



Operating manual

TMS III

Tecalemit Management System

Item-No.: 030 471 200, 030 471 291

Translation of the
original operating manual

Important!

The operating manual is always to be read before commissioning the equipment. No warranty claim will be granted for faults and damage to the equipment arising from insufficient knowledge of the operating manual.

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1. Safety instructions

The device is a state of the art piece of equipment and has been constructed according to recognised safety specifications. It is nevertheless possible that use of the device will present hazards to the operator or to third parties, or may damage the device or other property. It is therefore essential to act in accordance with these safety instructions, and in particular with those sections identified as warnings.

Warning notices and symbols

In the operating manual, the following signs are used for highlighting important information.



Special information for economical use of the equipment.



Special information or "dos and don'ts" for damage prevention.



Information or "dos and don'ts" for the prevention of damage to persons or equipment.

Appropriate use



The device may only be used if it is in perfect condition, and then only for its intended purpose, in compliance with all safety regulations, with an awareness of the potential risks, and according to the operating manual. Any faults that may impair the safety must be rectified immediately.



The device and its components are only to be used for handling the liquids listed and the purpose described. Using the machine for any other purpose would constitute inappropriate use. The manufacturer is not responsible for any loss arising as a result of this, the risk for this is borne only by the operating company.

Organisational measures



This operating manual should always be kept readily available at the site of operation! Each person concerned with the assembly, commissioning, maintenance and operation of the equipment must have read and understood the entire operating manual. It is essential that the type plate and the warning notices attached to the device are observed, and are maintained in a fully readable condition.

Qualified personnel



The operating, maintenance and assembly personnel must be appropriately qualified for their work. The areas of responsibility, competences and supervision of the personnel must be precisely regulated by the operating company. If the personnel do not have the required knowledge, they must be trained and instructed. The operating company must also ensure that the contents of the operating manual are properly understood by the personnel.

Waters protection



The device has been designed to handle water hazardous substances. The regulations on the operating place (e.g. Water Resources Act WHG, = ordinance on installations for handling of substances hazardous to water VAWS) must be adhered to.

Hydraulics



Only persons with special knowledge and experience with hydraulic systems may carry out work on hydraulic parts and equipment. All lines, hoses and screw joints should regularly be checked for leaks and visible external damage. Any damage must be rectified immediately. Any oil spurting out can cause injuries and fire.

The relevant safety regulations for the product must be followed when handling oils, greases or other chemical substances!

Maintenance and Service



According to the regulations of the water resources law only authorized services may work on devices for flammable and/or water endangering substances. During such works, appropriate tools are to be used (avoid sparking). Before any kind of work on the device, all fuel lines are to be completely emptied and aerated.

Do not make any changes. Modifications or additions to the device which may affect the safety cannot be carried out without consent of the manufacturer. Exclusively genuine spare parts made by the manufacturer may be used.

Electric power



Work on the electrical equipment may only be carried out by a qualified electrician or by trained persons under the guidance and supervision of a qualified electrician according to electro-technical guidelines. Machine or system components, on which inspection, maintenance or repair work is to be carried out must be de-energised.

2. Technical description

2.1. Appropriate use

Electric counter with measurement value memory
The TMS III serves the purpose of measurement value detection, measurement value display, measurement value processing and measurement value storage as well as control and monitoring of a measurement system for the delivery of fluids.

2.2. Product description

The TMS III receives volume proportional impulses from a measurement value detector, calculate the delivered volumes using the saved impulse valence and displays them. The measurement data is stored in a non-volatile data memory. The measurement data can be transferred for further processing using interfaces. The basic version of a unit can control up to ten products on up to ten dispensing stations. The full measurement system can be extended by adding more counters. The two versions differ in the following features:
Item. 030 471 200 with Matrix-Display 240x64 mm
Item 030 471 291 with TFT-Display 640x480 mm

2.3. Technical data

Mains connection:	Wide range power pack Nominal voltage 100-240 V 50/60 Hz Power consumption approx. 15 W (without external components)
Dimensions (W x H x D):	Approx. 200 x 362 x 122 mm
Temperature range:	Operation -10°C to +55 °C Storage -10°C to +55°C
Housing material:	Aluminium die-casting
Housing protection type:	IP 54
Weight:	Approx. 4.5 kg
Display:	Item 030 471 200 mit Matrix-Display 240 x 64 Item 030 471 291 mit TFT-Display 640 x 480
Keypad:	19 keys, of which 3 are softkeys
Process connection:	Control of 10 delivery points
Data interfaces:	USB - connection for effective system configuration using PC RS 485 + 2 x RS232 for connection to Dealer Management-System / other peripherals LAN-Interface optional
Data memory:	Data-Flash for almost unlimited data reception of system and delivery data
Other:	Integrated real-time clock with buffer battery (service life up to 10 years), updated system time including in case of power failure Switch for commissioning Connection option for transponder reader unit or barcode scanner

2.4. Rated operating conditions

These rated operating conditions apply to the complete measuring equipment.



Individual components of the measuring equipment may be more sensitive!

Measured variable:	Volume (litres / ℓ)
Measuring range:	2.0 litres/min to 20 litres/min 1.0 litres/min to 10 litres/min 0.5 litres/min to 5 litres/min (depending on the pumping capacity of the pump)
Smallest measuring quantity:	0,1 litre
Smallest digital step:	0.01 litres (operating mode)
Measured medium:	Liquids in the viscosity range ≥ 20 mPa·s at 20 °C
Temperature of measured medium:	- 10 °C to + 50 °C
Maximum operating pressure:	10 bar
Minimum operating pressure:	1 bar
Number of measuring points (dispensing points):	1 to 10 per TMS III
Environmental conditions/ influencing variables	
Climatic:	Upper temperature limit: +55 °C Lower temperature limit: -25 °C* (condensing)
Mechanical:	M 2
Electromagnetic:	E 2

*The temperature limit applies to the measuring equipment; the TMS III can withstand only -10 °C!

2.5. Accessories

Product	Item no.
Transponder reader unit for TMS III / TKS IV incl. 5 Transponder-Tags	030 479 900
Transponder-Tag	028 780 101
Barcode scanner for TMS III / TKS IV For producing barcodes, possibly with additional accessories (barcode printer, PC software) necessary	030 465 041
Matrix printer with serial interface	030 465 021
Mini-Gateway	030 465 241
Software PC-Gateway / asanetwork	030 560 921
Software PC-Gateway / File	030 560 901
Software PC-Gateway / XML	030 560 961
Software OilControl	030 560 911

3. Assembly and commissioning

3.1. Assembly

The TMS III is foreseen for assembly in a vertical or horizontal area. The cable is inserted from underneath the housing through the variable use cable inserts. The electric connection is made according to the circuit diagram in chapter 3.2 page 11.

