This product is discontinued!

DL240

Data Logger DL240

Operating Manual and Installation Instructions

Operating Manual:	73015765	SW version:	from V2.04
Issued	13.11.2006 (d)	Edition:	

All details and descriptions in this operating manual and installation instructions have been given only after careful checking. Despite this however, the possibility of errors cannot be completely eliminated. Therefore, no guarantee can be given for completeness or for the content. Also, the manual cannot be taken as giving assurance with regard to product characteristics. Furthermore, characteristics are also described in it that are only available as options.

The right is reserved to make changes in the course of technical development. We would be very grateful for suggestions for improvement and notification of any errors, etc.

With regard to extended product liability the data and material characteristics given should only be taken as guide values and must always be individually checked and corrected where applicable. This particularly applies where safety aspects must be taken into account.

Mainz-Kastel, November 2006

Contents

I Safety information

F *The connections of the DL240 are freely accessible during setting up. Therefore, make sure that no electrostatic discharge (ESD) can occur in order to avoid damage to the components. The person carrying out the installation can, for example, discharge himself/herself by touching the potential equalisation line.*

F *To avoid erroneous operation and problems, the operating manual must be read before putting the DL240 into operation. In particular the descriptions in Chapter 4 should be followed.*

In the device there are modules which are approved as "**associated electrical equipment**" in Category "ib" according to DIN EN 50020 with intrinsically safe circuits (s. Chap.A-2). This means that the DL240 is suitable for the connection of pulse generators and signals which are located in areas subject to explosion hazards. As stated on the manufacturer's declaration, the DL240 itself is rated for application in Ex Zone 2 (see Chap. A-3).

When operating the device as "**associated electrical equipment**", it is essential to follow the instructions below:

F *Follow the regulations in the relevant standards, in particular DIN VDE 0165.*

F *For the installation and operation of the DL240 follow the DVGW guidelines for the construction and operation of gas measurement systems as well as the appropriate PTB guidelines.*

F *Make sure that the limits quoted in Appendix B for the devices to be connected are not exceeded.*

F *The DL240 must be connected by the PA terminal on the CPU board to the potential equalisation strip without interruption.*

When operating the device in **Ex Zone 2**, it is essential to follow the instructions below:

F *Refer to the manufacturer's declaration in Chap.A-3!*

The DL240 can be optionally supplied with **mains voltage at 230 V**. Mains voltage is highly dangerous!

F *The installation and any modification must only be carried out by appropriately trained personnel.*

F *Only switch on the mains voltage when all cables have been connected. When making modifications to the connections, it is essential to make sure that there is no voltage present on the device and that it is secured against switch-on.*

II Items supplied and accessories

II-1 Included items

The following items are included with the DL240:

a) Data Logger DL240
b) Dispatch list
c) Design data sheet
d) Operating Manual
e) 4 cable glands, 2 internal hinges and var. hardware

II-2 Ordering data and accessories

Data Logger DL240

• Complete device	834 80 050
• Basic device (without accessories and batteries)	730 15 763

Accessories

• Operating manual, English	730 15 765
• Plug-in terminal, 2-pole black	041 30 407
• Calibration covering cap	730 15 777
• Battery module	730 17 964
• Cable tie, releasable (for battery)	040 90 124
• Interior hinges (mounting aid)	041 95 034
• IR readout head	730 15 883
• KD-100/PS2 direct readout cable	730 15 152

Options

• Power supply, 230V (incl. accessories)	730 15 770
• Standard modem, 14k4 (incl. accessories)	730 16 757
• ISDN modem (incl. accessories)	730 17 117
• GSM modem - Wavecom (incl. accessories)	
• GSM antenna housing	730 17 320
• External modem connection (incl. accessories)	730 16 941
• RS232/RS485 interface (incl. accessories)	730 16 909
• Ethernet card (incl. accessories)	730 17 688
• CS interface (incl. accessories)	730 17 709

1 Brief description

1.1 Functions and performance features

General:

The Data Logger DL240 is intended to be used as a battery operated, compact device for the acquisition and storage of counting pulses and / or level changes for various types of energy in applications subject to official calibration.

Four counter/signalling inputs, separate from one another, from the Ex area or outside of the Ex area (any combination possible).

Acquisition and archiving of meter readings and maxima separately for each channel.

System monitoring (signalling function) with appropriate reactions, locally via outputs or via remote data transmission (SMS message) to a GSM recipient (with modem option).

Optional: Various modems (analogue, ISDN or GSM) with external power supply.

Power supply:

Battery operation for acquisition unit; service life depending on operating mode ≥ 8 years.

Battery replacement possible without loss of data and without violation of calibration seals.

Data back-up of all system data and relevant billing data (e.g. month-end readings, maxima...) without battery supply using EEPROM.

Connection to external 230 VAC supply possible.

Operator interface:

12-character LCD display, description of values with short designations.

Operation via 4 cursor keys, special functions by operation of two keys.

Programming via keypad possible.

Calibration switch (separately sealed in the device).

Access to the device via different levels possible:
Calibration official, manufacturer, supplier or customer.

Adjustable write and read rights for various values.

Pulse / signal inputs:

4 intrinsically safe inputs (programmable as pulse or signal inputs).

Mixed operation of all inputs possible (intrinsically safe or non-intrinsically safe).

Connection possibility provided for reed contacts and transistor switches.

Maximum counting frequency 10 Hz.

Various counters for each input (totaliser, adjustable counter, current measuring period counter, current day counter and, where possible, for HT/LT selection).

Pulse / signal outputs:

2 transistor outputs (switching to ground), each freely programmable as pulse, alert, warning output, limit monitoring, time-synchronous output.

Remote switching of outputs possible using parameterising software.

Pulse duration adjustable on pitch of 125 ms (max. output frequency: 4 Hz)

Output buffer can be read out (memory depth: 65535 pulses)

Data interface:

Optical interface according to IEC 1107.

Internal TTL interface for modem connection (alternative):
- various internal modems (analogue, ISDN, GSM),
- use of an external modem via RS-232 / RS-485 interface,
- connection of Ethernet bus,
- connection of external modem with CS interface (CL0, passive, max. 19200 Bd).

Mechanical details / housing:

Wall-mounted housing, 160x160x90mm (WxHxD)

Optional: External mounting feet, top-hat rail mounting or panel-mounting frame

Mounting and device installation without breaking the calibration seals.

Temperature range for basic unit: -25°C...+60°C;
temperature range with various options: see Annex. B.

Class of protection: IP 64, non-condensing atmosphere.

Approvals:

PTB approval as high-flow display device for the media gas and water.

PTB approval as flow recording device for the media gas and water.

Associated operating equipment for Ex Zone 1 (also in modem mode)

Application in Ex Zone 2 possible also in modem mode (according to DIN VDE 0165)

National / European telecommunications approval (constituent part of modem).

Software:

Event-controlled archiving of counter readings:

a) 4 counting channels (E1-E4): approx. 173 days with 60 min. measurement period or 6 weeks for 15 min. (depends on status messages).

b.) Month end readings (2 adjustable counters) and day and measurement period maxima for E1-E4 and computation counter: 15 months

c.) Logbook: 250 entries

Manual possibility for backing up all counter readings.

Backing up of all system data after a change.

Automatic saving of date and all counter readings 1x per day

Display of the archived values possible on the display incl. skip function in the archive

Computation of measurement period value (consumption) in archive possible on-line.

Setting of the counters to be archived (2 counters for each archive).

Separate read-out modes for supplier, customer, maintenance and network operator (i.e. support of up to 4 independent read-out parties possible).

Provision of a day boundary separately for each channel; value can be called into display.

HT/LT switchover; display of current counter and condition at switchover.

Display of the momentary flow.

Pulse summation function possible via computation counter.

Measurement period of 1...60 min. and 1...24 h adjustable separately for each channel.

Display of remaining time for current measurement period.

Display of current daily and measurement period consumptions on display.

Display of last daily and last measurement period consumptions on display.

Provision of a measuring point label according to association agreement.

Also non-decade pulse values can be programmed separately for each channel.

Three modes for the selection of summer/winter time (none, automatic, manual setting).

Completely programmable via interface.

Modem functions, general:

Data transmission via modem or other remote data transfer devices.

Remote adjustment of all values possible depending on lock status.

Programmable number of ringing tones before accepting call.

Access monitoring for readout and setting of values via locks.

Two time frames programmable for receiving calls.

Spontaneous message via SMS (see below).

Participation on an IEC1107 bus system (connection formation with device address).

GSM mode (optional):

GSM modem with SIM card holder can be integrated.

External GSM antenna (approx. 3m), optional with housing as screening.

PIN support for SIM card security.

Display of network operator and reception strength.

Auto-login once per day and before sending an SM.

SM initiation for test purposes possible on device.

Sending short messages (SMS):

Instant message via SMS and D1 or D2 networks to a control station (with GSM modem) or mobile phone based on messages occurring in the DL240.

Sending of an SM to up to two recipients possible.

Customised setting of up to 8 values which are to be sent by SMS (incl. short designation and unit); adjustable separator of individual values.

SMS mode not possible via external modems with CS interface.

Monitoring functions

Monitoring of signalling inputs with appropriate reactions (e.g. warning, entries in the logbook, signal on outputs, sending a short message).

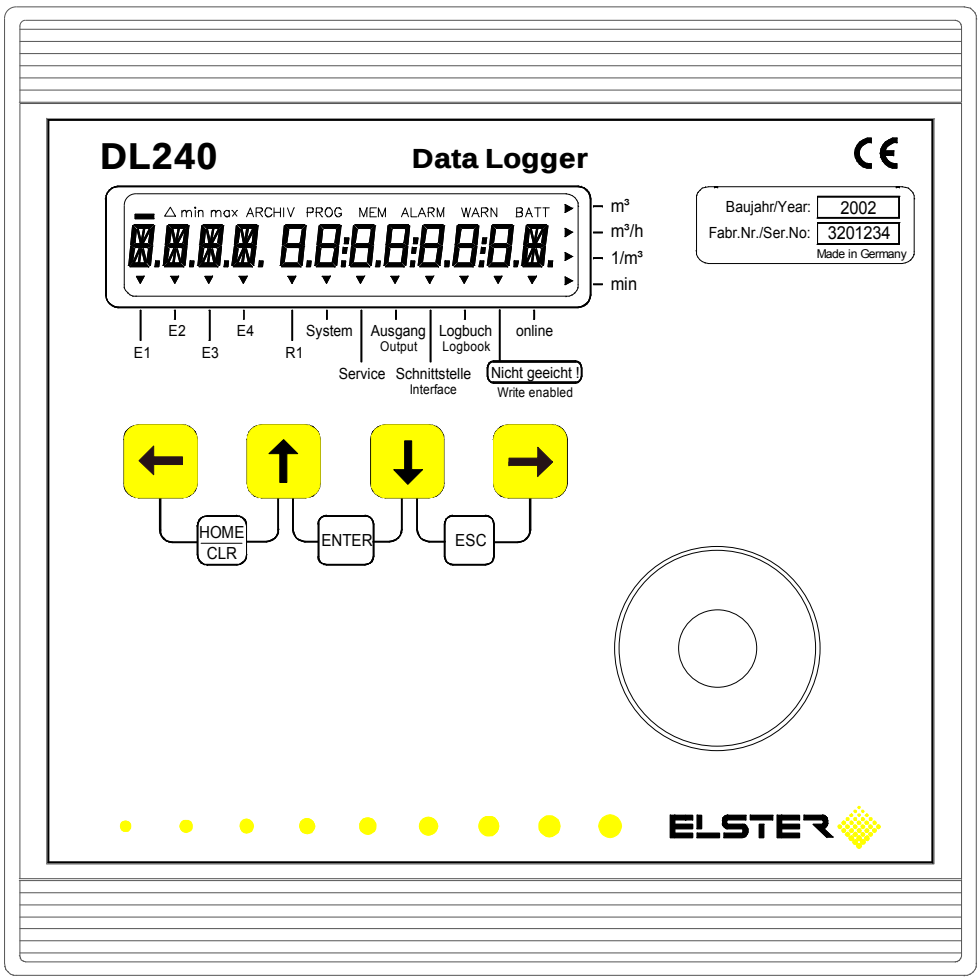
Monitoring of programmable limits with appropriate reactions (e.g. signalling via outputs, sending a short message).

Internal monitoring of the HW and SW functions in the device with appropriate reactions (e.g. signalling via outputs, sending a short message).

2 Operation

2.1 Front panel

For operation an LCD display with 160 segments and four cursor keys is provided on the front panel:



The display has the following display features:

- Single-line text display with 12 characters.
- Ten special symbols in the top margin.
- Four arrow symbols in the right-hand margin for identifying the unit.
- Ten indicator arrows in the bottom margin for identifying the list in which the displayed value is located, one indicator arrow for showing whether the value is calibrated and one indicator arrow for the interface status.
- There are four keys on the front panel for operating the DL240. When a key is pressed, a corresponding movement occurs within the list structure. Special functions can be executed by pressing two keys simultaneously.

2.2 Displaying values

Identification of the data on the 12-character display occurs using abbreviated designations. Generally, an abbreviated designation consists of up to four letters which appear at the left end of the display. The right-hand eight places are normally used for displaying numerical values.

The corresponding address can be superimposed for unambiguous identification of the displayed values using the display "Help" function (see Chap **0**). The significance of the address is explained in Appendix 0 .

2.3 Formation of the list structure

The data display in the DL240 is structured in a tabular form. The individual columns in the table each contain associated values.

2.3.1 Movement within the list structure

Key(s)	Designation	Action
"↑"	Arrow key, top	**Upwards movement** within the current list: From the first value in the list movement is then to the last value.
"↓"	Arrow key, bottom	**Downwards movement** within the current list: From the end of the list movement is then to the first value.
"←"	Arrow key, left	**Skip** from any value within a table to the top value of the column to the **left.**[1]
"→ "	Arrow key, right	**Skip** from any value within a table to the top value of the column to the **right.**[1]
"↓ ↑"	ENTER	**Activate entry mode, open submenu or update measurements.**
"← ↑"	HOME/CLR	**Skip to the top row** of the current column or to left field (Field 1,1) within a matrix.
"↓ →"	ESC	**Skip from a submenu** to the menu immediately above.
"← →"	HELP	**Calls the address** of the displayed value.

Note: Key function during operation: See Chap. 2.4

[1] With similar lists (e.g.: Input 1-4), skipping to the similar value in the adjacent list occurs.

2.3.2 Summary charts, List Structure 1

	E1 – E4 (Counter input)				E1 – E4 (Status input)		
⇔ to "Log book"	Vx	Main counter x **(1£ x £ 4)**		*or*	ST.Ex	Status signal input Ex	⇔ to "R1"
	Vx.LT	LT counter x			MD.Ex	Mode input x	
	Vx.T	Totaliser x			MD.ME	Mode for monitoring Ex	
	Vx.P	Counter, adjustable x					
	Qx	Flow rate x					
	L.ME	Limit for monitoring input Ex					
	HT.LT	Event for switchover HT/LT					
	MD.Ex	Mode, input x					
	MD.ME	Mode for monitoring x					
	SC.ME	Source for monitoring x					
	CP.Ex	cp value, input x					
	SN.M	Serial no., meter (places 1-4) and with arrow right places 5-12					
	DS.Ca	DS-100 number for Counter "a" in archive					
	DS.Cb	DS-100 number for Counter "b" in archive					
	Cu.No	Customer number input x					
	MP.Ex	Measurement period input x					
	MP.RE	Remaining time in meas. period					
	Vx.MP	Incr. meas. period counter Ex					
	VxM.L	Last meas. period value Ex					
	Vx.MP	Max. meas. per. counter Ex current month	**U1**				
	DY.Ex	Day boundary for input x					
	Vx.DT	Current day counter input x					
	VxD.L	Last day value input x					
	Vx.DT	Max. day counter input x current month	**U2**				
	Arx.1	Month archive input x	**U3**				
	Arx.2	Meas. period archive Ex	**U4**				
	Frx.2	Meas. period archive Ex frozen					

Note:

- x (1≤ x ≤ 4) signifies that "x" can take on the value 1...4 in the abbreviated designation; e.g.: V1, V2, V3 or V4
- Meaning of the abbreviated designations: See Chapter 3 and Appendix 0 .
- So-called submenus, which are explained in the following tables, are arranged under "U1" - "U7" (see Chapter: 2.3.3).

2.3.2 Summary charts, List Structure 2

	R1		
⇔ to "E4"	R1	Comp. counter Vx (e.g. ∑ V1-V4)	⇔ to "System"
	R1.LT	Comp. counter Vx.LT	
	R1.T	Comp. counter Vx.T	
	R1.P	Comp. counter, Vx.P	
	Q.R1	Flow R1	
	L.ME	Limit for monitoring R1	
	MD.R1	Mode R1	
	MD.ME	Mode for monitoring R1	
	SC.ME	Source for monitoring R1	
	DS.Ca	DS-100 number for Counter "a" in archive	
	DS.Cb	DS-100 number for Counter "b" in archive	
	Cu.No	Customer no., comp. counter	
	MP.R1	Measurement period R1	
	MP.RE	Remaining time for meas. per.	
	R1.MP	Incr. meas. period counter R1	
	R1M.L	Last meas. period value R1	
	R1.MP	Max. meas. period counter R1 current month	**U1**
	DB.R1	Day boundary, comp. counter	
	R1.DT	Incr. day counter R1	
	R1D.L	Last day value R1	
	R1.DT	Max. day counter current month R1	**U2**
	Ar5.1	Month archive R1	**U3**

Note:

- Meaning of the abbreviated designations: See Chapter 3 and Appendix C .
- So-called submenus, which are explained in the following tables, are arranged under "U1" - "U7" (see Chapter: 2.3.3).

2.3.2 Summary charts, List Structure 3

⇔	System		⇔	Service		⇔
to "R1"	TIME	Time and with "→ " to date		-	Display test	to "Output"
	MOD.T	Summer / winter time on/off		L.STA	Supplier's combination status/close	
	M.CYC	Measurement cycle		L.COD	Supplier's combination enter/change	
	DISP	Permanent display on/off		BAT.R	Residual service life of battery	
	AUT.V	Time to automatic display changeover		BAT.C	Battery capacity	
	Fa.No	Fabrication no. DL240		BACK	Backup all data	
	VER.1	Software version, application		CLR.V	Clear counter (incl. archive)	
	VER.2	Software version, driver		CLR.X	Execute restart	
	CHK.1	Checksum, application		Add	User-specific display	
	CHK.2	Checksum driver		Misc	Value of user-specific display	

⇔	Output		⇔	Interface		⇔
to "Service"	MD.A1	Mode, Signal Output A1		MD.S2	Mode, internal interface	to "Logbook"
	SC.A1	Source, Signal Output A1		DF.S2	Data format, internal interface	
	CP.A1	cp value, Signal Output A1		Bd.S2	Baud rate, internal interface	
	SM.A1	Signal for Status Output A1		NUM.T	Number of ringing tones before accepting call.	
	MD.A2	Mode, Signal Output A2		GSM.N	Network operator	
	SC.A2	Source, Signal Output A2		GSM.L	GSM reception level	
	CP.A2	cp value, Signal Output A2		RES.P	Status, SIM card PIN (GSM)	
	SM.A2	Signal for Status Output A2		Bd.S1	Baud-rate identification, optical interface	
				CA1.B	Call Acceptance Window 1, start	
				CA1.E	Call Acceptance Window 1, end	
				CA2.B	Call Acceptance Window 2, start	
				CA2.E	Call Acceptance Window 2, end	
				RES.1	Response to Spont. Signal 1	
				RES.2	Response to Spont. Signal 2	
				SEND	Release spontaneous signal	

⇔	Logbook			⇔
to "Interface"	S.REG	Status register	**U5**	to "E1"
	STAT	Momentary status	**U6**	
	CLR	Clear status register		
	LOGB	Logbook	**U7**	

2.3.3 Summary charts, submenus "U1" – "U7"

U1 Submenu: "Max. measurement period counter E1 - E4 in current month"

to date ⇔ TIME ⇔ (Date) ⇔ to TIME

U2 Submenu: "Max. day counter E1 - E4 in current month"

to date ⇔ TIME ⇔ (Date) ⇔ to TIME

U3 Archive: "Month archive E1 - E4 / computation channel"

to Er.Ch	⇔	ABNo	⇔	TIME	⇔	(Date)	⇔	***C"a"***	⇔	***C"b"***	⇔	to VxM.L
	⇔	ABNo	⇔	TIME	⇔	(Date)	⇔	***C"a"***	⇔	***C"b"***	⇔	
	⇔	ABNo	⇔	TIME	⇔	(Date)	⇔	***C"a"***	⇔	***C"b"***	⇔	

to Vx.LT	⇔	***VM.L***	⇔	TIME	⇔	(Date)	⇔	STAT	⇔	to VxT.L
	⇔	***VM.L***	⇔	TIME	⇔	(Date)	⇔	STAT	⇔	
	⇔	***VM.L***	⇔	TIME	⇔	(Date)	⇔	STAT	⇔	

to STAT	⇔	***VT.L***	⇔	TIME	⇔	(Date)	⇔	STAT	⇔	ST.x	⇔	ST.SY	⇔	Er.Ch	⇔	
	⇔	***VT.L***	⇔	TIME	⇔	(Date)	⇔	STAT	⇔	ST.x	⇔	ST.SY	⇔	Er.Ch	⇔	to ABNo
	⇔	***VT.L***	⇔	TIME	⇔	(Date)	⇔	STAT	⇔	ST.x	⇔	ST.SY	⇔	Er.Ch	⇔	

U4 Archive: "Measurement period archive E1 – E4"

to Er.Ch	⇔	ABNo	⇔	TIME	⇔	(Date)	⇔	***C"a"***	⇔	*D**"a"***	⇔	to Vx.LT
	⇔	ABNo	⇔	TIME	⇔	(Date)	⇔	***C"a"***	⇔	*D**"a"***	⇔	
	⇔	ABNo	⇔	TIME	⇔	(Date)	⇔	***C"a"***	⇔	*D**"a"***	⇔	

to DVx	⇔	***C"b"***	⇔	*D**"b"***	⇔	ST.x	⇔	ST.SY	⇔	S.TE	⇔	Er.Ch	⇔	to ABNo
	⇔	***C"b"***	⇔	*D**"b"***	⇔	ST.x	⇔	ST.SY	⇔	S.TE	⇔	Er.Ch	⇔	
	⇔	***C"b"***	⇔	*D**"b"***	⇔	ST.x	⇔	ST.SY	⇔	S.TE	⇔	Er.Ch	⇔	

U5 Submenu: "Status register, total"

to SR.4	ô	SR.SY	ô	SR.1	ô	SR.2	ô	SR.3	ô	SR.4	ô	to SR.SY
		2:100		1:111		2:111		3:111		4:111		

U6 Submenu: "Momentary status, total"

to ST.4	ô	ST.SY	ô	ST.1	ô	ST.2	ô	ST.3	ô	ST.4	ô	to ST.SY
		2:100		1:110		2:110		3:110		4:110		

U7 Archive: "Logbook"

to Er.Ch	⇔	ABNo	⇔	TIME	⇔	(Date)	⇔	S.TE	⇔	Er.Ch	⇔	to ABno
	⇔	ABNo	⇔	TIME	⇔	(Date)	⇔	S.TE	⇔	Er.Ch	⇔	
	⇔	ABNo	⇔	TIME	⇔	(Date)	⇔	S.TE	⇔	Er.Ch	⇔	

Note: Meaning of the abbreviated designations: See Chapter 3 and Appendix 0 .

The entries marked in bold and italic text depend on the programming of the archive entries (see Chapter 0).

2.3.4 LCD special characters and function of the arrows

The special characters positioned in the top margin of the LCD have the following meaning:

_	The value located in the display is a mean value.
D	The value located in the display is a counter increment (consumption).
min	Label for a minimum.
max	Label for a maximum.
ARCHIV	The value in the display is an archive value, i.e. it has been saved due to a defined event.
PROG	The segment is illuminated while the calibration lock is open.
WARN	Display of the current device status. A flashing segment indicates that the cause of the disturbance is actively present on the DL240. Constant illumination means that the cause is no longer present on the device, but the status message in the status register has not been acknowledged.
BATT	The segment flashes when the computed battery service life has fallen below the limit (default: three months).

The ten left arrows in the bottom margin on the display are used for orientation and for better identification of the relevant displayed value. A "column heading" of the display list (see Chap. 0) is assigned to each arrow. For each value the relevant associated arrow is switched on (e.g. display *TIME* -> Arrow "System").

The two right arrows at the lower margin of the display have the following meaning:

- Arrow "**Not calibrated**"
  Indicates to the user that the value located in the display is not calibrated and therefore may not be used for billing purposes. The function can only be switched off for non-calibrated applications.
- Arrow "**On-line**"
  Flashes during the time in which a link exists via the optical interface or via the internal interface (e.g. via modem).

The arrows located in the right-hand margin of the display point to the units printed on the front membrane. The corresponding arrow is turned on when displaying values with units.

All the right-hand arrows flash, except the arrow which, if applicable, indicates a unit, for indicating a possible branch to a submenu (e.g. "Logbook").

When operation is currently located in a submenu, the arrows in the lower margin of the display flash except the arrow pointing to the present display list.

2.4 Changing values

2.4.1 Differentiating between values (operating classes)

The methods of changing values differ depending on the value. These are therefore subdivided into so-called "operating classes". Each value in an operating class is treated identically on entry. The following operating classes are present in the DL240:

Type	OC[1]	Description	Change via "ENTER"
Constant	1	Value is permanently specified	No change possible
Measurements	2	Value determined by measurement (e.g. flow rate)	Displayed value is updated.
Permanent values	3	Parameters (e.g. serial number, c_P value)	Change possible depending on state of lock; values can be changed in permissible range.
Discrete values	4	Parameters which can only assume a few permanently defined values (e.g.: Mode, input)	Change possible depending on state of lock; values can be changed in predefined range.
Initial. values	5	Values which can only be set to their initial value (e.g.: status register).	Change possible depending on state of lock; values can be changed to initial values.
Trigger function	6	Functions which can be triggered via keypad (e.g. Clear counter).	Change possible depending on state of lock; trigger by changeover to "1" and terminating with "Enter".
Combination	7	Opening / closing the supplier's lock.	Similar to "Permanent values", but with masked entry.
Archive values	8	Display of the archived values possible in Operating Classes 1-3.	No change possible.
-	9	Not used in the DL240.	
Headings	10 / 11	Heading for archives (10) or submenus (11).	Branching to the appropriate menu (submenu)

[1] OC: Operating Class; each value is assigned to one of the 11 operating classes

2.4.2 Input function

Depending on the operating class, there are slight differences when entering values. The following points are the same for all operating classes:

ENTER [↓ ↑] activates the entry mode (corresponding figures flash) and terminates the entry of a value with acceptance as a valid value.

ESC [↓ →] cancels an entry; the previous value is retained.

The display mode becomes active again after termination of the entry.

In various operating classes the following actions in the entry mode lead to different functions:

OC	Action	Function
1	ENTER [↓ ↑]	Entry not possible (constant)
2	ENTER [↓ ↑]	Entry not possible; only updating of measurement
3	ENTER [↓ ↑]	Entry mode becomes activated, the most significant figure flashes.
	↑, ↓, →, ←	The value of the flashing figure can be changed via the keys ↑, ↓ from 0 to 9. Further figures to be changed are selected with the keys ←, →. Acceptance of the changed numerical value occurs with ENTER.
	CLR [← ↑]	The value is described with its default setting, see the field "Default" in the description of the individual lists.
4	ENTER [↓ ↑]	Entry mode becomes activated, the complete number flashes.
	↑, ↓, →, ←	The next higher resp. next lower valid value is superimposed with ↑, ↓. Acceptance of the changed numerical value occurs with ENTER. No reaction to: →, ←
	CLR [← ↑]	The value is described with its default setting, see the field "Default" in the description of the individual lists.
5	ENTER [↓ ↑]	Entry mode becomes activated, the complete number flashes.
	↑, ↓, →, ←	The display can be set to its initial values with ↑, ↓. Value acceptance is made with ENTER. No reaction to: →, ←
	CLR [← ↑]	The value is described with its default setting, see the field "Default" in the description of the individual lists.
6	ENTER [↓ ↑]	Entry mode becomes activated, "0" or "1" flashes.
	↑, ↓, →, ←	Toggling between "0" and "1" occurs with ↑, ↓. With "1" the function is executed when ENTER is pressed. Successful execution of the function is indicated with "OK" and an error is indicated with "Error".
	CLR [← ↑]	No function.

OC	Action	Function
7	ENTER [↓ ↑]	After ENTER the masked entry mode is activated.
	↑, ↓, →, ←	Entry similar as with Operating Class 3, but masked. An exact description is given under the list "System".
	CLR [← ↑]	No function.
8	ENTER [↓ ↑]	Entry not possible (e.g.: archive values) in the archive: Releases the skip function (s. . Chap. **0**)
9	ENTER [↓ ↑]	Operating class not present.
10	ENTER [↓ ↑]	Branching occurs to the appropriate submenu after ENTER.
I	↑, ↓, →, ←	No function.
11	CLR [← ↑]	No function.

2.4.3 Entry errors

Entry errors are output to the display if incorrect entries are made by the operator via the keypad.

The display is structured as follows:

----x--- x = Error code according to the following table.

Error code	Description
1	Archive empty. No entries in selected archive.
2	Archive value erroneous.
4	Parameter is write-protected.
5	Calibration or user lock closed. An attempt has been made to change a value protected by a lock (e.g. calibration or supplier's lock), although the lock is closed.
6	Entered value is outside the permissible limits. Entered value is outside the permissible value range.
7	Incorrect supplier's combination. The entered supplier's combination is not correct.
8	No find function (e.g.: in the archive) possible.
13	"CLR.X" function not executable, because date is not at default date (see Chap. 0)

2.5 Securing the values

Within the DL240 a setting can be made for each existing value of whether it can be read and/or written by the corresponding parties (calibration official, manufacturer, supplier or customer). This enables the DL240 to be used in a very flexible manner. In the field subject to calibration regulations, the rights are appropriately preset.

Depending on the application, inputs which are not used as inputs subject to calibration regulations can also be placed under the supplier or customer lock via the WinPADS software, for example to be able to use them as signalling inputs. A change is only possible with the calibration lock open.

2.5.1 Calibration lock and calibration switch

The highest ranking lock for securing the calibration parameters is the calibration lock. This includes all values which affect the volume counting. The calibration lock applies both to entries via the keypad as well as for access via the optical or internal modem interface. If the lock is locked, all attempts to set values are acknowledged with an appropriate error message (see Chap. 2.4.3).

The calibration switch is realised as a pushbutton and is located inside the DL240 next to the battery; it is sealed with an adhesive label.

The calibration lock is opened by pressing the pushbutton once (the following symbol appears in the display: "PROG") and then also closed again (symbol: "PROG" turns off).

The parameters protected under calibration regulations are each identified with "C" in the lists in the functional description.

2.5.2 Supplier and customer locks

The supplier and customer locks are used to protect all data which are not relevant to calibration regulations and which, where applicable, need to be changed by the supplier and/or customer.

The lock function applies both to entries via the keypad as well as for access via the interfaces. If the lock is locked, all attempts to set or read values are acknowledged with an appropriate error message (see Chap. 2.4.3).).

The parameters protected under the supplier's lock are each identified with "S" in the lists in the functional description. If a value can be changed both by the supplier as well as the customer, it is labelled with "U".

