Start-up + Operation

Electronic pneumatic tank measurement system
of the e-litro® series

e-litro	SW-Version V7.0.x
e-litro secu4	SW-Version V6.3.x
e-litro net	SW-Version V7.0.x
e-litro gsm	SW-Version V7.0.x

for tank sizes up to max. 10,000 liters

e-litro® sets

Installation and mounting

E-litro devices are <u>not viable for external installation</u> (safety class IP50).
The tank monitoring system is no overfill safety.

⚠️ During the tank filling the **secu4** assists to avoid an overfilling, conformal to <u>TRwS 791</u>.
It will report a filling limit ALARM to stop the tank filling.
The **secu4** can interrupt the filling process (overfill protection) by triggering the current loop of the limit indicator. The **secu4** does <u>not replace</u> but supports the limit indicator by monitoring the downstream battery tanks.

⚠️ For installation and mounting of the devices mentioned above please follow the conditions of the respective manual. The corresponding safety instructions for electric devices and oil tanks need to be observed.
The startup is performed after successful mounting.

The displaying devices of the e-litro® series are applicable for <u>liquid level measurements of tanks operated unpressurized</u>. Maximum display value: 10,000 liters (per tank, in case of **secu4**)

The liquid level is indicated by the LCD display. The instrument versions **e-litro net** and **e-litro gsm** are able to retransmit the displayed data and the present status (data transfer via RDT). The devices of the **e-litro** series are equipped with a power plug for 230V sockets.

The transducer (sensor) is connected to the measuring input of the **e-litro** displaying device. Usually the transducer is the electronic-pneumatically measuring LITRO-Sensor: A level measurement sensor with a measurement range of 0-25 kPa (0-250 mbar) for relative hydrostatic pressure.

Measuring input: 4-20 mA analog signal, 2-wire principle with sensor supply of 20V dc.
clamp 1 = plus, **white** (or red)
clamp 2 = minus, **brown** (or black)

Other transducers with 4-20 mA signal could also be connected to the **e-litro** displaying devices (except for **secu4**).

CONCEPT:

e-litro / e-litro net / e-litro gsm
with LITRO-sensor
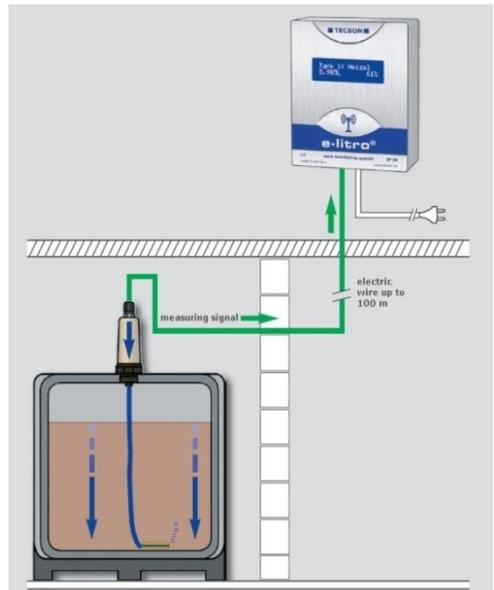
e-litro secu4:

The **secu4** device is an oil tank measuring system for battery tank systems. The complete set consists of the displaying device and the sensorbox which has to be mounted close to the tank.

The sensorbox of the **secu4** has 4 measuring hose inputs to measure and observe 4 single tanks of one tank-battery at the same time. In addition to the level indication (in liters, cm, %, refillable clearance) the device also monitors the levels of every single tank to avoid an overfilling. If during the tank filling the level of <u>one</u> of the tanks reaches its maximum, e.g. 95% filling limit, the **secu4** will sound the ALARM and an output relay will interrupt the current loop of the tanker.

The displaying device and the sensorbox both contain of an alarm sound.
Such an alarm can be switched off by pushing the QUIT-button on top of the displaying device.
In case of an alarm the QUIT-button will flash red.

Instead of connecting it to a 4-20mA sensor as usual the **secu4** has to be connected to the sensorbox via three-pole clamping block on the left hand side of the circuit board:

secu4 data input from the sensorbox:
      clamp 1 = plus, **white** (or red)
      clamp 2 = data, **green** (or blue)
      clamp 3 = minus, **brown** (or black)
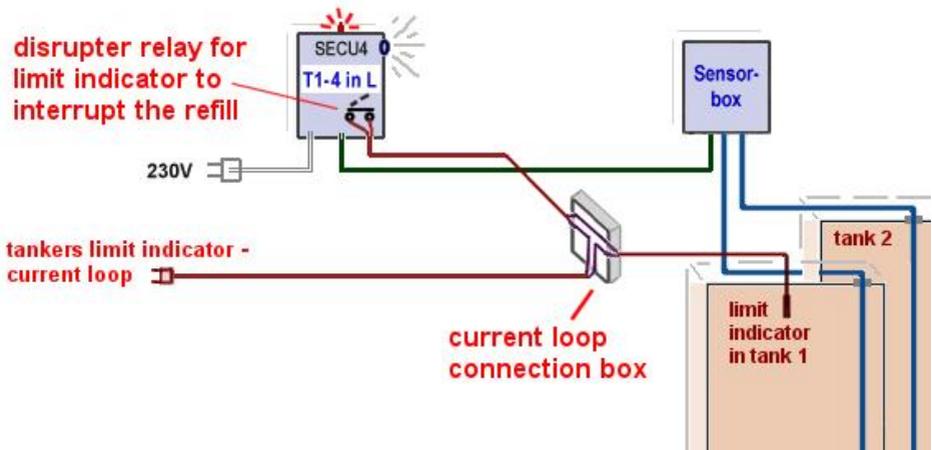
The data line from the sensorbox to the displaying device (three-pole) is prolongable up to 50m

The use of a current loop connection box is optional. Therewith the tank filling can be interrupted automatically.

Control elements and display

First determine the container data and then enter the data into the device menu.
The programming is described in the following pages.

To setup the displaying device the lid has to be twisted off. Perform the device setup once at the initial startup. After startup the device operates in displaying mode while the lid is closed.

By pressing the [Enter] button the displaying mode changes to menu mode.
With menu item „Exit" (step 0 or 7 or 8) the programming mode is left and the normal displaying mode is active.

Display panel
Data displaying via a LCD display. The display is equipped with a background lightning for best readability at all lightning conditions.

Control keys
For device setup use the 3 little pushbuttons (blue or pink) located on the electronic base plate:
[+]   [Enter]   [-]
Enter = Confirm selection.   **+/-** = Change values or skip to next menu step.

Language
Select the operation language (German / English / French) in menu step 18.

Select displaying mode for e-litro and e-litro net /gsm:

After setting menu items 1 to 5b the favored displaying mode is to be selected under menu item „6. Display"
The name of the tank/liquid is shown on the left hand side in the top line and is adjustable under menu item „18. Language + Names"
In in the second line of the display it is to be selected to either show the refillable clearance (up to limit indicator) and/or the percentage (inventory) and/or the current liquid level in cm.

Settings: 6. Display:

Line 1: Name   + Inventory in (-) L:
Line 2: Fillspace in (-) L + Vol.percentage:
          (bottom left)   (bottom right)

Heat. oil	6.200 L
– 3.550 L	65 %

Line 2: Fillspace in (-) L + Liquid level:

Heat. oil	6.200 L
– 3.550 L	104 cm

Line 2: Vol.percentage   + Liquid level:

Motor oil	6.200 L
65 %	104 cm

RECOMMENDATION:
Make sure the refillable clearance (fillspace) is always shown.
While refilling the tank the clearance needs to be detectable! (In accordance with TRwS 791)

Additional benefit: In Example 1 and 2 the bottom left value **Ë x.xxxL** shows the present heating oil consumption if previously the tank had been filled up to the filling limit.

Display of the e-litro secu4:

The menu item „6. Display" is "without a function" and therefore not available.

In case of a battery tank system the device is able to observe and show the values of 1 to 4 tanks in the four display lines.

Additional to the usual displaying of the current liquid volume the <u>clearance</u> is shown before and during the refilling process (<u>In accordance with TRwS 791</u>).

The clearance is the value (in L) that is left until one of the single tanks reaches the selected filling limit (of e.g. 95%) during a parallel filling.
Under menu item 5b the filling limit is to be adjusted to the limit indicator height as accurate as possible.

Password:
The device settings can be protected by activating a password under menu item 8.
A forgotten password can be requested by contacting TECSON.
Resetting the **secu4** will cause the device to demote in a non programmed state

<u>secu4</u> **display with 1 or 2 tanks:**

DISPLAY:	„wait...q" The displaying device waits for stable measurement data from the sensorbox. This can last 1 . 3 min. after turning on the device.	[1] Wait... [2] [3] [4]
DISPLAY: No displaying switch occurs. Line 3 and 4 show inventory and fillspace.	Values tank 1: Values tank 2: Inventory sum: Fillspace:	[1] 190L 39cm 19% [2] 170L 35cm 17% [3] Heat. oil ∑ 360L [4] Fillspace 2.160L
While refilling the inventory is measured and displayed as well. As soon as one of the tanks reaches e.g. 93% the display changes line 4 to STOP! FILLLIMIT.		[1] 4.100L 162cm 89% [2] 4.870L 168cm * 93% [3] Heat. oil ∑ 8.970L [4] S T O P ! FILLLIMIT
During the daily removal processes of the liquid later on line 4 will change itself into a consumption indicator. This consumption indicator shows the liter-consumption since the last complete refill.		[1] 3.870L 152cm 83% [2] 4.470L 158cm * 87% [3] Heat. oil ∑ 8.340L [4] Fillspace 1.000L
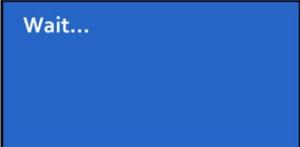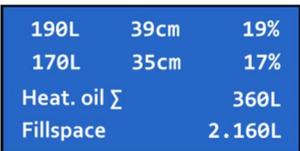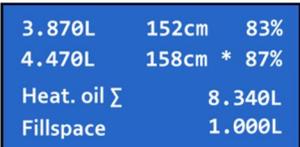
secu4 display with 3 or 4 tanks:

Regular display:

In case of a battery tank system with 3 or 4 tanks the display will switch over.
Thereby the single tank display and the inventory and clearance display are shown alternately.

[1]	990L	39cm	22%		[1]	Heat. oil ∑	
[2]	970L	35cm	17%	Switch-over	[2]		
[3]	990L	39cm	22%		[3]	Invent.	3.090L
[4]	1.040L	43cm	26%	=>	[4]	Fillspace	6.410L

If while refilling one of the tanks reaches 93%
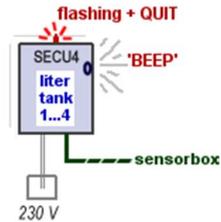a STAR as well as the warning STOP! Filllimit will appear.

[1]	8.970L	138cm	91%		[1]	S T O P !	FILLLIMIT
[2]	8.910L	135cm	89%	Switch-over	[2]		
[3]	8.980L	138cm	91%		[3]	Invent.	35.960L
[4]	9.100L	142cm * 94%		=>	[4]	Fillspace	600L

flashing + QUIT
'BEEP'
SECU4
liter
tank
1...4
sensorbox
230 V

ALARM and QUIT-button for secu4:

Reference in this case is 95% filling limit, i.e. signaling at 93%

Filling level / action	Status	Red LED (Quit-button)	Beeper (loud)	Relay break contact	Display
all levels below limit	OK	off	off	closed	OK
level >= 93 % at refill or reserve	**warning**	**flashes**	double beeping	closed	**STOP**
Quit-button, shortly (quit beeper)	warning gets quitted	turns off	turns off	closed	**STOP**
level reaches 95% (limit)	**alarm**	**flashes**	**fast double beeping**	**disrupts**	**STOP**
Quit-button, shortly (quit beeper)	**alarm** gets quitted	**flashes**	turns off	**stays disrupted**	**STOP**
Quit-button, long (quit beeper) **hold for 3 sec.**	**Quit-status** but level still exceeded	**changes to continuous light**	off	closes again	**STOP**
level drops under 94% (thru consumption)	warning	turns off	off	closed	full (stop)
level drops under 92%	OK	off	off	closed	OK

Device setup and programming

Press [Enter] to open the menu. The menu offers the menu steps 1 – 7.
Menu steps 9 – 24 offer special advanced options.

Only one level sensor can be connected to the instruments **e-litro net** / **e-litro gsm**.
Using the **e-litro** displaying device either one or two LITRO-Sensors can be connected.
Two sensors = **duo**-solution.
Shape and size of the tank or container has to be entered only once.
This applies for both the **e-litro** and the **e-litro duo.**

Press [+] to navigate to a particular menu item. Enter the parameterization of a particular
menu item and confirm the selected the value by pressing [Enter].

Input function: _Menu functions_	_Description_	_Device type_
4		
0. Exit	Entering the programming mode. **Proceed with [+].** Also leaving the programming with [Enter] at the Exit item.	all
1. Measuring probe For **secu4** **1. Tank quantity**	Setting up the measuring range of the level sensor: The LITRO-Sensor is preset to 250mbar. Measuring range: max. oil tank height: water column: **250 mbar** (3.00 m) (2.50 m) If a different level sensor to the LITRO-Sensor is used, the respective measuring range has to be entered in mbar. If ‚by calibration‘ is displayed, a calibration was done via menu item 10/11 ‚Trim height/Trim volume‘ Battery tanks: **n** n = quantity (1 to 4) of connected tanks	(all) **Do not enter the level or tank height here. Enter mbar referring to sensor label.** only for secu4
2. Liquid	Selection of measuring liquid (specific weight of the liquid): **Heating oil**, water, diesel oil, bio diesel oil, rapeseed oil, motor oil, lubrication oil, waste oil, other liquids after consultation. Do not use AdBlue, palm oil, A1-media (petrol). Or enter the ‚Density value‘ in xxx kg / m^3. Use [+] [-]. If the density value of the liquid is unknown calibrate the device via menu item ‚10.Trim height‘ If ‚by calibration‘ is displayed, a calibration was done via menu item 10/11 ‚Trim height/Trim volume‘ In that case the parameter ‚Liquid‘ (resp. density) is not relevant.	all