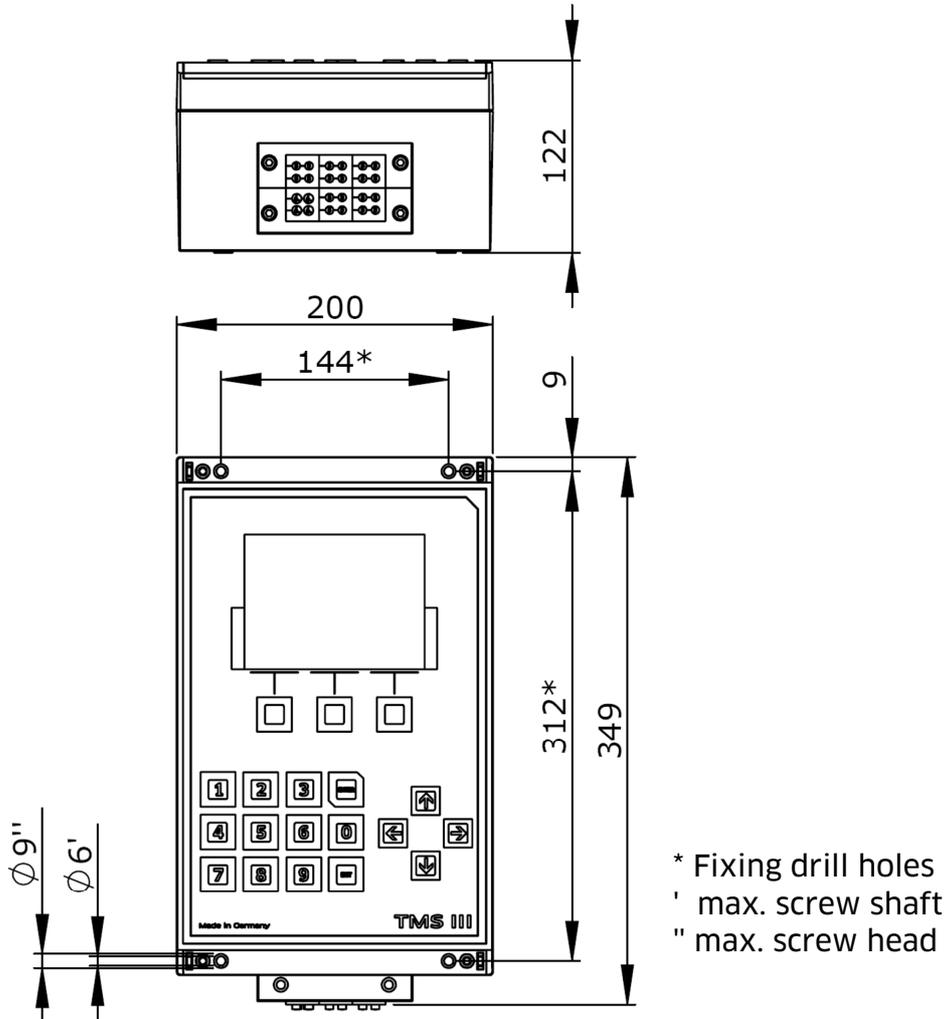
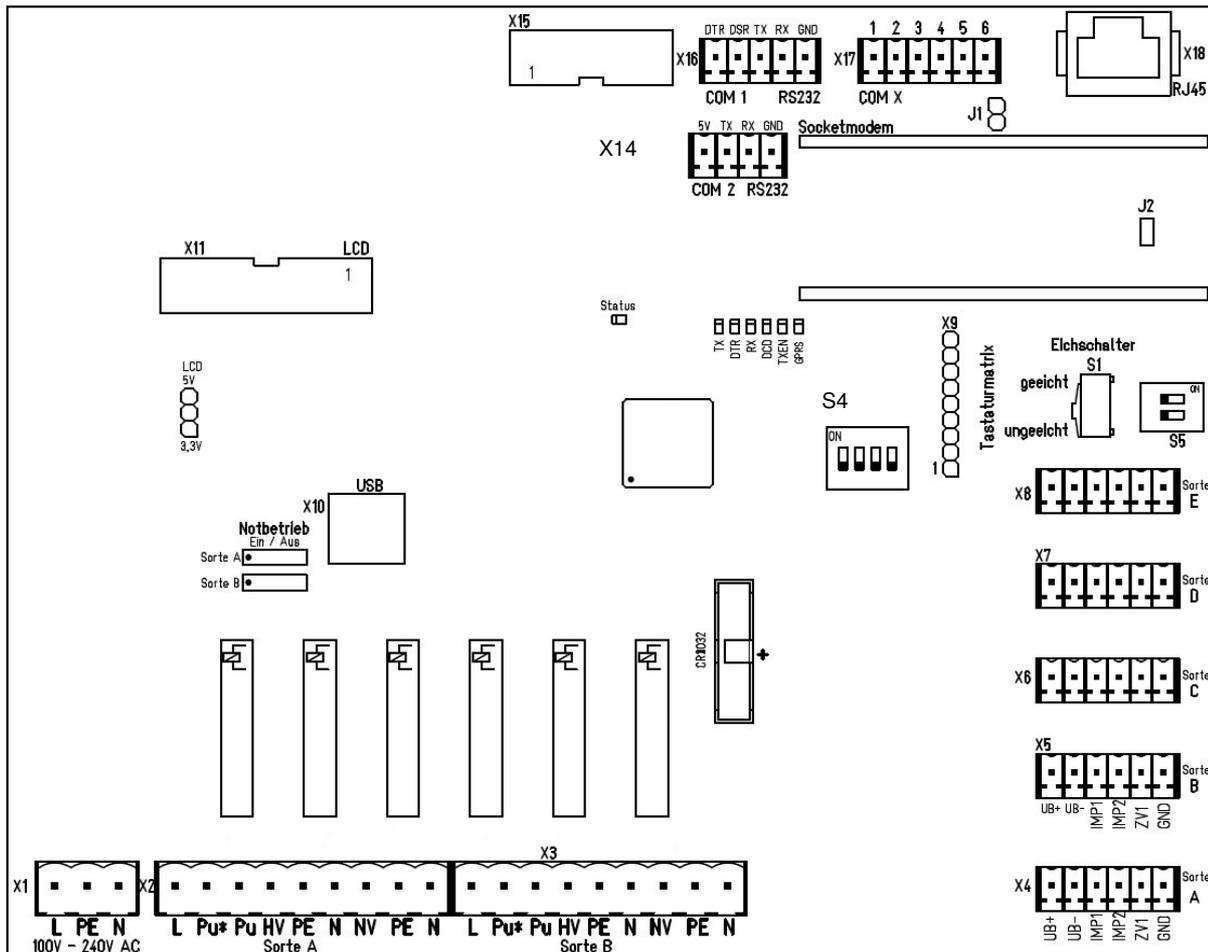


Abb. 1 TMS II dimension sheet

3.2. Circuit diagram

3.2.1. Computer 2010 main board



Terminal strip	Terminal	Signal
X1	L	Phase mains voltage
	PE	Mains voltage protective earth
	N	Mains voltage neutral conductor
X2 (magnetic valve)	L	1A fused mains voltage
	Pu*	
	Pu	
	HV	Phase valve, delivery point 1
	PE	Protective earth
	N	Neutral conductor
	NV	Phase valve, delivery point 2
	PE	Protective earth
	N	Neutral conductor

Continued on next page.