All values which are not labelled, (shown with "-") cannot be changed, because they represent, for example, measurements or constants.

The supplier and customer locks consist of an 8-figure code number. In operation only the supplier's lock can be called up in the service list (see Chap. 0). The customer lock can only be accessed via the optical interface or by remote data transmission.

The locks can only be changed when they themselves are open or a higher ranking lock is open. The calibration lock has however the highest priority. So with the calibration lock open, parameters can also be changed which are subject to the supplier's lock.

3 Functional description

The data display is structured in tabular form (list structure) (see Chapter 0). The individual columns in the table each contain associated values. The following functional description is orientated to this list structure.

3.1 Volume and signal input list (E1-E4)

KB	HELP	"Y"	Designation / value	V/S	Cal.	C/S/U	OC
Vx	Y:200	**1 - 4**	Main counter x	V	Yes	C	3
Vx.LT	Y:201	**1 – 4**	LT counter x	V	-	S	3
Vx.T	Y:202	**1 – 4**	Totaliser x	V	-	-	2
Vx.P	Y:203	**1 – 4**	Counter, adjustable x	V	-	S	3
Qx	Y:210	**1 – 4**	Flow rate x	V	-	-	2
L.ME	Y:150	**12 – 15**	Limit for monitoring Ex	V	-	S (where applicable U)	Var.
HT.LT	Y:209	**1 – 4**	Status mask for HT/LT changeover	V	Yes	C	3
ST.Ex	Y:228	**1 - 4**	Status Signal Input Ex	M	-	-	2
MD.Ex	Y:207	**1 - 4**	Mode, Input x	V/S	Yes	C	4
MD.ME	Y:157	**12 - 15**	Mode for monitoring Ex	V/S	-	S	4
SC.ME	Y:154	**12 - 15**	Source for monitoring Ex	V	-	S	Var.
CP.Ex	Y:253	**1 - 4**	c_p value, Pulse Input x	V	Yes	C	3
SN.M	Y:222	**1 - 4**	Serial no. of meter (places 1-4) and with arrow "→" places 5-12	V	-	S	3
DS.Ca	Y:22E	**1 - 4**	DS-100 number for Counter "a"	V	-	S	3
DS.Cb	Y:22F	**1 - 4**	DS-100 number for Counter "b"	V	-	S	3
Cu.No	Y:21A	**1 - 4**	Customer number Ex	V	-	S	3
MP.Ex	Y:150	**5 - 8**	Measurement period Ex	V	Yes	C	3
MP.RE	Y:15A	**5 - 8**	Remaining time in meas. period Ex	V	Yes	-	2
Vx.MP	Y:160	**1,5,9,13**	Current meas. period counter Ex	V	Yes	-	2
VxM.L	Y:E1 – E4	**1,5,9,13**	Last meas. period counter Ex	V	Yes	-	2
Vx.MP	Y:E1	**3,7,11,15**	Max. meas. period counter in current month	V	Yes	-	11
				Skip to submenu: "Max. meas. per. Ex in curr. month"			
DY.Ex	Y:141	**5 - 8**	Day boundary Ex	V	Yes	C	3
Vx.DT	Y:E1	**2,6,10,14**	Incr. day counter Ex	V	Yes	-	2
VxD.L	Y:E1 – E4	**2,6,10,14**	Last day counter Ex	V	Yes	-	2
Vx.DT	Y:E1	**4,8,12,16**	Max. day counter Ex in curr. month	Skip to submenu: "Max. day counter Ex in curr. month"			11
Arx.1	Y:A30	**1,3,5,7**	Month archive Ex	Skip to "Month archive Ex"			10
Arx.2	Y:A30	**2,4,6,8**	Meas. period archive Ex	Skip to "Meas. period archive Ex"			10

KB	HELP	"Y"	Designation / value	V/S	Cal.	C/S/U	OC
Frx.2	Y:A50	**2,4,6,8**	Freeze meas. period archive Ex	V		S	6

x = Input 1 to 4
AD = Abbreviated designation in display **HELP** = Address for identification
V/S = Use with **V**olume input or with **S**ignal input
OC = Operating class (for description see Chap. 2.4)

C/S/U "C": Value is subject to calibration lock. "U": Value is subject to suppl. & customer locks.
"S": Value is subject to supplier's lock. "-": Value cannot be changed.

F **The methods of changing values in dependence of the state of the locks is described in Chapter 0.**

3.1.1 Description of the values

Vx **Main counter x** Address: **1:200 – 4:200**
This counter counts the incoming pulses under defined conditions (e.g. high tariff) and converts them to a volume using the set cp value.
With open calibration lock the value can be changed as described in Chapter 2.4. The display occurs during entry in the full format of nine predecimal and four post-decimal places. Otherwise this value is displayed with 8 places before the decimal point. Pressing the key "→" displays the 4 post-decimal places.

With a programmed HT/LT switchover (see value: "HT/LT") the abbreviated designation of the counter which is not counting (Vx or Vx.LT) is shown flashing.

Vx.LT **LT counter x** Address: **1...4:201**
The counter counts under different conditions as "Vx" (see above) and is set ex-works under the supplier lock. The display and entry are analogous to the main counter.

With a programmed HT/LT switchover (see value: "HT/LT") the LT counter is used according to calibration regulations and then secured under the calibration lock. The abbreviated designation of the counter which is not flashing (Vx or Vx.LT) is shown flashing.

Vx.T **Totaliser x** Address: **1...4:202**
This counter counts the sum of Vx and Vx.LT (e.g. total quantity) and cannot be set.

Vx.P **Counter, adjustable x** Address: **1...4:203**
With the supplier's lock open the adjustable counter can be set via the keypad or interface to any value. The increment corresponds to the totaliser Vx.T and the display is analogous to the main counter x.

Qx **Flow x** Address: **1...4:210**
Momentary flow of the input converted to m^3/h (uncalibrated). The display is given in full cubic metres (without post-decimal places).

L.ME **Limit of monitoring function** Address: **12...15:150**
Limit for the value on the present input defined by **MD.ME** (see below). The representation of the limit occurs according to the set mode **MD.ME**.

HT.LT **Status mask for switching HT/LT counter** Address: **1...4:209**
Limit for the value on the present input defined by **MD.ME** (see below). The representation of the limit occurs according to the set mode **MD.ME**.

ST.Ex **Status Signal Input x** Address: **1...4:228**
The logical level of the signal input is shown as follows:
"1" = Input active (state according to mode **MD.ME**.)
"0" = Input inactive (state according to mode **MD.ME**.)

MD.Ex **Mode Signal Input x** Address: **1...4:207**
Each signal input on the DL240 can be assigned with two different input modes. The following modes are realised:

"1" = Counter input
The input counts the volume pulses on the present signal input.

"2" = Status input
Here the present input is used as the status input. The type of status signal (e.g. "N/C", "N/O" or time-synchronised signal) is defined with the system object **MD.ME** (Mode for monitoring).

MD.ME **Mode for monitoring** Address: **12...15:157**
Various modes can be programmed for monitoring. The following modes are possible:

Mode for monitoring		**Explanation**
0	Switched off	No monitoring.
1	> L.ME	Limit exceeded (value > L.ME)
2	] L.ME	Limit exceeded (value ≥ L.ME)
3	< L.ME	Limit undercut (value < L.ME)
4	* L.ME	Limit undercut (value ≤ L.ME)
5	Time-synchronised input	Time-synchronised input
9	] LIM1 AND < LIM2	Time within window (e.g. 01:00 – 03:00 hrs.)
10	] LIM1 OR < LIM2	Time outside window (e.g. 22:00 – 06:00 hrs.)
17	Pulse comparison	Comparison input for input SC.ME
21	Single value	E.g.: Meas. period, day or month counter
23	In range	In permissible range (e.g. for weekend)

SC.ME Source for monitoring Address: **12...15:154**

With activated monitoring and in dependence of the programmed mode (MD.ME), a source must also be defined, with the contents of which the limit is compared (i.e. the value that is to be monitored).

As a source the appropriate address must be programmed. The following sources are possible in dependence of the set mode (extract only):

Mode for monitoring		Source for monitoring
0	Switched off	No monitoring.
1	> L.ME	All counters and the flow rate and status of the corresponding input (e.g.: for Input 1: 1:200; 1:201; 1:202; 1:203; 1:210; 1:160; 2:E1; and 1:228)
2	] L.ME	
3	< L.ME	
4	* L.ME	
5	Time-synchronised input	Input status (e.g.: 1:228 for Input 1).
9	] LIM1 AND < LIM2	E.g. Day and month with day boundary: 02:0140_1
10	] LIM1 OR < LIM2	E.g. Day and month without day boundary: 01:0140_1
17	Pulse comparison	Raw pulse counter of another input (e.g.: 2:226, 3:226, 4:226 for Input 1).
21	Single pitch	e.g.: Monthly counter 02:0143
23	In pitch range	e.g.: Sec. counter, (tied to summer time) 01:0400_1

CP.Ex c_p value, Signal Input x Address: **1...4:253**

The c_P value indicates the pulse value e.g. in the unit **pulses per m³** and is valid separately for each input. The value is displayed with eight places without leading zeroes in which 5 predecimal and 3 post-decimal places are used.

The c_P value of the input does not influence the format of the counter readings. They are always displayed with eight predecimal and four post-decimal places.

SN.M Meter serial number (4 + 8 places) Address: **1...4:222**

From the serial number of the meter connected to this signal input, the upper 4 places are displayed here. The lower 8 places are displayed by the right cursor key. Ex-works 000000000002 is the default.

DS.Ca DS-100 number Counter "a" Address: **1...4:22E**

To differentiate between the two counters "a" and "b" in the archives (see Chap. 0) within the Elster-Instromet WinLIS evaluation software, a so-called "DS-100 number" for the 1st counter (Counter "a") and the 2nd counter (Counter "b") is required. This number is set ex-works based on the serial number of the DL240 and normally does not need to be changed (see also Chap. 0).

DS.Cb DS-100 number for Counter "b" Address: **1...4:22F**
See "DS.Ca"

Cu.No Customer number (4 + 8 places) Address: **1...4:21A**
From the 12-place customer number of the meter connected to this signal input, the upper 4 places are displayed here. The lower 8 places are displayed by the right cursor key. Ex-works "000000000001" is the default.

MP.Ex Measurement period, input x Address: **5...8:150**
Setting of the measurement period for saving the data records (counter readings) in the archive of input x. The output is given right-justified in minutes.

MP.RE Remaining measurement period Address: **5...8:15A**
Display of remaining time for the current measurement period for the user's information. The output is given right-justified in minutes.

Vx.MP Measurement period counter x Address: **1, 5, 9, or 13:160**
Display of the counter input volume measured during the current measurement period (momentary reading for measurement period consumption). The display occurs as described under "Main counter".

VxM.L Last measurement period counter x Address: **1, 5, 9, or 13: 160**
Display of the last measurement period consumption.

Vx.MP Max. meas. period counter in current month Address: **3,7,11 or 15: 160**
The measurement period maximum of the counting input found to date in the current month. The display is described under "Main counter".
This display item is also the entry into the ***submenu*** in which the corresponding date and time can be called.

DY.Ex Day boundary x Address: **5...8:141**
A separate day boundary can be defined for each input x. It is entered right justified in the form hh:mm. If affects the change of day and, where applicable, archiving in the monthly archive.

Vx.DT Day counter x Address: **2, 6, 10 and 14: 160**
The volume of the counting input (current level of day's consumption) found during the current day depending on the day boundary DT.Ex. The display occurs as described under "Main counter".

VxD.L Last day counter x Address: **2, 6, 10, and 14: 160**
Display of the last day's consumption.

Vx.DT Maximum day counter x current month Address: **4, 8, 12 and 16: 160**
The day maximum on the counting input up to current point in time in the current month depending on the day boundary. The display is described under "Main counter".
This display item is also the entry into the ***submenu*** in which the corresponding date and time can be called.

Arx.1 Monthly archive Ex Address: **1, 3, 5 and 7:A30**
Possible entry point into monthly archive of input Ex when it is programmed as counting input (See Chapter 0 for structure).

Arx.2 Measurement period archive Ex Address: **2, 4, 6 and 8:A30**
Possible entry point into the archive of measurement period values (counter readings or load profile) of input Ex when it is programmed as a counter input. (See Chapter 0 for structure).

Frx.2 Freeze measurement period archive Ex Address: **2, 4, 6 and 8:A50**
Manual method of saving a data record of the measurement period archive (independent of measuring period). It is used for saving a momentary value; no new measurement period is started. In the archive this type of data record can be recognised based on the triggering event
(label: aa:5.1 = Freeze command; aa = Current archive number).

The following other values are also available for each input:

Measuring point designation to AA Address: **1...4:221**
A 33-place designation of the measuring point can be saved in the DL240. As a result, the requirements of the association agreement (AA) can be optimally considered.

Unit Address: **1...4:208**
Each input can be assigned a unit (default: "m3"). It consists of 5 characters and has only a representative character. Any text string can be entered here, which though has no effect on the counter readings, etc.

SW debounce Address for space duration: **1...4:232**
Address for pulse duration: **1...4:233**
When the connected meter outputs bouncing pulses, a software debounce can be activated under the above addresses with the calibration lock open. It is adjustable with a pitch of 63 ms. Further information can be obtained from Elster-Instromet.

3.2 Archives in the DL240

There are three different archives in the DL240. They are all formed as a ring memory so that the last data is always available. The oldest data is always overwritten by a new entry. For each of the four inputs there are two different types of archive and also a further archive for the overall device:

a) Measurement archive

b) Month archive

c) Logbook

About a): The measurement period archive contains the counter readings (meter reading response) which have been saved by the event "End of measurement period" or other events (counter reading change, time change, other signals). Two counters can be saved in the measurement period archive.

About b): The month archive contains the month-end readings from two counters as well as the determined day and measurement period maxima. These are saved when the event "End of month" occurs.

About c): In the DL240 a logbook is integrated which saves the last 250 non-period events (i.e. changes of status messages). The events relevant to calibration are also saved in the measurement period archives for the relevant inputs. For a description of the logbook: See Chapter: 3.8.4.

3.2.1 Setting the counters for archiving

In the DL240 two counters can be selected which are to be saved in the archives (designated: Counters: "a" and "b"). These can be set separately for each archive (measurement period or month archive). The settings can be checked later by calling the archives into the display. This means that different applications can be satisfied depending on customer requirements.

Basically, the following counters can be saved:

Display	Address	"x"	Designation / value
Vx	x:**200**	**1 - 4**	Main counter, Input x
Vx.LT	x:**201**	**1 - 4**	LT counter x, Input x
Vx.T	x:202	**1 - 4**	Totaliser, Input x
Vx.P	x:203	**1 - 4**	Counter, adjustable Input x
R1.1	01:500	**-**	Computation Counter 1 (sum of V1...V4)
R1.LT	01:501	**-**	Computation Counter 2 (sum of V1.LT...V4.LT)
R1.T	01:502	**-**	Computation Counter 3 (sum of V1.T...V4.T)
R1.P	01:503	**-**	Computation counter, adjustable (sum of V1.P...V4.P)

The setting of the counters to be archived is possible with WinPADS240 (from version V2.20). The setting of the archives for the inputs is subject to the calibration lock, whereas the setting of the archives for the computation counter is subject to the supplier's lock.

F **If the counters to be archived are changed, all archive entries for the affected archives are deleted! The settings of the parameters such as cp value, measurement period etc. are of course retained.**

The desired counters ("a" and "b") for the month and measurement period archives are set under the addresses C00 (for Counter "a") and C01 (for Counter "b"):

Address	Setting for Counter "a"
1:C00	Month archive input 1
2:C00	Meas. period archive input 1
3:C00	Month archive input 2
4:C00	Meas. period archive input 2
5:C00	Month archive input 3
6:C00	Meas. period archive input 3
7:C00	Month archive input 4
8:C00	Meas. period archive input 4
9:C00	Month archive computation counter

Address	Setting for Counter "b"
1:C01	Month archive input 1
2:C01	Meas. period archive input 1
3:C01	Month archive input 2
4:C01	Meas. period archive input 2
5:C01	Month archive input 3
6:C01	Meas. period archive input 3
7:C01	Month archive input 4
8:C01	Meas. period archive input 4
9:C01	Month archive computation counter

The arrangement of the counters "a" and "b" in the month archives is described in Chapter 3.2.3 and in Chapter 3.2.4 for the measurement period archives.

3.2.2 Values common in all archives

Each archive data record consists of values which exist in all archives (e.g. time stamp, etc.) and values which label the relevant archive (e.g. which counter reading is saved). The values which exist in all archives and are displayed are described in the following. The structure of the individual archives and the values which label the relevant archive are explained in the next chapter.

AB No **Internal archive block number**
This is a number from 1 to 65535 which is used as a label for **one** data record (corresponds to one row) in the archive. For the first time of saving the block number 1 is issued, then 2 etc. up to 65535. After an overflow counting starts from "1" again. The block numbers of all archives are set to 1 by the trigger function "Clear counter (incl. archive)". The contents of all archives are then cleared!

TIME **Time / Date**
The time and date at the time of saving a data record in the corresponding "Archive row".

STAT **Momentary status**
Saved momentary status when creating the data record.

S.TE Triggering event

Reason for saving the archive row (for structure see Chapter 3.8.4). Exactly one triggering event exists for each saved data record.

An event may be:

- the change in a single signal in the momentary status; e.g. "Warning signal on Status Input 1 starts",
- the change in a defined signal (signal group); e.g. "Warning starts", "Warning ends",
- an event which occurs outside of the momentary status; e.g. "month limit" or "meter reading set",
- manual triggering of data backup using "BCK" in the service list.

Er.Ch Checksum evaluation

Here an evaluation of the checksum of the current data record for the "archive row" is displayed. The evaluation can have two possible results:

"0K" = No errors in data record

"ERROR" = Erroneous value in current data record.

If a data record contains errors, all values in the relevant row are displayed flashing in the display. They CANNOT be used for billing!

Checksum of a data record

In the DL240 a checksum is appended to each data record to ensure that the data is transferred correctly. Here, two errors are certain to be detected and one error can also be corrected (CRC-16 procedure). In the DL240 only a simple evaluation of the checksum is used without determining which value within the data record is erroneous. The checksum formed can be read out later by the evaluation systems.

3.2.3 Structure of month archive Input x / computation counter

Under "ARx.1" a skip to the month archive Ex (x=1..4) can take place in each counting channel. In the month archive the month-end readings of the Counters "a" and "b" (see below) and the day and measurement period maxima found by the DL240 are retained (***high-flow display function***). They are saved for the last 15 months and can be used for billing purposes.

The month archive is available for all counter inputs and the computation counter.

The following values are saved in this archive:

Data record no.	**ABNo**	**TIME**	**TIME**	**Counter "a"**	**Counter "b"**	**VM.L** max	**TIME**	**TIME**
Explana-tion	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
1	*1*	*06:00:00*	*01.02.99*	*11111111*	*22222222*	*00000123*	*12:00:00*	*15.01.99*
2	*2*	*06:00:00*	*01.03.99*	*22222222*	*33333333*	*00000345*	*07:00:00*	*12.02.99*

Data record no.	STAT	VT.L max	TIME	TIME	STAT	ST.x	ST.SY	Er.Ch
Explana-tion	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**	**(16)**
1	*x.y.z*	*00012345*	*06:00:00*	*23.01.99*	*x.y.z*	*x.y.z*	*x.y.z*	*OK*
2	*x.y.z*	*00023456*	*06:00:00*	*02.02.99*	*x.y.z*	*x.y.z*	*x.y.z*	*OK*

The meter readings of the Counters "a" and "b" to be archived can be set via WinPADS240 (see Chap.0).

ABNo **(1)** Internal archive block number

TIME **(2)** Time of saving (at end of month)

TIME **(3)** Date of saving (at end of month)

Counter "a" **(4)** Counter "a" (depends on the set source) – see Chapter 0
Counter reading of the counter at the time of saving.

Counter "b" **(5)** Counter b (depends on the set source) – see Chapter 0
Counter reading of the counter at the time of saving.

VM.Lmax **(6)** Last measurement period maximum
The measurement period maximum found at end of month.

TIME **(7)** Time of the measurement period maximum
The time of day determined when the measurement period maximum was saved.

TIME **(8)** Date of the measurement period maximum
The date determined at the time of saving the measurement period maximum.

STAT **(9)** Status of the measurement period maximum
All signals on this input occurring during the measurement period maximum (for structure see Chapter 3.8.8).

VD.Lmax **(10)** Last day maximum
The day maximum found at end of month.

TIME **(11)** Time of the day maximum
The time of day determined when the day maximum was saved.

TIME **(12)** Date of the day maximum
The date determined at the time of saving the day maximum.

STAT **(13)** Status of the day maximum of Ex
All signals on this input occurring during the day of the day maximum (for structure see Chapter 3.8.8).

ST.x **(14)** Status register of the input Ex or computation counter R1 at time of saving (for structure see Chapter 3.8.8).

ST.SY **(15)** Momentary status on the input Ei or computation channel R1 at time of saving (for structure see Chapter 3.8.8).

Er.Ch **(16)** Checksum evaluation
Display of whether the data row is correct (OK) or faulty (ERROR).

3.2.4 Structure of measurement period archive, Input x

Under "**ARx.2**" a skip to the measurement period archive Ex (x=1..4) can take place in each counting channel. Here the readings of the Counters "a" and "b" (see below) are saved (= "taking meter readings"). The consumption values (D"a" or D"b") are determined for the display in the DL240 or calculated by the evaluation software based on the differences in counter readings.

The measurement period archive is only available for counter inputs E1...E4.

The structure of the measurement period archive is as follows:

Data record no.	ABNo	TIME	TIME	Counter "a"	D "a"	Counter "b"	D "b"	ST.x	ST.SY	S.TE	Er.Ch
Explanation	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1	*11111*	*06:00:00*	*01.04.99*	*33333333*	*x*	*44444444*	*X*	*x.y.z*	*x.y.z*	*xx.yy:z*	*OK*
2	*11112*	*07:00:00*	*01.04.99*	*33333444*	*111*	*44444444*	*0*	*x.y.z*	*x.y.z*	*xx.yy:z*	*OK*
3	*11113*	*08:00:00*	*01.04.99*	*33333499*	*55*	*44444489*	*45*	*x.y.z*	*x.y.z*	*xx.yy:z*	*OK*
4	*11114*	*09:00:00*	*01.04.99*	*33333555*	*56*	*44444523*	*34*	*x.y.z*	*x.y.z*	*xx.yy:z*	*OK*

ABNo **(1)** Internal archive block number

TIME **(2)** Time of day

TIME **(3)** Date

Counter "a" **(4)** Counter "a" of Input x (setting of counter "a": see Chap. 0).
Counter reading at the time of saving.

D**"a"** **(5)** Counter increment, counter "a" of Input x
Difference value at conclusion of measurement period (e.g. consumption)

Counter "b" **(6)** Counter "b" of Input x (setting of counter "b": see Chap. 0).
Counter reading at the time of saving.

D**"b"** **(7)** Counter increment, counter "b" of Input x
Difference value at conclusion of measurement period (e.g. consumption)

ST.x **(8)** Status register Input x at time of saving (see Chapter 3.8.5)

ST.SY **(9)** Momentary system status Input x at time of saving (for structure see Chapter 3.8.5).

S.TE **(10)** Triggering event
E.g. appearance of a warning (for structure see Chapter 3.8.4).

Er.Ch **(11)** Checksum evaluation
Display of whether the data row is correct (OK) or faulty (ERROR).

3.2.5 Measurement period and memory depth

The depth of the measurement period archive is strongly dependent on the measurement period used and the signals that occur in the meantime. The following table gives an indication of the memory depth (for each channel, without further signals):

Memory depth	Measurement period MP.Ex (x = 1..4 for Input 1..4) in minutes						
	2	5	10	15	20	30	60
Days	6	14	29	43	58	86	173
Months	-	-	-	1,4	1,9	2,8	5,7

F **When setting the measurement period it is essential to take into account the DL240 "measurement cycle". Refer to "M.Cyc" in Chap. 0.**

3.2.6 Application as flow recording device

With the function "Flow recording device" the counter readings relevant to billing are contained in the **measurement period archives** for Inputs 1 to 4.

The readings of the counters are saved on the cycle of the set measurement period or additionally for appropriate events (meter reading response).

Ex-works the following counters are set:

- Counter "a": Main counters (Vx) of inputs 1-4
- Counter "b": Adjustable counters (Vx.P) of inputs 1-4.

The following structure then arises in the measurement period archives:

ABNo	TIME	DAT	**Vx (HT)**	D**Vx (HT)**	**Vx.P**	D**Vx.P**	ST.x	ST.SY	S.TE	Er.Ch
-	**calib'd**	**calib'd**	**calib'd**	**calib'd**	**uncalib'd**	**uncalib'd**	**uncalib'd**	**uncalib'd**	**uncalib'd**	**-**

The entries in the second row indicate whether the value is calibrated or assigned outside of calibration regulations. The meaning of the individual values is described in Chapter 3.2.4 ("Vx": x= 1...4 for Input 1...4).

The values of the measurement period archive can only be cleared with the calibration lock open and can be used for billing purposes.

3.2.6.1 Display of counter increment (flow value)

The entries of the measurement period archive can be called into the display. Here the increments of the counters in comparison to the corresponding previous entry are also included. They are identified with a "Δ". Normally, with a counter increment the flow (consumption) within a measurement period is involved.

This is not the case when an archive row has been entered due to a special event (e.g. setting of the clock or of a counter, appearance of an important status message). Then the segment "Δ" and the abbreviated designation flash for the displayed counter increment in order to make the user aware of this special feature.

With an error in one of the two relevant archive rows (detected by the CRC procedure) the complete flow value flashes. If for some reason no consumption can be determined, an appropriate error message is issued. In both of the latter cases the displayed value may not be used for billing purposes.

3.2.6.2 Calling up archive entries

Since the measurement period archive may have up to 4150 entries, a measurement that is to be checked cannot be reasonably accessed with the cursor keys. The check is made easier using a "skip function" with the entry of the desired destination address in the following columns:

- Block number
- Date and time
- Counter reading

The entry takes place initially by selecting the desired column (block number, date/time or counter reading) in any row. Then the "ENTER" key is pressed to enable entry of the desired value. Then by terminating again with "ENTER" skipping takes place to the desired value or to the nearest possible value. If the desired value is not present at all, skipping occurs to the "nearest" value. If you are located in a "wrong" column in which the skip function is not possible, the message "8" is output.

3.2.7 Application as high flow display device

With the function "High flow display device" the end-readings from two adjustable counters relevant for billing and the maxima (measurement period and day maxima) are included in the **month archives** of Inputs 1 to 4.

The month archive of the computation counter cannot be used for applications subject to official calibration.

The counter increments per measurement period and per day are determined separately as the measurement period flow and day flow and are temporarily saved. The current and last saved values can be called up via the DL240 display. At the end of each month the counter reading and the highest of these two flow values for each channel are saved in the corresponding month archive. The month archives each have a depth of 15 entries so that

for each channel the maximum measurement period and daily flow of the last 15 months can be called up on the display.

The values of the month archive can only be cleared with the calibration lock open and can therefore be used for billing purposes.

Ex-works the following counters are set:

- Counter "a": Main counter (Vx) of inputs 1-4
- Counter "b": Adjustable counter (Vx.P) of inputs 1-4.

The following structure then arises in the month archives:

ABNo	Date/time	**Vx**	**Vx.P**	**VxM.Lmax**	Date/time	STAT	**VxD.Lmax**	Date/time	STAT	ST.x	ST.SY	Er.Ch
-	**calib'd.**	**calib'd.**	**uncalib'd**	**calib'd.**	**calib'd.**	**uncalib'd**	**calib'd.**	**calib'd.**	**uncalib'd**	**uncalib'd**	**uncalib'd**	**-**

The entries in the second row indicate whether the value is calibrated or assigned outside of calibration regulations. The meanings of the individual settings are described in Chapter 0. Vx (x= 1...4 for Input 1...4).

The maximum consumption within the measurement period from the last month is given in "**VxM.Lmax**" or the day maximum from the last month is given in "**VxD.Lmax**" and each is derived from the totaliser for Input x. (x= 1...4 for Input 1...4). Settings of counters via the keypad or interface are neutralised for the formation of the consumption values and therefore also have no influence over the maxima.

3.2.8 Use of the "HT/LT changeover"

In the DL240 there is also the possibility of carrying out a changeover of the main counter to the LT counter (low tariff counter) under previously specified conditions.

The event, which leads to switching over from the main to the LT counter, is stated for each input under the value "HT.LT" in the DL240 display. The explanation of this event is described in Chap. 3.8.9.

To show the customer which counter is currently counting, the abbreviated designation of the ***non***-counting counter is shown flashing. In addition a appropriate sticker is applied to the front membrane, bringing the user's attention to the above mentioned operating mode.

The LT counter is also used in this operating mode subject to calibration regulations and is therefore secured under the calibration lock.

This switchover should also, of course, be recorded in the archives. Therefore, the following counters are preset during an HT/LT switchover:

- Counter "a": Main counter (Vx) of inputs 1-4
- Counter "b": LT counter (Vx.LT) of inputs 1-4.

The structure in the **month archive** is therefore as follows:

ABNo	Date/time	**Vx**	**Vx.LT**	VxM.L max	Date/time	STAT	VxD.L max	Date/time	STAT	ST.x	ST.SY	Er.Ch
-	**calib'd.**	**calib'd.**	**calib'd.**	**calib'd.**	**calib'd.**	**uncalib'd**	**calib'd.**	**calib'd.**	**uncalib'd**	**uncalib'd**	**uncalib'd**	**-**

VxM.L (measurement period maximum of the last month) and VxD.L (day maximum of the last month) are derived from the totaliser (Vx + Vx.LT) of input x.

The entries in the second row indicate whether the value is calibrated or assigned outside of calibration regulations (see Chap. 2.5). The meanings of the individual values are described in Chapter 3.2.2 (x= 1...4 for Input 1...4).

The structure of the **measurement period archive** is as follows:

ABNo	TIME	DAT	**Vx**	D**Vx**	**Vx.LT**	D**Vx.LT**	ST.x	ST.SY	S.TE	Er.Ch
-	**calib'd.**	**calib'd.**	**calib'd.**	**calib'd.**	**calib'd.**	**calib'd.**	**uncalib'd**	**uncalib'd**	**uncalib'd**	**-**

The entries in the second row indicate whether the value is calibrated or assigned outside of calibration regulations. (See Chap. 2.5).

The meaning of the individual values is described in Chapter 3.2.2 (x= 1...4 for Input 1...4).