3. Tank shape		Selection of tank shape:	all
		Alternatively just 1 special tank geometry can be setup by a "Bearing chart" for liter conversion.	
	Linear	Default: <u>Linear</u> tank. Rectangular tank; vertical cylinder; steel cellar tank.	
	Cylindric horizontal lying	<u>Lying cylindric</u> tank with <u>arched ends</u> Horizontal lying steel tank. Typical tank shape for outdoor and buried tanks.	
	Ball-shaped	<u>Spherical</u> tank. Ball-shaped subgrounded tank; common subgrounded plastic tanks (GRP).	
	Oval	<u>Oval</u> cellar tank. Typical shape of GRP plastic tanks	
	Convex	<u>Convex</u> plastic tank, mostly as a battery. Slightly bellied tank shape	
	Concave	<u>Concave</u> plastic tank, mostly as a battery. Concaved tank shape.	
	Holed plastic	Plastic tank with large cavity. Hollow in the middle of the tank's body. (No ring bandages)	
	Tube with flat ends	<u>Lying cylindric</u> tank <u>with flat ends</u>, Tube segment with straight end plates. Typical tank shape for smaller Diesel tanks.	
	Steel tanks	<u>Steel tank</u> or <u>battery tanks group</u>, mostly single-walled tanks: Linear side panels, w. <u>hemicycles</u> at top a. bottom.	
	Bearing chart (input of 1 special chart) <u>Value input</u> from an existing <u>bearing chart</u> for the tank	<u>Reference table:</u> Basic value table with up to 15 pairs of values "cm => liter" for the non-linear regions of the tank. Step 4 (Tank volume) and Step 5 (Tank height) have to be set up beforehand. Value pairs for 0% (0.0 cm => 0 L) and 100% (tank height => volume) are already set and do not have to be entered again. Index [1] xxx.x cm => xxxx L Index [2] . . . . . cm => . . . . L Index [n] . . . . . cm => . . . . L Non-linear region: Enter several value pairs. Linear region: Enter only begin and end pairs.	Unsymmetrical or other tank shape. [i] nicht lin. linearer Bereich nicht lin. Individual tank shape
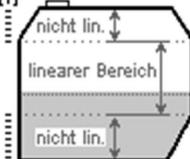
Input function: Menu functions	Description	Device type
4. Tank volume	Enter the tanks volume by [+] [-]. (100% value) Default is 0 L. This value <u>must</u> be entered. <u>Attention, in case of an existing bearing chart</u>: Please use the pair of values for 100% for tank volume and tank height from the table. For a 10m^3 buried tank values may be e.g. 10,250 l and 198.5 cm.	maximum volume: 10,000 L
For **secu4** **4b. Minimum limit**	<u>For the **secu4**</u> the total volume of a single tank has to be set. Display: e.g. 3 x 1000 liters Set the <u>minimum limit</u> as a %-value. If the level comes below the minimum limit the device will sound an acoustic alarm. 0% = feature off / 50% = max value	only for secu4 Cancel alarm via Quit-button
5. Tank height	Enter the interior height of the tank in cm: e.g. 249.0 cm <u>Attention:</u> If a bearing chart is available it is recommended to take the max. value pair out of the chart. For a 10 m^3 buried tank with d = 2 m a potential value could be 198.7 cm.	all
5b. Filling limit	Set the filling limit of the tank here: For oil tanks this will represent the switch-off point of the limit indicator. The preset is 95%. e.g. Filling limit: 95%=190cm change of value with + / - . If e.g. a water tank may be filled to capacity the filling limit is to be set to a value of 99%.	all

6. Display
 	
  - for e-litro
  - for e-litro gsm
  - for e-litro net
	The upper display line shows the name of the tank und the inventory in liters (for other units see menu item 12).
	
	Set the displaying mode for the second display line here:
	`View details:      Fillspace+Percnt   (-L, % )`
	`            or  Fillspace+Level   (-L, cm)`
	`            or  Percent+Level    (% , cm)`
	For heating oil tanks option 1 or 2 is recommended (**according to TRwS 791-2 the clearance must be detecable**).
		<u>Not for secu4</u>

6. Sum Liters - for secu4	Selection for displaying and data transfer between: 'liters added' (liter sum = T1 + T2 + T3 + T4) and 'liters removable' (liters sum = empty tank * n)	<u>Only for secu4.</u> ← recom- mended
7. Relay	Switching function of relay 1: **deactive** / active / on / off - deactive Effect: Relay operates independently of the content. In addition there is no remote signaling of the relay state. - active Effect: Relay operates depending on the content. - on Makes the relay energize (fix ON). - off Makes the relay release (fix OFF). õ	e-litro gsm + e-litro net