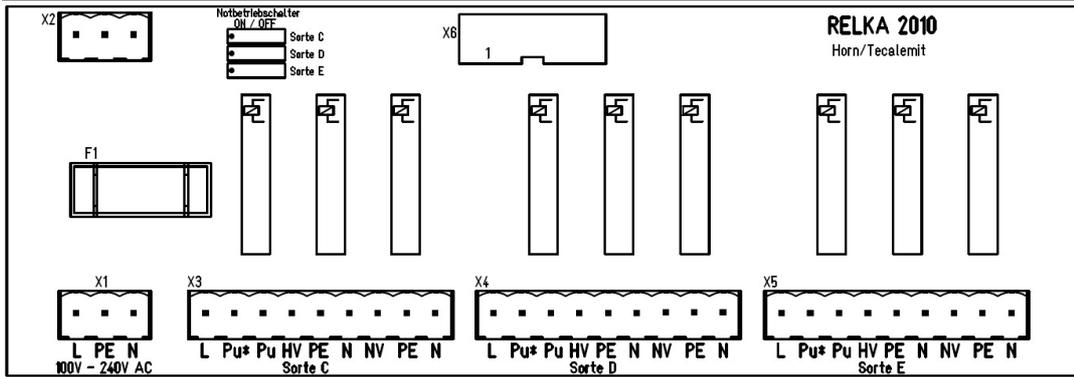
Terminal strip	Terminal	Signal
X3 (magnetic valve)	L	1A fused mains voltage
	Pu*	
	Pu	
	HV	Phase valve, delivery point 3
	PE	Protective earth
	N	Neutral conductor
	NV	Phase valve, delivery point 4
	PE	Protective earth
	N	Neutral conductor
X4 (Pulse generator)	UB+	
	UB-	
	IMP1	Pulse input, delivery point 1
	IMP2	Pulse input, delivery point 6
	ZV	
	GND	Mass
X5 (Pulse generator)	UB+	
	UB-	
	IMP1	Pulse input, delivery point 2
	IMP2	Pulse input, delivery point 7
	ZV	
	GND	Mass
X6 (Pulse generator)	UB+	
	UB-	
	IMP1	Pulse input, delivery point 3
	IMP2	Pulse input, delivery point 8
	ZV	
	GND	Mass
X7 (Pulse generator)	UB+	
	UB-	
	IMP1	Pulse input, delivery point 4
	IMP2	Pulse input, delivery point 9
	ZV	
	GND	Mass
X8 (Pulse generator)	UB+	
	UB-	
	IMP1	Pulse input, delivery point 5
	IMP2	Pulse input, delivery point 10
	ZV	
	GND	Mass
X9	Keyboard connection	
X10	USB connection	
X11	Display connection	
X12	Not used	
X13	Not used	
X14 COM2 RS232	5V	Operating voltage +5 V
	TX	RS232 Transmission data
	RX	RS232 Reception data
	GND	Mass

Terminal strip	Terminal	Signal
X16 COM1 RS232	DTR	RS232 DTR
	DSR	RS232 DSR
	TX	RS232 transmission data
	RX	RS232 reception data
	GND	Mass
X17 COM X (socket modem)	1	RS485 A
	2	RS485 B
	3	Mass
	4	RS485 A
	5	RS485 B
	6	Mass
X18 (socket modem)	RJ45 network connection	
X19 (I ² C)	Not in use	
X20	Not in use	

Connection information

The switch contact (Pu* and Pu) for the pump contractors is potential-free. The contact to mains voltage is made with a bridge from L to Pu*.

3.2.2. Relay card RELKA 2010



Terminal strip	Terminal	Signal
X1, X2	L	Phase mains voltage
	PE	Mains voltage protective earth
	N	Mains voltage neutral conductor
X3 (magnetic valve)	L	1A fused mains voltage
	Pu*	
	Pu	
	HV	Phase valve, delivery point 5
	PE	Protective earth
	N	Neutral conductor
	NV	Phase valve, delivery point 6
	PE	Protective earth
X4 (magnetic valve)	N	Neutral conductor
	L	Mains voltage protected by 1A fuse
	Pu*	
	Pu	
	HV	Phase valve, delivery point 7
	PE	Protective earth
	N	Neutral conductor
	NV	Phase valve, delivery point 8
X5 (magnetic valve)	PE	Protective earth
	L	Mains voltage protected by 1A fuse
	Pu*	
	Pu	
	HV	Phase valve, delivery point 9
	PE	Protective earth
	N	Neutral conductor
	NV	Phase valve, delivery point 10
X6	Connection Computer 2010 (X15)	
F1	Fuse 5x20 250V/1A T	

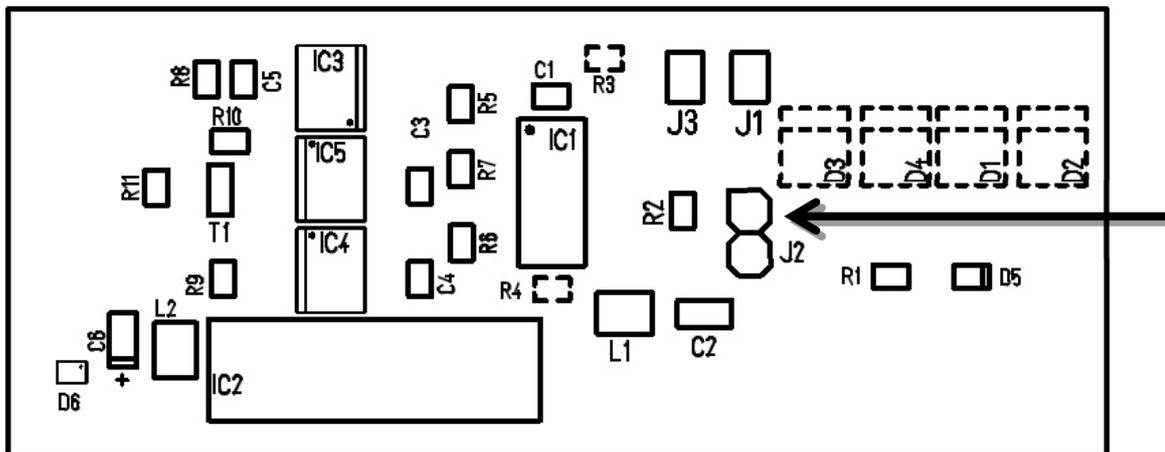
Connection information

The switch contact (Pu* and Pu) for the pump contractors is potential-free.
The contact to mains voltage is made with a bridge from L to Pu*.

3.2.3. Switch

Switch	Position	Function	
S1 (calibration switch)	Locked	Disables certain functions in the system	
	Non-calibrated	Permits the adjustment of all functions	
S2, S3 (emergency operation switch)	On	Switches the solenoid valves (uncontrolled delivery)	
	Off	Normal operation	
S4 (DIL switch)	1	On	Initialisation
		Off	Normal operation
	2	On	Normal operation
		Off	Demo-Mode
3		Not in use	
4		Not in use	
S5	1	On	Programming
		Off	Normal operation
	2	On	Programming
		Off	Normal operation

3.2.4. RS 485 socket modem



If several TMS are connected with RS 485, Jumper J2 must be set on the last TMS.

3.3. Cable specification

Application	Design	Min. cross-section.	Connection	Max. cable length
Voltage supply TMS	NYM	1.5 mm ²	L/N/PE	
Voltage supply Pump control	NYM	1.5 mm ²	L/N/PE	
Control cable TMS / pump control		0.75 mm ²	Pu or Pu/Pu*	
Data cable TMS / pulse generator	LiYCY	0.25 mm ²	Vcc/ ImpA/ ImpB/ GND	15 m
Data cable TMS / pulse generator	LiYCY	0.25 mm ²	Imp/ GND	15 m
Control cable TMS / main valve		0.5 mm ²	L/N/PE	
Control cable TMS / auxiliary valve		0.5 mm ²	L/N/PE	
Data cable TMS / TMS	LiYCY	0.25 mm ²	RS 232 o. RS 485	15 m 1200 m
Data cable TMS / PC (EDV)	LiYCY	0.25 mm ²	RS 232 o. RS 485	15 m 1200 m
Data cable TMS / Gateway	LiYCY	0.25 mm ²	RS 232 o. RS 485	15 m 1200 m
Data cable TMS / printer			RS 232	15 m

3.4. Switch on

After producing the voltage supply, an electronics self-test takes place as well as the display test. After display of the software Version notification, the TMS III is in the operating mode "delivery mode"

3.5. Access control mode with Mastercode

You access the main menu of the control mode (not delivery active) by pressing the softkey "settings". The Mastercode must be entered for access to all menu points. The factory setting for the Mastercode is **5214049**.