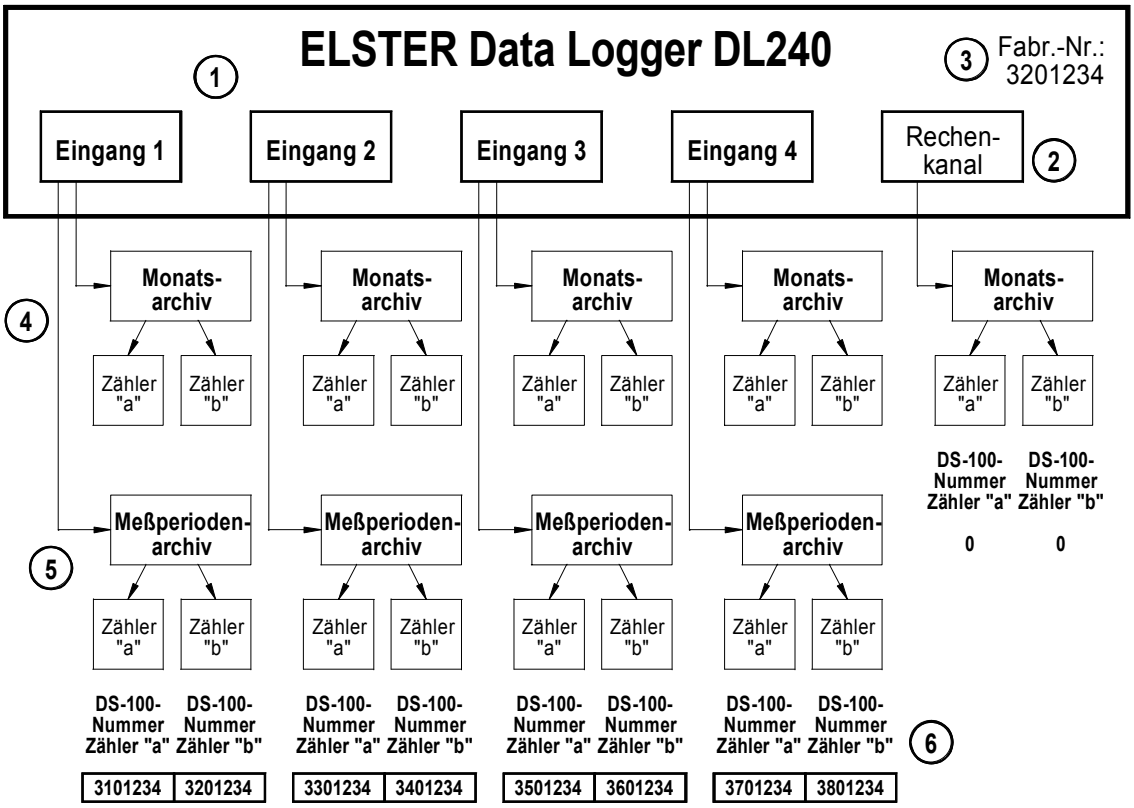
The values of the measurement period archive can only be cleared with the calibration lock open and can be used for billing purposes.

3.2.9 System interface

In the following the relationship between the archives and the necessary settings for the correct processing of the archives in the Elster-Instromet WinLIS and WinVIEW evaluation software is explained.

- Each DL240 has 4 inputs and a computation counter (**,**).

This means that a max. of four different customers or four different meters can be connected to the DL240.



For example, "3201234" (**f**) is taken as the serial number.

The computation counter has a special significance, because it has **no** measurement period archive (load profile) of its own and so cannot be practicably processed by the Elster-Instromet WinLIS and WinVIEW evaluation software.

Each input has a month archive (**„**) and a measurement period archive (**…**). Also here, the month archive cannot be processed by WinLIS or WinVIEW, because it only contains the month end reading and no consumption data. (??)

As already described in Chaps. 3.2.3 and 3.2.4, two different counters (Counters "a" and "b") can be saved in each of the two archives.

The evaluation software must be able however to differentiate between the two counters.

This is carried out based on the DS-100 numbers for Counter "a", resp. Counter "b" (**†**), which are appropriately set ex-works.

Consequently, each counter can be clearly assigned in the evaluation based on the customer number, meter number and the DS-100 number.

F **To prevent a "counter" that is not required from being processed in WinLIS, the DS-100 number must be set to "0".**

In the following the above mentioned relationships are listed with reference to the representation in the DL240, in the AS-200 and in WinPADS or WinCOMS software.

DL240 display	Archive no.	Designation	Archive content	DS no. Counter "a"	DS no. Counter "b"
Ar1.1	1	Month archive E1	Month-end reading of Counters "a" and "b" as well as measurement period and day maxima.	-	-
Ar1.2	2	Meas. per. archive E1	Counter readings Counter "a" / "b"	3101234	3201234
Ar2.1	3	Month archive E2	Month-end reading Counter "a" / "b" and meas. per. + day maxima	-	-
Ar2.2	4	Meas. per. archive E2	Counter readings Counter "a" / "b"	3301234	3401234
Ar3.1	5	Month archive E3	Month-end reading Counter "a" / "b" and meas. per. + day maxima	-	-
Ar3.2	6	Meas. per. archive E3	Counter readings Counter "a" / "b"	3501234	3601234
Ar4.1	7	Month archive E4	Month-end reading Counter "a" / "b" and meas. per. + day maxima	-	-
Ar4.2	8	Meas. per. archive E4	Counter readings Counter "a" / "b"	3701234	3801234
Ar5.1	9	Month archive R1	Month-end reading Counter "a" / "b" and meas. per. + day maxima	0	0
LOGB	10	Logbook	Status messages	-	-

Explanation:

The column "**DL240 display**" is used in the DL240 display.

The "**Archive number**" is needed for reading out using the AS-200.

The "**Designation**" corresponds to details in WinPADS240 and WinCOMS.

The "**DS-100 number**" is mandatory for evaluation with WinLIS and has an appropriate ex-works default value.

F **To prevent a "counter" that is not required from being processed in WinLIS, the DS-100 number must be set to "0".**

3.2.10 Reading out archives

There are a number of ways of reading out the above mentioned archives in the DL240:

- AS-200/S2 (from V8.0) on site (with entry of mech. meter reading possible).
- WinPADS240 parameterising software (with OPTO head, via remote data transfer or Ethernet)
- Manual recall via the WinCOMS PC readout software.

- Automatic, time-controlled recall via the WinCOMS control station software.
- Via third-party system / tracing system via MDE or via remote data transmission according to IEC 1107.

3.2.10.1 Readout parties

In the DL240 the following four different readout parties can be defined:

Readout party	Access as	Readout mode adjustable under
Supplier	Supplier	1...10:B02 for archive 1- 10 (see table above)
Customer	Customer	1...10:B03 for archive 1- 10 (see table above)
Maintenance	Supplier	1...10:B04 for archive 1- 10 (see table above)
Network operator	Customer	1...10:B05 for archive 1- 10 (see table above)

Each of the above parties can readout the archives completely independently of the other readout parties. Also, each party can specify which archives can be read out and how they can be read out:

Readout mode	Meaning
0	Archive not read out
1	Read out up to the last readout
2	Only read out previous month
3	Read out previous month up to today
4	Complete readout

Example:

The "supplier" only wants to read out the "measurement period archives" of inputs 1 and 2 "up to the last readout", not the others. The following settings arise:

1:B02 (0) 3:B02 (0) 5:B02 (0) 7:B02 (0) 9:B02 (0) 6:B02 (0) 8:B02 (0) 10:B02 (0)	Do not read out month archives E1-E4, R1, logbook and meas. per. archives.
2:B02 (1) 4:B02 (1)	Read out measurement period archive input 1 and 2 "up to last readout

These settings can be conveniently set with WinPADS.

It should be noted that the above readout modes are only considered by the Elster-Instromet AS-200 Readout Unit and the WinCOMS evaluation software when in the "***automatic mode***". In the manual operation or when reading out the archives with WinPADS all archives can be read out, also in other modes where applicable.

3.2.10.2 Reading out with the AS-200

The DL240 archives can be read out in various ways with the AS-200/S2 (from version V8.0):

- Automatic - Use the readout notes given in Chap. 3.2.10.2.
- Preset - here the note values in the DL240 are NOT used and a readout based on the setting in the AS-200 is carried out.
- Manually - manual input of which archive is to be read out and in which time period.

In order that a readout can be carried out based on the readout notes, these must first be set in the DL240. This can be done easily with WinPADS240 or with the AS-200. Here is defined whether an appropriate archive is to be read out and in which time period. If these are correctly set, a "fully automatic correct" readout of the DL240 is ensured independent of the number of inputs used.

3.2.10.3 Reading out with WinPADS240

With readout using the WinPADS240 PC software the DL240 archives can either be read out on site using the optical interface, by remote data transmission or using an Ethernet card. In this connection there is not the possibility of reading out based on the readout notes. This is only intended for the AS-200 and the WinCOMS automatic readout software.

With a readout using WinPADS240 the desired time period and the archives to be read out can be directly stated.

3.2.10.4 Reading out with WinCOMS

WinCOMS links both ways of reading out (automatically based on the readout notes and a readout from the row). It is intended for the manual recall via remote data transmission (manual selection of the required device) or for the fully automatic recall by a scheduler (time control) which can execute any jobs at set points in time.

In order that an automatic readout can be carried out based on the readout notes, these must first be set in the DL240. This can be done effectively with WinPADS240 or, with restrictions, with the AS-200. Here is defined whether an appropriate archive is to be read out and in which time period. If these are correctly set, a "fully automatic" readout of the DL240s is ensured independent of the number of inputs used.

3.2.10.5 Reading out with 3rd party systems / tracing systems

Since the data and therefore also the archives are interrogated via the internationally standardised IEC 1107 protocol, it is possible to link the DL240 to 3rd party/tracing systems.

Information about which 3rd party systems can read out the DL240 can be obtained on request from Elster-Instromet GmbH. Also, a summary of the requirements placed on 3rd party/tracing systems for reading out the LIS-200 devices (Long-term Pulse Acquisition System) can be obtained here.

3.3 Computation Counter (R1)

AD	HELP	Designation / value	Cal.	C/S/U	OC
R1.1	1:500	Computation Counter 1 (of V1...V4)	-	S	3
R1.LT	1:503	Computation Counter 2 (of V1.LT...V4.LT)	-	S	3
R1.T	1:502	Computation Counter 3 (V1.T...V4.T)	-	-	2
R1.P	1:503	Computation Counter 4 (of V1.P...V4.P)	-	S	3
Q.R1	1:510	Flow, computation counter	-	-	2
L.ME	16:150	Limit for monitoring function	-	S	Var.
MD.R1	1:507	Mode, computation counter	-	S	4
MD.ME	16:157	Mode for monitoring, computation counter	-	S	4
SC.ME	16:154	Source for monitoring, computation counter	-	S	Var.
DS.Ca	1:52E	Computation counter DS-100 number Counter "a"	-	S	3
DS.Cb	2:52F	Computation counter DS-100 number Counter "b"	-	S	3
Cu.No	3:51A	Customer number, computation counter	-	S	3
MP.R1	9:150	Measurement period, computation counter	-	S	3
MP.RE	9: 51A	Remaining time in meas. period, computation counter	-	-	2
R1.MP	17:160	Current meas. period counter, computation counter	-	-	2
R1M.L	17:161	Last meas. period counter, computation counter	-	-	2
R1.MP	19:160	Max. meas. period counter, computation counter in current month	Skip to submenu: "Max. meas. per. R1 in curr. month"		11
DY.Ex	9:141	Day boundary, computation counter	-	S	3
R1.DT	18:160	Incr. day counter, computation counter	-	-	2
R1D.L	18: 161	Last day counter, computation counter	-	-	2
R1.DT	20:160	Max. day counter in curr. month, computation counter	Skip to submenu: "Max. day counter R1 in curr. month"		11
Ar5.1	9:A30	Month archive computation counter	Skip to "Month archive R1"		10

AD = Abbreviated designation in display **HELP** = Address for identification
OC = Operating class (for description see Chap. 2.4)

C/S/U "C": Value is subject to calibration lock. "U": Value is subject to suppl. & customer locks.
"S": Value is subject to supplier's lock. "-": Value cannot be changed.

F **The methods of changing values in dependence of the state of the locks are described in Chapters 2.5 and 2.5.2.**

3.3.1 Description of the values

The structure of computation counter corresponds to the volume inputs E1 - E4. However, it is not derived from pulses on an input, but from an addition of the volumes acquired on the inputs E1 to E4 (e.g.:R1=E1+E2+E3).

The consumption values are determined and stored in dependence of the measurement period of the computation counter. The max. flow rates within a measurement period and within a day are found and saved at the end of the month.

For the computation counter however no additional measurement period archive is occupied for the meter reading response (solution: see Chapter 0).

Precisely as with the volume input, monitoring to a set limit can also take place in the computation counter (e.g. day or measurement period maximum).

Programming of this function occurs via the interface and can only be set with the supplier lock open!

MD.R1 Mode, Computation Counter 1 Address: **1:507**

The following modes are possible in the computation counter:

"0" = Switched off (default)
The computation counter has no function (deactivated).

"1" = Summation
The computation counter sums all inputs given below:

1st Summand for computation counter Address: **1:50A**

2nd Summand for computation counter Address: **1:50B**

3rd Summand for computation counter Address: **1:50C**

4th Summand for computation counter Address: **1:50D**

3.3.2 Application: Measurement period archive for computation counter

The counter readings for the computation counter can be taken via the following paths:

1. Mathematical device in WinLIS

In the Elster-Instromet WinLIS / WinVIEW evaluation software, an addition, subtraction, etc. be performed for any devices (i.e. also from spatially separated customer devices) under the function "mathematical devices".

2. Saving the computation counter in the archive of an input

Since the counters in the archives can be set, the computation counter can also be used instead of the adjustable or LT counters.

Here, the following should be noted:

1. The counter readings may only be used for invoicing with restrictions, because the computation counter itself is not calibrated. In case of doubt, the sum of the (calibrated) meter readings / consumption values in the appropriate inputs must be added separately to check the summed value.

2. The measurement period of the input in whose measurement period archive the computation counter is to be saved, should correspond to the measurement period of the computation counter. For example, it is not very practicable to specify a measurement period of 15 min. in the computation counter if the measurement period in the corresponding input is set to 60 min. Then an entry will occur only every 60 min.
3. The c_P value of the input in which the computation counter is saved, determines the number of post-decimal places in the evaluation software (resolution), because processing generally occurs with counter readings.

3.4 System list

AD	HELP	Designation / value	Cal.	C/S/U	OC
TIME	1:400	Time and with "→" to date	-	S	2
MOD.T	1:407	Summer / winter time on/off	-	S	4
M.CYC	1:1F0	Measurement cycle	-	S	3
DISP	2:1A0	Continuous display on/off	-	S	4
AUT.V	1:1A0	Time up to automatic display changeover	-	S	3
Fa.No	1:180	DL240 fabrication number	-	C	3
VER.1	2:190	Software version "Application software"	Yes	-	1
VER.2	3:190	Software version, "Driver software"	Yes	-	1
CHK.1	2:191	Checksum, "Application software"	Yes	-	1
CHK.2	3:191	Checksum, "Driver software"	Yes	-	1

AD = Abbreviated designation (default) **HELP** = Address for identification
OC = Operating class (for description see Chap. 2.4)

C/S/U "C": Value is subject to calibration lock. "U": Value is subject to suppl. & customer locks.
"S": Value is subject to supplier's lock. "-": Value cannot be changed.

F **The methods of changing values in dependence of the state of the locks are described in Chapters 2.5 and 2.5.2.**

3.4.1 Description of the values

TIME Time Address: **1:400**

Time on the internal clock, 24h format (e.g. 17:06:16). The date (format: DD.MM.YYYY) is displayed by pressing the cursor key "→". With an entry the date and time are shown together and can be changed appropriately.

MOD.T Daylight saving mode Address: **1:407**

"0" or "1" is displayed, corresponding to:

"0" = Daylight saving off

"1" = Daylight saving automatic according to PTB stipulation.

"2" = Daylight saving changeover via adjustable times

In Mode "2" any times can be set which are needed to switch from summer to winter time and back again, because they, for example, deviate from the PTB times. These must then be adjusted annually if required.

The following details are then needed:

- Changeover from winter to summer time: **1:4A0**
- Changeover from summer to winter time: **1:4A8**

The details must be given in the format: "yyyy-mm-dd,hh:mm:ss".

F When changing the mode, the time in the DL240 is automatically corrected and should therefore be checked.

M.CYC Measurement cycle Address: **1:1F0**

Time interval at which all data (e.g. meter readings, measurements, time) are updated. Reaction to events can only take place on this cycle (e.g.: end of measurement period). The display is also only updated on the measurement cycle. The measurement cycle is superimposed right-justified as a unit and numerical value.

F The shorter the time is selected, the more often the measurements are updated and the more the battery service life is reduced !

F The measurement cycle can only be set to a multiple or to an integer divisor of 60 seconds (e.g.: 15s, 60s, 120s, 180s).

F The measurement cycle must also be matched to the measurement periods used; e.g.: with a measurement cycle of 120 s a measurement period of 5 leads to asynchronous saving of data (06:00; 06:06(!); 06:10).

DISP Continuous display on/off Address: **2:1A0**

Time in minutes from the last key depression till the switch-off of the display.

DISP 0 Continuous display on; the display is continuously active (Important: Increase in current consumption)!

DISP x Continuous display off, the display goes out after x minutes.

The switched-off display is switched on again by pressing a key; the function AUT.V is retained.

AUT.V Time up to automatic display changeover Address: **1:1A0**

Time in minutes from the last key depression up to selection of the standard display "V1" (Main Counter in Input 1).

AUT.V 0 No automatic selection.

AUT.V x Display switchover after x minutes.

Fa.No DL240 fabrication number Address: **1:180**

The upper four places of the DL240 serial number are shown here. The lower 8 places are displayed by the right cursor key. The details correspond to the name-plate on the front membrane.

VER.1 Version of the application software Address: **2:190**
Version of the application software which can be loaded by downloading.

VER.2 Version of the driver software Address: **3:190**
Version of the hardware driver software which is permanently installed on the board.

CHK.1 Checksum of the application software Address: **2:191**
Checksum of the loaded application software.

CHK.2 Checksum of the driver software Address: **3:191**
Checksum of the permanently installed driver software.

The checksums are recomputed for the complete program memory and displayed after restart or on pressing the "ENTER" key.

3.5 Service list

AD	HELP	Designation / value	Cal.	C/S/U	OC
-	1:1F7	Display test	-	-	6
S.STA	3:170	Supplier's lock status/close	-	-	4
S.COD	3:171	Supplier's combination, enter / change	-	S	7
BAT.R	2:404	Remaining battery service life	-	-	2
BAT.C	1:1F3	Battery capacity	-	S	3
BACK	1:131	Manual backup	-	S	6
CLR.V	2:130	Clear counters (incl. archive)	-	C	6
CLR.X	1:130	Execute restart	-	C	6
Add	1:1C2	User-specific value	-	S	3
Misc	Various	Displays the value set under "Add"	Depends on value		

AD = Abbreviated designation (default) **HELP** = Address for identification
OC = Operating class (for description see Chap. 2.4)

C/S/U "C": Value is subject to calibration lock. "U": Value is subject to suppl. & customer locks.
"S": Value is subject to supplier's lock. "-": Value cannot be changed.

F **The methods of changing values in dependence of the state of the locks are described in Chapters 2.5 and 2.5.2.**

3.5.1 Description of the values

- **Display test** Address: **1:1F7**
When this point is selected, all LCD segments flash at a frequency of 0.5 Hz until the next key depression.

S.STA **Supplier's lock status/close** Address: **3:170**
Depending on the status of the supplier's lock a "0" (= closed) or "1" (= open) appears. Here, it is only possible **to close** the supplier's lock.

To close the supplier's lock, the entry mode is activated with ENTER and the "1" begins to flash. This must be switched over with ↑ and terminated with ENTER. Then the display S.STA 0 appears and the supplier's lock is closed.

S.COD **Supplier's combination, enter / change** Address: **3:171**
Here, the supplier's lock can **only be opened** or **changed**, but not closed. The supplier's combination must be entered with 8 places. The lock is opened after the correctness of the combination has been checked. An incorrect combination produces the error message ----7---.

With the lock opened a new supplier's combination can be entered here. After calling the address S.COD -------- always appears. The entry mode can now be activated with ENTER. In this case the left place begins to flash. Here, depending on the status of the supplier's lock, a "0" (for the "closed" status) or the appropriate figure in the combination (for the "open" status) is shown. After changing to the desired number with ↑ or ↓ and switching to the next place with → or ←, the previously entered place is shown again with "-" and the same procedure can be applied to the next place. Therefore, only the place currently being processed can be seen on the display and then only in dependence of the status of the supplier's lock.

All places not changed are automatically written with "0" due to the default combination **00000000** and the entry procedure. This must also be taken into account when entering the combination via the interface.

BAT.R Remaining battery service life Address: **2:404**

Display of the remaining battery service life in months. If this is less than three months, the "BAT" symbol in the display flashes and a status message is generated to indicate to the user an imminent battery replacement.

The calculation of the remaining battery service life occurs in dependence of the consumed capacity (which is measured) and a mean consumption (which gives the remaining battery service life). Therefore, with high usage (frequent reading out) the remaining battery service life may reduce quicker than stated by the figure for the service life!

Recalculation of the remaining battery service life is carried out automatically after the entry of a new battery capacity (see **BAT.C**).

With mains operation the remaining service life does not continue to be calculated, because the battery is then no longer loaded.

BAT.C Battery capacity in Ah Address: **1:1F3**

Display of the battery capacity in ampere-hours of the installed battery as new (constant). After a battery replacement it is essential to enter the capacity of the battery used so that recalculation of the remaining battery service life is initiated.

For a battery with ID number **730 17 964** the following values apply:

Entered device capacity:	*8.0 Ah*
Approximate remaining service life (display: "BAT.R"):	*122 months*

For a battery with ID number **730 15 773** the following values apply:

Entered device capacity:	*5.2 Ah*
Approximate remaining service life (display: "BAT.R"):	*71 months*

BACK Manual backup Address: **1:131**

Here, it is possible for the user to carry out a manual backup of all system data, counter readings and the determination of the maxima in the current month. This is an additional backup so that, for example with an ensuing battery replacement, it is ensured that the data is not lost. In addition, the new battery should first be connected before the old one is removed. Two plug connections are provided for this purpose.

CLR.V Clear counters, incl. archives Address: **2:130**

After calling by ENTER, an "0" is positioned right-justified in the display. After selecting "1" with "↑" and termination with ENTER, the function is initiated, i.e. all **counter readings** and **archives** (measurement period and month archives) are cleared. Similarly, all intermediate values associated with volume and flow calculations are deleted.

F This function may only be executed when there is no link (by remote data transfer or optical interface) to the DL240, because it would be uncontrollably interrupted.

CLR.X Execute restart Address: **1:130**

With this function the DL240 can be reset to a defined initial status. With this function the DL240 is completely reset and "forgets" all settings and loses all values saved in the archives.

F The function should therefore only be executed by trained persons with appropriate operating equipment, because a complete parameterisation with, where applicable, calibration must then be carried out.

F This function may only be executed when there is no link (by remote data transfer or optical interface) to the DL240, because it would be uncontrollably interrupted and not then reset.

The following steps are necessary to trigger the function:

1. First, the date must be set to the default date. This is needed to prevent the function being triggered unintentionally. For entry call the time, press "ENTER", reset the date to the start date using "HOME/CLR" and terminate using "ENTER" again.
2. The function can then be triggered. To do this call the display "CLR.X" again. A "0" is located to the right in the display. With "ENTER" and changing using the "↑" key to "1" and by terminating with "ENTER", all counter readings, all archives and the system data (all parameters) are cleared and the DL240 is restarted.
3. After the "busy" signal and checking the internal memory, the DL240 is reset and can be put into operation again. If necessary, contact Elster-Instromet GmbH.

Add User-specific value Address: **1:1C2**

Here, a user-specific value (address) can be set, the result of which is displayed in the DL240 display using "↓". This means that it is possible to display ***any*** value of the DL240 on the display. This is, for example, possible during a calibration inspection. The value can of course also be changed in dependence of the locks.

F The representation in the display depends on the selected value. For example, with the selection of a status message or an event, the display is formatted according to Chapter 3.8.9. Output via interface occurs in hexadecimal representation according to the table in Chapter 0 and is therefore shown accordingly in the design data book.

3.6 Output list

AD	HELP	Designation / value	Cal.	C/S/U	OC
MD.A1	1:605	Mode, Signal Output A1	-	S (where applicable U)	4
SC.A1	1:606	Source, Signal Output A1 (for pulse output)	-	S (where applicable U)	Var.
CP.A1	1:611	cp value, Signal Output A1 (for pulse output)	-	S (where applicable U)	3
SM.A1	1:607	Status mask A1 (only for status output)	-	S (where applicable U)	3
MD.A2	2:605	Mode, Signal Output A2	-	S (where applicable U)	4
SC.A2	2:606	Source, Signal Output A2 (for pulse output)	-	S (where applicable U)	Var.
CP.A2	2:611	cp value, Signal Output A2 (for pulse output)	-	S (where applicable U)	3
SM.A2	2:607	Status mask A2 (only for status output)	-	S (where applicable U)	3

AD = Abbreviated designation (default) **HELP** = Address for identification
OC = Operating class (for description see Chap. 2.4)

C/S/U "C": Value is subject to calibration lock. "U": Value is subject to suppl. & customer locks.
"S": Value is subject to supplier's lock. "-": Value cannot be changed.

F The methods of changing values in dependence of the state of the locks are described in Chapters 2.5 and 2.5.2.

3.6.1 Setting as fixed value output (remote function)

MD.Ax Mode, Signal Output Ax Address: **1 or 2:605**

In order to be able to use the DL240 output as a fixed value output, the output mode must be set as follows:

Mode	Output function	Meaning
0	Output always open	Content of the pulse buffer is cleared and output is switched to open.
4	Output always active (closed)	Output is switched on

This means, for example, that the outputs can be remotely switched by data transmission.

3.6.2 Setting as pulse output

In the "Pulse output" mode the pulses to be output are collected in a pulse buffer and output with a max. frequency of 4 Hz. This intermediate memory can retain a max. of 65535 pulses. If the pulses arrive at a faster rate than they can be output, this may cause an overflow. In this case an error message is entered into the status register.

MD.Ax Mode, Signal Output Ax Address: **1 or 2:605**

As a "signal output" the mode must be set to the following value:

Mode	Output function	Meaning
1	Pulse output	Output of volume pulses of an input or computation counter (defined under "SC.Ax").

SC.Ax Source, Pulse Output Ax Address: **1 or 2:606**

The counter reading (the source) to be output must be set for the function "Pulse output". The following addresses are practicable as sources:

Address	Meaning
X:200	Main counter of Input x ($1 \leq x \leq 4$)
X:201	LT counter of Input x ($1 \leq x \leq 4$)
X:202	Totaliser of Input x ($1 \leq x \leq 4$)
X:203	Adjustable counter of Input x ($1 \leq x \leq 4$)
1:500	Computation Counter 1 (Σ V1 ... V4)
1:503	Computation Counter 2 (Σ V1.LT ... V4.LT)
1:502	Computation Counter 3 (Σ V1.T ... V4.T)
1:503	Computation Counter 4 (Σ V1.P ... V4.P)

After changing the source all associated values (e.g. c_P values) are set to the corresponding default values and the pulse buffer cleared.

CP.Ax c_p value, Signal Output Ax: Address: **1 or 2:611**

Setting of weighting for Pulse Output x in the format: "*Pulses per cubic metre"* with two post-decimal places.

When changing an input c_P value, a check is made of whether a pulse output is programmed as pulse output for this input. If this is the case, all output c_P values CP.Ax are automatically set to the next lower, decade c_P value and the output buffer cleared. If the output is programmed as a pulse output of a computation counter, the lowest of the input c_P values is set as output c_P value (decade).

The following further values can be set in the function "Pulse output" using WinPADS240:

Time pitch for Pulse Output Ax Address: **1 or 2:616**

The pulse duration and frequency of the outputs can be set to suit customer requirements. The basis is provided by the so-called time pitch, which defines in which steps the above values can be set. With the DL240 the time pitch is set to: 125 ms.

Period duration for Pulse Output Ax Address: **1 or 2:617**

The period duration of the pulse output can be specified as a multiple of the above time pitch. The lowest value is two so that the period duration can be a minimum of 2 x 125 ms = 250 ms and so the output frequency is limited to at maximum of 4 Hz.

Pulse duration for Pulse Output Ax Address: **1 or 2:618**

The pulse duration of the output can be specified as a multiple of the above time pitch. The value must always be smaller than the period duration and the smallest value is 1 so that the minimum pulse duration is 1 x 125 ms = 125 ms.

Output – pulse memory Address: **1 or 2:619**

The status of the output pulse memory can be readout via the interface to check whether the output is overloaded.

3.6.3 Setting as switching output

In the "Switch output" mode the DL240 can be set to the output of previously defined events (e.g.: exceeding of set limits) or status signals (also group signals) or it can also be set as a time-synchronous output.

MD.Ax Mode, Signal Output Ax Address: **1 or 2:605**

As a switch output, the following modes are possible:

Mode	Output function	Meaning
2	Status output with which the logic "N/O" => active = closed	The output is closed when, and for as long as, the signal defined with SM.Ax (see below) is active in the momentary status.
3	Time-synchronised output	The output is closed at the measurement period boundary or hourly for ½ second. The measurement period boundary is selected via "Source, Signal Output Ax".
6	Status output with which the logic "N/C" => active = open.	The output is opened when, and for as long as, the signal defined with SM.Ax (see below) is active in the momentary status.

SM.Ax Status mask, Switching Output Ax Address: **1 or 2:607**

The status messages which are to lead to output switching are specified under this address. As a mask, a single message or a group message of the momentary status or the status register can be programmed. A comprehensive description of the status mask and of the event is given in Chapter **3.8.9** .

SC.Ax Source, Time-synchronous Output Ax Address: **1 or 2:606**

If the output is to be used as a time-synchronous output, the following addresses are practicable as sources:

Address	Output of time-synch. pulses based on
5:156	End of measurement period, Input 1
6:156	End of measurement period, Input 2
7:156	End of measurement period, Input 3
8:156	End of measurement period, Input 4
9:156	End of measurement period, computation counter

3.7 Interface list

AD	HELP	Designation / value	Cal.	C/S/U	OC
MD.S2	2:705	Internal interface mode	-	S	4
DF.S2	2:707	Data format, internal interface	-	S	4
BD.S2	2:708	Initial baud rate, internal interface	-	S	4
NUM.T	2:720	Number of ringing tones before accepting call.	-	S	3
GSM.N	2:775	Network operator in plain text	-	-	2
GSM.L	2:777	Reception level	-	-	2
RES.P	2:77A	Status PIN of SIM card	-	-	2
BD.S1	1:709	Baud rate for optical interface	-	S	3
CA1.B	10:150	Call acceptance window 1, start	-	U	3
CA1.E	10:158	Call acceptance window 1, end	-	U	3
CA2.B	11:150	Call acceptance window 2, start	-	U	3
CA2.E	11:158	Call acceptance window 2, end	-	U	3
RES.1	2:742	Response to Spontaneous Signal 1 (on telephone no. 1)	-	-	2
RES.2	2:74A	Response to Spontaneous Signal 2 (on telephone no. 2)	-	-	2
SEND	2:734	Trigger spontaneous signal	-	U	6

AD = Abbreviated designation (default) **HELP** = Address for identification
OC = Operating class (for description see Chap. 2.4)

C/S/U "C": Value is subject to calibration lock. "S": Value is subject to supplier's lock.
"U": Value is subject to suppl. or customer lock.
"S": "-": Value cannot be changed.

F The methods of changing values in dependence of the state of the locks are described in Chapters 2.5 and 2.5.2.

3.7.1 Description of the values

MD.S2 Mode of internal interface Address: **2:705**

Here is defined in which mode the internal interface of the DL240 is operated. The following values are possible:

Md.S2 =

1 With the baud rate selection according to DIN EN 61107 (procedure as for the optical interface). Not suitable for the connection of a modem.

2 Without baud rate selection, with RS-232 control lines and with modem operation. Connection of the internal or of an external commercially available modem.

