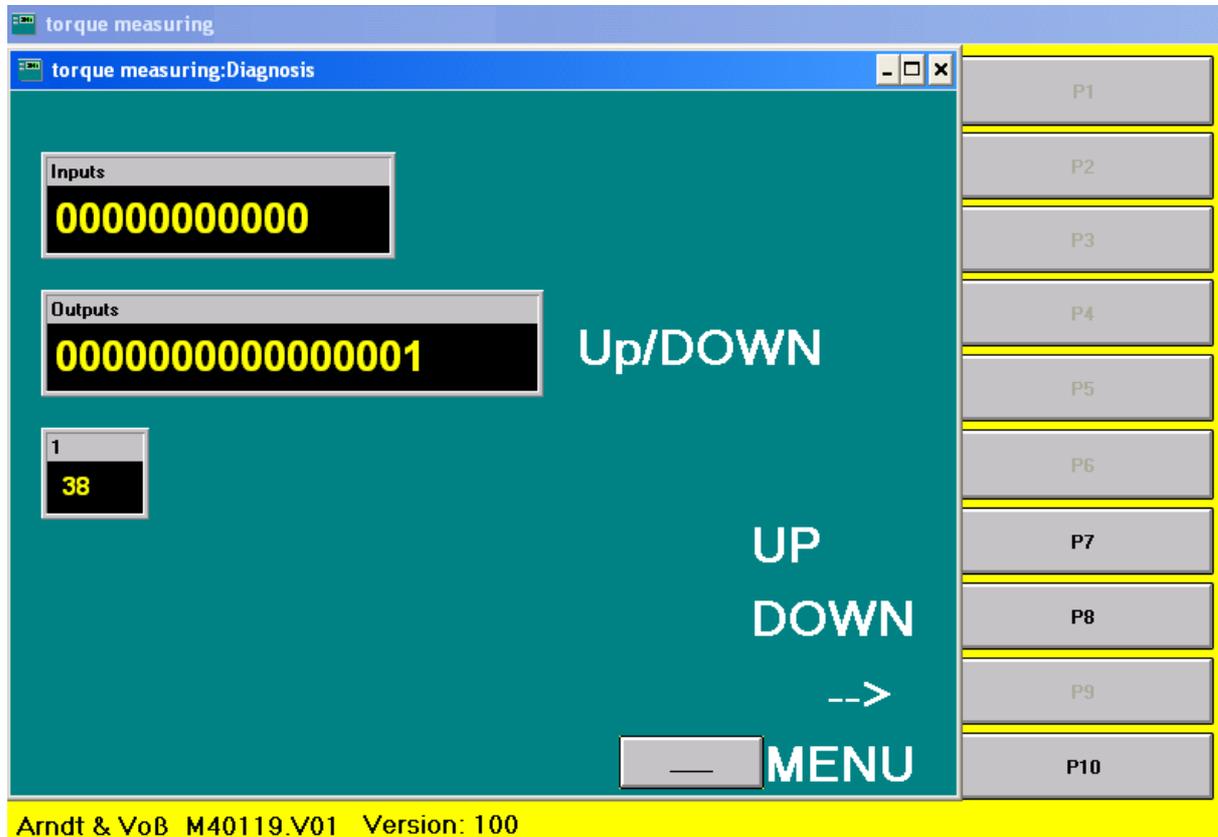
start-torque UL Upper limit for start-torque

torque UL Upper limit for torque

torque LL Lower limit for torque

When touching the fields UP/DOWN the value of the selected item (background GREY) is incremented/decremented. When touching the field --> the next item is activated. The maximal values are limited through the torque sensors measuring range. These settings will be stored after leaving this screen.