	Example switching point setup for "active" (with hysteresis):	
	On 10% - Enter relay's energizing point by + / - Off 15% - Enter relay's releasing point by + / -	
	If both values are set to 0% the relay switching function is disabled.	
	For secu4: Preset: - **opener (tanker off)** = limit indicator-disrupter - closer (<u>only</u> for other switching functions!) The relay switching point is the %-limit from menu item 5b.	secu4: for limit indi-cator-disruption
8. Exit or **8. Password+Exit** secu4 password activation:	Press [Enter] to leave the setup mode (parameterization). For the **secu4** the **password protection** needs to be activated with "YES" if the relay disruptor function for the overfill safety is used. During the activation the password will be shown once. **The password is fixed**, meaning it is not changeable but <u>only activatable/deactivatable.</u> The qualified technician should note down the password and store it appropriately. If the password is lost please contact TECSON. Therefore please have the <u>serial number</u> of the device ready!	not for secu4 for <u>secu4</u> loss of password
Menu item 9 Ë 24 see ff.	Steps 9 . 24 contain **special settings** which usually will not be needed.	all

After entering/setup of step 1 to 7 the <u>standard programming is completed</u>.

By confirming the "Exit" step the device automatically returns to the usual displaying mode and the present tank content is shown.

Mount the device cover after completing the initial setup!

Programming examples

Example 1	Cellar welded heating oil tank for 6000 L of heating oil, linear steel tank. Interior height 165 cm, (filling level: 125 cm), LITRO-level probe 0 - **250 mbar**. Device **e-litro**:

	Menu item	Setting / Selection
	1. Measuring probe	250 mbar
	2. Liquid	Heating oil
	3. Tank shape	Linear
	4. Tank volume	6000 liter
	5. Tank height	165.0 cm
	5b. Filling Limit	95%
	6. Display	Fillspace + Level
	7. Relay	OFF
	8. Exit [Enter]	Displaying mode => ... 4550 l ... 76 %

	Menu item	Setting / Selection
Example 2	Buried tank, cylindric horizontal, for 10,000 liters diesel, Inner height 1.59 m, (filling level 54 cm), LITRO-level probe 0 - **250 mbar** Device **e-litro gsm** with SIM card:	

	Menu item	Setting / Selection
	1. Measuring probe	250 mbar
	2. Liquid	Diesel oil
	3. Tank shape	Cylindric horizontal
	4. Tank volume	10050 l (<u>exact value from bearing chart</u>)
	5. Tank height	159.0 cm (<u>exact value from bearing chart</u>)
	5b. Filling limit	99% (no limit indicator)
	6. Display	Fillspace + Level
	7. Relay	On: 96% Off: 94% (relay energizes at 96%)
	8. (Exit)	Go forward to next step with [+]
	. . .	...
	15. Modem	PIN: xxxx - enter the PIN code of the SIM-card
	. . .	...
	19. Exit [Enter]	Displaying mode => ... 1280 l ... 13 %

	Menu item	Setting / Selection
Example 3	**e-litro secu4** device with 4 <u>battery tanks</u> 4 x 1250 liters, steel tanks with hemicycles at top and bottom, 155cm tank height, display: Fillspace + Level for each single tank disable tank filling at a limit of 94%.	

	Menu item	Setting / Selection
	1. Number of tanks	4
	2. Liquid	Heating oil
	3. Tank shape	Steel tanks
	4. Tank volume	1250 L (x 4)
	5. Tank height	155.0 cm
	5b. Filling limit	94% = 146cm
	6. Display	Not available for secu4 (no function)
	7. Unit	Active => »on«at 99% ; »off«at 10% of the filling level
	8. Exit [Enter]	Back to displaying mode; Display 1 (details per tank) switches with Display 2 total inventory in L; filling space in L

Tank with interior mantle

In case of a tank with interior mantle (e.g. horz. cyl. or cellar steel tank) correct the input values.

Example: Mantle thickness: ca. 5 . 10 mm:
=> Enter »5.Tank height«   reduce height by ca. 15 mm
=> Enter »4.Tank volume«   reduce volume by ca. 2 %

Special settings

Input function: Additional functions	Description	Device type
Menu items 1 to 7 see pages 7-9	The menu items 1 to 7 are the basic setup of the devices. Some special settings, e.g. language, network parameters or others, have to be set up via menu items 9 to 24.	all

9. Offset probe
 	
or for secu4:
9. Exit
	Sub-menu a. –Offset calibration– ±(electrical zero point)
	 b. –Probe bottom gap– (position over ground)
	 c. –Bottom dead stock– (shall not be displayed)
	- ESC Exit this sub-menu.
	- Offset calibration: Stores signal value of probe's zero point.
	                 Probe must not be plunged.
	- Probe bottom gap: Distance x cm
	                 Standard is x = **0 cm**, max = 99 cm
	- Bottom deadstock: <u>Sucking</u> position over ground: y cm
	                 Standard is **0 cm** = full inventory.
	                 y > 0 cm means dead stock height
	                 which doesn't occur in the liter displaying
	- **Default values**: Resets all values back to standard 0.
	