3 Without baud rate selection, without RS-232 control lines with modem operation. Connection of an external modem with control (e.g.: call acceptance) of modem by the DL240 via the data lines (= 2-wire operation).

Md.S2 =

5 With baud rate selection, without RS-232 control lines and without evaluation of modem signals. So-called "transparent operation" (i.e. only "RxD", "TxD" and "GND") for the connection of an external modem with its own automatic call acceptance or another device (e.g. a PC). Here, the settings for NUM.T (see below) have no effect.

In Md.S2 = "2", "3" and Md.S2 = "5" an external power supply (integrated power supply of the DL240) must be present, because the DL240 is continually active. Otherwise, the incoming calls are not detected.

In Md.S2 = "3" and "5" it is usually not possible to send a short message (SMS), because these modems cannot be controlled by the DL240.

DF.S2 Data format for internal interface Address: **2:707**

Here the data format of the data traffic between the DL240 and the connected device (e.g. a modem), the number of data bits, use of a parity bit and the number of stop bits are set:

Value	Meaning	
0	7e1	7 data bits, even parity, 1 stop bit (default)
1	7o1	7 data bits, odd parity, 1 stop bit
2	8n1	7 data bits, no parity, 1 stop bit (for SMS)

Bd.S2 Initial baud rate, internal interface Address: **2:708**

The baud rate for the internal interface can be set here. Possible settings: 300, 600, 1200, 2400, 4800, 9600, 19200 (default) Bd

With *Md.S2* = "1" the baud rate *Bd.S2* is used briefly according to DIN EN 61107 to initiate the data traffic (i.e. initial baud rate). The baud rate used for transferring the useful data can be automatically increased. This is suggested by the terminal device (Dl240), see "Baud rate selection" (02:709).

With a modem normally no baud rate selection occurs. *Bd.S2* should then be set to the desired value (e.g.: "19200").

NUM.T Number of ringing tones be accepting call Address: **2:720**

The number of ringing tones, which the modem must await before accepting an incoming call (adjustable between 1 and 12 ringing tones), is output.

F **Depending on the type of modem this range can be restricted. Normally the number of ringing tones can be set to] 1. When using the external Siemens GSM modem, it must be set exactly to 1 ringing tone to accept the call. When using a different external modem, the corresponding operating manual for the modem should be checked.**

GSM.N Display GSM network operator Address: **2:775**

When using a GSM modem, the network operator with which the DL240 has logged in, can be called up in plain text. This display also a way of ensuring that the DL240 is logged into the GSM network.

The network operator is determined once every day, after a mains failure or by manual triggering (see GSM.L).

GSM.L Display GSM reception level Address: **2:777**

When using a GSM modem, the reception level can be displayed. The values have the following meaning:

0	at least -113 dBm	poor reception
1	-111 dBm	.
2..30	– 109... -53 dBm	.
31	max. – 51 dBm	good reception
99	unknown	

The reception level is determined once each day (at approx. 00:00 hrs) or after a mains failure. In addition, updating can be carried out manually by pressing the "ENTER" key.

RES.P Status of PIN on SIM card Address: **2:77A**

When using a GSM modem, the PIN of the SIM card is supported. This SIM card message is shown here:

PIN NEW	No PIN interrogation carried out yet or use of a SIM card without activated PIN interrogation.
PIN OK	PIN is correctly set.
PIN ERROR	PIN is incorrect

BD.S1 Baud rate identification for optical interface Address: **1:709**

Here, the suggestion of the terminal device for the selection of the baud rate of the optical interface according to DIN EN 61107 is stated (default: 9600 Bd).

CA1.B Call acceptance window 1, start Address: **10:150**

A time is displayed (e.g. 07:30:00).

CA1.E Call acceptance window 1, end Address: **10:158**

A time is displayed (e.g. 09:30:00).

CA2.B Call acceptance window 2, start Address: **11:150**

A time is displayed (e.g. 12:00:00).

CA2.E Call acceptance window 2, end Address: **11:158**

A time is displayed (e.g. 13:00).

This means that only calls occurring between 07:30 and 09:30 hrs. and between 12:00 and 13:00 hrs. are accepted.

The sending of a spontaneous signal is not affected by call acceptance windows.

The effect of the time windows can be influenced with the mode for the event "Call acceptance":

Address	Event	Value	Meaning (examples)
10:157	Call Window 1	9	Call between 07:30 and 09:30
		10	Call between 09:30 and 07:30 (e.g. call up in the night)
11:157	Call Window 2	9	Call between 07:30 and 19:30
		10	Call between 09:30 and 07:30

The call acceptance windows are conceived in order to be able to only establish a connection to the DL240 at certain times. No link is established outside of these windows (DL240 does not accept call). It should be ensured that at least one window is open during the "normal" working period.

RES.1 Last response to Spontaneous Signal 1 Address: **2:742**

Status of the last spontaneous signal which was sent to Phone Number 1.

RES.2 Last response to Spontaneous Signal 2 Address: **2:74A**

Status of the last spontaneous signal which was sent to Phone Number 2.

SEND Trigger spontaneous signal Address: **2:734**

A spontaneous signal can be triggered here for test purposes.

The following values for the interfaces can also be set via WinPADS240:

Suggestion for baud rate selection Address: **2:709**

The suggestion for selection of the baud rate according to IEC 1107 for the internal interface in the DL240 can be set under the address given on the right. It can be set depending on the connected modem / remote data transfer device between 4800 Bd and 19,200 Bd (default: 19,200 Bd).

Standard – INIT string for modem Address: **2:721**

In order to enable secure operation of the data recall, the string can be entered here which is sent to the modem after a mains failure or an SM in order to bring it to the basic state. The string always depends on the modem used. Contact Elster-Instromet if necessary.

With GSM operation the following values can be set via WinPADS240:

SIM card with PIN interrogation Address: **2:772**

In the DL240 operation of a SIM card using the PIN is supported. This means that the card can be secured against theft or it being used further. This function is only possible with GSM modems. The command for interrogating whether a PIN has been set or how the entered PIN number is sent to the modem depends on the GSM modem used. Also here, contact Elster-Instromet if necessary.

With WinPADS (from V2.40) batch files are present with the aid of which the above settings can be carried out. Also the PIN number can be entered there from V2.50 of WinPADS.

Device address for DIN EN 61107 bus operation Address: **2:70E**

If the DL240 is to participate in the bus operation (e.g. with connection of a modem with CS interface), a "device address" (max. 32 ASCII characters) must be specified for each bus participant. Each participant may therefore only respond when the correct or no device address is specified in the requesting telegram.

If a connection is to be established to a DL240 operated in this way with WinPADS, the device address in addition to the phone number must be given on establishing the connection (possible from V2.40).

3.7.2 Optical interface (Interface 1)

All DL240 values can be called via the optical interface and also changed in dependence of the locks. This is primarily intended for simple parameterisation of the DL240 via the WinPADS software. The connection of an AS-200 with appropriate optical adapter and LIS-200 software for setting the values and for reading out the archives for transfer to the control room is also possible.

Transmission via the interface occurs according to the IEC 1107 protocol, which is, for example, very popular in the electrical field. The optical head required for reading out is automatically centred on the read-out interface by a magnet.

3.7.3 Modem operation in the DL240 (Interface 2)

Optionally, the DL240 can be equipped with an integrated modem (analogue, ISDN or GSM). All values can be called via this interface and also changed in dependence of the locks. This is primarily intended for transmitting the consumption data (meter reading response) or the data relevant to billing (month archive) to the control room.

Alternatively, other interface cards (RS-232, RS-485, Ethernet, CL0 interface), for example for an external modem, can also be connected to Interface 2.

For each modem special settings may be needed here under some circumstances (mode, baud rate and data format of Interface 2). In this case Elster-Instromet can provide further information.

A requirement for the operation of such an interface card is the presence of an external power supply. A continuous check is made of whether this power supply is connected, even during the transmission. If it is not connected, the link is immediately relinquished.

3.7.4 Short messages in the DL240 (SMS function)

Short messages (SMs) can be sent to SM recipients over various networks using the SMS (Short Message Service). In the DL240 an SM can be used to given users information on a defined event. This may be an alert (device signal), switching of an input (tamper contact), exceeding of limits or, where required, automatically at the end of the month for transmitting the consumption data (maxima).

With the DL240 SMs can be sent to mobile phones in the D2 and D2 networks using a GSM receiver and an SM reception program (e.g.: dmail).

Sending an SM is usually only possible with integral modem (see MD.S2 – Chap. 3.7.1).

The parameters relevant to SMS can only be set via the interfaces. Entry of the SMS parameters via the DL240 keypad is not provided. Entry is made with the WinPADS240 readout and parameterising program (possible via the local interface or via remote data transfer).

3.7.4.1 Basic set-up of the SMS function

Mode RDT Address: **2:730**

In the DL240 it is possible to send an SMS to up to two different recipients. This is set in the "Remote data transfer mode":

Value	Meaning
0	No SM transmission
1	SM to Recipient 1. If unsuccessful, also to Recipient 2.
2	SMS to Recipient 1 AND Recipient 2.

MD.D Mode, dialling method Address: **2:731**

This defines whether pulse dialling ("0") or frequency dialling ("1") is used. Where required, mixed dialling modes may be needed in the system. Then here the dialling mode is set which is first used. The change from one method to another must be entered in the telephone number. This depends on the modem used and is described in its documentation (e.g.: "P": "P: from here pulse dialling and "T": frequency dialling from here for the ELSA MicroLink 14.4 modem).

Number of dialling attempts Address: **2:732**

The number of attempts to send an SM to Recipient 1 and/or Recipient 2 can be set in the address.

Maximum waiting period for carrier signal Address: **2:733**

Since various modems are installed in the SMS centres (SMSCs) which may need different lengths of time to agree a transmission (MNP, V.42) with the modem in the DL240, a time can be set in the DL240 which is allowed to pass as a maximum before the carrier signal is detected. With the time set here (in seconds) the following country-specific limits must be noted:

Country	**Valid values [s]**	**Standard val. [s]**
Germany	10...100	90
Switzerland	10...100	90
Austria	10...60	60

Event for triggering an SM Address: **2:735**

To send an SM, it must be defined on which event this is to be carried out. Description of the events: See Chap. 3.8.9.

Own phone number Address: **2:736**

In order to inform the recipient who is sending him an SM, the station's "own phone number" can be entered.

Trigger spontaneous signal Address: **2:734**

For test purposes a spontaneous signal can be triggered through operation on the DL240 (interface list – in menu point: SEND).

3.7.4.2 Content and form of an SM

An SM sent from the DL240 contains the following user data:

- Header information from SMSC (SMS centre).
- Content which is defined in the DL240.

The **header information** consists of the phone number of the SM sender (DL240) and the time/date of reception of the SM at the SMS centre. The recipient of the SM is shown these automatically.

The **SM content** in the DL240 consists of up to eight values which can be set customer-specifically. Here it must be noted that normally an SM may consist of up to 160 characters. The following table provides examples:

Address	Explana-tion	Default	Meaning	Example
2:750	1. Value	02:0181	Manufacturer's name	Elster-Instromet
2:751	2. Value	01:0181	Device designation	DL240
2:752	3. Value	01:0180	Serial number	3201234
2:753	4. Value	01:0400	Current time	2001-06-25,14:35:05
2:754	5. Value	01:0100	Current status	13;14;16
2:755	6. Value	01:021B	Customer name E1	Müller Baker
2:756	7. Value	01:0201	Main Counter E1	000000000,0000
2:757	8. Value	01:0203	Adjustable counter E1	000000123,0000

A separator ("*") is provided between each value. Depending on the mobile phone or reception program, this is converted into an appropriate character. The separating character can be entered depending on the receiving mobile phone under the address 02:760 for Recipient 1 and 02:768 for Recipient 2. It should be noted that it must be entered in "decimal" (extract from the ASCII table):

Deci-mal	Char-acter	Decimal	Char-acter	Decimal	Char-acter	Decimal	Char-acter
09	TAB	35	#	46	.	61	=
32	Blank	42	*	58	:	64	@
33	!	45	-	59	;	124	|

Clear SM content Address: **2:75F**

If the above default setting is to be changed, the new value can be set directly under the appropriate address. If not all values are required (e.g. on 7 instead of 8 values), the values no longer needed must be deleted. The value to be deleted is entered here from "0" (= 1st value) to "7" (= 8th value); e.g. "4" – so that the 5th value is deleted). In addition no gaps should be present, i.e. with four values to be transferred not the values 1, 3, 5 and 7, but instead 1-4.

3.7.4.3 SMS Recipient 1 und 2

SM Recipient Type 1 Address: **2:740**
SM Recipient Type 2 Address: **2:748**

Here is defined whether the SM for Recipient 1 resp. 2 is sent to a D1 recipient ("1") or to a D2 recipient ("2"). This can, of course, be set completely independently for Recipient 1 resp. 2.

Phone number for SM Recipient 1 Address: **2:741**
Phone number SM Recipient 2 Address: **2:749**

Details of the phone number for SM Recipient 1 resp. 2. Apart from the ten numbers 0...9, the following characters, which must be regarded as being dependent on the relevant modem, may be contained in the phone number for the control of the modem function during the dialling process:

Character	Meaning
0...9	Figures 0...9 for phone number
w	Waiting for dialling tone
,	Dialling pause. Ex-works setting for most modems = 2 seconds
>	Initiates a 'Ground pulse'. Sometimes needed in private networks to request outside line.
i	Call in ISDN mode in GSM network (only GSM modem)
Space	Space

SMSC access number for SM Recipient 1 Address: **2:743**
SMSC access number for SM Recipient 2 Address: **2:74B**

To send an SM, a link to an SMSC (SMS centre) must be established. Depending on by which network the SM recipient can be reached, the appropriate access number (tel. no.) of the relevant SMS centre must be selected.

Data format for SM Recipient 1 Address: **2:744**
Data format for SM Recipient 2 Address: **2:74C**

If the data format for the dispatch of an SM does not conform to the standard format (see Chap. 3.7.1), the format for Recipient 1 resp. 2 can be set here.

Baud rate for SM Recipient 1 Address: **2:745**
Baud rate for SM Recipient 2 Address: **2:74D**

The baud rate for the SM dispatch to Recipient 1 resp. 2 can be set between 300 Bd and 19200 Bd if a baud rate other than standard (2:708) is used.

Supplementary string for modem (Recipient 1) Address: **2:746**
Supplementary string for modem (Recipient 2) Address: **2:74E**

Depending on the modem it may be necessary to parameterise the modem differently for the dispatch of an SM to Recipient 1 resp. 2 than in the standard string (2:721) for the normal data recall.

3.8 Logbook list

AD	HELP	Designation / value	Explanation	C/S/U	OC
S.REG	1:101	Status register	Display of the status register and skip to the menu: "Status register"	-	11
STAT	1:100	Momentary status	Display of the status register and skip to the submenu: "Momentary status"	-	11
CLR	4:130	Clear status register		U	6
LOGB	10:A30	Logbook	Skip to archive: "Logbook"	-	10

AD = Abbreviated designation (default) **HELP** = Address for identification
OC = Operating class (for description see Chap. 2.4)

C/S/U "C": Value is subject to calibration lock. "U": Value is subject to suppl. & customer locks.
"S": Value is subject to supplier's lock. "-": Value cannot be changed.

F The methods of changing values in dependence of the state of the locks are described in Chapters 2.5 and 2.5.2.

3.8.1 Description of the values

S.REG Status register Address: **1:101**
In this status display all collective status signals which have occurred in the DL240 since the last deletion are displayed (only the signal number(s)). If they are no longer applied, they can be cleared under "CLR" (see below). For the display of the individual status messages this display item is also realised as a method of entry into a ***submenu*** for further messages (see submenu Status register).

STAT Momentary status Address: **1:100**
Here, the currently existing group momentary status signals are displayed. The display can be updated by pressing "ENTER", as for measurements. Deletion here is not possible!
For the display of the individual status messages this display item is also realised as a method of entry into a ***submenu*** for further messages (see submenu Momentary status).

CLR Clear status Address: **4:130**
After calling by ENTER, an "0" is positioned right-justified in the display. The function is triggered, i.e. all status register content is deleted, after switching to "1" with ↑ or ↓ and terminating with ENTER. If messages are still current, then they are recorded again afterwards.

LOGB Logbook Address: **10:A30**
The archive heading is displayed as the entry method to the logbook (archive). Branching to the logbook can now occur with ENTER.

3.8.2 Submenu: Status register

A skip into the submenu "Status register" can be made under "S.REG" using ENTER. There, the messages can be summarised to "System" and "Channel 1 - 4" (e.g. Input 1-4, Output 1-2) can be interrogated. The display is restricted to a max. of eight messages; i.e. the messages with lower priority are masked off if required:

Designation	SR.SY	SR.1	SR.2	SR.3	SR.4
Examples: (see Chap. 3.8.8)	*03*	*0*	*8*	*0*	*0*

SR.SY **Status register of the DL240 device (System)**
This affects messages which are independent of the inputs, e.g.: restart, calibration lock open, etc.

SR.1 **Status Registers Input 1, Computation Counter 1, Output 1**

SR.2 **Status Registers Input 2, Output 2**

SR.3 **Status Register Input 3**

SR.4 **Status Register Input 4**

3.8.3 Submenu: Momentary status

Branching into the submenu "Momentary status" can be made under "STAT" using ENTER. There, only the messages of the system and Inputs 1 - 4 or Outputs 1 - 2 which are currently valid are saved:

Designation	ST.SY	ST.1	ST.2	ST.3	ST.4
Examples: (see Chap. 3.8.8)	*13.15*	*12*	*16*	*14*	*14*

ST.SY **Momentary status of the DL240 device (System)**
This affects messages which are independent of the inputs, e.g.: restart, calibration lock open, etc.

ST.1 **Momentary Status of Input 1, Computation Counter 1, Output 1**

ST.2 **Momentary Status of Input 2, Output 2**

ST.3 **Momentary Status of Input 3**

ST.4 **Momentary Status of Input 4**

3.8.4 Submenu: Logbook

The logbook is a chronological listing of all events which can occur in the DL240. Any change ("start" and "end") leads to a corresponding entry in the logbook. The structure is as follows:

Data record no.	ABNo	DAT	TIME	S.TE
1	*4711*	*01.01.01*	*12:00:00*	*14_01:1.0*
2	*4712*	*01.01.01*	*12:15:22*	*10:4.0*
3	*4713*	*01.01.01*	*12:17:53*	*03_02:2.0*

ABNo **Internal archive block number**
This is a number (constant from 1 to 65535) which is used as a label for **one** data record (corresponds to one row) in the archive. For the first time of saving the block number 1 is issued, then 2 etc. up to 65535. After an overflow counting starts from "1" again.

DAT **Date**
Storage date of the data record in the corresponding "archive row".

TIME **Time**
Storage time of the data record in the corresponding "archive row".

S.TE **Triggering event**
Event which causes the saving of the data record (for structure see Chapter 3.8.9).

3.8.5 The status register

3.8.5.1 Types of message

A differentiation is made between four types of message:

Alert	is only used in the DL240 for "Restart".
Warning	affects all signals which are so important that the user must be informed about the signal and must therefore acknowledge it.
Report	is similar to "Warning", but does not need to be acknowledged.
Information	is only needed for internal functions for the labelling of operating states (usually time modes).

3.8.5.2 Status register and momentary status

The status display in the DL240 is subdivided into two ranges: One is the ***"momentary status"*** which contains only the current messages. The messages: Alert, Warning and Report are entered in this register. If the cause of a message is no longer active, it is automatically deleted from this register. This means that a quick overview of the current operating states is possible.

The second register, designated the ***"status register"***, contains all active and passed messages (alerts and warnings) which have not yet been acknowledged. There is then the possibility of being able to check messages that have already passed.

3.8.6 Deleting the status message

The deletion of all messages in the status register S.REG occurs in the main menu "**Logbook**" under "**CLR**" (address 4:130). After calling by ENTER, an "0" is positioned right-justified in the display. The function is triggered, i.e. all status registers are cleared, after switching to "1" with ↑ or ↓ and terminating with ENTER.

If messages are currently present, then they are recorded again directly after a clear. The deleted messages can still be called in the logbook.

3.8.7 Overview of message numbers

Momentary status		STAT (1:100)	ST.SY (2:100)	ST.1 (1:110)	ST.2 (2:110)	ST.3 (3:110)	ST.4 (4:110)
Status register		S.REG (1:101)	SR.SY (2:101)	SR.1 (1:111)	SR.2 (2:111)	SR.3 (3:111)	SR.4 (4:111)
No.	**Type [2]**	**Group message**	**System message**	**Status [3] E1/R1/A1**	**Status E2 / A2**	**Status E3**	**Status E4**
01	**A**	Any message 01	Restart	-	-	-	-
02	**W**	-	-	-	-	-	-
03	**W**	Any message 03	Clock stopped	-	-	-	-
04	**W**	Any message 04	Voltage failure	Output 1: Fault	Output 2: Fault	-	-
05	**W**	Any message 05	Severe data error	Input x : Deviation when comparing pulses			
06	**W**	Any message 06	Hardware fault	Input x : Warning limit violated			
07	**W**	Any message 07	Software error	Computation counter warning limit violated	-	-	-
08	**W**	Any message 08	Setting error	Input x : Warning signal active			
09	**H**	Any message 09	Replace battery	-	-	-	-
10	**H**	Any message 10	Data error (corrected)	-	-	-	-
11	**H**	Any message 11	Clock not set	-	-	-	-
12	**H**	Any message 12	-	Limit monitoring in input x infringed			
13	**H**	Any message 13	Data trans. running	Input x : Report signal active			
14	**H**	Any message 14	-	Calibration lock open	Manufacturer's lock open	Supplier's lock open	Customer's lock open
15	**I**	Any message 15	Device in battery mode	-	-	-	-
16	**I**	Any message 16	Summer time	Low tariff identification	Call accep-tance window 1	Call accep-tance window 2	-

[2] A = Alert; W = Warning; H = Report; I = Information

[3] E1= Input 1; R1= Computation Counter 1; A1= Output 1

3.8.8 Explanation of the messages

Code	Description	Type[4]	Cause
Group message			
	Group message	-	Combination of all messages (system, inputs 1-4, computation channel and outputs) in the form of status register S.REG or momentary status STAT in main menu. Example: All "04" messages in the system and E1, R1 and A1 are combined under "04". If one or more "04" messages occurs, the collective message "04" becomes active.
System messages			
01	Restart	A	During run-up not correct data was detected in the RAM and the DL240 starts with default values. Then all parameters are read from the E^2PROM. The date/time and meter readings however do not correspond to the actual status, but instead to the last saving to E^2PROM (written once each day at about 00:00 hrs.).
02	-	-	-
03	Clock stopped	W	The date/time had to be read back out of the E^2PROM, because, for example, the battery was discharged. The difference to the current time corresponds to the duration of the power failure.
04	-	-	-
05	Data error found in memory	W	During the self-test an error was found in the memory (e.g. checksum error). In this case no new values are formed nor saved.
06	Hardware fault	W	A hardware fault was found during an internal test. In this case no new values are formed nor saved.
07	Software error	W	A software error (e.g. stack overflow) was found during the internal test. In this case no new values are formed nor saved.
08	Setting error	W	On account of the programming an unprocessable combination of data arose, e.g. a data type which is not acceptable in a certain mode.
09	Battery service life approaching the end	W	The notice appears when the battery service life computed by the DL240 has fallen below the limit of 3.0 months.
10	Data error (corrected)	H	A data error was detected based on the checksum or a 2-from-3 comparison and then rectified.
11	Real-time clock adjustment missing	H	The correction factors needed for the internal clock are not correct or have not yet been entered.
12	-	-	-

[4] A = Alert; W = Warning; H = Report; I = Information

Code	Description	Type	Cause
13	Data transfer is active	H	A data transmission (e.g. via modem) is currently active.
14	-	-	-
15	Device in battery mode	I	Indication that the external power supply has failed and, for example, modem operation is no longer possible. The DL240 continues to operate under battery supply.
16	Display in summer time	I	The display of the time occurs in summer time (CEST).
Status messages for inputs, outputs, computation counters			
01	-	-	-
02	-	-	-
03	-	-	-
04	Output x : Fault	W	The pulse buffer of Output A1...2 has overflowed and output pulses have therefore been lost.
05	Ex : Deviation when comparing pulses	W	In Input E1...4 a deviation from a comparison input was detected.
06	Ex : Warning limit violated	W	A set warning limit in Input E1...4 has been violated.
07	Computation Counter 1 : Warning limit violated	W	A set warning limit in Computation Counter R1 has been violated.
08	Ex : Warning signal	W	A warning has occurred in the Status Input E1...4 (e.g.: tampering detected, volume corrector alert).
09	-	-	-
10	-	-	-
11	-	-	-
12	Ex : Limit monitoring on Ex infringed	H	In inputs E1...4 the set limit for monitoring (e.g. measurement period or day limit) has been exceeded.
13	Ex : Report signal	H	A report has occurred in the Status Input E1...4 (e.g.: time-synchronised signal, HT/LT changeover signal).
14	Kx : Lock open	H	Channel K1...3: Lock open (1= Calibration lock, 2= Manufacturer's lock, 3= Supplier's lock, 4 = Customer's lock).
15	-	-	-
16	Internal information	I	Channel 1: Counting takes place in LT counter Channel 2/3: Call acceptance window 1 or 2 active

3.8.9 Events in the DL240

Exactly one triggering event exists for each saved data record. An event may be, for example:

- the change in a single signal in the momentary status; e.g. "Warning signal on Status Input 1 starts",
- the change in at least one of a defined number of signals (signal group); e.g. "Warning starts", "Warning ends",
- an event which is not derived from the momentary status; e.g. the "month boundary"

The structure of the messages is as follows: **a,ss_ii:t.x**

a Message range from number 1 to ss
ss Message number (Chap. 3.8.7)
ii Channel number
t Type ("1" = Channel message; "2" = Group/system message; "3" = Event counter; "4" = Data message; "5" = Freeze)
x For status messages: "Signal arises" (.1) or "Signal goes" (.0), for events: "Event counter incremented" (.1) or "...decremented (.0).

3.8.9.1 Summary of all events and their meaning

Code	Hex	Event	Meaning
Individual channel signal (Input 1-4, Output 1-2, Computation Counter)			
04_01:1.0	0301	Signal 4 in Channel 1	Output 1 Fault (overload) goes
04_01:1.1	2301		Output 1 Fault (overload) arises
04_02:1.0	0302	Signal 4 in Channel 2	Output 2 Fault (overload) goes
04_02:1.1	2302		Output 2 Fault (overload) arises
05_01:1.0	0401	Signal 5 in Channel 1	Deviation during pulse comparison on Input 1 goes
05_01:1.1	2401		Deviation during pulse comparison on Input 1 arises
05_02:1.0	0402	Signal 5 in Channel 2	Deviation during pulse comparison on Input 2 goes
05_02:1.1	2402		Deviation during pulse comparison on Input 2 arises
05_03:1.0	0403	Signal 5 in Channel 3	Deviation during pulse comparison on Input 3 goes
05_03:1.1	2403		Deviation during pulse comparison on Input 3 arises
05_04:1.0	0404	Signal 5 in Channel 4	Deviation during pulse comparison on Input 4 goes
05_04:1.1	2404		Deviation during pulse comparison on Input 4 arises
06_01:1.0	0501	Signal 6 in Channel 1	Input 1: Warning limit violated goes
06_01:1.1	2501		Input 1: Warning limit violated arises
06_02:1.0	0502	Signal 6 in Channel 2	Input 2: Warning limit violated goes
06_02:1.1	2502		Input 2: Warning limit violated arises
06_03:1.0	0503	Signal 6 in Channel 3	Input 3: Warning limit violated goes
06_03:1.1	2503		Input 3: Warning limit violated arises
06_04:1.0	0504	Signal 6 in Channel 4	Input 4: Warning limit violated goes
06_04:1.1	2504		Input 4: Warning limit violated arises
07_01:1.0	0601	Signal 7 in	Computation counter: Warning limit violated goes

Code	Hex	Event	Meaning
07_01:1.1	2601	Channel 1	Computation counter: Warning limit violated arises
08_01:1.0	0701	Signal 8 in Channel 1	Input 1: Warning signal active goes
08_01:1.1	2701		Input 1: Warning signal active arises
08_02:1.0	0702	Signal 8 in Channel 2	Input 2: Warning signal active goes
08_02:1.1	2702		Input 2: Warning signal active arises
08_03:1.0	0703	Signal 8 in Channel 3	Input 3: Warning signal active goes
08_03:1.1	2703		Input 3: Warning signal active arises
08_04:1.0	0704	Signal 8 in Channel 4	Input 4: Warning signal active goes
08_04:1.1	2704		Input 4: Warning signal active arises
12_01:1.0	0B01	Signal 12 in Channel 1	Input 1: Limit monitoring violated goes
12_01:1.1	2B01		Input 1: Limit monitoring violated arises
12_02:1.0	0B02	Signal 12 in Channel 2	Input 2: Limit monitoring violated goes
12_02:1.1	2B02		Input 2: Limit monitoring violated arises
12_03:1.0	0B03	Signal 12 in Channel 3	Input 3: Limit monitoring violated goes
12_03:1.1	2B03		Input 3: Limit monitoring violated arises
12_04:1.0	0B04	Signal 12 in Channel 4	Input 4: Limit monitoring violated goes
12_04:1.1	2B04		Input 4: Limit monitoring violated arises
13_01:1.0	0C01	Signal 13 in Channel 1	Input 1: Report signal active goes
13_01:1.1	2C01		Input 1: Report signal active arises
13_02:1.0	0C02	Signal 13 in Channel 2	Input 2: Report signal active goes
13_02:1.1	2C02		Input 2: Report signal active arises
13_03:1.0	0C03	Signal 13 in Channel 3	Input 3: Report signal active goes
13_03:1.1	2C03		Input 3: Report signal active arises
13_04:1.0	0C04	Signal 13 in Channel 4	Input 4: Report signal active goes
13_04:1.1	2C04		Input 4: Report signal active arises
14_01:1.0	0D01	Signal 14 in Channel 1	Calibration lock open goes
14_01:1.1	2D01		Calibration lock open arises
14_02:1.0	0D02	Signal 14 in Channel 2	Manufacturer lock open goes
14_02:1.1	2D02		Manufacturer lock open arises
14_03:1.0	0D03	Signal 14 in Channel 3	Supplier lock open goes
14_03:1.1	2D03		Supplier lock open arises
14_04:1.0	0D04	Signal 14 in Channel 4	Customer lock open goes
14_04:1.1	2D04		Customer lock open arises
16_01:1.0	0F01	Signal 16 in Channel 1	Low tariff period goes
16_01:1.1	2F01		Low tariff period goes
16_02:1.0	0F02	Signal 16 in Channel 2	Call acceptance window 1 goes
16_02:1.1	2F02		Call acceptance window 1 arises
16_03:1.0	0F03	Signal 16 in Channel 3	Call acceptance window 2 goes
16_03:1.1	2F03		Call acceptance window 2 arises