If the Mastercode is changed, please note the new Mastercode.

3.6. Access control mode without Mastercode

Only delivery data and the Version notification are accessible without entering a valid Mastercode. If you are requested to enter the Mastercode, you can skip this point by pressing the "ENTER" button to view the freely accessible menu points.

3.7. Producing the basic status

For full initialisation of the TMS III, the calibration switch must be set to the position "non-calibrated" (versions message). The menu point "initialisation" is then to be selected in the "delete" menu and confirmed.

4. Data transfer

4.1. Transmission protocols

Selection: Main menu - Interface - Protocol

- | | |
|--------------------|--|
| 1 No protocol: | without data transmission |
| 2 Gateway 1000: | RS485, delivery volumes up to 999.9 litres |
| 3 Gateway Classic: | RS485, delivery volumes up to 99.99 litres |
| 4 IT protocol V1: | RS232, VAG 8 digit order number |
| 5 IT protocol M1: | RS232, MB 11 digit order number |
| 6 IT protocol M2: | RS232, MB special version |
| 7 IT protocol M3: | RS232, MB special version |
| 8 IT protocol B1: | RS232, BMW protocol |
| 9 IT protocol O1: | RS232, Opel protocol |

4.1.1. Baud rates

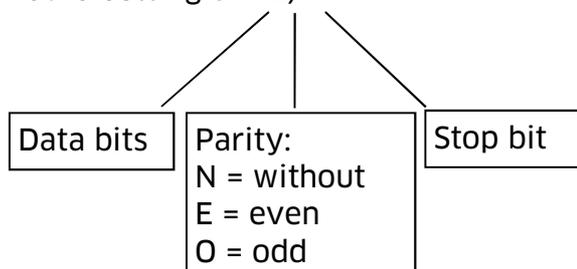
Selection: Main menu - Interface - Protocol - Baud rate

Setting values 1200; 2400; 4800; 9600; 19200; ... 115200 Baud
Standard = 9600 Baud

4.1.2. Parameter

Selection: Main menu - Interface - Parameter

Setting values 8 N 1 ; 8 E 1 ; 8 O 1 ; 7 N 1 ; 7 E 1 ; 7 O 1
(Standard setting 8 N 1)



4.1.3. RS232 interface

Following signal lines are used

TxD	=	TRANSMITTED DATA	(transmission data)
RxD	=	RECEIVED DATA	(received data)
DSR	=	DATA SET READY	(received data)
GND	=	Mass	(0 Volt)
DTR	=	DATA TERMINAL READY	(transmission data)

4.2. Automatic transmission

After the end of delivery, the unit tries to issue the data record using the respective interface. If transmission is not possible, the data record is marked as not transmitted and with each data record transmission, another attempt is made to transfer all of the data records that have not been transmitted up to this point, beginning with the oldest.

5. Printer operation

If this unit is used as an individual unit, a printer can be directly connected using the existing RS233 interface. For the operation of several TMS on one printer, it is recommended that a MiniGateway is used which is available as an accessory. If the TMS is used in a network with IT connection, the IT print options should be used.

With respect to configuration of the print of the operation on a serial interface of the RS232 of the TMS, the following settings are recommended.

- Baud rate: 9600 Baud
- Parameter: 8 data bits, none parity bit, 1 stop bit
- Flow control: No handshake

In each case, the settings on the printer (see printer handbook) and the settings on TMS must be identical.

5.1. A4 print out:

The following illustration shows examples of printout in A4 format. Each line contains a delivery data record. The delivery data is output as a list.

TMS III - Delivery protocol NO CALIBRATABLE RECEIPT!							
<hr/>							
Date	Time	Order no.	Pieces.	Bed.	Oil type	Error	Volume
11.01.02	11:19	12345678	1	1	Product 1	0	1.00 L

5.2. A5 print out:

The following illustration shows examples of printout in A5 format. The delivery data record is compiled separately as a block and can be used as a receipt. This is not a calibratable receipt.

TMS III - Delivery protocol	
NO CALIBRATABLE RECEIPT!	
<hr/>	
Date:	11.01.02
Time:	11:18
Order number:	12345678
Dispensing point:	1
Operator:	1
Sort	Product 1
Error:	0
Volume:	1.00 L

6. IT operation

The device is prepared for IT operation by selecting the suitable protocol in the "interface" menu. A release request is sent to IT in IT operation before delivery. All parameters for delivery must be entered in the TMS. The start of delivery takes place after release by the IT.

After delivery, a full data record with all parameters is sent to the IT. Takeover of the data in IT depends on the functionality of IT. The necessary parameters for approval are also dependent on the scope of functions in IT.

In order to ensure correct data transfer, all data records are returned by TMS from IT (Echo). The data record confirmed in this way is marked as transmitted with the status "üb" in the memory of the TMS.

In rare cases, the IT cannot send an echo for confirmation.

6.1. Data record transmission protocols

The transmission of delivery data takes place in specific protocols that are structured differently depending on the connected IT system.

6.1.1. Serial interface protocols

In the following illustration, the structure of the "classic" IT protocols based on the serial interface RS232 is shown.

BMW	
hex	02 41 31 32 33 34 35 36 37 38 03
STX	A 1 2 3 4 5 6 7 8 ETX
start	code
	order no
hex	02 44 33 33 33 30 30 36 31 32 33 34 35 36 37 39 31 31 31 31 30 31 20 30 32 30 30 20 03
STX	D 3 3 3 0 0 6 1 2 3 4 5 6 7 8 1 1 1 1 0 1 0 2 0 0 0 ETX
start	code
	day
	run.no.
	order no
	oper.no
	disp.p.
	cal.code
	quant.
	end
VAG	
7 digit	41 31 32 33 34 35 36 37 38 03
order number	A 1 2 3 4 5 6 7 8 ETX
normal record	44 33 33 33 30 30 36 31 32 33 34 35 36 37 38 31 31 31 31 30 31 20 30 32 30 30 20 03
	D 3 3 3 0 0 6 1 2 3 4 5 6 7 8 1 1 1 1 0 1 0 2 0 0 0 ETX
data record not just.cal.	44 33 33 33 30 30 36 31 32 33 34 35 36 37 38 31 31 31 31 30 31 23 30 32 30 30 20 03
	D 3 3 3 0 0 7 1 2 3 4 5 6 7 8 1 1 1 1 0 1 # 0 0 3 0 0 ETX
MB	
11 digit	41 31 32 33 34 35 36 37 38 39 30 31 03
order number	A 1 2 3 4 5 6 7 8 9 0 1 ETX
normal record	44 33 33 33 30 30 36 31 32 33 34 35 36 37 38 39 30 31 31 31 31 31 31 30 31 20 30 32 30 30 20 03
	D 3 3 3 0 0 6 1 2 3 4 5 6 7 8 9 0 1 1 1 1 1 0 1 0 2 0 0 0 ETX
OPEL	
as with MB + per minute	52 03
	R ETX

6.1.2. Gateway protocols

Several TMS central units can be switched together from a data point of view on a RS485 data bus. Two protocols are available for the RS485 data bus:

- "Gateway Classic" transmits delivery data with delivery volumes up to a maximum of 99.999 litres.
- "Gateway 1000" transmits delivery with delivery volumes up to maximum 999.99 litres.