	For secu4: Exit
		all
		
		do <u>not</u> execute with e-litro

10. Trim height	Input option for the reference height for calibration of probe and measurement device. It is useful in case of unknown specific weight of the fluid. Enter the current liquid level: **xx.x** cm (+ / - / Enter) and confirm with **YES** / no. If this is done at a low tank filling level it is recommend to repeat this later again at a higher filling level.	all
11. Exit	Exit the menu with [Enter].	all
12. Unit	Adjustable units are: **L** (liters), %, m, kg, t (tons), IG (Imperial Gallons), UG (US-Gallons) as well as pressure units mbar and kPa. [+ / - / Enter] –L– or –kg– values are displayed with a separator point for values over 1000. –%– or –m– values are displayed with two decimal places.	not for secu4
13. Rounding	**Automatically** - Default setting for automatic rounding Without rounding - No rounding means highest resolution. Unsteady, wobbling values may occur. 2 / 5 / 10 / 20 / 50 / 100 [L] are selectable	not for secu4
14. Exit	Exit the menu with [Enter].	all

15. Network or	**e-litro net** :	- DHCP . . . Sub-menu for network parameter setup like IP address, message destination and communication test. Please coordinate these settings with your network admin. See additional documentation 'network device connection'	only for e-litro net since V7.0 with **email** function!
15. Modem	**e-litro gsm:**	- Modem 'Active: YES / NO' - Send SMS: NO / YES At this point is no SIM card PIN editing necessary. The device will ask for the PIN when needed.	only for e-litro gsm
16. Delete tank	'ESC'/ 'tank n'	Deletion of a registered tank. Here you may re-sort or delete the registered tank numbers. (+ / - / Return)	only for e-litro gsm e-litro net
17.Input/Output	Alarm-In: . . .	Choose the function of the alarm contact input: - **Deactive** Defines the alarm input to be 'not operating' - Opening If input contact opens for > 4 min. then alarm case will be entered. - Closing If input contact closes for > 4 min. then alarm case will be entered.	only for e-litro gsm e-litro net

	Data-Out:
	. . .
		Defines the data output at the adaptor slot.
		The available options are:
		 - Output of one liter value:
		     Total (sum) in case of secu4 or pluged output adaptor.
		 - Output of all tanks T1 . T4 in sequence.
		   => Data of all tanks sequentially go to the output, e.g. for a PC-LINK serial output adaptor.
			only for secu4, e-litro gsm, e-litro net

17b. H protocol	Data output:	- Deactive - Data: Liters - Data: Level.	Data output 'Serial link out'
18.Language + Names	Language: . . .	'German'/ 'English'/ 'French'/ 'Spanish' + / - / Enter	all
	Names: . . .	Tank name: (Name suggestion:) Heating oil Choose letters with + / - / Enter	all
19.Exit	Press [Enter] to return to the displaying mode.		all

Input function: Additional functions	Description	Device type
20. LCD Display	By factory the contrast of the LCD display is preset as: 　　　　　Contrast: xx　　(xx is a hexadecimal value)	all
21. Device-info	Shows: Software version :　V6.01　　　　　　　(e.g.) Serial no.　　　 :　Tank i: SN=1234　　(i = Tank-no.) Offset + Gain　 :　X0=2980 B=1268　　(for Tank i)	all
22.Test current	Testing function for the current mA signal of the measuring probe:　　e.g.　　ADC = 28A0 = 4.00 mA 　If the bubbling-through pipe is not plunged the value 　should be near to 4 mA. 　Tolerance range is　3.7 ... 4.3 mA. 　If out of tolerance range see menu item 9.	Not for secu4
23. Test relay	Testing function for relay switching: Relay 1 = **Off** / On　　　　　　　　　　　　　+ / - / Enter	Not for e-litro
24. Reset	Resetting the device software: - ESC　　:　　　　　Leaves this sub-menu without execution. - Restart :　　　　　New initialization of the device software, 　　　　　　　　　　　but parameter setup is left unchanged. - Reset Password: Password resetting to ±tankq 　　　　　　　　　　　(only with e-litro net). - Factory setting:　Complete reset of all parameters back to 　　　　　　　　　　　the original factory settings.	all since V7.00
25. Configuration	Protected area:　　Exit with:　　£fg:0q [Enter]	all
26. Exit	Press [Enter] to return to the displaying mode.	all

Error messages / Error indication

Display:　<u>±wait...'</u>

> This notification indicates that the connected LITRO-Sensor or the sensorbox is still
> in power charging mode. It should disappear after 1 to max. 5 min. and the normal tank
> level should be displayed.
>
> Normally the LITRO-Sensor indicates this status with a red-green parallel blinking.
> In case the display status remains unchanged for more than 10 min, please unplug the
> power plug for at least 10 sec.