Code	Hex	Event	Meaning
DL240 system message			
0:0.0	0000	-	No event defined
01_02:2.0	1002	Message 1 in system status	Restart goes
01_02:2.1	3002		Restart arises
03_02:2.0	1202	Message 3 in system status	Clock stopped goes
03_02:2.1	3202		Clock stopped arises
04_02:2.0	1302	Message 4 in system status	Voltage failure goes
04_02:2.1	3302		Voltage failure arises
05_02:2.0	1402	Message 5 in system status	Severe data error goes
05_02:2.1	3402		Severe data error arises
06_02:2.0	1502	Message 6 in system status	Hardware fault goes
06_02:2.1	3502		Hardware fault arises
07_02:2.0	1602	Message 7 in system status	Software error goes
07_02_2.1	3602		Software error arises
08_02:2.0	1702	Message 8 in system status	Settings error goes
08_02:2.1	3702		Setting error arises
09_02:2.0	1802	Message 9 in system status	Replace battery goes
09_02:2.1	3802		Replace battery arises
10_02:2.0	1902	Message 10 in system status	Data error corrected goes
10_02:2.1	3902		Data error corrected arises
11_02:2.0	1A02	Message 11 in system status	Clock not set goes
11_02:2.1	3A02		Clock not set arises
13_02:2.0	1C02	Message 13 in system status	Data transmission running goes
13_02:2.1	3C02		Data transmission running arises
15_02:2.0	1E02	Message 15 in system status	Device in battery mode goes
15_02:2.1	3E02		Device in battery mode arises
16_02:2.0	1F02	Message 16 in system status	Daylight saving goes
16_02:2.1	3F02		Daylight saving arises
Group message of all channel and system messages			
01_01:2.0	1001	Message 1 in overall status	Any channel message "1" goes
01_01:2.1	3001		Any channel message "1" arises
02_01:2.0	1101	Message 2 in overall status	Any channel message "2" goes
02_01:2.1	3101		Any channel message "2" arises
03_01:2.0	1201	Message 3 in overall status	Any channel message "3" goes
03_01:2.1	3201		Any channel message "3" arises
04_01:2.0	1301	Message 4 in overall status	Any channel message "4" goes
04_01:2.1	3301		Any channel message "4" arises
05_01:2.0	1401	Message 5 in overall status	Any channel message "5" goes
05_01:2.1	3401		Any channel message "5" arises
06_01:2.0	1501	Message 6 in overall status	Any channel message "6" goes
06_01:2.1	3501		Any channel message "6" arises

Code	Hex	Event	Meaning
07_01:2.0	1601	Message 7 in overall status	Any channel message "7" goes
07_01:2.1	3601		Any channel message "7" arises
08_01:2.0	1701	Message 8 in overall status	Any channel message "8" goes
08_01:2.1	3701		Any channel message "8" arises
09_01:2.0	1801	Message 9 in overall status	Any channel message "9" goes
09_01:2.1	3801		Any channel message "9" arises
10_01:2.0	1901	Message 10 in overall status	Any channel message "10" goes
10_01:2.1	3901		Any channel message "10" arises
11_01:2.0	1A01	Message 11 in overall status	Any channel message "11" goes
11_01:2.1	3A01		Any channel message "11" arises
12_01:2.0	1B01	Message 12 in overall status	Any channel message "12" goes
12_01:2.1	3B01		Any channel message "12" arises
13_01:2.0	1C01	Message 13 in overall status	Any channel message "13" goes
13_01:2.1	3C01		Any channel message "13" arises
14_01:2.0	1D01	Message 14 in overall status	Any channel message "14" goes
14_01:2.1	3D01		Any channel message "14" arises
15_01:2.0	1E01	Message 15 in overall status	Any channel message "15" goes
15_01:2.1	3E01		Any channel message "15" arises
16_01:2.0	1F01	Message 16 in overall status	Any channel message "16" goes
16_01:2.1	3F01		Any channel message "16" arises

Code	Hex	Event	Change
Message group of channels (Input 1-4, Output 1-2, Computation Counter)			
1,04_01:1.0	4301	Message 1 - 4 in Channel 1	goes
1,04_01:1.1	6301		arises
1,04_02:1.0	4302	Message 1 - 4 in Channel 2	goes
1,04_02:1.1	6302		arises
1,05_01:1.0	4401	Message 1 - 5 in Channel 1	goes
1,05_01:1.1	6401		arises
1,05_02:1.0	4402	Message 1 - 5 in Channel 2	goes
1,05_02:1.1	6402		arises
1,05_03:1.0	4403	Message 1 - 5 in Channel 3	goes
1,05_03:1.1	6403		arises
1,05_04:1.0	4404	Message 1 - 5 in Channel 4	goes
1,05_04:1.1	6404		arises
1,06_01:1.0	4501	Message 1 - 6 in Channel 1	goes
1,06_01:1.1	6501		arises
1,06_02:1.0	4502	Message 1 - 6 in Channel 2	goes
1,06_02:1.1	6502		arises
1,06_03:1.0	4503	Message 1 - 6 in Channel 3	goes
1,06_03:1.1	6503		arises
1,06_04:1.0	4504	Message 1 - 6 in Channel 4	goes
1,06_04:1.1	6504		arises

Code	Hex	Event	Change
1,07_01:1.0	4601	Message 1 - 7 in Channel 1	goes
1,07_01:1.1	6601		arises
1,08_01:1.0	4701	Message 1 - 8 in Channel 1	goes
1,08_01:1.1	6701		arises
1,08_02:1.0	4702	Message 1 - 8 in Channel 2	goes
1,08_02:1.1	6702		arises
1,08_03:1.0	4703	Message 1 - 8 in Channel 3	goes
1,08_03:1.1	6703		arises
1,08_04:1.0	4704	Message 1 - 8 in Channel 4	goes
1,08_04:1.1	6704		arises
1,12_01:1.0	4701	Message 1 - 12 in Channel 1	goes
1,12_01:1.1	6B01		arises
1,12_02:1.0	4B02	Message 1 - 12 in Channel 2	goes
1,12_02:1.1	6B02		arises
1,12_03:1.0	4B03	Message 1 - 12 in Channel 3	goes
1,12_03:1.1	6B03		arises
1,12_04:1.0	4B04	Message 1 - 12 in Channel 4	goes
1,12_04:1.1	6B04		arises
1,13_01:1.0	4C01	Message 1 - 13 in Channel 1	goes
1,13_01:1.1	6C01		arises
1,13_02:1.0	4C02	Message 1 - 13 in Channel 2	goes
1,13_02:1.1	6C02		arises
1,13_03:1.0	4C03	Message 1 - 13 in Channel 3	goes
1,13_03:1.1	6C03		arises
1,13_04:1.0	4C04	Message 1 - 13 in Channel 4	goes
1,13_04:1.1	6C04		arises
1,14_01:1.0	4D01	Message 1 - 14 in Channel 1	goes
1,14_01:1.1	6D01		arises
1,14_02:1.0	4D02	Message 1 - 14 in Channel 2	goes
1,14_02:1.1	6D02		arises
1,14_03:1.0	4D03	Message 1 - 14 in Channel 3	goes
1,14_03:1.1	6D03		arises
1,14_04:1.0	4D04	Message 1 - 14 in Channel 4	goes
1,14_04:1.1	6D04		arises
1,16_01:1.0	4F01	Message 1 - 16 in Channel 1	goes
1,16_01:1.1	6F01		arises
1,16_02:1.0	4F02	Message 1 - 16 in Channel 2	goes
1,16_02:1.1	6F02		arises
1,16_03:1.0	4F03	Message 1 - 16 in Channel 3	goes
1,16_03:1.1	6F03		arises

Code	Hex	Event	Change
Message group of system messages			
1,01_02:2.0	5002	Message 1 – 1 in system status	goes
1,01_02:2.1	7002		arises
1,03_02:2.0	4202	Message 1 – 3 in system status	goes
1,03_02:2.1	7202		arises
1,04_02:2.0	4302	Message 1 – 4 in system status	goes
1,04_02:2.1	7302		arises
1,05_02:2.0	4402	Message 1 – 5 in system status	goes
1,05_02:2.1	7402		arises
1,06_02:2.0	4502	Message 1 – 6 in system status	goes
1,06_02:2.1	7502		arises
1,07_02:2.0	4602	Message 1 – 7 in system status	goes
1,07_02:2.1	7602		arises
1,08_02:2.0	4702	Message 1 – 8 in system status	goes
1,08_02:2.1	7702		arises
1,09_02:2.0	4802	Message 1 – 9 in system status	goes
1,09_02:2.1	7802		arises
1,10_02:2.0	4902	Message 1 – 10 in system status	goes
1,10_02:2.1	7902		arises
1,11_02:2.0	4A02	Message 1 – 11 in system status	goes
1,11_02:2.1	7A02		arises
1,13_02:2.0	4C02	Message 1 – 13 in system status	goes
1,13_02:2.1	7C02		arises
1,15_02:2.0	4E02	Message 1 – 15 in system status	goes
1,15_02:2.1	7E02		arises
1,16_02:2.0	4F02	Message 1 – 16 in system status	goes
1,16_02:2.1	7F02		arises
Message group of all channel and system messages			
1,01_01:2.0	5001	Any message 1 - 1 in overall status	goes
1,01_01:2.1	7001		arises
1,02_01:2.0	5101	Any message 1 – 2 in overall status	goes
1,02_01:2.1	7101		arises
1,03_01:2.0	5201	Any message 1 – 3 in overall status	goes
1,03_01:2.1	7201		arises
1,04_01:2.0	5301	Any message 1 – 4 in overall status	goes
1,04_01:2.1	7301		arises
1,05_01:2.0	5401	Any message 1 – 5 in overall status	goes
1,05_01:2.1	7401		arises
1,06_01:2.0	5501	Any message 1 – 6 in overall status	goes
1,06_01:2.1	7501		arises
1,07_01:2.0	5601	Any message 1 – 7 in overall status	goes
1,07_01:2.1	7601		arises

Code	Hex	Event	Change
1,08_01:2.0	5701	Any message 1 – 8 in overall status	goes
1,08_01:2.1	7701		arises
1,09_01:2.0	5801	Any message 1 – 9 in overall status	goes
1,09_01:2.1	7801		arises
1,10_01:2.0	5901	Any message 1 – 10 in overall status	goes
1,10_01:2.1	7901		arises
1,11_01:2.0	5A01	Any message 1 – 11 in overall status	goes
1,11_01:2.1	7A01		arises
1,12_01:2.0	5B01	Any message 1 – 12 in overall status	goes
1,12_01:2.1	7B01		arises
1,13_01:2.0	5C01	Any message 1 – 13 in overall status	goes
1,13_01:2.1	7C01		arises
1,14_01:2.0	5D01	Any message 1 – 14 in overall status	goes
1,14_01:2.1	7D01		arises
1,15_01:2.0	5E01	Any message 1 – 15 in overall status	goes
1,15_01:2.1	7E01		arises
1,16_01:2.0	5F01	Any message 1 – 16 in overall status	goes
1,16_01:2.1	7F01		arises
Event counter			
01:3.0	8001	Event Counter No. 1 (Backup time)	Changes
01:3.1	8101		Increases
02:3.0	8002	Event Counter No. 2 (Low tariff period)	Changes
02:3.1	8102		Increases
03:3.0	8003	Event Counter No. 3 (Month boundary, computation counter)	Backwards correction
03:3.1	8103		Month expired
04:3.0	8004	Event Counter No. 4 (Day boundary, computation counter)	Backwards day change
04:3.1	8104		Day expired
05:3.0	8005	Event Counter No. 5 (Meas. period E1)	Backw'd meas. per. change
05:3.1	8105		End of meas. period
06:3.0	8006	Event Counter No. 6 (Meas. period E2)	Backw'd meas. per. change
06:3.1	8106		End of meas. period
07:3.0	8007	Event Counter No. 7 (Meas. period E3)	Backw'd meas. per. change
07:3.1	8107		End of meas. period
08:3.0	8008	Event Counter No. 8 (Meas. period E4)	Backw'd meas. per. change
08:3.1	8108		End of meas. period
09:3.0	8009	Event Counter No. 9 (Meas. period R1)	Backw'd meas. per. change
09:3.1	8109		End of meas. period
10:3.0	800A	Event Counter No. 10 (Call time window 1)	Changes
10:3.1	810A		Increases
11:3.0	800B	Event Counter No. 11 (Call time window 2)	Changes
11:3.1	810B		Increases
12:3.0	800C	Event Counter No. 12 (Monitoring E1)	Changes

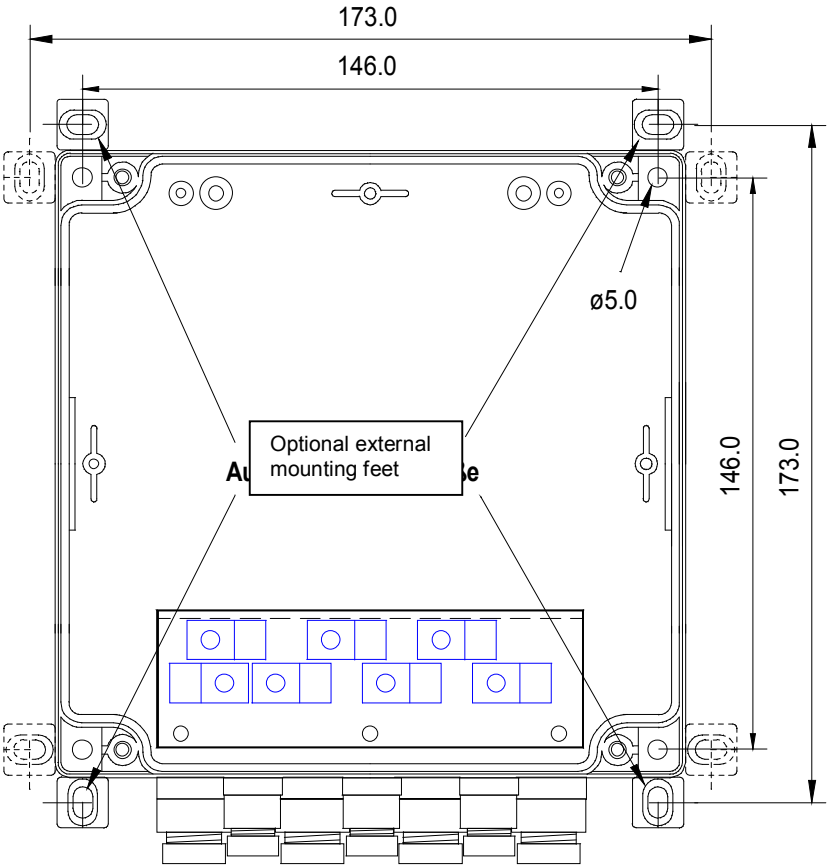
Code	Hex	Event	Change
12:3.1	810C		Increases
13:3.0	800D	Event Counter No. 13 (Monitoring E2)	Changes
13:3.1	810D		Increases
14:3.0	800E	Event Counter No. 14 (Monitoring E3)	Changes
14:3.1	810E		Increases
15:3.0	800F	Event Counter No. 15 (Monitoring E4)	Changes
15:3.1	810F		Increases
16:3.0	8010	Event Counter No. 16 (Monitoring R1)	Changes
16:3.1	8110		Increases
17:3.0	8011	Event Counter No. 17 (Month boundary E1)	Backwards correction
17:3.1	8111		Month expired
18:3.0	8012	Event Counter No. 18 (Month boundary E2)	Backwards correction
18:3.1	8112		Month expired
19:3.0	8013	Event Counter No. 19 (Month boundary E3)	Backwards correction
19:3.1	8113		Month expired
20:3.0	8014	Event Counter No. 20 (Month boundary E4)	Backwards correction
20:3.1	8114		Month expired
21:3.0	8015	Event Counter No. 21 (Day boundary E1)	Backwards day change
21:3.1	8115		Day expired
22:3.0	8016	Event Counter No. 22 (Day boundary E2)	Backwards day change
22:3.1	8116		Day expired
23:3.0	8017	Event Counter No. 23 (Day boundary E3)	Backwards day change
23:3.1	8117		Day expired
24:3.0	8018	Event Counter No. 24 (Day boundary E4)	Backwards day change
24:3.1	8118		Day expired
Change of data (e.g. change of counter reading or time)			
01:4.0	8201	Change to source data Archive 1	After change
01:4.1	8301	Change to source data Archive 1	Before change
02:4.0	8202	Change to source data Archive 2	After change
02:4.1	8302	Change to source data Archive 2	Before change
03:4.0	8203	Change to source data Archive 3	After change
03:4.1	8303	Change to source data Archive 3	Before change
04:4.0	8204	Change to source data Archive 4	After change
04:4.1	8304	Change to source data Archive 4	Before change
05:4.0	8205	Change to source data Archive 5	After change
05:4.1	8305	Change to source data Archive 5	Before change
06:4.0	8206	Change to source data Archive 6	After change
06:4.1	8306	Change to source data Archive 6	Before change
07:4.0	8207	Change to source data Archive 7	After change
07:4.1	8307	Change to source data Archive 7	Before change
08:4.0	8208	Change to source data Archive 8	After change
08:4.1	8308	Change to source data Archive 8	Before change
09:4.0	8209	Change to source data Archive 9	After change

Code	Hex	Event	Change
09:4.1	8309	Change to source data Archive 9	Before change
10:4.0	820A	Change to source data Archive 10	After change
10:4.1	830A	Change to source data Archive 10	Before change
Freeze command			
01:5.1	8501	Freeze command Archive 1	Saving of values
02:5.1	8502	Freeze command Archive 2	Saving of values
03:5.1	8503	Freeze command Archive 3	Saving of values
04:5.1	8504	Freeze command Archive 4	Saving of values
05:5.1	8505	Freeze command Archive 5	Saving of values
06:5.1	8506	Freeze command Archive 6	Saving of values
07:5.1	8507	Freeze command Archive 7	Saving of values
08:5.1	8508	Freeze command Archive 8	Saving of values
09:5.1	8509	Freeze command Archive 9	Saving of values
10:5.1	850A	Freeze command Archive 10	Saving of values

4 Installation

The DL240 is normally intended for mounting on a wall.
After removal of the two covering strips and opening the housing cover, the holes for wall mounting become accessible

The drilling dimensions can be taken from the adjacent illustration.



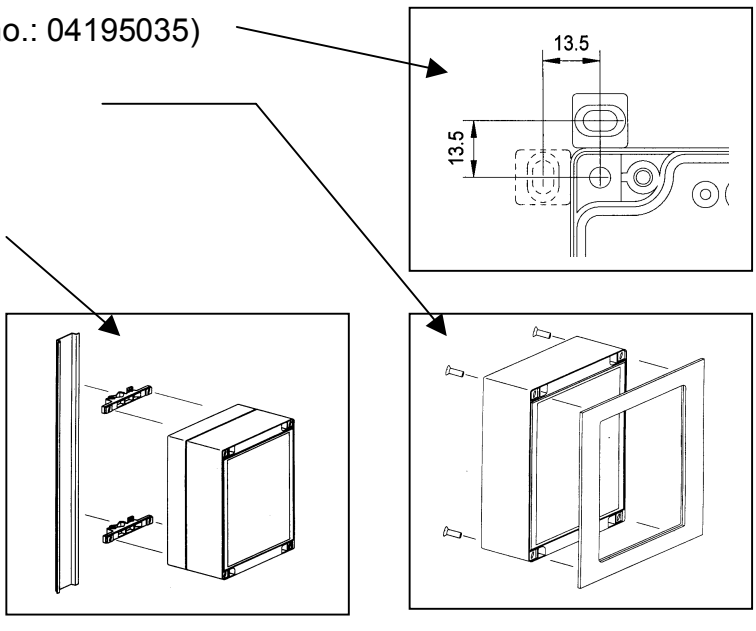
The <u>installation</u> and <u>testing</u> can occur without the presence of a calibration official, because all relevant areas are secured by adhesive labels.

However, when used as a tariff unit subject to calibration regulations, checking of the programmed values and usually acceptance of the measurement point by a calibration official are required.

4.1 Mounting options

In addition, the following options can be obtained for mounting the DL240:

1. External mounting feet (order no.: 04195035)
2. Control panel mounting frame Order no.: 04195052)
3. Mounting rail kit (Order no.: 04195036)



4.2 Installation procedure

F *The installation and any modification must only be carried out by appropriately trained personnel, because, where applicable, mains supply voltage is present in the device. Therefore, it is essential that you follow the safety instructions in the preface.*

F *Only switch on the mains voltage when all cables have been connected. When making modifications to the connections, it is essential to make sure that there is no voltage present on the device and that it is secured against switch-on.*

4.2.1 Mounting the device

1. **Fitting the cable glands**
   Where applicable, fit all additional cable glands in the bottom part.
2. **Mounting the base section**
   Mounting of the base section on the wall, where necessary with the external mounting feet (the cover with the electronics can be first placed to one side). Use corrosion-protected screws so that device can be later removed if necessary.
3. **If applicable, introduce mains lead and connect**
   Bring in mains connection lead through the left cable gland and connect to the power supply unit. A proper and reliable connection of the PE (earth) cable is especially important (EMC).

   Do not switch on yet, but secure against unintentional switch-on!
4. **Cable routing for inputs and outputs**
   Bring in the screened cables for the inputs and outputs into the housing via the lower cable glands (**length in DL240 approx. 25 cm**).

F *With intrinsically safe inputs follow the stipulations of DIN VDE 0165 (e.g. blue cable identification and connection of the earth bonding which is a mandatory requirement in the DL240 (cf. VDE 0165, Chapter 6.1.3)).*

5. **Connecting the cable screens**
   Remove the sheath of all screened cables (especially for the inputs) and connect the cable screen with a good contact to the earthing strips. To do this, loosen the mounting screw enough so that the cable with the bare cable screen can be pushed under the clamp.
   A double-ended connection of the cable screen is always to be recommended. It is only with passive sensors (reed contacts, etc.) that a single-ended connection of the screen in the DL240 is sufficient. Further measures may be required (see Potential equalisation strip).
6. **Telephone line / antenna line**
   Where applicable, pass the modem connection lines or, with GSM operation, the antenna line, into the housing via the upper cable glands. Connection to the earthing strip is not required.

7. **Potential equalisation strip**
   If the DL240 is connected to a device located in Ex Zone 1, a potential equalisation strip (of at least 1.5 mm² cross-sectional area) is essential. Then pass the cable into the housing via an upper cable gland and connect to the PA terminal on the CPU board (with cable ferrules where applicable).

   To improve the fault interference immunity, the earthing strip should also be connected to the PA cable. To do this, separate the screen from the PA cable (without damaging the internal cores) and connect it to the earthing strip with a cable clamp. This method is also to be recommended when the PE connection for the DL240 is subject to interference or is not of low resistance (e.g. long routes and connections of the PE cable in the sockets).

   If a potential difference exists between the earthing points of the DL240 and the connected sensor (e.g. ensure double-ended connection of the cable screen), it must be remedied by using a low resistance potential equalisation.
   - a cable between the housings or earthing points or
   - in each case a cable from each device to the PA strip (recommended).

8. **Connect the cables to the plug-on terminals**
   Plug-on terminals, which can be later plugged onto the CPU board, are provided on all connections (except the potential equalisation strip). Fit the plug-on terminals on the connection leads with wire-end sleeves.

9. **Fitting the internal hinges (mounting aid)**
   The supplied internal hinges can be fitted as a mounting aid. They are firmly clamped with two screws between the base section and the cover. They only act as a "mounting aid" and cannot be stressed mechanically.

10. **Connect all cables to the circuit board**
    Plug the plug-on terminals onto the inputs and outputs provided (see following terminal layout).

F *With the intrinsically safe inputs take special care to ensure connection to the correct input terminals and the correct connection polarity.*

F *Make sure that the maximum characteristic data for the inputs and outputs (see Appendix B) is not exceeded due to the connection of components.*

11. **Connection of telephone line**
    Depending on the modem used, the telephone line must be connected in the terminal compartment (see following terminal layout) or directly onto the modem board. If not fitted ex-works, a round ferrite ferrule must be fitted against EMC effects. Simple push it over the cores of the telephone cable.

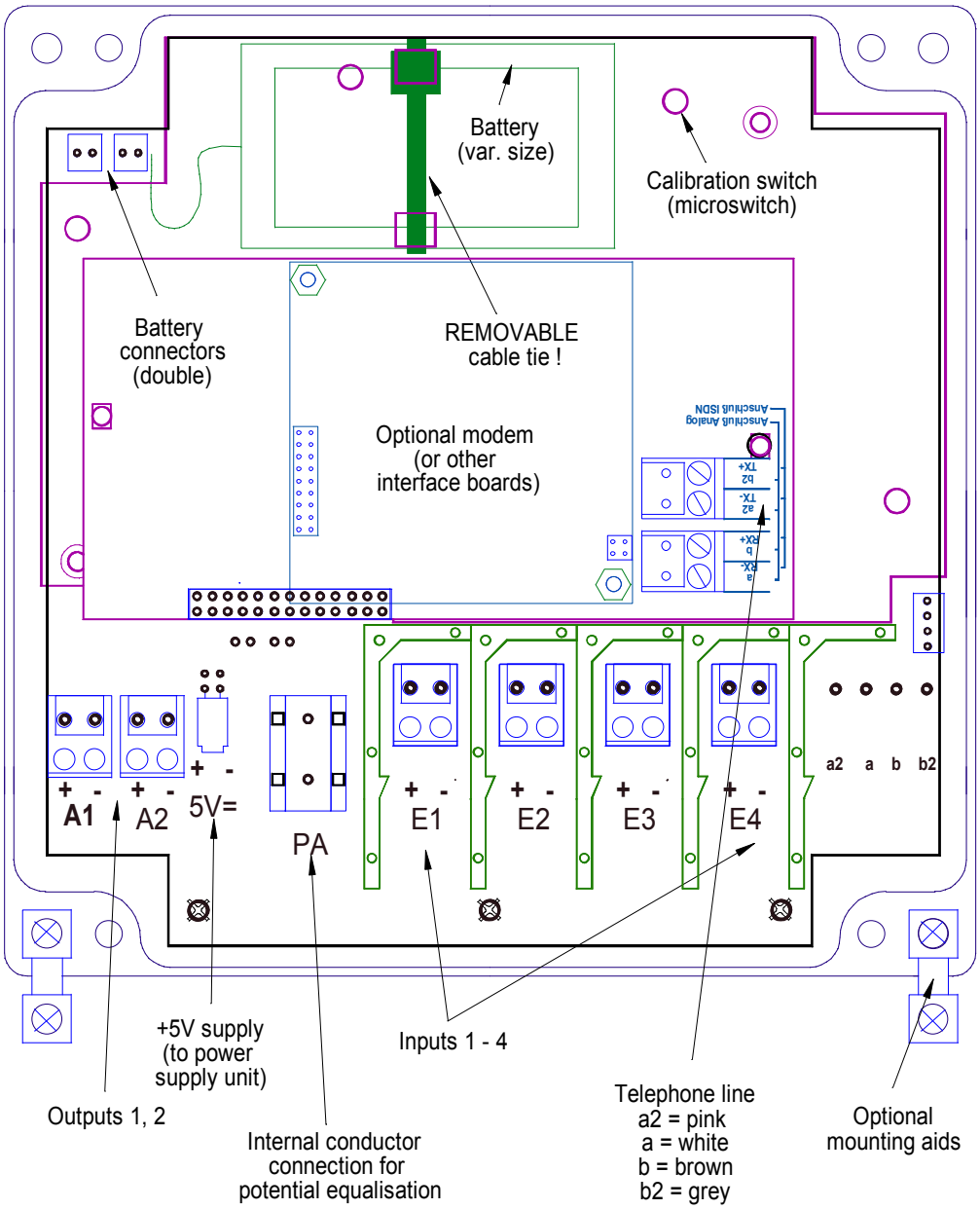
12. **Connection to the external modem**
    When using an external modem or a telecontrol system, the connection is made directly onto the corresponding interface board in the DL240. Where applicable, connect the supplied cable according to the enclosed installation instructions.

13. **Check components**
    If applicable, check that the modem is correctly installed and the connection is made to the CPU board. Check that the battery contact has not become loose.

14. **Fix the cover to the base section with two mounting screws.**

F ***Make sure that no cables are crushed when fitting the cover.***

4.2.2 Terminal layout



4.2.3 Functional inspection

1. **Functional tests**
   Pressing a key switches on the LCD and the inputs and outputs can be tested (see Chapter 2).

2. **Putting into operation**
   All parameters can be put into operation conveniently via the WinPADS software. The most important values can however also be adjusted via the keypad. The only significant exception are the values for the spontaneous signal, because these are quite complicated. This is carried out exclusively via the WinPADS software.

F ***Values subject to calibration regulations cannot be changed without appropriate authorisation. This can only take place with the calibration lock open (see below).***

F ***When using the WinLIS software, it is essential to set certain values. Refer to Chapter:*** *4.2.6* ***!***

3. **Test of pulse counting**
The pulse transfer from the meter to the DL240 must be checked for proper functioning.

4.2.4 Sealing

1. **Setting parameters**
   In each input the input mode (counting or signal input), cp value, measurement period and, where applicable, the reading of the main and adjustable counter must be set.

F ***Before changing values subject to calibration regulations, the calibration switch in the device must be opened and the button pressed ("PROG" symbol flashes in the display).***

2. **Closing and securing the calibration switch**
   Once all values subject to calibration regulations have been modified with the WinPADS240 software, the calibration lock is closed by pressing the button (*"PROG" symbol goes out)* and the opening is sealed with an adhesive label.

3. **Securing the inputs**
   When used in applications subject to calibration for billing purposes, the required inputs must be secured against tampering by calibration covering caps. Sealing is provided by an adhesive label on the relevant covering cap.
   (**for seal layout see Chapter 4.2.5**).

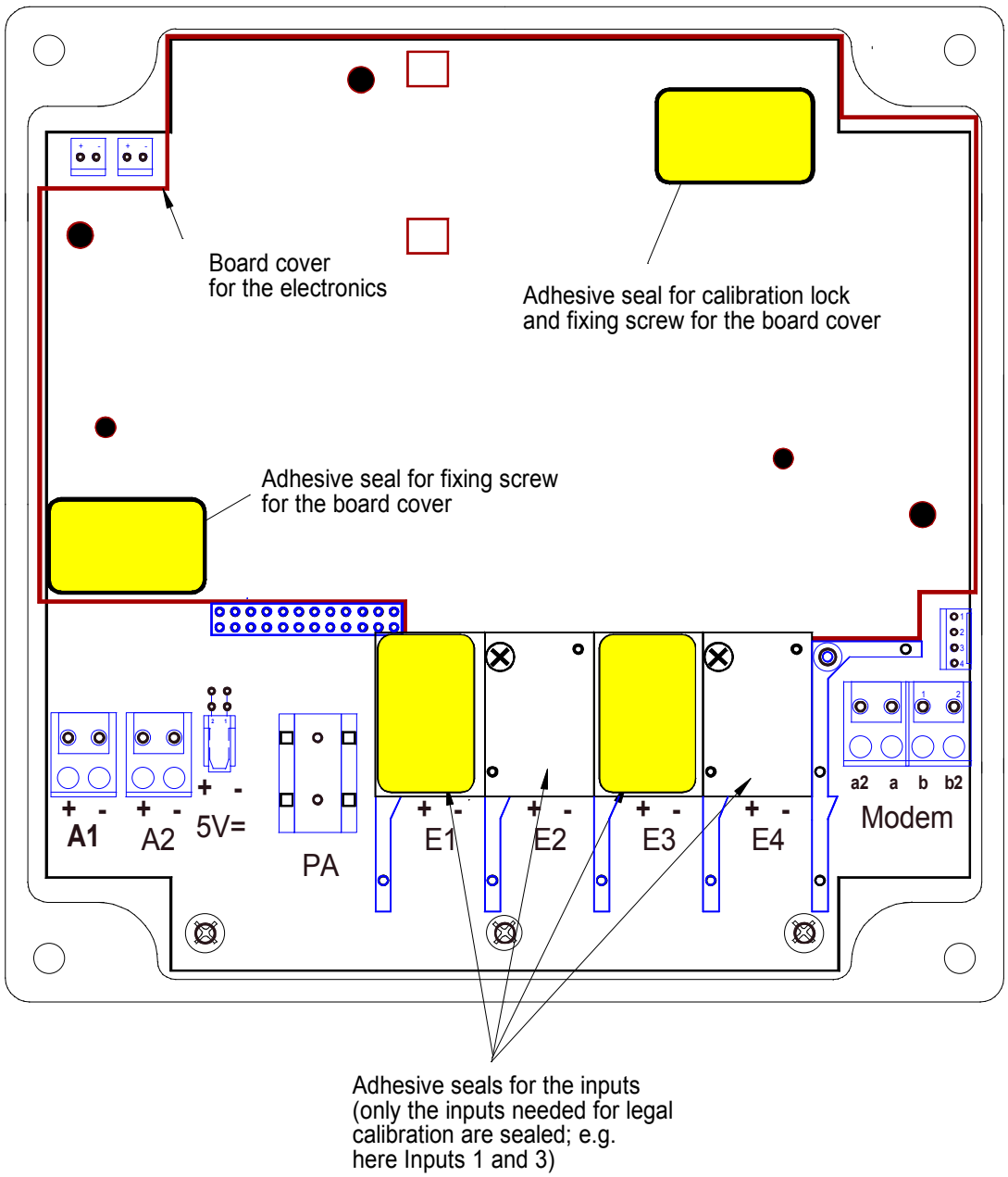
F *The connection of the measurement device and additional equipment should be sealed by the official, but the PTB regulations Vol. 22 5.2 Section 5.2.3 Page 29 says: "if such a person is present, this occurs with an official stamp, otherwise securing by the user is sufficient!"*
This must though be previously agreed with the relevant officials.