The adaptation of specific manufacturer of protocol by the RS485 interface to the IT system protocol takes place by using a gateway.

6.1.3. Hardware Gateway

The MiniGateway is a hardware solution which independently undertakes the adaption of a RS485 data bus to a printer (serial or parallel interface) or a RS232 based IT system. Detailed information for use of the MiniGateway is contained in the operating manual for the MiniGateway.

6.1.4. Software Gateway

The "PC-Gateway" software adapts the RS485 databus to different IT systems. After installation of the software on an on-site PC, the connection with the RS485 data bus is made. PC must have a free RS232 interface. If no RS232 interfaces available, converters (USB - RS232) or COM-Servers (TCP/IP - RS232) can be used. The software is available for wide-ranging IT systems and also for connection to the Asanetwork.

6.1.5. OilControl

If no IT system is available, the software "OilControl" can be used to detect the delivery data. After installation of the software on an on-site PC, the connection with the RS485 data bus is made. .PC must have a free RS232 interface. If no RS232 interfaces available, converters (USB - RS232) or COM-Servers (TCP/IP - RS232) can be used. The OilControl software offers a range of functions for analysis of the delivery data. A detailed description for use of the software is contained in the software assistance file.

7. General operation

The keypad has 10 number keys, 4 arrow keys, 3 softkeys and the keys "EXIT" and "ENTER".

The entry of numbers can take place directly using the number keys. If the entry of letters or special characters is possible in the entry screen, these characters can be selected with the "↕" or "⇩" keys.

In the menus, a menu point can be selected with the "↕" or "⇩" keys. If options are possible for a menu point, the required option can be selected with the "⇐" or "⇒" keys. The takeover of an entry takes place with the "ENTER" button and termination by pressing the "EXIT" button.

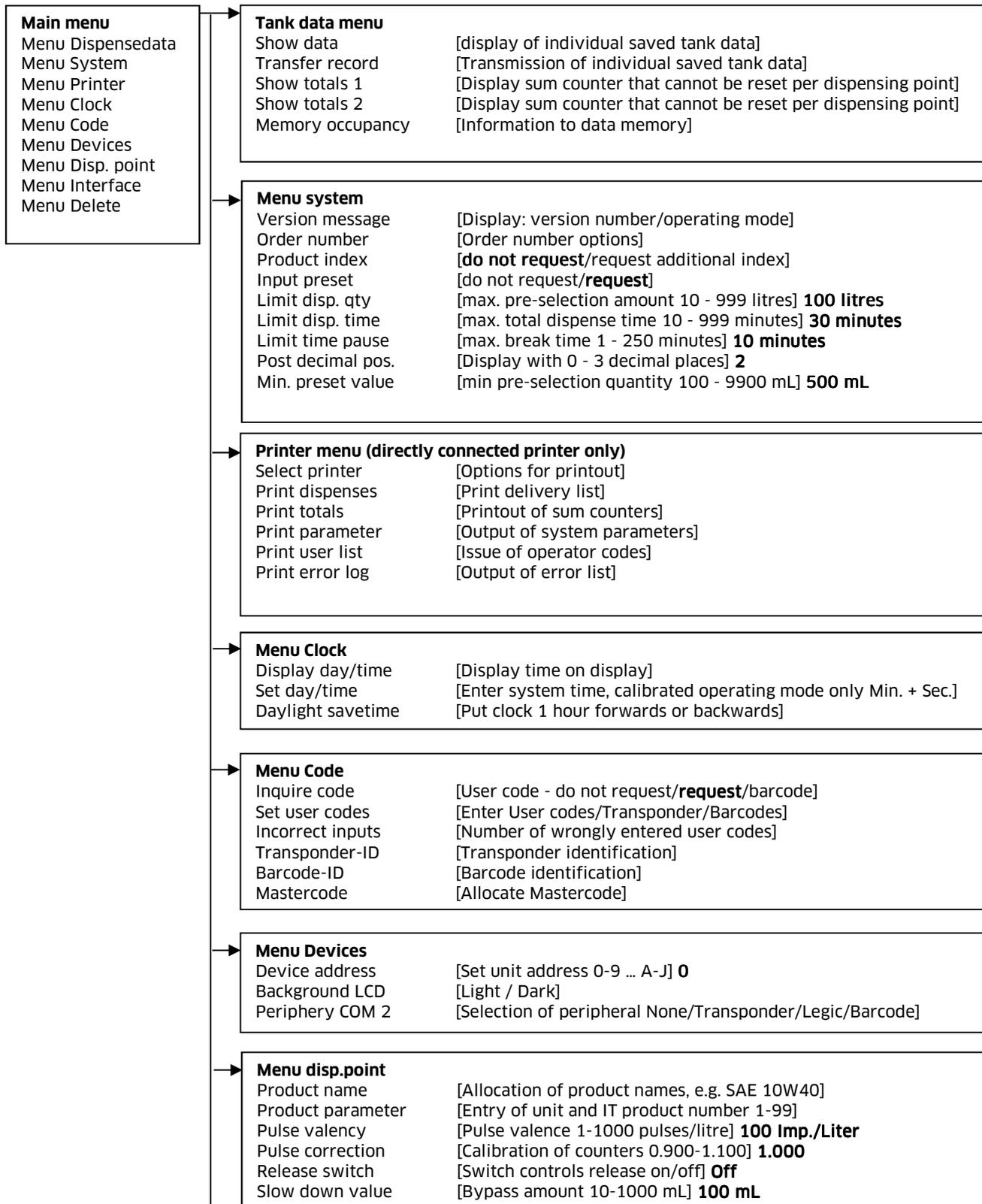
The allocation of the function of the softkeys beneath the display takes place depending on the status. The allocated meaning of the keys is directly presented on the display using the key. The following softkey functions can be presented.

Softkey	Meaning
	Change to delivery mode, dispensing operation
	Change to control mode, configuration
	Language settings
USB	Change to USB mode
	Order list

Symbols are shown on the display that allow fast and simple assessment of the status of a delivery. The following symbols can be displayed.

Symbol	Meaning
	Dispensing point with active delivery
Stop 	Delivery is ended
Timeout 	Delivery has been interrupted by time excess
	Wait for approval by EDV or confirmation of transmission to IT
Time out 	IT has not reacted within the set time.
Stop 	Delivery request rejected by IT
Err 	Termination of delivery due to double pulse generator
Err 	Termination of delivery due to pulse generator error

8. Menu structure



Standard values
in bold

Standard values
in bold

Menu Interface	
Protocol	[Selection of the data connection]
Baud rate	[Baud rate of interface] 9600 Baud
Parameter	[Parameter of interface] 8 N 1
EDP release	[Options for release not required /required]
Timeout EDP	[Time for response from IT 10-100 seconds] 30 sec.
Menu Delete	
Data memory	[Delete data memory, not calibrated in operating mode]
Totals 2	[Delete the resettable sum counter]
Language	[Selection of an available language]
Initialization	[Calibrated operating mode: initialise, otherwise factory setting]

9. Delivery mode

The delivery mode can be left by pressing the "EXIT" button. The system message and the current time can be viewed in the top line in the delivery mode. In the bottom line, the parameters for starting a delivery can be entered. Up to five deliveries can be active at the same time. An active delivery is displayed in each line.

9.1. Entry of delivery parameters

The entry of different parameters can be necessary for the different parameters. The parameters which are called up can be set in the control mode (chapter 12).

9.2. User code

A user code (max. 6 digits) must be entered. For each entered number, a '*' appears on the display. Leading zeros do not need to be entered

9.3. Order number

Press the "ENT" button to skip this point. A one to eleven digit order number can be entered.