Diagnosis

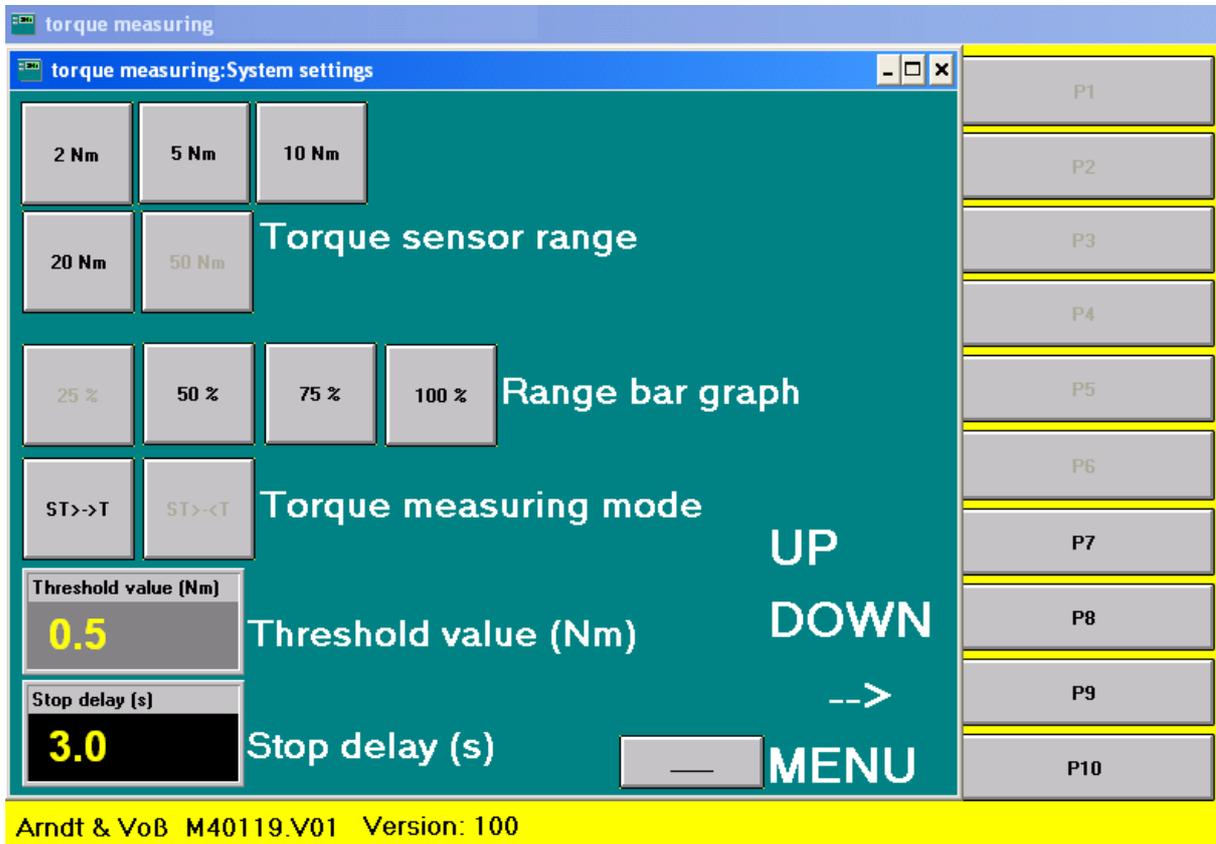


The actual values of the control inputs are shown (1=ON, 0=OFF)
Left: Bit 10, Right: Bit 0

The control output maybe switched bitwise when touching the fields UP/DOWN.
Left: Bit 15, Right: Bit 0

The unscaled input value of the torque sensor is displayed continuously.

System settings



Torque sensor range

Selection of the torque sensor connected to the measuring input. A collection of the normal used ranges is available. The activated measuring range is shown light grey.

Range bar graph

Selection of the display area for the bar graph (start-torque and torque). The value is in percent, based on the torque sensor range. The activated range is shown light grey.
For example, torque sensor range = 20Nm; range bar graph = 50%: Maximum value of bar graph is 10Nm.

Torque measuring mode

ST->T torque measuring will be done in the same moving direction as the start-torque measuring.
ST-<T torque measuring will be done in the opposite moving direction as the start-torque measuring.
The activated mode is shown light grey.

Threshold value (Nm)