4. **Close the housing**
   Completely close the housing, secure it with four screws and fit covering strips for the mounting holes.

F ***Make sure that no cables are pinched.***

F ***Ensure that the screws are securely tightened so that no moisture can penetrate the DL240.***

4.2.5 Seal layout



The main stamped label is located on the device front panel.

4.2.6 Putting the link to the WinLIS software into operation

Some settings must be made for the correct interface to the Elster-Instromet evaluation software, WinLIS: They can be set via the keypad on the DL240, using the AS-200 or via the WinPADS240 software:

Address	LIS-200 designation	LIS-100 (DS-100) designation	Remarks	Setting by Keypad	AS-200	WinPADS	Rights[5]
1...4: 21A	Customer no.	Customer no.	-	**Cu.No**	**Yes**	**Yes**	**S**
1...4: 22E	DS-100 designation (Counter "a")	Device no.	Separation of counters in the archive into 2 DS-100 channels. Normally only used for main counter (Vx). For recognition, the device number of the DL240 is used where the 6th position from the right indicates the channel (ex-works setting):	**DS.Ca**	**No**	**Yes**	**S**
1...4: 22F	DS-100 designation (Counter "b")	Device no.	x1xxxxx = E1 -HT x2xxxxx = E1 -P x3xxxxx = E2 -HT x4xxxxx = E2 -P x5xxxxx = E3 -HT x6xxxxx = E3 -P x7xxxxx = E4 -HT x8xxxxx = E4 -P	**DS.Cb**			
1...4: 222	Meter no.	Meter no.	In the display initially only the upper 4 places are shown and the lower 8 places with the cursor key "→".	**SN.M**	**Yes**	**Yes**	**S**
1...4: 21C	Measuring point no.	-	Not used in the WinLIS	**No**	**Yes**	**Yes**	**S**
1...4: 203	Adjustable counter	Adjustable counter	Corresponds, for example to mech. reading of the meter.	**Vx.P**	**Yes**	**Yes**	**S**
5...8: 150	Measure-ment period	Interval period	When interfacing to WinLIS / AWS-100, the values are restricted to 5, 10, 15, 20, 30, 60 minutes or the day value of 1440 minutes.	**MP.Ex**	**No**	**Yes**	**C**
1...4: 253	Cp value	c_P / c_Pz value	When interfacing to WinLIS / AWS-100 only the following decade values are possible: 0.01; 0.1; 1; 10; 100.	**CP.Ex**	**Yes**	**Yes**	**C**
2...5: 141	Day boundary	Day boundary	Set ex-works to 06:00 hours.	**DY.Ex**	**No**	**Yes**	**C**
1...4: 208	Unit for Input x	-	Set ex-works to "m3".	**No**	**No**	**Yes**	**S**
-	-	I/O mark	Formed by the readout notices in the DL240 (separate for supplier and customer) and adjustable by readout modes in AS-200 and WinPADS.	**No**	**Yes**	**Yes**	**U**

[5] Value is subject: C = calibration lock; S = supplier's lock; U = supplier's or customer's lock

4.3 Maintenance

Apart from battery replacement the DL240 operates largely without needing maintenance. Notice should be taken, where applicable, of the recalibration periods if the DL240 is used in applications subject to official calibration.

When cleaning the housing becomes necessary, no aggressive cleanser (e.g. acetone, petroleum spirit, etc.) should be used, because this may attack the housing. A damp cloth with a soapy solution or similar is quite sufficient.

4.3.1 Battery replacement

During operation a check must be made from time to time of whether the battery needs to be replaced. A display of the remaining battery service life is provided for this in the DL240 under the list "Service".

F *With the specified standard operating mode (see Chapter: B-2), operation is still possible until as shown in the display. The remaining battery service life, of course, reduces more quickly through more frequent measurement, reading out of the values and active display.*

F *Battery replacement can be carried out without the present of a calibration official, because the housing itself is not sealed.*

F *DL240 measurements (e.g. all load profiles) may be lost due to careless procedures. All set parameters as well as, once daily, the date, time and meter readings are additionally backed-up in an EEPROM, so that these values are not completely lost due to a battery failure.*

F *Therefore, replacement should only be carried out by Elster-Instromet Service or by specially trained personnel.*

4.3.1.1 Carrying out battery replacement

F *For the sake of data security, a manual backup must be carried out under "Service" - "Backup" (BACK, address: 1:131). The date, time and all counter readings are then saved in a non-volatile memory.*

(1) Open up the front cover with the electronics and swivel downwards. The battery is now accessible on the CPU board.

(2) Check whether the size and identity number of the batteries match. Note the capacity value.

F *For the battery replacement the battery with the Elster-Instromet ID number: 73017964 is also permissible (refer to Chapter 3.5.1).*

F *It is essential to enter the initial capacity value in the software so that the computation of the remaining service life is restarted anew.*

(3) Plug on the new battery on the free board connector (X9 or X10) in parallel to the old battery (both are electrically isolated). The connectors are fitted with polarity reversal protection and a mech. interlock.

(4) Unlock the removable cable tie at the lug and remove the old battery.

(5) Fix the new battery with the cable tie and pull the cable tie tight by hand. Reclose the device (make sure that the cable is not pinched).

(6) Check in the display that no message "3" is entered under "Status"!

(7) The initial capacity noted above minus about 30% must be entered under "Service - "Battery capacity" (BAT.C, address: 1F3) (**it is essential to refer to Chapter 3.5.1**). The entry is also essential even with the same capacity value, so that the computation of the remaining battery service life is re-initiated.

(8) This successfully concludes the battery replacement.

4.3.1.2 Voltage failure during battery replacement

F *An operating error during battery replacement (e.g. very brief disconnection of the battery) may result in the abbreviated designations in the DL240 display not being correctly displayed.*

F *In this case the battery must be disconnected again for at least 30 s so that reliable initialisation of the DL240 can take place. After the start the DL240 should start with "INIT DATBASE" and "INIT ARCHIV". This then ensures reliable operation.*

F *After the start the DL240 signals a voltage failure (Error code "3") and various values are no longer correct and must be re-entered:*

- *The supplier lock is automatically closed (also with the default setting: 00000000); for opening of the lock see Chapter 3.5.1 – L.COD.*
- *Time (in the DL240 the time for automatic saving at 00:00 hrs. or for manual saving was restored- see Chap. 3.4).*
- *Acknowledgement of the error message in the status register (see Chap. 3.8.6).*
- *The quantity arising from the time of the last backup (00:00 hrs. for automatic backup or the time of the manual backup) up to the insertion of the new battery in the DL240 could not be acquired. The backed up counter readings are restored and therefore do not, for example, correspond to the mech. counting mechanism. It must, if applicable, be matched under the calibration lock.*

F *The determination of the day maxima is only restarted after a correct day termination (normally at 06:00 hrs.). Therefore where applicable, a day maximum arising on the day of the voltage failure is not taken into account. However, the day maximum of the current month found before the day of the voltage failure is correctly restored from the EEPROM.*

4.3.2 Recalibration of the DL240

When using the DL240 in applications subject to official calibration, the recalibration periods should be observed.

According to the **Calibration directive – General regulations**, issued in 2000, these recalibration periods are given in Appendix B (Special validity periods for calibration) under the following item number:

7.11 Additional equipment for gas measurement devices with the exception of the transmitter devices and the switching equipment.

Validity period: 5 years.

In the **Inspection Regulations, Volume 22 from the standards authority (PTB)** the procedures for inspecting electronic supplementary equipment for the formation of new measurements for gas, water and heat are described.

In the last paragraph of Chapter 4.2 (Inspection of measurement system) in Volume 22 a full inspection is only necessary if official stamp labels have been violated.

Otherwise the following is adequate:

- determination of the **correctness of the internal time measurement** based on Chap. 4.2.2 (Devices with internal crystal-controlled clocks) or Chapter 4.2.2.1 (Inspection of the time base).
- inspecting the **control functions** according to 4.2.1 4 (Remark: However, this is not relevant here, because in Chapter 4.2.1 tests for devices **without** internal crystal-controlled time bases are described).

Approvals

A-1 EC Declaration of Conformance for DL240

Konformitätserklärung

gemäß der Richtlinie 89/336/EWG des Rates vom 03.Mai 1989 und den Änderungen 392L0031, 393L0068, übernommen durch 294A0103(52) über die elektromagnetische Verträglichkeit (EMV)
und
der Richtlinie 73/23/EWG des Rates vom 19.Februar 1973 und der Änderung 393L0068, übernommen durch 294A0103(52) betreffend der elektrischen Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen (Niederspannungs-Richtlinie)

Nr. **KCE111**

Anbieter: ELSTER GmbH

Anschrift: Steinernstrasse 19-21
D – 55252 Mainz-Kastel

Produkt: Data Logger DL240

Das oben beschriebene Produkt ist konform mit:

Dokument-Nr	Titel	Ausgabe/ Ausgabedatum
DIN EN 61326	Elektrische Betriebsmittel für Leittechnik und Laboreinsatz – EMV-Anforderungen	März 2002
DIN EN 61010-1	Sicherheitsbestimmungen für elektrische Mess-, Steuer, Regel- und Laborgeräte	August 2002

Zusätzliche Angaben

Störaussendung „Klasse B“,
Störfestigkeit nach Einstufung in „Kontinuierlicher nicht überwachter Betrieb“

Mainz-Kastel, 13.11.2002
(Ort und Datum der Ausstellung)

O. Pfaff, Leiter Entwicklung Elektronik-Systeme
(Name, Funktion) (Unterschrift)

(Translation of German document)

Declaration of Conformance

according to the Directive 89/336/EEC of the Council of 3rd May 1989 and the changes 39L0031, 39L0068, incorporated through 294A0103(52) about the electromagnetic compatibility (EMC)

and

the Directive 73/23/EEC of the Council of 19th February 1973 and the change 393L0068, incorporated through 294A0103(52) regarding electrical operating equipment for use within certain voltage limits (Low Voltage Directive)

No. KCE111

Supplier: ELSTER GmbH

Address: Steinernstrasse 19-21
D-55252 Mainz-Kastel

Product: Data Logger DL240

The product described above conforms to:

Document No.	Title	Issue / publishing date
DIN EN 61326	Electrical equipment for measurement, control and laboratory use - EMC requirements	March 2002
DIN EN 61010-1	Safety requirements for electrical equipment for measurement, control and laboratory use	August 2002

Additional details

Interference emission "Class B",

Interference immunity according to classification for "Continuous non-supervised operation"

Mainz-Kastel, 13.11.2002

(Place and date of issue)

O. Pfaff, Development Manager for Electronic Systems

(Name, function) (Signed)

A-2 Certificate for "Associated electrical equipment Ex Zone 1"

(1) **EG-Baumusterprüfbescheinigung**

(2) Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen **- Richtlinie 94/9/EG**

(3) **TÜV 99 ATEX 1396**

(4) Gerät: CPU-Leiterkarte, Typ DL240-CPU (73015775)

(5) Hersteller: Elster Produktion GmbH

(6) Anschrift: Steinernstraße 19-21
D – 55252 Mainz-Kastel

(7) Die Bauart dieses Gerätes sowie die verschiedenen zulässigen Ausführungen sind in der Anlage zu dieser Baumusterprüfbescheinigung festgelegt.

(8) Der TÜV Hannover/Sachsen-Anhalt e.V., TÜV CERT-Zertifizierungsstelle, bescheinigt als benannte Stelle Nr. 0032 nach Artikel 9 der Richtlinie des Rates der Europäischen Gemeinschaften vom 23. März 1994 (94/9/EG) die Erfüllung der grundlegenden Sicherheits- und Gesundheitsanforderungen für die Konzeption und den Bau von Geräten und Schutzsystemen zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen gemäß Anhang II der Richtlinie.

Die Ergebnisse der Prüfung sind in dem vertraulichen Prüfbericht Nr. 99/PX01390 festgelegt.

(9) Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt durch Übereinstimmung mit

EN 50 014:1997 **EN 50 020:1994**

(10) Falls das Zeichen "X" hinter der Bescheinigungsnummer steht, wird auf besondere Bedingungen für die sichere Anwendung des Gerätes in der Anlage zu dieser Bescheinigung hingewiesen.

(11) Diese EG-Baumusterprüfbescheinigung bezieht sich nur auf die Konzeption und den Bau des festgelegten Gerätes. Weitere Anforderungen dieser Richtlinie sind für die Herstellung und das Inverkehrbringen dieser Geräte zu erfüllen.

(12) Die Kennzeichnung des Gerätes muß die folgenden Angaben enthalten:

II (2) G [EEx ib] IIC

TÜV Hannover/Sachsen-Anhalt e.V.
TÜV CERT-Zertifizierungsstelle
Am TÜV 1
D – 30519 Hannover

Der Leiter

Hannover, 04.03.1999

Diese EG-Baumusterprüfbescheinigung darf nur unverändert weiterverbreitet werden.
Auszüge oder Änderungen bedürfen der Genehmigung des TÜV Hannover/Sachsen-Anhalt e.V.

10/014d TÜV Nord o. DAR 5.97

Seite 1/3

(13) **ANLAGE**

(14) **EG-Baumusterprüfbescheinigung Nr. TÜV 99 ATEX 1396**

(15) Beschreibung des Gerätes

Die CPU-Leiterkarte DL240 dient als zugehöriges Betriebsmittel zur Erfassung und Speicherung von Zählimpulsen und/oder Pegeländerungen für Eingänge aus dem explosionsgefährdeten Bereich.

Die höchstzulässige Umgebungstemperatur beträgt 60°C.

Elektrische Daten

Versorgungsstromkreis..... (Stecker X8)	Nennspannung	5 V DC U_m = 260 V
Versorgungsstromkreis..... (Stecker X9, X10)	Lithiumbatterie, Fa. Saft, Typ LS 26500 bzw. LS 33600	Nennspannung 3,6 V
Melde- und Impulsausgänge..... (Stecker X5, X6)		max. Schaltspannung 30 V DC Nennstrom $I_N \leq 50$ mA DC U_m = 260 V
interne Snittstelle..... (Stecker X12)		U_m = 260 V
Modemanschluß..... (Stecker X13, X14, X15)		U_m = 260 V
Testanschluß Uhr..... (Stecker X16)		U_m = 260 V
Download-Anschluß..... (Stecker X18)		U_m = 260 V
Anschluß Folientastatur..... (Stecker X17)		U_m = 260 V

Die Leiterkarte ist mit dem Potentialausgleich des explosionsgefährdeten Bereichs zu verbinden (PA-Klemme X11).

Eingangsstromkreise:.....	Zündschutzart Eigensicherheit EEx ib IIC	
(Stecker X 1 Stecker X 2 Stecker X 3 Stecker X 4)	Höchstwerte (je Eingang) U_O = 10 V I_O = 2 mA P_O = 16 mW R = 228 kΩ (Kennlinie trapezförmig)	

BA 02 11.97 600.000

Seite 2/3

Die Eingangsstromkreise sind galvanisch miteinander verbunden.

höchstzulässige äußere Induktivität	(je Eingang)	L_o	50 mH
höchstzulässige äußere Kapazität	(je Eingang)	C_o	500 nF

Nur zum Anschluß an passive Geber.

(16) Prüfungsunterlagen bestehend aus Beschreibung (9 Seiten) sowie Zeichnungen und Stückliste (29 Seiten) sind im Prüfbericht aufgelistet.

(17) Besondere Bedingungen

keine

(18) Grundlegende Sicherheits- und Gesundheitsanforderungen

keine zusätzlichen

BA 02 11.97 600.000

(Translation of German original)

(1) **EC Prototype Test Certificate**

(2) Devices and protection systems for proper regulated application in areas subject to explosion hazards - Guideline 94/9/EG

(3) **TÜV 99 ATEX 1396**

(4) Device: CPU circuit board, type DL240-CPU (73015775)

(5) Manufacturer: Elster Produktion GmbH

(6) Address: Steinernstrasse 19-21
D-55252 Mainz-Kastel

(7) The construction of this device and the various approved versions are defined in the appendix to this prototype test certificate.

(8) TÜV Hannover/Sachsen-Anhalt e.V., TÜV-CERT certification station, grants certification to the quoted Station No. 0032 according to Article 9 of the Guideline of the European Community of 23rd March 1994 (94/9/EG) for the fulfilment of the fundamental safety and health requirements for the design and construction of devices and protection systems for the proper regulatory application in areas subject to explosion hazards according to Appendix II of the guideline.

The results of the test are laid down in the confidential Test Report No. 99/PX01390.

(9) The fundamental safety and health requirements are fulfilled through conformance with

EN 50 014:1997 **EN 50 020:1994**

(10) If the character "X" is located behind the certificate number, then reference is made to special conditions for the safe application of the device in the appendix to this certificate.

(11) This EC prototype test certificate only relates to the design and construction of the defined device. Other requirements of this guideline must be fulfilled for the manufacture of these devices and their introduction into commercial usage.

(12) The labelling on the device must contain the following details:

Ex II (2) G [EEx ib] IIc

TÜV Hannover/Sachsen-Anhalt e.V. Hannover, 04.03.1999
TÜV CERT-Zertifizierungsstelle
Am TÜV 1
D-30519 Hannover
Signed

Manager

This EC prototype test certificate must only be propagated unchanged.
Extracts or modifications require the approval of TÜV Hannover/Sachsen-Anhalt e.V.

Page 1/3

(13) **APPENDIX**

(14) **EC Prototype Test Certificate No. TÜV 99 ATEX 1396**

(15) Description of the device.

The CPU circuit board DL240 is used as associated equipment for the acquisition and storage of counting pulses and/or level changes for inputs from an area subject to explosion hazards.

The maximum permissible ambient temperature is 60°C.

Electrical data

Supply circuit	Nominal voltage	5 VDC
(Plug X8)		U_m = 260 V
Supply circuit	Lithium battery, Saft, type LS 26500 or LS 33600	
(Plug X9, X10)		Nominal voltage 3.6 V
Signal and pulse outputs		Max. switching voltage 30 VDC
(Plug X5, X6)		Nominal current $I_N \leq 50$ mA DC U_m = 260 V
Internal interface		U_m = 260 V
(Plug X12)		
Modem connection		U_m = 260 V
(Plug X13, X14, X15)		
Test connection, clock		U_m = 260 V
(Plug X16)		
Download connection		U_m = 260 V
(Plug X18)		
Connection, membrane keypad		U_m = 260 V
(Plug X17)		

The circuit board must be connected to the potential equalisation system of the area subject to explosion hazards (PA Terminal X11).

Input circuit:	Type of protection - Intrinsically safe EEx ib IIC	
(Plug X1	Highest value (per input)	
Plug X2	U_o	= 10 V
Plug X3	I_o	= 2 mA
Plug X4)	P_o	= 16 mW
	R	= 228 kOhm
	(trapezium characteristic)	

Appendix EC Prototype Test Certificate No. TÜV 99 ATEX 1396

The input circuits are connected electrically.

Highest permissible external inductance	(per input)	L_o 50 mH
Highest permissible external capacitance	(per input)	C_o 500 nF

Only for connection to passive generators.

(16) Test documentation consisting of a description (9 pages) with drawings and parts list (29 pages) is listed in the test report.

(17) Special conditions

None.

(18) Fundamental safety and health requirements

None additional.

1st supplement to certificate for "Assoc. operating equip. Ex Zone 1"

1. E R G Ä N Z U N G
zur
EG-Baumusterprüfbescheinigung Nr. TÜV 99 ATEX 1396

der Firma: Elster Produktion GmbH
Steinernstraße 19 –21
D-55252 Mainz-Kastel

Die CPU-Leiterkarte, Typ DL240-CPU (73015775) darf künftig entsprechend den im Prüfbericht aufgelisteten Unterlagen gefertigt werden.

Der zulässige Umgebungstemperaturbereich ist – 25°C bis 60°C.

Elektrische Daten

Versorgungsstromkreis ..... (Stecker X9, X10)	Lithiumbatterie, Fa. Saft, Typen LS 26500, LS 33600 oder LS 14500, Nennspannung 3,6 V
Eingangsstromkreise ..... (Stecker X 1 Stecker X 2 Stecker X 3 Stecker X 4)	in Zündschutzart Eigensicherheit EEx ib IIC Höchstwerte (je Eingang) U_O = 10 V I_O = 2 mA P_O = 16 mW R = 228 kΩ Kennlinie: trapezförmig

Die Eingangsstromkreise sind galvanisch miteinander verbunden.

höchstzulässige äußere Induktivität (je Eingang)	L_O = 50 mH
höchstzulässige äußere Kapazität (je Eingang)	C_O = 500 nF

Nur zum Anschluss an passive Geber.

Oder .....auch zum Anschluss an passive Geber außerhalb des explosionsgefährdeten Bereichs
U_m = 260 V

Alle anderen Angaben gelten unverändert für diese Ergänzung.

(16) Prüfungsunterlagen sind im Prüfbericht Nr.: 00PX11500 aufgelistet.

(17) Besondere Bedingungen

keine

(18) Grundlegende Sicherheits- und Gesundheitsanforderungen

keine zusätzlichen

BA 02 - 1.98 - 1.000 000

TÜV Hannover/Sachsen-Anhalt e.V.
TÜV CERT-Zertifizierungsstelle
Am TÜV 1
D-30519 Hannover

Hannover, 15.06.2000

Der Leiter

Seite 1/1

(Translation of German document)

1st SUPPLEMENT

to the

EC Prototype Test Certificate No. TÜV 99 ATEX 1396

from the company: Elster Produktion GmbH
Steinernstrasse 19 - 21
D-55252 Mainz-Kastel

The CPU circuit board, Type DL240-CPU (73015775), may in future be produced according to the documentation listed in the test report.

The permissible ambient temperatue range is - 25°C to 60°C.

Electrical data

Supply circuit..... Lithium batter, Saft, types LS 26500, LS 33600 or LS 14500, rated voltage 3.6 V.

Input circuits..... in intrinsically safe type of protection EEx ib IIC

(Plug X 1
Plug X 2
Plug X 3
Plug X 4)

Highest values (per input)
U_o = 10 V
I_o = 2 mA
P_o = 16 mW
R = 228 kΩ
Characteristic: trapezium shaped

The input circuits are connected together electrically.

Highest permissible external inductance (per input) L_o = 50 mH
Highest permissible external capacitance (per input) C_o = 500 nF

Only for the connection of passive transmitters.

Or ..... also for connection to passive transmitters outside of the area subject to the risk explosion.
U_m = 260 V

All other details apply unchanged to this supplement.

(16) Test documentation is lised in the Test Report No.: 00PX11500.

(17) Special conditions
None

(18) Basic safety and health requirements
None additonal.

TÜV Hannover/Sachsen-Anhalt e.V.
TÜV CERT Certification Staton
Am TÜV 1
D-30519 Hannover

Hanover, 15.06.2000

Manager

Page 1/1

2nd supplement to certificate for "Assoc. operating equip. Ex Zone 1"

2. E R G Ä N Z U N G
zur
EG-Baumusterprüfbescheinigung Nr. TÜV 99 ATEX 1396

der Firma: Elster GmbH
Steinern Str. 19
D-55252 Mainz-Kastel

Die CPU-Leiterkarte Typ DL240-CPU wird um die Ident-Nr. 73017732 erweitert und darf künftig entsprechend den im Prüfbericht aufgelisteten Unterlagen gefertigt werden.

Die Änderungen betreffen den inneren Aufbau und die elektrischen Daten.

Elektrische Daten

Eingangsstromkreise	in Zündschutzart Eigensicherheit EEx ib IIC
(Stecker X 1	Höchstwerte (je Eingang)
Stecker X 2	U_o = 10 V
Stecker X 3	I_o = 1 mA
Stecker X 4)	P_o = 3 mW

höchstzulässige äußere Induktivität (je Eingang) L_o = 1 H
höchstzulässige äußere Kapazität (je Eingang) C_o = 3 µF

oder ..... zum Anschluss an bescheinigte eigensichere Stromkreise
Höchstwert: U_i = 30 V

oder ..... zum Anschluss an passive Geber

oder auch ..... zum Anschluss an aktive Geber außerhalb des explosionsgefährdeten Bereichs U_m = 30 V

Die Eingangsstromkreise sind galvanisch miteinander verbunden.

Alle weiteren Daten gelten unverändert.

Prüfungsunterlagen sind im Prüfbericht Nr. 02 YEX 550193 aufgelistet.

TÜV NORD CERT GmbH & Co. KG
TÜV CERT-Zertifizierungsstelle
Am TÜV 1
D-30519 Hannover
Tel.: 0511 986-1470
Fax: 0511 986-2555

Hannover, 19.12.2002

Der Leiter

BA 02.03.02

Seite 1/1

(Translation of German document)

2nd SUPPLEMENT

to the

EC Prototype Test Certificate No. TÜV 99 ATEX 1396

from the company: Elster GmbH
Steinernstrasse 19
D-55252 Mainz-Kastel

The CPU circuit board, Type DL240-CPU has been extended with the ident. no. 73017732 and may in future be produced according to the documentation listed in the test report.

The changes relate to the internal construction and the electrical data.

Electrical data

Input circuits..... in intrinsically safe type of protection EEx ib IIC

(Plug X 1 Plug X 2 Plug X 3 Plug X 4) Highest values (per input)
U_o = 10 V
I_o = 1 mA
P_o = 3 mW

Highest permissible external inductance (per input) L_o = 1 H
Highest permissible external capacitance (per input) C_o = 3 µF

or ..... for connection to certified intrinsically safe circuits
Max. value: U_i = 30 V

or ..... for connection to passive transmitters

or also..... for connection to active transmitters outside of the area subject to the risk of explosion U_m = 30 V

The input circuits are connected together electrically.

All other details apply unchanged to this supplement.

Test documentation is listed in the Test Report No.: 02 YEX 550193.

TÜV NORD CERT GmbH & Co. KG
TÜV CERT Certification Station
Am TÜV 1
D-30519 Hannover

Tel.: 0511-986-1470

Fax: 0511-986-2555

Hanover, 19.12.2002

Manager

Page 1/1

3rd supplement to certificate for "Assoc. operating equip. Ex Zone 1"

TÜV NORD

3. E R G Ä N Z U N G

zur Bescheinigungsnummer:	**TÜV 99 ATEX 1396**
Gerät:	CPU-Leiterkarte, Typ DL240-CPU (73015775)
Hersteller:	**ELSTER-Instromet**
Anschrift:	Steinern Str. 19-21 55252 Mainz-Kastel
Auftragsnummer:	8000338680
Ausstellungsdatum:	31.07.2006

Änderungen:

Für die CPU-Leiterkarte Typ DL240-CPU (73015775) kann zukünftig auch der Batterietyp LSH 20 eingesetzt werden.

Die elektrischen Daten sowie alle weiteren Angaben gelten unverändert für diese Ergänzung.

Diese Ergänzung erfüllt die Anforderungen der folgenden Normen:

EN 50014:1997+A1+A2 **EN 50020:2002**

(16) Die Prüfungsunterlagen sind im Prüfbericht Nr. 06 YEX 338680 aufgelistet.

(17) Besondere Bedingungen

keine zusätzlichen

(18) Grundlegende Sicherheits- und Gesundheitsanforderungen

keine zusätzlichen

TÜV NORD CERT GmbH, Langemarckstraße 20, 45141 Essen, akkreditiert durch die Zentralstelle der Länder für Sicherheitstechnik (ZLS), Ident. Nr. 0044, Rechtsnachfolger der TÜV NORD CERT GmbH & Co. KG Ident. Nr. 0032

Der Leiter der Zertifizierungsstelle

Schwedt

Geschäftsstelle Hannover, Am TÜV 1, 30519 Hannover, Tel.: +49 (0) 511 986-1455, Fax: +49 (0) 511 986-1590

BA 02 01.06 1.000.000

P17-F-006 06-06

Seite 1/1

(Translation of German document)

3rd supplement to certificate for "Assoc. operating equip. Ex Zone 1"

3rd Supplement

For the certificate number:	TÜV 99 ATEX 1396
Device:	CPU Circuit Board, Type DL240-CPU (73015775)
Manufacturer:	**ELSTER-Instromet** Steinernstr. 19-21 55252 Mainz-Kastel
Order number:	8000338680
Date of issue:	31.07.2006

Modifications:

In future the battery type LSH 20 may be used for the CPU Circuit Board Type DL240-CPU (73015775).

This electrical data and all other details apply unchanged to this supplement.

This supplement fulfils the requirements of the following standards:

EN 50014:1997+A1+A2 **EN 50020:2002**

(16) The test documentation is listed in the Test Report No. 06 YEX 338680.

(17) Special conditions
None

(18) Basic safety and health requirements
None additional.

TÜV NORD CERT GmbH, Langemarckstrasse 20, 45141 Essen, certified by the Central Office of the States for Safety Engineering (ZLS), ID No. 0044, legal successor to TÜV NORD CERT GmbH &Co. KG ID No. 0032.

Manager of the Certification Station

Schwedt

Branch Office Hanover, Am TÜV 1, 30519 Hanover, Tel.: +49-511-986-1455, Fax: +49-511-986-1590

Page 1/1

A-3 Manufacturer's declaration for application of the DL240 in Ex Zone 2

Herstellererklärung

gemäß DIN VDE 0165 von Aug. 1996, Abschnitt 4.2

Der ELSTER Data Logger

DL240

ist entsprechend DIN VDE 0165

zum Einsatz in Zone 2 für Gase der Temperaturklasse T1

(Zündtemperatur > 450 °C, z.B. Erdgas) geeignet.
(Anlagen beachten!)