Error code	Meaning
Error **E 1**	Invalid input value.
Error **E 2**	Signal value of the LITRO-sensor is too small (signal current less than 3.7 mA). In case of the secu4 the sensorbox transmits invalid data (probe error). Disconnect the current supply and turn the device back on. If the error lasts for at least 5 min. the LITRO-sensor or the sensorbox is defective.
Error **E 3**	Measuring value of the LITRO-sensor is too high for offset calibration. The probe must not be plunged! A current of 4.5 mA or higher indicates a probe problem.
Error **E 4**	Measured value is implausible. Perform menu item ‚9.Offset probe'
Error **E 5**	Height input is larger than tank height. (Wrong input)
Error **E 6**	The measured value is too small for reference. Make sure the probe is plunged. The appointed height is too big or the measuring value (resp. the filling level) is too small for setting. Perform step ‚9. Offset probe' Otherwise probe error.
Error **E 7**	The measured value is too small for the appointed tank height or tank volume. Make sure the probe is plunged!
Error **E 8**	**For secu4:** The high test pressure during the maintenance check (s. page 20) was fully reached. This was the aim of the test. So no error is present. For LITRO-sensor: Wait until the loading phase after the initial start is completed (max. 5min.). Otherwise the sensor is not connected properly. Plus (= blue or white or red) => connect to clamp 1. The second display line shows the signal current. A value larger than 22 mA (e.g. 25 mA) indicates a clogged or bent measurement line to the buried tank. Please blow through or replace the measurement line, preferably with the blue bubbling-through pipe of the e-litro set. As a TEST the bubbling-through pipe can be disconnected from the LITRO-Sensor. E8 should disappear with the next pumping action. Otherwise the LITRO-sensor is defective or it has too much pressure.
Error **E 9**	The current value is 0 mA. The probe's connection could be broken. Check probe connection (polarity) and extension and if necessary reconnect it.
Error **E10**	Calibration error. Switch off and on the 230V supply voltage after waiting for 5 sec and retry. Otherwise the LITRO-sensor or the sensorbox is defective.
Error **E11**	Warning: The liquid level of the tank is too low for an exact calibration (Press [Enter] to continue anyway).
Error **E12**	With the e-litro: Invalid signal values from the LITRO probe. For the testing pull off the measuring hose briefly. After pumping then check 0 Liter displaying. With secu4: Sensorbox hasn't sent measurement data yet. Wait 3 minutes. With e-litro net or e-litro gsm: No reading from tank 2, 3, or 4 yet.
Error **E13**	No measurable pump pressure. Disconnect the current supply then reconnect it and wait for one pumping cycle. If the error E13 remains the micro pump is defective. Otherwise send in the LITRO-sensor or the sensorbox! The device is not repairable on site. Do not open the device, loss of warranty!
Error **E14**	Charging voltage is too low. Wait for 3 min. If necessary disconnect the power supply for 10s.
Error **E15**	No data from the sensorbox. Potential disruption of the signal line to the sensorbox.
Error **E16**	Implausible pressure drop of one of the tank measuring lines (please check!). Disconnect the power supply for 10s or cancel E16 with OK. Otherwise the sensorbox is defective.
Error **E18**	Device function error. The internal test pressure was not reached!

	The sensorbox of the secu4 or the LITRO-sensor <u>has to</u> be replaced.

For device type **e-litro net**

Info/Error-Messages at Network Communication

| Error **N 1**	No network communication. Problem with the internal network module. The device automatically executes a 'reset' for the internal network module and retries communicating. Try disconnecting the power supply, wait 5' and reconnect.
Error **N 2**	Error in the network communication. Signal destination cannot be reached / data sending impossible. Check the connections at the device and at the network router. Check parameter setup at menu item '15.Network'.. Perform the function '15.Network > Test > Ping: Yes' . Try to connect a different network device at this network cable, e.g. a Laptop. If it does not work please contact your network administrator. Error N2 only occurs in case of a domain like 'oilview.de' is entered for destination. In case of entering an individual dest-IP, no Error N2 message will be shown. Important: The destination address must be a <u>fixed</u> IP address. Otherwise the device retries sending again and again, caused by an unreachable destination IP address.
Sending ...	'Sending' is displayed if a data message is currently in process of sending. The message destination can be setup as an IP address at menu item '15.Network => Dest. ...' 'Sending...' will be displayed periodically caused by an unreachable destination IP. The destination should be a fixed IP address. IP + Port should be set correctly.