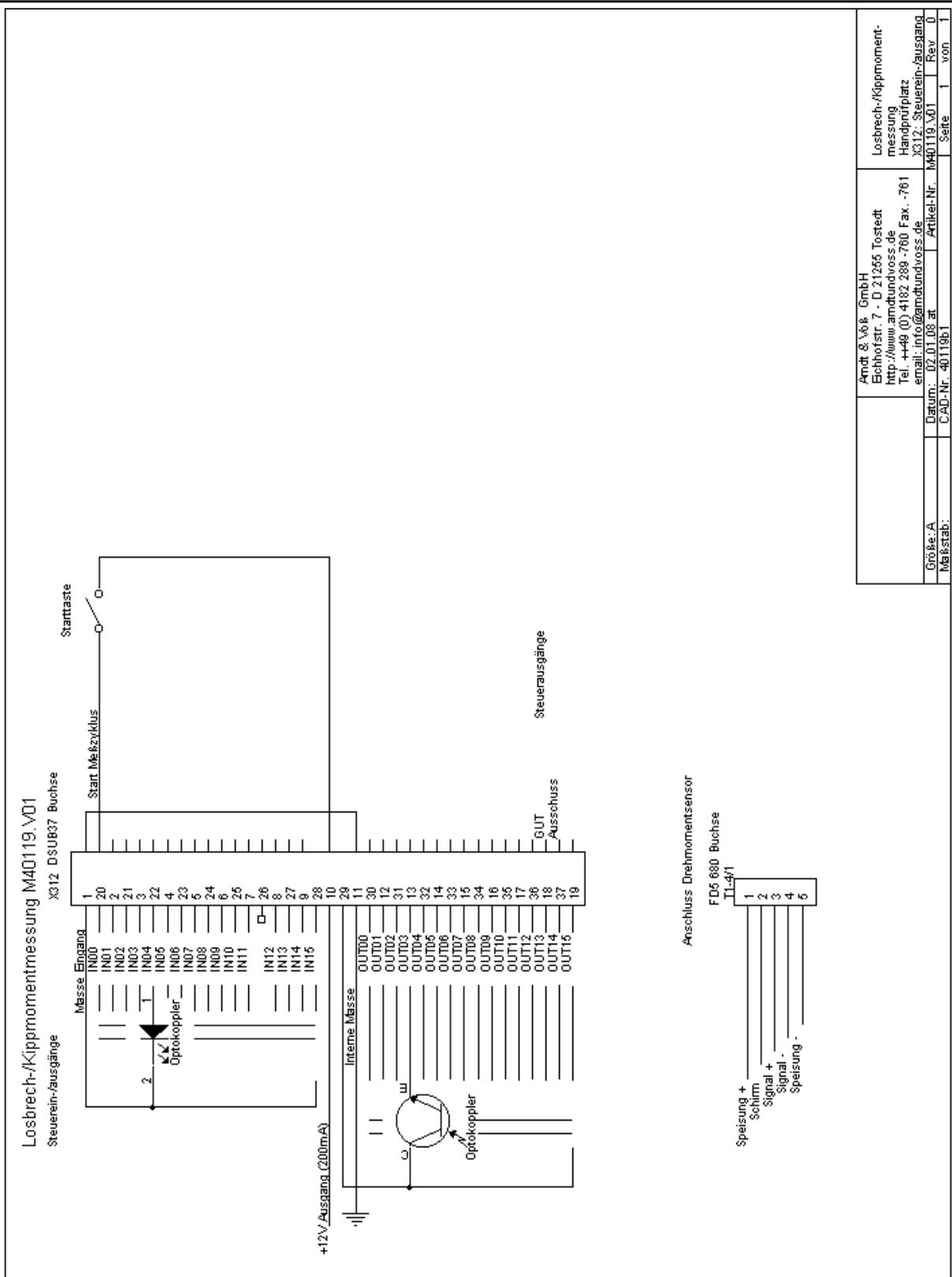
If the actual torque value increases this threshold the collecting of the start-torque or torque will be done until the actual value decreases this threshold..

Stop delay (s)

If there is no movement after start-torque- (and torque-)measurement is running within this time, the measurement will be finished and the results will be stored.

When touching the fields UP/DOWN the value of the selected item (background GREY) is incremented/decremented. When touching the field --> the next item is activated. These settings will be stored after leaving this screen.

7. Connection schematics



Security comments according to VDE 0411

General technical

time for warming up	20 minutes
temperature	0...+40 Grd C
atmospheric humidity	on to 75% rel.
frequency	50/60 Hz
power supply voltage	230V +/-10%
security	according to VDE 0411, protection class 1

This unit is built and checked under DIN 57411 part 1/VDE 0411 part 1 and left the factory in a safe and perfect condition. To preserve this condition and to guarantee a safe working the user has to follow the comments and warnings which are given in this instructions.

Before turning on the power you have to make sure, that the voltage of operation and the mains voltage correspond.

The mains plug may only be inserted into a socket with ground contact. The safety effect may not be abolished by an extension lead without ground connection.

The opening of covers or removing of components, except if it is possible to do by hand, might uncover parts or connections under dangerous voltage.

Racks may only be used inside a cover.

If an adjustment, a maintenance or a repair at the opened unit under voltage is unavoidable, it may be done only by a qualified employee, who is well acquainted with the dangers involved.

ATTENTION:

After the end of those works, the unit has to be checked according to VDE 0411, part 1.

You have to make sure, that only fuses of the given type and values are taken for replacement. The use of mended fuses or short-circuiting them is inadmissible.

If it is presumed, that a safe work is not possible, you have to take this unit out of work. A safe work may not be possible, if

- there are visible damages at the unit.
- the unit doesn't work.
- after longer storage under unfavourable circumstances.
- after heavy stress of transport.