O. Pfaff
Leiter Entwicklung
Elektronik-Systeme

J. Kern
Leiter Geschäftssegment
Elektronik-Systeme

Mainz-Kastel, den 24.07.2001

Zugrundeliegende Verordnungen, Richtlinien und Normen:

- Verordnung über elektrische Anlagen in explosionsgefährdeten Räumen (ElexV) vom 19.12.1996 (BGBI. 1996, Teil I Nr. 65, S. 1931)
- Explosionsschutz-Regeln (EX-RL) mit Beispielsammlung, Ausgabe Juli 2000
- DIN VDE 0165, Ausgabe Aug. 1996

ELSTER

ELSTER GmbH, Steinernstraße 19-21, D-55252 Mainz-Kastel,
Telefon: 06134/605-0, Telefax: 06134/605-390, Internet: www.elster.com

Anlage zur Herstellererklärung für ELSTER Data Logger **DL240**
Seite 1 von 2

1. Allgemeines

In Normen, Verordnungen und Richtlinien ist festgelegt, welche Maßnahmen zur Vermeidung der Gefahren durch explosionsfähige Atmosphäre notwendig sind.

Über Maßnahmen, die das Entstehen und die Entzündung gefährlicher explosionsfähiger Atmosphäre verhindern, geben die "Explosionsschutz-Regeln (EX-RL)", Ausgabe Juli 2000 der Berufsgenossenschaft der chemischen Industrie erschöpfend Auskunft. In enger Bindung an VDE 0165 wurden als Grundlage für die Beurteilung des Umfanges der Schutzmaßnahmen Zoneneinteilungen für die explosionsgefährdeten Bereiche vorgenommen.

In einer umfangreichen Beispielsammlung zu den Explosionsschutz-Regeln sind auch für den Bereich der Umgebung geschlossener gasführender Apparate, Behälter und Rohrleitungen Hinweise gegeben, welche Schutzmaßnahmen möglich sind zur Vermeidung von:

1. Explosionsfähiger Atmosphäre
2. Zündquellen oder
3. welcher konstruktive Explosionsschutz möglich ist.

Zone 2 umfaßt Bereiche, in denen damit zu rechnen ist, daß gefährliche explosionsfähige Atmosphäre durch Gase, Dämpfe oder Nebel nur selten und dann auch nur kurzzeitig auftritt.

Daher sind nur Betriebsmittel zulässig, bei denen betriebsmäßig keine Funken, Lichtbögen oder zündfähig heiße Oberflächen entstehen.

Anlage zur Herstellererklärung für ELSTER Data Logger **DL240**
Seite 2 von 2

3. Einsatz des Data Loggers DL240 in der Zone 2

Vom Betreiber ist sicherzustellen, daß nach der erfolgten Installation für den Data Logger **DL240** die Schutzart IP 54 nach DIN 40 050 erfüllt wird. Dazu müssen alle Kabeldurchführungen dicht und alle nicht genutzten Durchführungen verschlossen sein.

Beim Einsatz des Auslesegerätes AS-200/S2 oder andere mobile Auslesegeräte müssen folgende Punkte beachtet werden:

- Diese Geräte müssen per Herstellererklärung oder eine Ex-Zulassung für den Einsatz in Ex-Zone 2 geeignet sein oder es muß vorher sicher gestellt werden, daß keine explosionsfähige Atmosphäre vorhanden ist. Die Vorgaben in den Erklärungen müssen beachtet werden.

Bei Verwendung der internen Schnittstelle (zum Modemabruf) müssen folgende Punkte beachtet werden:

- Es dürfen nur die von ELSTER freigegebenen und zertifizierten Modemtypen verwendet werden.

Beim Anschluß von Einrichtungen an die Ein-/Ausgänge der **DL240** müssen folgende Punkte beachtet werden:

- Eine Veränderung der Installation darf nur in spannungslosem Zustand erfolgen. Vor der Installation ist sicherzustellen, daß keine explosionsfähige Atmosphäre vorhanden ist.
- Es ist sicherzustellen, daß die in der Betriebsanleitung des **DL240** genannten Grenzwerte und Vorgaben eingehalten werden.

ELSTER GmbH, Mainz-Kastel, den 24. Juli 2001

(Translation of German document)

Manufacturer's Declaration

according to DIN VDE 0165 of Aug. 1996, Section 4.2

The ELSTER Data Logger

DL240

is suitable according to DIN VDE 0165

for use in Zone 2 for gases in the Temperature Class T1

(ignition temperature > 450°C, e.g. natural gas).

(Take note of appendices)

O. Pfaff	**J. Kern**
Development Manager	Manager of Division
Electronic Systems	Electronic Systems

Mainz-Kastel, 24.07.2001

Foundation directives, guidelines and standards:

- Directive on electrical systems in rooms subject to explosion hazards (ElexV) of 19.12.1996 (BGBl. [Federal Code] 1996, Part 1 No. 65, page 1931).
- Explosion protection regulations (EX-RL) with collection of examples, issued July 2000.
- DIN C´VDE 0165, issued Aug. 1996.

ELSTER

ELSTER GmbH, Steinernstrasse 19-21, D-55252 Mainz-Kastel,

Telephone: +49-6134-605-0, Telefax: +49-6134-605-390, Internet: www.elster.com

Appendix to the Manufacturer's Declaration for ELSTER Data Logger **DL240**
Page 1 of 2

1. General remarks

Standards, directives and guidelines define which measures are necessary for the avoidance of hazards due to explosive atmospheres.

The "Explosion Protection Regulations" (EX-RL), issued in July 2000 from the chemical industry trade association, provide comprehensive information about measures which prevent the formation and ignition of hazardous explosive atmospheres. Zone divisions for areas subject to explosion hazards have been made in close connection with VDE 0165 as a basis for assessing the extent of protective measures.

In an extensive collection of examples on the explosion protection regulations, information for the area in the vicinity of enclosed, gas-bearing apparatus, containers and pipes is also given regarding which protective measures are possible for the avoidance of:

1. atmospheres capable of exploding
2. ignition sources or
3. which design in explosion protection is possible.

Zone 2 includes areas in which it must be expected that dangerous atmospheres of gases, vapours or mists capable of exploding only occur seldom and then only for a brief period of time.

Therefore only operating equipment is permissible with which during operation no sparks, arcing or hot surfaces capable of providing ignition arise.

Appendix to the Manufacturer's Declaration for ELSTER Data Logger **DL240**
Page 2 of 2

3. Use of DL240 Data Logger in Zone 2

The operator must make sure that after concluded installation IP 54 Class of Protection according to DIN 40 050 is fulfilled for the **DL240** Data Logger. For this, all cable entries must be sealed and all unused entries must be closed off.

When using the AS-200/S2 Readout Device or other mobile readout devices, the following points must be followed:

- According to the manufacturer's declaration or an Ex approval, these devices must be suitable for use in Ex Zone 2 or it must first be ensured that no atmosphere capable of exploding is present. The stipulations in the declarations must be followed.

The following points must be followed when connecting equipment to the inputs/outputs of the **DL240**:

- Modification of the installation must only be made in the voltage-free state. Before installation, it must be ensured that no atmosphere capable of exploding is present.
- It must be ensured that the limits and specifications quoted in the **DL240** operating instructions are observed.

ELSTER GmbH, Mainz-Kastel, 24th July 2001

B Technical data

B-1 General data (mechanical)

Housing/construction	Wall-mounted housing, ABS plastic (Material durability: see Chap. 4.3)	
Dimensions (W x H x T)	approx. 160 x 160 x 90 mm	
Weight	approx. 1.4 kg	
Protection	IP 64 according to EN60529	
Ambient temperature	DL240 basic unit:	- 25 ... +60 °C
	with power supply unit:	- 10 ... +60 °C
	with analogue modem (INSYS HS14):	- 10 ... +60 °C
	with analogue modem (INSYS i-module):	0 °C ... +50 °C
	with ISDN modem (INSYS):	0 °C...+50 °C
	with int. GSM modem (Wavecom):	-10 °C...+60 °C
	with RS-232 board:	- 10 °C...+ 60 °C
	with CS interface (CL0), passive):	- 10 °C...+ 60 °C
	with Ethernet card:	0 °C...+50 °C
Relative humidity	[93 % (non-condensing)	
Mounting	Using corrosion-protected screws where possible	

B-2 Power supply

Battery	Lithium battery module, 3.6V: • Order No.: 73017964, replacement for 73015773 • "Removable" (!) cable tie for fixing battery; Order No.: 04090124 or commercially available cable tie.
Potential equalisation	Terminal **PA**: max. 2.5 mm² (flexible); 4 mm² (solid wire); cross-section: at least 1.5 mm²; connection to PA terminal and to DL240 – earthing strip essential (do not interrupt copper wire or damage it)
Option "**Internal power supply**"	Voltage range: 115 or 230 VAC 50/60 Hz +10/-15 % Output: 5.0 V DC (+/- 10%) / minimum. 280 mA Power intake: approx. 1.4 W; T_A: -10 °C ... +60 °C; Fuse: 315 mA slow-blow (TR5); Input terminals: **L1 / N / PE** and screw terminals; 0.2...4 mm^2 (solid wire); 0.2...2.5 mm^2 (flexible);

*The min. service life of eigth years is guaranteed for the following **standard operating mode**:*

Display active	1 h / month
Measuring cycle mode	300 s (updating of all values every 5 minutes)
Interface active	30 min / month
Max. input frequency	f = 1 Hz on two inputs
Ambient temperature	T_A = 20 °C

B-3 Pulse / signal inputs

Four signal inputs for reed contacts or transistor switches (no active generators, such as NAMUR generators or external voltages) which, if required, are implemented as intrinsically safe. Each input can be used as an intrinsically safe or non-intrinsically safe input.

Designation	E1... E4		
Cable connection	Plug-in terminals; 0.5 ... 1.5 mm² (solid); With flexible cable use wire-end sleeves.		
Screening	Connected at one end to the DL240 earthing strip.		
Special features	Each input can be set and sealed separately.		
Max. cable length	approx. 100 m depending on ambient conditions (EMC)		
Rated data	Open-circuit voltage $U_0 \approx 3.3$ V Short-circuit current I_{SC} = 330 µA (short term)		
Switching levels	Resistance		Voltage
Switching point "on":	$R_{on} \leq 100$ kΩ		$U_{on} \leq 0.5$ V
Switching point "off":	$R_{off} \leq 2$ kΩ		$U_{off} \leq 3.0$ V
Pulse duration	ton ≥ 25 ms	Space duration	toff ≥ 50 ms
Counting frequency	$f_{max} \leq 10$ Hz		
Ex data for inputs	See appendix: A-2		

B-4 Signal and pulse outputs

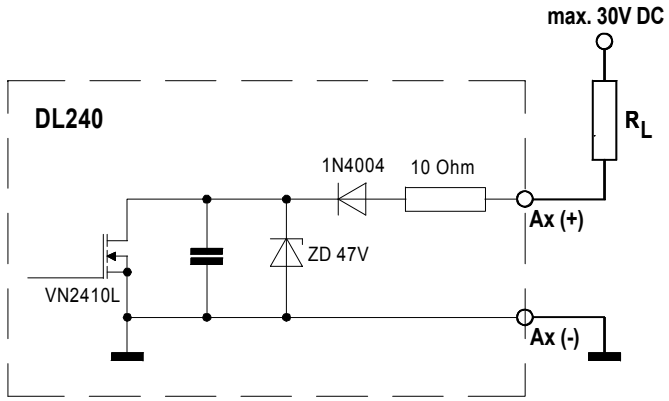
The two signal and pulse outputs are transistor (MOSFET) outputs which operate separately from one another. They are implemented as plug-on terminals.

Designation	A1, A2
Cable connection	Plug-in terminals; 0.5 ... 1.5 mm² (solid); With flexible cable use wire-end sleeves.
Screening	Connected at one end to the DL240 earthing strip.
Max. cable length	approx. 100 m depending on ambient conditions (EMC)
Rated data	Max. switching voltage U_O £ 30 V DC Max. output current I_O £ 100 mA DC Voltage drop £ 1.7 V at 50 mA DC Leakage current (for "Off" signal) £ 0.001 mA (at U_O = 24 V).

Pulse duration (tp)	Adjustable on a 125 ms pitch (1...254 x 125 ms).
Period (T)	Adjustable on a 125 ms pitch (2...255 x 125 ms); T> tp !
Output frequency	Max. 4 Hz, accuracy of pulse duration +/- 10 %; temporary buffer for 65,535 pulses

Output circuit:

(Ground is switched !)



B-5 Optical interface

Optical interface according to IEC 1107; bit-serial, asynchronous data transmission according to ISO 1177, half duplex. Support of **Data transmission mode "C"** (= Data read-out, programming and manufacturer-specific applications with autom. change of the baud rate).

Baud rate	300 Bd (initial baud rate); automatic up to 9600 Bd.
Format	1 start, 7 data, 1 parity (even) and 1 stop bit.
Connection	Optical read-out head on device front panel (automatic positioning / fixing by magnet).

B-6 Internal, serial TTL interface

Interface similar to RS232 and V.24, TTL levels; no electrical isolation; connection of internal modem or various interface cards.

Limits (Voltages measured with respect to GND:

Input voltage V_{CC}: max 5.0 V

Input level "1" U_i ³ 2.1 V Input level "0" U_i £ 1.2 V

B-7 Measurement uncertainty

Volume counter (V_x)	No loss of pulses
Momentary flow rate (Q_x)	< 5.0 % of measurement (display is not calibrated)
Measurement period flow (Vx.MP)	< 0.1 % of measurement (display in m³ is not calibrated)
Daily flow (Vx.DT)	< 0.1 % of measurement (display in m³ is not calibrated)

C Value index

Below all values are listed which can be called via the keypad or interface and also changed depending on the status of the locks. The designation "x" is a placeholder for the corresponding input or output, whereas "Y" represents the start of the address (via the "Help" function):

e.g.:	Vx	Y:200	Counter "a" of Inputs 1-4	(1≤ Y ≤ 4)
for Y = 3:	V3	3:200	Counter "a" in Input 3	
or:	Vx.MP	Y:160	Incr. measurement period counter Input 1-4	(Y: 1,5,9,13)
for Y = 5:	V2.MP	5:160	Incr. measurement period counter Input 2	

AD[6]	HELP	"Y"	Description	Display[7]	Value range	Spec. fig.	Prot[8]
STAT	1:100	-	Total momentary status	Logbook	-	-	-
ST.SY	2:100	-	System - momentary status	Logbook	-	-	-
S.REG	1:101	-	Total status register	Logbook	-	-	-
SR.SY	2:101	-	System status register	Logbook	-	-	-
ST.x	Y:110	1...4	Momentary status of Channels 1-4	Logbook	-	-	-
SR.x	Y:111	1...4	Status register of Channels 1-4	Logbook	-	-	-
CLR.X	1:130	-	Execute restart	Service	-	-	C
CLR.V	2:130	-	Clear counters (incl. archive)	Service	-	-	C
-	3:130	-	Clear system data	-	-	-	C
CLR	4:130	-	Clear status register	Logbook	-	-	S
BACK	1:131	-	Manual backup	Service	-	-	S
-	1:140	-	Date/time based on system day boundary	-	2099-12-31, 23:59:59	-	-
-	1:140_1	-	Date based on system day boundary	-	31.12	-	-
-	1:140_2	-	Day/hour based on system day boundary	-	31-04	-	-
-	1:140_3	-	Hour/minute based on system day boundary	-	04:55	-	-
-	1:141	-	Day boundary (system backup)	-	00:00 – 23:00	00:00	C
DY.E1	5:141	-	Day boundary (input 1)	E1	00:00 – 23:00	06:00	C
DY.E2	6:141	-	Day boundary (input 2)	E2	00:00 – 23:00	06:00	C
DY.E3	7:141		Day boundary (input 3)	E3	00:00 – 23:00	06:00	C
DY.E4	8:141		Day boundary (input 4)	E4	00:00 – 23:00	06:00	C
DY.R1	9:141	-	Day boundary (computation counter)	R1	00:00 – 23:00	06:00	C
-	Y:142	1, 5-9	Day counter (days since 01.01.1970)	-	65535	-	-
-	Y:143	1, 5-9	Month counter (months since 01.01.1970)	-	65535	-	-
	1:150	-	Backup time (Event 1)	-	(dynamic)	1	M
	2:150	-	Low tariff period (Event 2)	-	(dynamic)	604800	S

[6] AD = Abbreviated designation HELP = Value no. for identification.

[7] Display list: "-" means that this value can only be called via interface.

[8] Prot: Value secured under Calibration (C), Manufacturer (M), Supplier (S) or Customer (K) lock.

AD[6]	HELP	"Y"	Description	Display[7]	Value range	Spec. fig.	Prot[8]
	3:150	-	Month boundary, comp. counter (Event 3)	-	(dynamic)	1	C
	4:150	-	Day boundary comp. counter (Event 4)	-	(dynamic)	1	C
MP.E1	5:150	-	Measurement period input 1 (Event 5)	E1	(dynamic)	60	C
MP.E2	6:150	-	Measurement period input 2 (Event 6)	E2	(dynamic)	60	C
MP.E3	7:150	-	Measurement period input 3 (Event 7)	E3	(dynamic)	60	C
MP.E4	8:150	-	Measurement period input 4 (Event 8)	E4	(dynamic)	60	C
MP.R1	9:150	-	Measurement period comp. counter (Event 9)	R1	(dynamic)	60	S
CA1.B	10:150	-	Call acceptance window 1 start (event)	Interface	(dynamic)	00:00	S
CA2.B	11:150	-	Call acceptance window 2 start (event)	Interface	(dynamic)	00:00	S
L.ME	12:150	-	Limit for monitoring E1 (event)	E1	(dynamic)	50000	S/K
L.ME	13:150	-	Limit for monitoring E2 (event)	E2	(dynamic)	50000	S/K
L.ME	14:150	-	Limit for monitoring E3 (event)	E3	(dynamic)	50000	S/K
L.ME	15:150	-	Limit for monitoring E4 (event)	E4	(dynamic)	50000	S/K
L.ME	16:150	-	Limit for monitoring R1 (event)	R1	(dynamic)	50000	S/K
-	17:150	-	Month boundary input 1 (Event 17)	-	(dynamic)	1	S
-	18:150	-	Month boundary input 2 (Event 18)	-	(dynamic)	1	S
-	19:150	-	Month boundary input 3 (Event 19)	-	(dynamic)	1	S
-	20:150	-	Month boundary input 4 (Event 20)	-	(dynamic)	1	S
-	21:150	-	Day boundary input 1 (Event 21)	-	(dynamic)	1	S
-	22:150	-	Day boundary input 2 (Event 22)	-	(dynamic)	1	S
-	23:150	-	Day boundary input 3 (Event 23)	-	(dynamic)	1	S
-	24:150	-	Day boundary input 4 (Event 24)	-	(dynamic)	1	S
-	Y:151	1...24	Event: Basic 1	-	(dynamic)	div.	div.
-	Y:153	1...24	Event: Status pointer	-	(dynamic)	div.	div.
-	1:154	-	Source for backup time point (Event 1)	-	(dynamic)	1:142	M
-	2:154	-	Source for LT time point (Event 2)	-	(dynamic)	1:400_1	L
-	3:154	-	Source for month bound'y, comp. counter	-	(dynamic)	2:143	S
-	4:154	-	Source for day boundary, computation counter	-	(dynamic)	2:142	S
-	5:154	-	Source for meas. period E1 (Event 5)	-	(dynamic)	1:402	C
-	6:154	-	Source for meas. period E2 (Event 6)	-	(dynamic)	1:402	C
-	7:154	-	Source for meas. period E3 (Event 7)	-	(dynamic)	1:402	C
-	8:154	-	Source for meas. period E4 (Event 8)	-	(dynamic)	1:402	C
-	9:154	-	Source for meas. period, comp. counter	-	(dynamic)	1:402	S
-	10:154	-	Source for Call time window 1 (Event 10)	-	(dynamic)	1:140_3	S
-	11:154	-	Source for Call time window 2 (Event 11)	-	(dynamic)	1:140_3	S
SC.ME	12:154	-	Source for monitoring E1 (Event 12)	E1	(dynamic)	1:160	S
SC.ME	13:154	-	Source for monitoring E2 (Event 13)	E2	(dynamic)	5:160	S
SC.ME	14:154	-	Source for monitoring E3 (Event 14)	E3	(dynamic)	9:160	S
SC.ME	15:154	-	Source for monitoring E4 (Event 15)	E4	(dynamic)	13:160	S
SC.ME	16:154	-	Source for monitoring R1 (Event 16)	R1	(dynamic)	17:160	S
-	17:154	-	Source for month boundary E1 (Event 17)	-	(dynamic)	3:143	E

AD[6]	HELP	"Y"	Description	Display[7]	Value range	Spec. fig.	Prot[8]
-	18: 154	-	Source for month boundary E2 (Event 18)	-	(dynamic)	4:143	C
-	19: 154	-	Source for month boundary E3 (Event 19)	-	(dynamic)	5:143	C
-	20: 154	-	Source for month boundary E4 (Event 20)	-	(dynamic)	6:143	C
-	21: 154	-	Source for day boundary E1 (Event 21)	-	(dynamic)	3:142	C
-	22: 154	-	Source for day boundary E2 (Event 22)	-	(dynamic)	4:142	C
-	23: 154	-	Source for day boundary E3 (Event 23)	-	(dynamic)	5:142	C
-	24: 154	-	Source for day boundary E4 (Event 24)	-	(dynamic)	6:142	C
-	Y: 155	1...24	Designation of the Events 1..0.24	-	16 characters	Var.	S
-	Y: 156	1...24	Event: Event counter	-	-	-	-
	1: 157	-	Source for backup time (Event 1)	-	0;1.... 23	21	M
	2: 157	-	Mode for LT time (Event 2)	-	0;1.... 23	0	S
	3: 157	-	Mode for month boundary R1 (Event 3)	-	0;1.... 23	21	C
	4: 157	-	Mode for day boundary R1 (Event 4)	-	0;1.... 23	21	C
	5: 157	-	Mode for meas. period E1 (Event 5)	-	0;1.... 23	21	C
	6: 157	-	Mode for meas. period E2 (Event 6)	-	0;1.... 23	21	C
	7: 157	-	Mode for meas. period E3 (Event 7)	-	0;1.... 23	21	C
	8: 157	-	Mode for meas. period E4 (Event 8)	-	0;1.... 23	21	E
	9: 157	-	Mode for meas. period R1 (Event 9)	-	0;1.... 23	21	S
	10: 157	-	Mode for Call time window 1 (Event 10)	-	0;1.... 23	9	S
	11: 157	-	Mode for Call time window 2 (Event 11)	-	0;1.... 23	9	S
MD.ME	Y: 157	12...15	Mode for monitoring Ex	E1 – E4	0;1.... 23	2	S
MD.ME	16: 157	-	Mode for monitoring R1 (Event 16)	R1	0;1.... 23	0	S
-	17: 157	-	Mode for month boundary E1 (Event 17)	-	0;1.... 23	21	C
-	18: 157	-	Mode for month boundary E2 (Event 18)	-	0;1.... 23	21	C
-	19: 157	-	Mode for month boundary E3 (Event 19)	-	0;1.... 23	21	C
-	20: 157	-	Mode for month boundary E4 (Event 20)	-	0;1.... 23	21	C
-	21: 157	-	Mode for day boundary E1 (Event 21)	-	0;1.... 23	21	C
-	22: 157	-	Mode for day boundary E2 (Event 22)	-	0;1.... 23	21	C
-	23: 157	-	Mode for day boundary E3 (Event 23)	-	0;1.... 23	21	C
-	24: 157	-	Mode for day boundary E4 (Event 24)	-	0;1.... 23	21	C
	Y: 158	1...9	Limit 2 (Event 1..0.9)	-	-	-	Var.
CA1.E	10: 158	-	Call acceptance window 1, end	Interface	(dynamic)	23:59	S
CA2.E	11: 158	-	Call acceptance window 2, end	Interface	(dynamic)	00:00	S
	Y: 158	12...24	Limit 2 (Event 12..0.24)	-	-	-	K
-	1: 159	-	Event: Basic 2 (Event 1)	-	-	-	Var.
-	2: 159	-	Event: Basic 2 (Event 2)	-	(dynamic)	367200	Var.
-	Y: 159	3..24	Event: Basic 2 (Event 3...24)	-	-	-	Var.
-	Y: 15A	1..4	Remaining times for the Events 1-4	Not used			
MP.RE	Y: 15A	5...8	Remaining time meas. period, Input x	E1 – E4	(dynamic)	-	-
MP.RE	9: 15A	-	Remaining time meas. period comp. cntr.	R1	(dynamic)	-	-
-	Y: 15A	10..24	Remaining times for the Events 10-24	Not used			
-	Y: 15C	1...24	Source for Event 2 (Events 1...24)	-	(dynamic)	Var.	Var.
V1.MP	1: 160	-	Current meas. period counter E1	E1	-	-	-

AD[6]	HELP	"Y"	Description	Display[7]	Value range	Spec. fig.	Prot[8]
V1.DT	2:160	-	Incr. day counter E1	E1	-	-	-
V1.MP max	3:160	-	Max. measurement period counter E1 in current month (skip to submenu)	E1	-	-	-
V1.DT max	4:160	-	Max. day counter E1 in curr. month	E1	-	-	-
V2.MP	5:160	-	Incr. measurement period counter E2	E2	-	-	-
V2.DT	6:160	-	Incr. day counter E2	E2	-	-	-
V2.MP max	7:160	-	Max. measurement period counter E2 in current month (skip to submenu)	E2	-	-	-
V1.DT max	8:160	-	Max. day counter E2 in curr. month	E2	-	-	-
V3.MP	9:160	-	Current measurement period counter E3	E3	-	-	-
V3.DT	10:160	-	Incr. day counter E3	E3	-	-	-
V3.MP max	11:160	-	Max. measurement period counter E3 in current month (skip to submenu)	E3	-	-	-
V1.DT max	12:160	-	Max. day counter E3 in curr. month	E3	-	-	-
V4.MP	13:160	-	Incr. measurement period counter E4	E4	-	-	-
V4.DT	14:160		Incr. day counter E4	E4	-	-	-
V4.MP max	15:160	-	Max. measurement period counter E4 in current month (skip to submenu)	E4	-	-	-
V1.DT max	16:160	-	Max. day counter E4 in curr. month	E4	-	-	-
R1.MP	17:160	-	Incr. measurement period counter R1	R1	-	-	-
R1.DT	18:160	-	Incr. day counter R1	R1	-	-	-
R1.MP	19:160	-	Max. meas. per. counter R1 in curr. month	R1	-	-	-
R1.DT	20:160	-	Max. day counter R1 in curr. month	R1	-	-	-
VxM.L	Y:161	1,5,9,13	Last meas. period counter Ex	E1 – E4	-	-	-
VxD.L	Y:161	2,6,10,14	Last day counter Ex	E1 – E4	-	-	-
-	Y:161	3,7,11,15	Max. meas. per. counter Ex, last month	-	-	-	-
-	Y:161	4,8,12,16	Max. day counter Ex, last month	-	-	-	-
R1M.L	17:161	-	Last meas. period counter R1	R1	-	-	-
R1D.L	18:161	-	Last day counter R1	R1	-	-	-
-	19:161	-	Max. meas. per. counter R1, last month	-	-	-	-
-	20:161	-	Max. day counter R1, last month	-	-	-	-
-	Y:162	1,5,9,13	Snap value: Mode for meas. period counter Ex	-	0; 1; ... 8	2	C
-	Y:162	2,6,10,14	Snap value: Mode for day counter Ex	-	0; 1; ... 8	2	C
-	Y:162	3,7,11,15	Snap value: Mode for meas. period max. Ex	-	0; 1; ... 8	7	C
-	Y:162	4,8,12,16	Snap value: Mode for day max. Ex	-	0; 1; ... 8	7	C
-	17:162	-	Snap value: Mode for meas. per. counter R1	-	0; 1; ... 8	2	S
-	18:162	-	Snap value: Mode for day counter R1	-	0; 1; ... 8	2	S
-	19:162	-	Snap value: Mode for meas. per. max R1	-	0; 1; ... 8	7	S
-	20:162	-	Snap value: Mode for day maximum R1	-	0; 1; ... 8	7	S
-	1:163	-	Snap value: Source for meas. per. counter E1	-	(dynamic)	1:202	C

AD[6]	HELP	"Y"	Description	Display[7]	Value range	Spec. fig.	Prot[8]
-	2: 163	-	Snap value: Source for day counter E1	-	(dynamic)	1:202	C
-	3: 163	-	Snap value: Source for meas. per. max E1	-	(dynamic)	1:160	C
-	4: 163	-	Snap value: Source for day max. E1	-	(dynamic)	2:160	C
-	5: 163	-	Snap value: Source for meas. per. counter E2	-	(dynamic)	2:202	C
-	6: 163	-	Snap value: Source for day counter E2	-	(dynamic)	2:202	C
-	7: 163	-	Snap value: Source for meas. per. max. E2	-	(dynamic)	5:160	C
-	8: 163	-	Snap value: Source for day max. E2	-	(dynamic)	6:160	C
-	9: 163	-	Snap value: Source for meas. per. counter E3	-	(dynamic)	3:202	C
-	10: 163	-	Snap value: Source for day counter E3	-	(dynamic)	3:202	C
-	11: 163	-	Snap value: Source for meas. per. max. E3	-	(dynamic)	9:160	C
-	12: 163	-	Snap value: Source for day max. E3	-	(dynamic)	10:160	C
-	13: 163	-	Snap value: Source for meas. per. counter E4	-	(dynamic)	4:202	C
-	14: 163	-	Snap value: Source for day counter E4	-	(dynamic)	4:202	C
-	15: 163	-	Snap value: Source for meas. per. max. E4	-	(dynamic)	13:160	C
-	16: 163	-	Snap value: Source for day max. E4	-	(dynamic)	14:160	C
-	17: 163	-	Snap value: Source for meas. per. counter R1	-	(dynamic)	1:502	S
-	18: 163	-	Snap value: Source for day counter R1	-	(dynamic)	1:502	S
-	19: 163	-	Snap value: Source for meas. per. max. R1	-	(dynamic)	17:160	S
-	20: 163	-	Snap value: Source for day maximum R1	-	(dynamic)	18:160	S
-	Y: 164	1...20	Snap value: Time stamp for current set of data	-	-	-	-
-	Y: 165	1...20	Snap value: Time stamp for last set of data	-	-	-	-
-	Y: 166	1,5,9,13	Snap value Y: Mode for time stamp	-	0;1.... 13	1	C
-	Y: 166	2,6,10,14	Snap value Y: Mode for time stamp	-	0;1.... 13	1	C
-	Y: 166	3,7,11,15	Snap value Y: Mode for time stamp	-	0;1.... 13	13	C
-	Y: 166	4,8,12,16	Snap value Y: Mode for time stamp	-	0;1.... 13	13	C
-	17: 166	-	Snap value 17: Mode for time stamp	-	0;1.... 13	1	S
-	18: 166	-	Snap value 18: Mode for time stamp	-	0;1.... 13	1	S
-	19: 166	-	Snap value 19: Mode for time stamp	-	0;1.... 13	13	S
-	20: 166	-	Snap value 20: Mode for time stamp	-	0;1.... 13	13	S
-	1: 167	-	Snap value: Event: Value acceptance	-	(dynamic)	0x8005	C
-	2: 167	-	Snap value: Event: Value acceptance	-	(dynamic)	0x8015	C
-	3: 167	-	Snap value: Event: Value acceptance	-	(dynamic)	0x8011	C
-	4: 167	-	Snap value: Event: Value acceptance	-	(dynamic)	0x8011	C
-	5: 167	-	Snap value: Event: Value acceptance	-	(dynamic)	0x8006	C
-	6: 167	-	Snap value: Event: Value acceptance	-	(dynamic)	0x8016	C
-	7: 167	-	Snap value: Event: Value acceptance	-	(dynamic)	0x8012	C