XML-Data:	Call the device via browser or program with command ***IP-address* / xml**

Relay remote control:

Telecontrol / Teleswitching via relay of the **e-litro net** device:
The relay can be operated by remote commands from the browser at the 'config' page.
Please refer to the additional device parametrization.
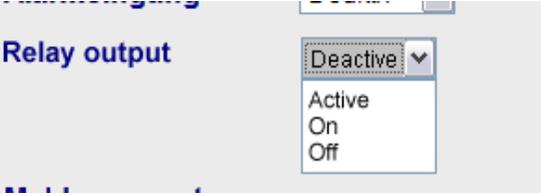 	
Relay output Deactive ▼   Deactive = No switching
                      Active = State depends on level
          Active   On = Makes the relay operate (fix)
          On   Off = Makes the relay release state (fix)
          Off

For device type **e-litro gsm**

Error messages GSM module / SIM card / Mobile network

Error **M 0**	GSM modem is inactive. Entering PIN => 0000 completely deactivates the modem.
Error **M 1**	Internal communication error. The device automatically executes an internal RESET and retries communicating with the internal modem.
Error **M 2**	SIM card is not inserted, is not readable or is defective. Please check the SIM card using a mobile phone.
Error **M 3**	PUK code must be entered. Wrong PIN has been entered three times, SIM-card is locked. Insert the SIM card in a mobile phone and enter the PUK code to unlock it.
Error **M 4**	No credit on the prepaid account.
Error **M 5**	No mobile network available for the SIM card (an external antenna could help). Destination number set correctly? (please check)
Error **M 6**	Network or other failure during sending procedure.
Error **M 7**	Mobile network registration not completed yet.
Error **M 8**	Interlock is active! In case of too many failed network logins after 7 days only 1 dial-in trial will be performed on a daily basis for 255 days maximum. The [Enter] button activates the device for another logon trial. In case of a successful sending the interlock will be removed.
Error **M 9**	No destination mobile number configured yet. #T command or OilView-connection not configured yet.

Relay- remote control:	Telecontrol / Teleswitching via relay of the e-litro gsm device: The relay can be operated by #S-commands. Please refer to the additional device parametrization.

Electrical connections for e-litro

= slot for adaptors:
M-BUS ; 0-5 V outlet ;
4-20 mA outlet ; link adaptor

Clamp contact number:

1: LITRO-sensor input **(+)**
   (**red** or white or blue)

2: LITRO-sensor input **(-)** (**brown** or black)

3 + 4: Input for a second LITRO-sensor
   (this option is not equipped)

Rightmost clamping block: AC 230V N/L supply

Electrical connections for secu4

Left clamping block:

Sensorbox connection
   [1] = white (plus)
   [2] = green (signal)
   [3] = brown (minus)

Bottom right clamping block:

Power supply: 230V AC N/L

Electrical connections for e-litro net / e-litro gsm

Clamp contact number:

1: LITRO-Sensor input **(+)** (red, white, blue)

2: ditto **(-)** (black, brown)

3: data input for additional e-litro device **(+)**

4: ditto **(-)**

5: alarming contact input **(+)**

6: ditto **(-)**

7 + 8: relay output: opening contact   (normal status is closed)

9 + 10: relay output: closing contact   (normal status is open)

Rightmost clamping block: AC 230V N/L supply

Modem / Communication:

GSM module at **e-litro gsm:**	GPRS modem, Quad-band	**Up to V7.0:** 2G radio modem. **Since V7.1: 4G / 2G** radio modem with SIM card purely for SMS communication to be inserted..
Network modem at **e-litro net:**	Ethernet 10/100 MBit	Connection RJ45 network socket.

Regulations, Maintenance and Documentation

Regulations: ⚠️	▪ Installation and startup have to be performed by a qualified technician. ▪ The regulations of the device documentation have to be followed precisely. The documentation needs to be preserved at the device. ▪ The device settings are to be performed accurately for all parameters. The device parameters will be set by a qualified technician once and will be checked at maintenance. ▪ During a refill the display warning and alarm signaling need to be observed carefully by the responsible person (tanker truck driver)! In case of an alarm the refill needs to be stopped immediately! ▪ In displaying mode the device is unmanned. Accordingly the device has no adjustment options accessible from the outside. Only an alarm-QUIT-button is located at the top of the device. ▪ The unit functions should be checked regularly e.g. during the boiler maintenance. This needs to be induced by the operator.
Password for **secu4**:	▪ If the **secu4**'s tanker switch off function is used the password needs to be activated in menu item 8. The password is predefined.

Maintenance: ⚠️ 	▪ Manufacturer's specification: Perform hardware maintenance at every tank or boiler maintenance. After expiration of the warranty period perform maintenance 1 x per year. ▪ Check the relay switching function via menu item "23 Test relay" ▪ For the measurement value test the filling level of the tank needs to be determined and compared to the displayed value (cm). Valid measurement variation <= 2% of a full tank. ▪ **Additionally for secu4:** Fold and hold the measurement hose of tank 1 until the sensorbox has completed its pumping process… <u>**Check:**</u> Then the display has to show Error **E008**, by means the test was successful (OK). <u>**Otherwise**</u> the check was **not** successful! In that case please send in the sensorbox to TECSON to be repaired.

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CE	The producer conformity certificate is located at www.tecson.de under menu item "Documentation"	