9.4. Product index

A product index can be entered. This index can be transmitted to suitable IT to differentiate the product (e.g. pricing).

9.5. Dispensing point

A dispensing point must be entered. Only free dispensing points are accepted. After entry, the product to be dispensed is displayed briefly.

9.6. Pre-selection

A pre-selection for automatic switch off of delivery can be entered. The minimum and maximum value for the pre-selection can be set in the system menu.

9.7. Delivery

After confirmation of the volume pre-selection, the pumps are switched on and the shut-off magnetic valve is opened. The delivery status appears in the display and the current delivery volume. During delivery, the delivery volume is constantly updated on the display. The delivery status is shown with symbols (e.g. dispensing nozzles for active delivery). The shut-off magnetic valve is closed and the pump switched off when achieving the pre-selection amount. The corresponding error message is issued if an error occurs during delivery.

9.8. Termination of running deliveries

Pressing the "EXIT" button during running deliveries leads you to an entry screen where the corresponding dispensing point can be ended by selected a number key.

10. Special functions delivery mode

Different special functions are available depending on the configuration.

10.1. Order list

The parameters for a delivery can also be transferred by the PC-Software "OilControl". With the request for an order number, the softkey "order list" is shown when orders are recorded. By pressing the softkey, the order list is shown in which the required order is selected with arrow keys and taken over with the "**ENTER**" key. Delivery starts after entering the dispensing point.

10.2. Barcode

The user code or order data can be taken over with barcodes as required. The corresponding accessories are available for producing the suitable barcodes.

10.2.1. Barcode for user code

The entry of the user code (Menu Code/Inquire Code / Barcode) can be only released for barcodes as an option. Deliveries can only be started in this setting when the user has identified himself correctly with a barcode.

10.2.2. Barcode for order data

The entry of the order data (Menu System / Order number / Barcode) can be only released for barcodes as an option. Deliveries can only be started in this setting when the user has read a valid barcode into the control unit. The parameters for delivery are part of the barcode information and taken over automatically in the unit. Delivery starts after entering the dispensing point.

11. USB mode

In the USB mode, the full system configuration can be viewed and adapted. For a full view of the configuration, the Mastercode of TMS must be entered in the PC program. Parameters relevant for calibration cannot be changed in the "calibrated" (Version notification TMS).

11.1. Preparation for configuration

Open the TMS housing. The unit should be disconnected from the mains beforehand due to safety reasons. Connect the USB cable with the TMS and switch the power supply back on. Change to the USB operating mode with the corresponding softkey. Start the "USB Connection Tool" program on the PC and connect the USB cable with the PC. The "USB connection ok" message must appear on the TMS. If the message does not appear, disconnect the USB cable from the PC again and try to connect again after a short period.

11.2. Configuration with PC program

Enter the Mastercode in the PC program and click on the "Login" button. The "login ok" message appears on the TMS and the version notification of the TMS and the position of the calibration switch are shown in the PC program. By changing the views in the PC program, the configurations of the system parameters, user codes, dispensing points and IT connection are displayed. In the "calibrated" operating mode of the TMS, protected parameters are only released for view. Writing in this parameter is not possible.

11.3. Saving configurations

The register card "Service" in the PC program contains options that allow simple read and write of all parameters of the TMS. With the "readout" button, the full configuration of the TMS is transferred to the program. In the "name" field, this configuration can be given a name (e.g. "company Tecalemit") and saved on the PC as a configuration. A configuration that has already been saved can be selected here and fully transmitted to the TMS using the "write" button. In the "calibrated" operating mode (version notification TMS), changing the parameters relevant for calibration is not possible.

No changes can only to the following in the "calibrated" operating mode.

- Number of decimal places
- Memory contents with delivery data
- Relevant calibration parameters of dispensing points
 - o Pulse valence, correction factor, double pulses, power monitoring
- Date and time setting (hour value)

11.4. Leave USB mode

To leave the USB mode, remove the USB cable on the TMS. Then use the softkeys to change into the delivery mode or the control mode.

12. Control mode

In the control mode, all system parameters and the settings specific to the dispensing point take place. The selection of menu points is made using the „↑“ and „↓“ keys as well as confirmation with "ENTER". A sub menu or menu point can be left by pressing the "EXIT" button. The actual control mode can also be left by pressing the "EXIT" button.

Part of the submenu can only be accessed after entering a Mastercode. If no Mastercode or an incorrect one is entered, only the freely accessible menu points can be viewed. All parameters with the obligatory calibration can only be changed if the calibration switch is found in the "non-calibrated" position (version notification).

12.1. Menu Dispensedata

The menu points for use of the tank data memory are compiled in this sub menu.

12.1.1. Show data

The stored tank data records can be viewed individually. Selection of the tank data record with the „↑“ and „↓“ keys. The following abbreviation are used for the delivery status:

"Üb": Delivery already printed out/transmitted to IT

12.1.2. Transfer record

Tank data records are automatically transmitted after the end of delivery. Data records that have not yet been successfully transmitted can be manually transmitted here. The selection of the tank data record takes place by using the keys „↑“ and „↓“. Transmission takes place according to the set protocol (interface menu).

12.1.3. Show totals 1

Display of the non-resettable sum counter per dispensing point.

12.1.4. Show totals 2

Display of the resettable sum counter per dispensing point.

12.1.5. Memory occupancy

The information for use of the data memory is shown here.

12.2. Menu: System

The menu points for setting the system parameters are compiled in this sub menu

12.2.1. Version message

The version number of the software, the test number and the operating mode "locked" or "non-calibrated" are shown.

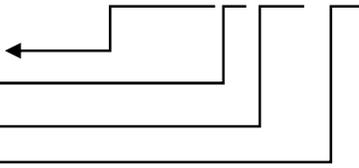
Structure of version number : Software: 5 _ . 02 . 03

5: Mark for the unit TMS III: "5" ←

A: Space ←

03: Major release ←

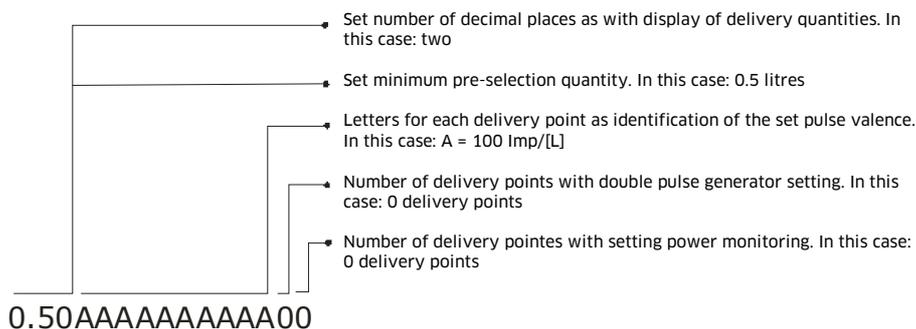
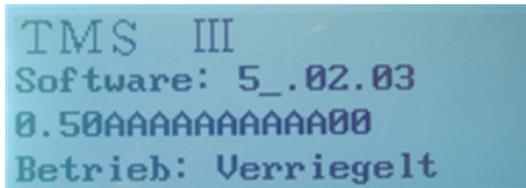
01: Minor release ←



The basic structure is: "Number letter number". The meaning is explained using the following example (factory setting):

12.2.2. TMS III test number

Display of test number
in the Version notification



12.2.3. Order number

Entry of the order number/order position is optional before each delivery. The option and the format of numbers can be specified in this menu point.

12.2.4. Product index

Entry of a product index before each delivery is optional and can be set here. The product index is transmitted to a suitable IT system and can be used for different prices.

12.2.5. Input preset

Entry of the pre-selection amount is optional before each delivery. Delivery without a pre-selection amount must be manually terminated. When achieving the delivery limit, the delivery is automatically terminated.

12.2.6. Limit dispense quantity

The maximum possible delivery amount can be specified here for a delivery without pre-selection amount or the maximum possible pre-selection amount. An amount between 1 and 999 litres can be entered.

12.2.7. Limit dispense time

The maximum possible delivery time can be specified here for a delivery. When exceeding this time, the delivery is interrupted and the error message "Timeout" appears on the display. A time between 10 and 999 minutes can be entered.

12.2.8. Limit time pause

The maximum possible delivery time without pulses can be specified here for a delivery. When exceeding this time, the delivery is interrupted and the error message "Timeout" appears on the display. A time between 1 and 250 minutes can be entered.

12.2.9. Post decimal pos.

The number of displayed decimal places for delivery details can be displayed and changed here. Changes can only be made in the non-Locked operating mode. The set value is shown in the test number (Version notification).

 **Changing this parameter is no longer possible in the "calibrated" operating mode.**

12.2.10. Minimum preset value

The smallest pre-selection amount can be entered here (100 ml - 9900 ml)
The basic setting is 0.5 litres.

 **For deliveries in commercial transactions, the authorised minimum delivery amount for the system must be considered.**

12.3. Menu Printer

The menu points for printing (directly connected printer only) are compiled in this sub menu.

12.3.1. Select Printer

The selection of a directly connected printer takes place here. Depending on the connected printer, some selectable formats may not be suitable.

12.3.2. Print dispenses

A list of the deliveries not yet marked as transmitted is printed out.

12.3.3. Print totals

A list of all sums of all dispensing points in the last delete process is printed out.

12.3.4. Print parameters

If the printer is directly connected to the system, the printout of all system parameters can be started.

12.3.5. Print user list

If the printer is directly connected to the system, the printout of all user codes can be started.

12.3.6. Print error log

A list of stored errors on a directly connected printer is issued.

12.4. Menu Clock

The menu points for setting the internal system time are compiled in this sub menu.

12.4.1. Display day/time

Display of the time in the delivery mode is optional. This can be faded out if required.

12.4.2. Set day/time

The date and time can be inspected and changed if required. In the "calibrated" operating mode, only the minutes and seconds can be changed.

12.4.3. Daylight Savetime

The system time can be put one-hour forward or one hour back according to the time of year.

12.5. Menu Code

The menu points for the user codes are compiled in this sub menu.

12.5.1. Inquire code

The entry of a user code before each delivery is optional and can be set here. If the option "barcode" is selected, deliveries can only be started if a correct barcode has been read-in in advance for identification.

The corresponding accessories are available for producing the suitable barcodes.

12.5.2. Set user codes

The user codes can be inspected and changed after selecting the respective menu point. The user codes can be selected using the keys "↑" and "↓" and confirmed with "ENTER". A one to six digit user code can be entered. Leading zeros do not need to be entered.

The transponder or barcodes used for user identification are also setup in this menu point:

- Select user for ID medium
- Activate the reader unit with "ENTER"
- The read-in ID medium is allocated to the selected user

12.5.3. Incorrect inputs

The number of incorrect entries of user codes can be viewed here.

12.5.4. Transponder identification

The transponder numbers and the corresponding users are displayed here. Hold the required transponder in front of the reader.

12.5.5. Barcode identification

The barcode numbers and the corresponding users are displayed here. Hold the required barcode in front of the reader. The corresponding accessories are available for producing the suitable barcodes.

12.5.6. Mastercode

A one to seven digit Mastercode can be entered. Leading zeros do not need to be entered.



Remember the newly allocated Mastercode well because it is necessary for a number of menu points.

12.6. Menu Devices

The menu points for configuration of the units connected to the network and the actual TMS are compiled in this sub menu.

12.6.1. Device address

In a network of several TMS or TKS units, it is necessary to allocate each unit its own address. The logical dispensing point number in the system results from this address. An address can be entered between "0" and "9" or "A" to "J". Each address may only be allocated once in each network.

12.6.2. Background LCD

Item 030 471 200:

The contrast of the display can be set here.

Item 030 471 291:

The background of the display can be set to light or dark here.

12.6.3. Peripheral COM 2

If the peripheral (e.g. transponder, barcode scanner, Legic-Reader, ...) exists, it must be activated here. The selection of the peripheral remains in place after switch off.

12.7. Menu Dispensing point

The menu points for configuration of the respective dispensing points are compiled in this sub menu. The selection of the actual dispensing point takes place in the specific sub menus with the keys „↑“ and „↓“. Changes are accepted with the "ENTER" button and the menu point can be left with the "EXIT" button.

12.7.1. Product name

Each dispensing point can be allocated a product name with a maximum length of 18 characters (e.g. SAE10W40). Numbers can be directly entered and other characters can be selected with the „↑“ and „↓“ keys. The characters are allocated as follows: ‘ ‘, ‘a’ - ‘z’, ‘ä’, ‘ö’, ‘ü’, ‘ß’, ‘A’ - ‘Z’, ‘0’ - ‘9’ ‘-’, ‘&’, ‘.’ The beginning and end of the character chain are always linked with each other so that the character ‘.’ follows the character ‘ ‘ (and vice versa). Individual characters can be deleted with the "←" key. Acceptance of the entry takes place with the "ENTER" key.

12.7.2. Product quality

For data transmission from/to an IT system, the respective product quality serves the purpose of clear product identification in the systems. A product quality between 1 and 99 can be entered. The allocation of qualities must be identical in the TMS and the IT system.

12.7.3. Pulse valence

The pulse valences of the counters can be inspected and changed if required. Changes can only be made in the non-Locked operating mode (see Version notification). Pulse valences between 1 and 1000 impulses/litre can be entered. A pulse valence of 100 pulses/litre is presented in the test number (version notification) with the letter A

 **Changing this parameter is no longer possible in the "calibrated" operating mode.**

12.7.4. Pulse Correction

The correction factor for an adjustment of the counter can be displayed and changed as required. The value of 1.000 is set in the factory. A correction factor between 900 and 1100 (corresponding with the factor of 0.900 or 1,100) can be entered.

 **Changing this parameter is no longer possible in the "calibrated" operating mode.**

12.7.5. Release switch

A separate switch can be connected to each dispensing point with which the start of delivery can be checked. The start of the delivery is only possible with the "release switch switched on" option when the external switch (potential-free) is closed.

12.7.6. Slow down value

The advance switch value can be displayed and changed here if a required. For delivery with the bypass valve, the main valve is switched off if the delivered amount is larger than the preselected amount deducting the advance which value. Advance switch values between 0.01 and 1.0 litre can be set.

12.8. Menu Interface

The menu points for configuration of the interfaces for data transmission are compiled in this sub menu.

12.8.1. Protocol

For connection of a unit to the IT or a gateway (PC gateway software or MiniGateway hardware), a communications protocol can be selected. The protocol must be set identically for all systems connected with the unit. The protocol "Gateway 1000" supports delivery amounts up to 999.9 litres "Gateway Classic" up to 99.99 litres.

12.8.2. Baud rate

The baud rate for communication is set here. The baud rates must be set identically for all systems connected with the unit.

12.8.3. Parameter

The parameters (e.g. 8 data bits, none parity bit, 1 stop bit) are set for communication. The parameters must be set identically for all systems connected with the unit.

12.8.4. EDP release

If responses not received from IT after a release request, the system can start or generally reject delivery in the "emergency operation without IT mode" after expiry of the timeout period. In the "not required" setting, delivery is always made if the request is not explicitly rejected by IT. In the "required" setting, delivery is only released when the request has explicitly been approved by IT.

12.8.5. Timeout EDP

The maximum reaction time of the connected IT system is set here. A value between 10 seconds and 100 seconds can be entered.

12.9. Menu Delete

The possible deletion options are compiled in this submenu.

12.9.1. Data memory

The data of the saved delivery processes is deleted from the memory. All system settings remain unaffected.



Deleting the delivery data is no longer possible in the "calibrated" operating mode.

12.9.2. Totals 2

The resettable sums of all dispensing points are set to zero, the non-resettable total delivery amounts remain unaffected.

12.9.3. Language

The selection of an available language for text outputs takes place here. The selection remains in place after switch off.

12.9.4. Initialisation

The system settings in the standard settings can be reset here. The following list of parameters cannot be initialised in the operating mode "calibrated" and retain the current values.

- Number of decimal places
- Memory contents with delivery data
- Protected parameters of the dispensing points: pulse value, correction factor
- Date and time setting (hour value)

All other values are reset to standard values (menu structure illustration). In the "non-calibrated" operating mode, all values are reset to the factory settings.

13. Disposal

The device is to be emptied completely and the liquids properly disposed of in case it is taken out of service.

The equipment is to be disposed of properly when taken permanently out of service:



- Return old metal for recycling.
- Return plastic parts for recycling.
- Return electronic waste for recycling.



The water legal regulations are to be followed.

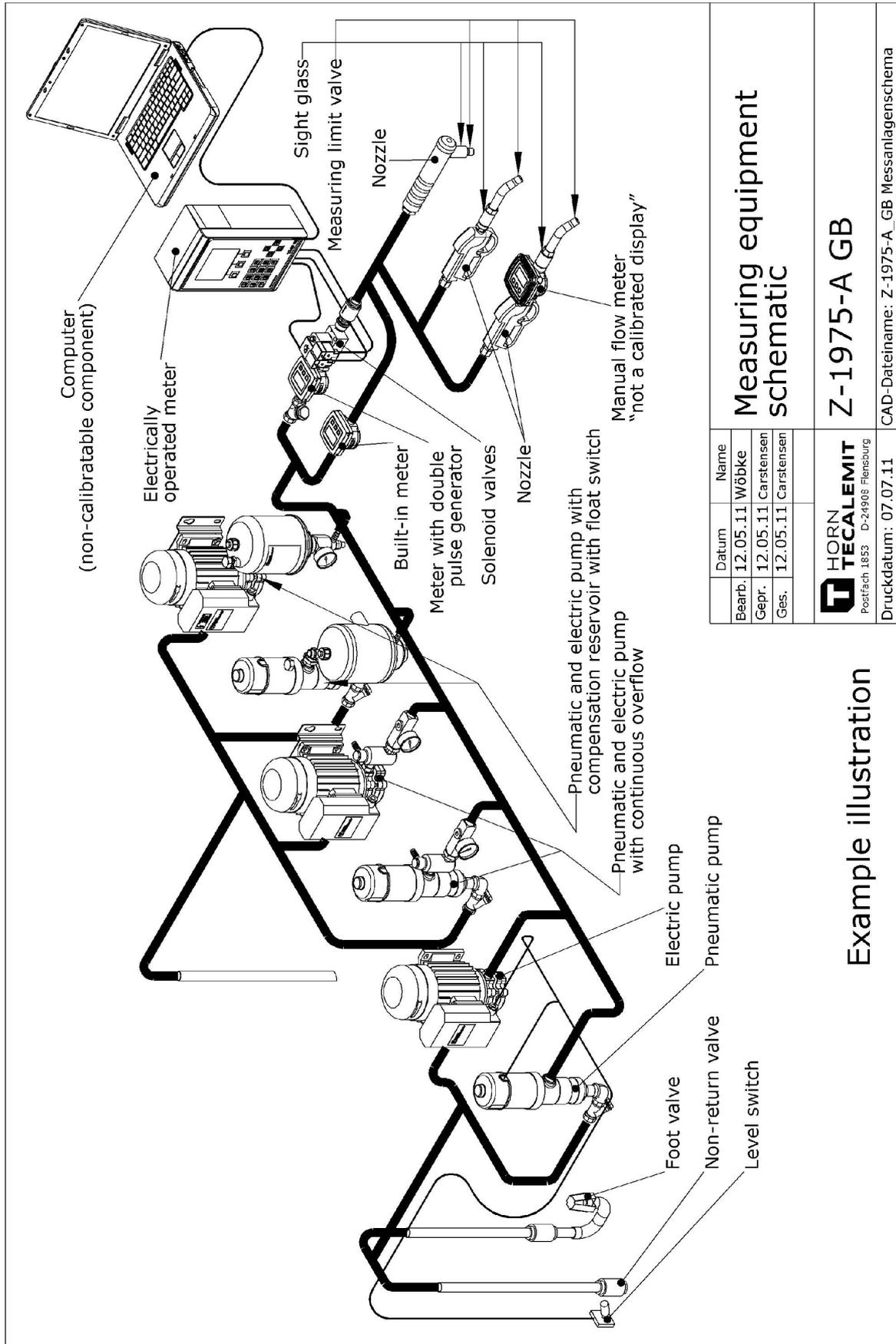
13.1. Return of batteries

Batteries must not be disposed of with the domestic waste. Batteries can be returned free of charge via a suitable collecting point or to the dispatch stores. Consumers are legally obliged to return used batteries.

Batteries that contain harmful substances are marked with a crossed out dustbin (see above) and the chemical symbol (Cd, Hg or Pb) of the heavy metal that is decisive for the classification as containing harmful substances:

1. "Cd" stands for cadmium.
2. "Pb" stands for lead.
3. "Hg" stands for mercury.

14. Measuring equipment schematic



Measuring equipment schematic

Z-1975-A GB

CAD-Dateiname: Z-1975-A_GB Messanlagenschema

Datum	Name
Bearb. 12.05.11	Wöbke
Gepr. 12.05.11	Carstensen
Ges. 12.05.11	Carstensen



HORN
TECALEMIT
Postfach 1853 D-24908 Flensburg

Druckdatum: 07.07.11

Example illustration

15. Declaration of conformity



Konformitätserklärung Declaration of Conformity

Hiermit erklären wir, dass die Bauart
We herewith declare that the construction type

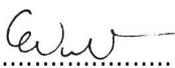
Typ: **TMS III**
Type:
Bezeichnung: **Elektrisches Zählwerk**
Designation: **Electrical Counter**
Artikel-Nummer: **030 471 200, 030 471 290, 030 471 291**
Item Number:

in der von uns gelieferten Ausführung folgenden einschlägigen Bestimmungen entspricht:
in the form as delivered by us complies with the following applicable regulations:

- Niederspannungsrichtlinie 2006/95/EG
Directive Low voltage equipment 2006/95/EC
- EMV-Richtlinie 2004/108/EG
Directive Electromagnetic compatibility 2004/108/EC

EG-Dokumentationsbevollmächtigter: Jörg Mohr Horn GmbH & Co. KG
EC official agent for documentation: Munketoft 42
24937 Flensburg

10.09.2013
Datum
Date


.....
i.V. Dipl.-Ing. Jörg Mohr
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16. Notes

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