AD[6]	HELP	"Y"	Description	Display[7]	Value range	Spec. fig.	Prot[8]
-	8: 167	-	Snap value: Event: Value acceptance	-	(dynamic)	0x8012	C
-	9: 167	-	Snap value: Event: Value acceptance	-	(dynamic)	0x8007	C
-	10: 167	-	Snap value: Event: Value acceptance	-	(dynamic)	0x8017	C
-	11: 167	-	Snap value: Event: Value acceptance	-	(dynamic)	0x8013	C
-	12: 167	-	Snap value: Event: Value acceptance	-	(dynamic)	0x8013	C
-	13: 167	-	Snap value: Event: Value acceptance	-	(dynamic)	0x8008	C
-	14: 167	-	Snap value: Event: Value acceptance	-	(dynamic)	0x8018	C
-	15: 167	-	Snap value: Event: Value acceptance	-	(dynamic)	0x8014	C
-	16: 167	-	Snap value: Event: Value acceptance	-	(dynamic)	0x8014	C
-	17: 167	-	Snap value: Event: Value acceptance	-	(dynamic)	0x8009	C
-	18: 167	-	Snap value: Event: Value acceptance	-	(dynamic)	0x8004	C
-	19: 167	-	Snap value: Event: Value acceptance	-	(dynamic)	0x8003	C
-	20: 167	-	Snap value: Event: Value acceptance	-	(dynamic)	0x8003	C
STAT	Y: 168	1...20	Snap value: Status for current set of data	-	-	-	-
STAT	Y: 169	1...20	Snap value: Status for last set of data	-	-	-	-
-	Y: 16A	1,5,9,13	Snap value Y: Mode for status	-	0;1.... 13	10	C
-	Y: 16A	2,6,10,14	Snap value Y: Mode for status	-	0;1.... 13	10	C
-	Y: 16A	3,7,11,15	Snap value Y: Mode for status	-	0;1.... 13	13	C
-	Y: 16A	4,8,12,16	Snap value Y: Mode for status	-	0;1.... 13	13	C
-	17: 16A	-	Snap value 17: Mode for status	-	0;1.... 13	10	S
-	18: 16A	-	Snap value 18: Mode for status	-	0;1.... 13	10	S
-	19: 16A	-	Snap value 19: Mode for status	-	0;1.... 13	13	S
-	20: 16A	-	Snap value 20: Mode for status	-	0;1.... 13	13	S
-	Y: 16C	1...20	Snap value: Block no. for current set of data	-	99	0	-
-	Y: 16D	1...20	Snap value: Block no. for last set of data	-	99	-	-
-	Y: 16E	1...20	Snap value: Mode for block number	-	-	12	-
-	Y: 16F	1...20	Snap value: Snap value designation	-	16 characters	0	S
-	1: 170	-	Calibration lock status	-	0; 1	0	-
S.STA	3: 170	-	Supplier's combination status/close	Service	00000000	-	-
-	4: 170	-	Customer's combination status / close	-	0; 1	-	-
S.COD	3: 171	-	Supplier's combination, enter / change	Service	00000000	-	S
-	4: 171	-	Customer's combination, enter / change	-	00000000	-	K
Fa.No	1: 180	-	DL240 fabrication number	System	12 figures	-	M
-	2: 180	-	Manufacturer number	-	12 figures	0	S
-	3: 180	-	Station number	-	12 figures	0	S
-	1: 181	-	Device designation	-	8 characters	DL240	M
-	2: 181	-	Manufacturer's name	-	8 characters	ELSTER	M
-	3: 181	-	Station name	-	8 characters	0	S
VER.1	2: 190	-	Software version "Application software"	System	-	-	-
VER.2	3: 190	-	Software version, "Driver software"	System	-	-	-
CHK.1	2: 191	-	Checksum, "Application software"	System	-	-	-
CHK.2	3: 191	-	Checksum, "Driver software"	System	-	-	-

AD[6]	HELP	"Y"	Description	Display[7]	Value range	Spec. fig.	Prot[8]
AUT.V	1:1A0	-	Time up to automatic display changeover	System	99h	5 m.	S
DISP	2:1A0	-	Continuous display on/off	System	99h	5 m.	S
Add	1:1C2	-	Application-specific display	Service	(dynamic)	01:452	S
-	1:1D0	-	Memory 1 designation	-	8 characters	EEPROM	M
-	2:1D0	-	Memory 2 designation	-	8 characters	RAM	M
-	1:1D1	-	Archive size in Memory 1	-	-	0	-
-	2:1D1	-	Archive size in Memory 2	-	-	520 k	-
M.CYC	1:1F0	-	Measurement cycle	System	5-3600 sec	300 sec.	S
-	1:1F2	-	Display changeover destination (column)	-	1 - 10	1	S
BAT.C	1:1F3	-	Battery capacity	Service	25,5	8.0 Ah	S
-	1:1F5	-	Time of day: Switch test mode on/off	-	0; 1	0	S
-	1:1F7	-	Display test	Service	-	-	-
-	1:1F8	-	Global block number for archive	-	4294967295	0	-
-	1:1F9	-	Backup event	-	0 – 8563	0x8001	-
-	1:1FA	-	Internal error register (incl. I1 ..I4)	-	64 bits	-	-
-	1:1FB	-	Sleep mode with ext. supply	-	0,1	1 (active)	M
Vx	Y:200	1...4	Counter a (Main counter / Tariff 1 / HT)	E1 – E4	999999999.9999	0	C
Vx.LT	Y:201	1...4	Counter b (disturbance vol., Tariff 2, LT)	E1 – E4	999999999.9999	0	S / C
Vx.T	Y:202	1...4	Counter c (totaliser)	E1 – E4	999999999.9999	0	-
Vx.P	Y:203	1...4	Counter d (totaliser, adjustable)	E1 – E4	999999999.9999	0	S
MD.Ex	Y:207	1...4	Mode for input	E1 – E4	1;2	1	C
-	Y:208	1...4	Unit for input	-	5 characters	m3	S
HT.LT	Y:209	1...4	Status mask: Counting in Counter "LT" instead of main counter	E1 – E4	Various	0x0000	C
Qx	Y:210	1...4	Flow rate a / measured value	E1 – E4	-	-	-
-	Y:216	1...4	Format size	-	0	0	S
-	Y:218	1...4	Unit for flow	-	6 characters	m3/h	S
Cu.No	Y:21A	1...4	Customer number	E1 – E4	12 figures	1	S
-	Y:21B	1...4	Customer's name	-	32 characters	Cust_x	S
-	Y:21C	1...4	Measuring point number	-	12 figures	3	S
-	Y:21D	1...4	Measuring point name	-	12 characters	Measpoint_x	S
-	Y:21E	1...4	Medium (conforming to "EDIS")	-	255	7	S
-	Y:21F	1...4	Designation, Input x	-	12 characters	Input_x	S
Me.AA	Y:221	1...4	Meas. point designation to assoc. agree.	-	40 characters	-	S
-	Y:222	1...4	Serial number (e.g.: Meter number)	E1 – E4	12 figures	2	S
-	Y:226	1...4	Raw pulse counter, Input x	-	65535	-	-
-	Y:227	1...4	Raw measurement, Input x	-	-	-	-
ST.Ex	Y:228	1...4	Status of inputs	E1 – E4	-	-	-
DS.Ca	Y:22E	1...4	DS-100 no. Counter "a"	E1 – E4	8 figures	Ser. No.	S
DS.Cb	Y:22F	1...4	DS-100 no. Counter "b"	E1 – E4	8 figures	Ser. No.	S
-	Y:230	1...4	Time pitch for SW debouncing in ms	-	-	63 ms	-
-	Y:232	1...4	SW debounce time period	-	255	0	C

AD[6]	HELP	"Y"	Description	Display[7]	Value range	Spec. fig.	Prot[8]
-	Y:233	1...4	SW debounce-time pulse duration	-	255	0	C
CP.Ex	Y:253	1...4	Pulse value (Cp value) in pulses / m³	E1 – E4	99999,999	1,000	C
-	Y:255	1...4	Adjustment mode input	-	-	1	-
TIME	1:400	-	Time stamp (date and time)	System	YYYY-MM-DD; hh:mm:ss	-	S
-	1:400_1	-	Time stamp in seconds	-	4294967295	-	S
-	Y:402	1...2	Minutes counter	-	4294967295	0	-
-	Y:403	1...2	Hours counter	-	4294967295	0	-
BAT.R	2:404	-	Remaining battery service life	Service	999M	122M	-
	2:404_1	-	Remaining battery service life in seconds	-	4294967295	-	-
-	2:405	-	Residual capacity of the battery	-	65.535 - 0	-	-
MOD.T	1:407	-	Summer / winter time on/off	System	0,1,2	0	S
-	1:452	-	Adjustment value, clock (crystal inaccuracy)	-	x.xxxxxx	See DDB[9]	C
-	1:455	-	Adjustment mode input	-	-	3	-
-	1:45A	-	Time adjustment - Reference value	-	-	976.562500	-
-	1:4A0	-	Summer time, begin	-	-	01.01.80 00:00:00	S
-	2:4A1	-	Battery warning limit (months)	-	Any	3	S
-	1:4A8	-	Summer time, end	-	-	01.01.80 00:00:00	S
R1	1:500	-	Computation Counter a (e.g. ∑ V1...V4)	R1	999999999.9999	0	S
R1.LT	1:501	-	Comp. Counter b (e.g. ∑ V1.LT...V4.LT)	R1	999999999.9999	0	S
R1.T	1:502	-	Comp. Counter c (e.g. ∑ V1.T...V4.T)	R1	999999999.9999	0	-
R1.P	1:503	-	Comp. Counter d (e.g. ∑ V1.P...V4.P)	R1	999999999.9999	0	S
MD.R1	1:507	-	Mode R1	R1	0;1	0	S
-	1:508	-	Unit for computation counter	-	6 characters	m3	S
-	1:50A	-	Computation counter: Pointer to 1st value	-	(dynamic)	0	S
-	1:50B	-	Computation counter: Pointer to 2nd value	-	(dynamic)	0	S
-	1:50C	-	Computation counter: Pointer to 3rd value	-	(dynamic)	0	S
-	1:50D	-	Computation counter: Pointer to 4th value	-	(dynamic)	0	S
Q.R1	1:510	-	Flow rate R1	R1	-	-	-
-	1:518	-	Unit for flow	-	6 characters	m3/h	S
Cu.No	1:51A	-	Customer number	R1	12 figures	1	S
-	1:51C	-	Measuring point number	-	12 figures	3	S
-	1:51E	-	Medium (conforming to "EDIS")	-	255	7	S
-	1:51F	-	Designation of computation counter	-	12 characters	Computation counter	S
Me.AA	1:521	-	Meas. point designation to assoc. agree.	-	40 characters	2	S
DS.Ca	1:52E	-	Computation counter DS-100 number Counter "a"	R1	8 figures	Ser. No.	S
DS.Cb	1:52F	-	Computation counter DS-100 number Counter "b"	R1	8 figures	Ser. No.	S

[9] "DDB": For value see: Design data book

AD[6]	HELP	"Y"	Description	Display[7]	Value range	Spec. fig.	Prot[8]
-	Y:600	1...2	Status of the output (active / inactive)	-	-	-	-
MD.Ax	Y:605	1...2	Mode, Output Ax	Output	0; 1; ...; 6	1	S
SC.Ax	Y:606	1...2	Source, Pulse Output Ax	Output	10:COD	01:200	S
SM.Ax	Y:607	1...2	Status mask (only for status output)	Output	Various	0x0000	S
-	1:60F	-	Designation of Output 1	-	12 characters	Output_1	S
-	2:60F	-	Designation of Output 2	-	12 characters	Output_2	S
CP.Ax	Y:611	1...2	cp value, Pulse Output Ax	Output	655,35	1,00	S
-	Y:616	1...2	Time pitch for output	-	-	125 ms	-
-	Y:617	1...2	Period of output (spec. figure multiplied by time pitch for output)	-	255	4 (=500ms)	S
-	Y:618	1...2	Pulse duration of output (spec. figure multiplied by time pitch for output)	-	255	2 (=250ms)	S
-	Y:619	1...2	Level of output pulse memory	-	65535	-	-
MD.S1	1:705	-	Optical interface mode	-	1, 2, 3, 5	1	S
MD.S2	2:705	-	Internal interface mode	Interface	1, 2, 3, 5	2	S
-	1:707	-	Data format, optical interface	-	0, 1, 2	0 (7e1)	S
DF.S2	2:707	-	Data format, internal interface	Interface	0, 1, 2	0 (7e1)	S
-	1:708	-	Initial baud rate of optical interface	-	300 – 19200 Bd	300	S
BD.S2	2:708	-	Initial baud rate, internal interface	Interface	300 – 19200 Bd	19200	S
BD.S1	1:709	-	Baud-rate selection, optical interface	Interface	4800, 9600 or 19200 Bd	9600	S
-	2:709	-	Baud-rate selection, int. interface	-		19200	S
-	Y:70E	1...2	Device address (to IEC)	-	32 characters	-	S
-	Y:70F	1...2	Interface designation	-	12 characters	Var.	S
-	Y:710	1...2	Character timeout (ms)	-	65535	15000	S
-	Y:712	1...2	Inactivity timeout (ms)	-	65535	60	S
-	Y:713	1...2	Protocol timeout (ms)	-	65535	25	S
NUM.T	2:720	-	Number of ringing tones before accepting call.	Interface	1-12	2	S
-	2:721	-	Initialisation string, modem	-	62 bytes	-	S
-	2:722	-	"Time window 1" (status pointer)	-	Various	0x2F02	S
-	2:723	-	"Time window 2" (status pointer)	-	Various	0x2F03	S
-	2:728	-	Trigger modem initialisation	-	1	-	-
-	2:729	-	Modem termination string	-	12 bytes	&w0	S
-	2:730	-	Remote data transfer mode	-	0,1,2	0	S
MD.D	2:731	-	Dialling method mode	Interface	0,1	1 (tone)	S
-	2:732	-	Max. number of dialling attempts	-	1...9	2	S
-	2:733	-	Max waiting time for carrier signal	-	10...100 sec	90	S
SEND	2:734	-	Trigger spontaneous signal (for test)	Interface	0, 1	-	S
-	2:735	-	Event for triggering a spontaneous signal	-	Various	0x0000	S
-	2:736	-	Own phone number	-	24-figure	0	S
-	2:737	-	E-mail address of recipient	-	64 bytes	-	S
-	2:740	-	Recipient Type 1	-	1,2	1	S
-	2:741	-	Phone no., Recipient 1	-	24-figure	-	S

AD[6]	HELP	"Y"	Description	Display[7]	Value range	Spec. fig.	Prot[8]
RES.1	2:742	-	Last response to Spontaneous Signal 1	Interface	-	-	-
-	2:743	-	SMS centre Access Number 1	-	24-figure	-	S
-	2:744	-	Data Format 1	-	0, 1, 2	2 (8n1)	S
-	2:745	-	Baud Rate 1	-	300 - 19200	4800	S
-	2:746	-	Supplementary string for modem init.	-	24-figure	-	S
-	2:748	-	Recipient Type 2	-	1,2	2	S
-	2:749	-	Phone no., Recipient 2	-	24-figure	-	S
RES.2	2:74A	-	Last response to Spontaneous Signal 2	Interface	-	-	-
-	2:74B	-	SMS centre Access Number 2	-	24-figure	-	S
-	2:74C	-	Data Format 2	-	0, 1, 2	2 (8n1)	S
-	2:74D	-	Baud Rate 2	-	300 - 19200	4800	S
-	2:74E	-	Supplementary string for modem init.	-	24-figure	-	S
-	2:750	-	Short message: 1. Value	-	Var.	02:181	S
-	2:751	-	Short message: 2. Value	-	Var.	01:181	S
-	2:752	-	Short message: 3. Value	-	Var.	01:180	S
-	2:753	-	Short message: 4. Value	-	Var.	01:400	S
-	2:754	-	Short message: 5. Value	-	Var.	01:100	S
-	2:755	-	Short message: 6. Value	-	Var.	01:200	S
-	2:756	-	Short message: 7. Value	-	Var.	01:201	S
-	2:757	-	Short message: 8. Value	-	Var.	01:203	S
-	2:75F	-	Delete SM value no. (0...7)	-	0...7	-	S
-	2:760	-	Separator for SMS values (Rec.1)	-	0-9; A-Z, a-z, var. State special chars in DEC	2A = "*"	S
-	2:768	-	Separator for SMS values (Rec.2)	-		2A = "*"	S
-	2:770	-	Command for reading PIN (SIM card)	-	8 characters	-	S
-	2:771	-	Command for setting PIN (SIM card)	-	8 characters	-	S
-	2:772	-	PIN of GSM SIM card	-	12 characters	-	S
-	2:773	-	Command for auto-login	-	12 characters	-	S
-	2:774	-	Command for reading network operator	-	8 characters	-	S
GSM.N	2:775	-	Network operator in plain text	Interface	24 characters	-	S
-	2:776	-	Command for reading recept. level (GSM)	-	8 characters	-	S
GSM.L	2:777	-	Reception level	Interface	0-33	-	S
-	2:778	-	Waiting time for connection formation	-	65535	25	S
RES.P	2:77A	-	Status PIN of SIM card (GSM)	Interface	-	-	-
-	2:8FF	-	Labelling "Value not calibrated"	-	0,0x8000	0x8000	C
-	Y:A00	1,3,5,7,9	Save archive in Memory x	-	(fix)	1 (EEPROM)	-
-	Y:A00	2,4,6,8,10	Save archive in Memory x	-	(fix)	2 (RAM)	-
-	Y:A01	1,3,5,7,9	Depth of month archive	-	(fix)	15	-
-	Y:A01	2,4,6,8	Depth of meas. period archive	-	(fix)	4150	-
-	10:A01	-	Depth of logbook	-	(fix)	250	-
ABNo	Y:A20	1...10	Internal archive block number	-	65535	0	-
Er.Ch	Y:A21	1...10	Checksum, archive data record (CRC)	-	-	-	-

AD[6]	HELP	"Y"	Description	Display[7]	Value range	Spec. fig.	Prot[8]
S.TE	Y: A22	1...10	Archiving: Trigger event	-	-	-	-
Arx.1	Y: A30	1, 3, 5, 7	Month archive Ex	E1 – E4	-	-	-
Arx.2	Y: A30	2, 4, 6, 8	Meas. period archive Ex	E1 – E4	-	-	-
Ar5.1	9: A30	-	Month archive R1	R1	-	-	-
LOGB	10: A30	-	Logbook	Logbook	-	-	-
-	Y: A32	1...10	Archive data record type	-	255	Var.	-
-	Y: A50	1, 3, 5, 7	Save data record in month archive Ex	-	0; 1	-	S
Frx.2	Y: A50	2, 4, 6, 8	Save data record in meas. period archive	E1 – E4	0; 1	-	S
-	9: A50	-	Save data record in month archive R1	-	0; 1	-	S
-	10: A50	-	Save data record in logbook	-	0; 1	-	S
-	1: A60	-	Arch. Event 1 in Month Archive 1	-	Var.	0x8111	C
-	2: A60	-	Arch. Event 1 in Meas. Period Archive 1	-	Var.	0x8005	C
-	3: A60	-	Arch. Event 1 in Month Archive 2	-	Var.	0x8112	C
-	4: A60	-	Arch. Event 1 in Meas. Period Archive 2	-	Var.	0x8006	C
-	5: A60	-	Arch. Event 1 in Month Archive 3	-	Var.	0x8113	C
-	6: A60	-	Arch. Event 1 in Meas. Period Archive 3	-	Var.	0x8007	C
-	7: A60	-	Arch. Event 1 in Month Archive 4	-	Var.	0x8114	C
-	8: A60	-	Arch. Event 1 in Meas. Period Archive 4	-	Var.	0x8008	C
-	9: A60	-	Arch. Event 1 in archive comp. counter	-	Var.	0x8103	C
-	10: A60	-	Arch. Event 1 in logbook	-	Var.	0x5D01	C
-	Y: A61	1, 3, 5, 7	Archiving Event 2 in month archive	-	Var.	0x0000	C
-	2: A61	-	Arch. Event 2 in Meas. Period Archive 1	-	Var.	0x8202	C
-	4: A61	-	Arch. Event 2 in Meas. Period Archive 2	-	Var.	0x8204	C
-	6: A61	-	Arch. Event 2 in Meas. Period Archive 3	-	Var.	0x8206	C
-	8: A61	-	Arch. Event 2 in Meas. Period Archive 4	-	Var.	0x8208	C
-	9: A61	-	Arch. Event 2 in comp. counter archive	-	Var.	0x0000	S
-	10: A61	-	Arch. Event 2 in logbook	-	Var.	0x820A	S
-	Y: A62	1, 3, 5, 7	Archiving Event 3 in month archive	-	Var.	0x0000	S
-	2: A62	-	Arch. Event 3 in Meas. Period Archive 1	-	Var.	0x8502	S
-	4: A62	-	Arch. Event 3 in Meas. Period Archive 2	-	Var.	0x8504	S
-	6: A62	-	Arch. Event 3 in Meas. Period Archive 3	-	Var.	0x8506	S
-	8: A62	-	Arch. Event 3 in Meas. Period Archive 4	-	Var.	0x8508	S
-	9: A62	-	Arch. Event 3 in comp. counter archive	-	Var.	0x0000	S
-	10: A62	-	Arch. Event 3 in logbook	-	Var.	0x850A	S
-	Y: A63	1, 3, 5, 7	Archiving Event 4 in month archive	-	Var.	0x0000	S
-	2: A63	-	Arch. Event 4 in Meas. Period Archive 1	-	Var.	0x4701	S
-	4: A63	-	Arch. Event 4 in Meas. Period Archive 2	-	Var.	0x4702	S
-	6: A63	-	Arch. Event 4 in Meas. Period Archive 3	-	Var.	0x4703	S
-	8: A63	-	Arch. Event 4 in Meas. Period Archive 4	-	Var.	0x4704	S
-	9: A63	-	Arch. Event 4 in comp. counter archive	-	Var.	0x0000	S
-	10: A63	-	Arch. Event 4 in logbook	-	Var.	0x0000	S
-	Y: B02	1...10	Readout mode, supplier	-	255	3	S
-	Y: B03	1...10	Readout mode, customer	-	255	3	K

AD[6]	HELP	"Y"	Description	Display[7]	Value range	Spec. fig.	Prot[8]
-	Y: B04	1...10	Readout mode, service	-	255	3	S
-	Y: B05	1...10	Readout mode, network operator	-	255	3	K
-	Y: B12	1...10	Position of note value, supplier	-	255	1	S
-	Y: B13	1...10	Position of note value, customer	-	255	1	K
-	Y: B14	1...10	Position of note value, service	-	255	1	S
-	Y: B15	1...10	Position of note value, network operator	-	255	1	K
-	Y: B22	1...10	Note value, supplier	-	24 characters	0	S
-	Y: B23	1...10	Note value, customer	-	24 characters	0	K
-	Y: B24	1...10	Note value, service	-	24 characters	0	S
-	Y: B25	1...10	Note value network operator	-	24 characters	0	K
-	Y: B32	1...10	Note text, supplier	-	12 characters	0	S
-	Y: B33	1...10	Note text, customer	-	12 characters	0	K
-	Y: B34	1...10	Note text, service	-	12 characters	0	S
-	Y: B35	1...10	Note text, network operator	-	12 characters	0	K
-	1: C00	-	E1 - 1st Counter (Counter "a") in month arch.	-	Var.	01:200	C
-	2: C00	-	E1 - 1st Counter (Counter "a") in meas.per.arch	-	Var.	01:200	C
-	3: C00	-	E2 - 1st Counter (Counter "a") in month arch.	-	Var.	02:200	C
-	4: C00	-	E2 - 1st Counter (Counter "a") in meas.per.arch	-	Var.	02:200	C
-	5: C00	-	E3 - 1st Counter (Counter "a") in month arch.	-	Var.	03:200	C
-	6: C00	-	E3 - 1st Counter (Counter "a") in meas.per.arch	-	Var.	03:200	C
-	7: C00	-	E4 - 1st Counter (Counter "a") in month arch.	-	Var.	04:200	C
-	8: C00	-	E4 - 1st Counter (Counter "a") in meas.per.arch	-	Var.	04:200	C
-	9: C00	-	R1 - 1st Counter (Counter "a") in month arch.	-	Var.	01:500	S
-	1: C01	-	E1 - 2nd Counter (Counter "b") in month arch.	-	Var.	01:203	C
-	2: C01	-	E1 - 2nd Counter (Counter "b") in meas.per. arch	-	Var.	01:203	C
-	3: C01	-	E2 - 2nd Counter (Counter "b") in month arch.	-	Var.	02:203	C
-	4: C01	-	E2 - 2nd Counter (Counter "b") in meas. per. arch	-	Var.	02:203	C
-	5: C01	-	E3 - 2nd Counter (Counter "b") in month arch.	-	Var.	03:203	C
-	6: C01	-	E3 - 2nd Counter (Counter "b") in meas.per. arch	-	Var.	03:203	C
-	7: C01	-	E4 - 2nd Counter (Counter "b") in month arch.	-	Var.	04:203	C
-	8: C01	-	E4 - 2nd Counter (Counter "b") in meas.per. arch	-	Var.	04:203	C
-	9: C01	-	R1 - 2nd Counter (Counter "b") in month arch.	-	Var.	01:503	S

D Status messages

Momentary status		STAT (1:100)	ST.SY (2:100)	ST.1 (1:110)	ST.2 (2:110)	ST.3 (3:110)	ST.4 (4:110)
Status register		SREG (1:101)	SR.SY (2:101)	SR.1 (1:111)	SR.2 (2:111)	SR.3 (3:111)	SR.4 (4:111)
No.	**Type [10]**	**Group message**	**System message**	**Status [11] E1/R1/A1**	**Status E2 / A2**	**Status E3**	**Status E4**
01	**A**	Any message 01	Restart	-	-	-	-
02	**W**	-	-	-	-	-	-
03	**W**	Any message 03	Clock stopped	-	-	-	-
04	**W**	Any message 04	Voltage failure	Output 1: Fault	Output 2: Fault	-	-
05	**W**	Any message 05	Severe data error	Input x : Deviation when comparing pulses			
06	**W**	Any message 06	Hardware fault	Input x : Warning limit violated			
07	**W**	Any message 07	Software error	Comp. counter warning limit violated	-	-	-
08	**W**	Any message 08	Setting error	Input x : Warning signal active			
09	**H**	Any message 09	Replace battery	-	-	-	-
10	**H**	Any message 10	Data error (corrected)	-	-	-	-
11	**H**	Any message 11	Clock not set	-	-	-	-
12	**H**	Any message 12	-	Limit monitoring in input x violated			
13	**H**	Any message 13	Data trans-mission runs	Input x : Report signal active			
14	**H**	Any message 14	-	Calibration lock open	Manufac. lock open	Supplier's lock open	Customer lock open
15	**I**	Any message 15	Device in battery mode	-	-	-	-
16	**I**	Any message 16	Daylight saving	Low tariff identifica-tion	Call ac-ceptance window 1	Call ac-ceptance window 2	-

[10] A = Alert; W = Warning; H = Report; I = Information

[11] E1= Input 1; R1= Computation Counter 1; A1= Output 1

E Operator interface, inputs / computation channel

E1 – E4 (Counter input)					R1			
⇔	Vx	0x:200	Main counter x (1 £ x £ 4)	⇔	R1	01:500	Comp. Count. Vx (e.g. ∑ V1...V4)	⇔
to "Log-book"	Vx.LT	0x:201	LT counter x		R1.LT	01:503	Computation Counter Vx.LT	to "Syste m"
	Vx.T	0x:202	Totaliser x		R1.T	01:502	Computation Counter Vx.T	
	Vx.P	0x:203	Counter, adjustable x		R1.P	01:503	Computation Counter Vx.P	
	Qx	0x:210	Flow rate x		Q.R1	01:**510**	Flow rate R1	
	L.ME	12-15: 150	Limit for monitoring Ex		L.ME	16:150	Limit for monitoring R1	
	HT.LT	0x:209	Event HT/LT changeover		MD.R1	01:507	Mode R1	
	MD.Ex	0x:207	Mode input x		MD.ME	16:157	Mode for monitoring R1	
	MD.ME	12-5:157	Mode for monitoring Ex		SC.ME	16:154	Source for monitoring R1	
	SC.ME	12-15: 154	Source for monitoring Ex		DS.Za	1:52E	DS-100 no. Counter "a" R1	
	CP.Ex	0x:253	cp value pulse input x		DS.Cb	1:52F	DS-100 no. Counter "b" R1	
	SN.M	0x:222	Serial no. meter x (1-4 + 5-12)		Cu.No	1:51A	Customer number R1	
	DS.Ca	0x:22E	DS-100 no. Counter "a" Ex		MP.R1	09:150	Measurement period R1	
	DS.Cb	0x:22F	DS-100 no. Counter "b" Ex		MP.RE	09:Not	Remaining time of meas. period	
	Cu.No	0x:21A	Customer number Ex		R1.MP	17:160	Incr. meas. period counter R1	
	MP.Ex	05-08: 150	Measurement period Ex		R1M.L	17:161	Last meas. period value R1	
	MP.RE	05-08: 15A	Remaining time of meas. period		R1.MP	19:160	Max. meas. per. counter R1 in curr. month	**U1**
	Vx.MP	01,05,09, 13:160	Current meas. peri. counter Ex		DY.R1	2:141	Day boundary Ex	
	VxM.L	01,05,09, 13:E1 – E4	Last meas. period value Ex		R1.DT	18:160	Incr. day counter R1	
	Vx.MP	03,07,11, 15:E1	Max. meas. period counter input Ex in current month	**U1**	R1D.L	18:R1	Last day value R1	
	DY.Ex	3-6:141	Day boundary Ex		R1.DT	20:160	Max. day counter curr. month R1	**U2**
	Vx.DT	02,06,10, 14:E1	Incr. day counter Ex		Ar5.1	09:A30	Month archive R1	**U3**
	VxD.L	02,06,10, 14:E1	Last day value Ex					
	Vx.DT	04,08,12, 16:E1	Max. day counter input Ex in curr. month	**U2**				
	Arx.1	01,03,05, 07:A30	Month archive Ex	**U3**				
	Arx.2	02,04,06, 08:A30	Meas. period archive Ex	**U4**				
	Frx.2	02,04,06, 08:A50	Freeze meas. period arc. Ex					

E1 – E4 (Status Input)				
⇔	ST.Ex	0x:228	Status Signal input Ex	⇔
to "Log-book"	MD.Ex	0x:207	Mode for input x	to "R1"
	MD.ME	12,13,14, 15:157	Mode for monitoring Ex	

Ux Skip to submenu possible

F Operator interface system - logbook

	System				Service			
⇔	TIME	01:400	Time and with "→" to date	⇔	3	01:1F7	Display test	⇔
to "R1"	MOD.T	01:407	Daylight saving on/off		S.STA	03:170	Supplier's combination status/close	to "Output "
	M.CYC	01:1F0	Measurement cycle		S.COD	03:171	Supplier's combination, enter / change	
	DISP	02:1A0	Continuous display on/off		BAT.R	02:404	Remaining battery service life	
	AUT.V	01:1A0	Time up to automatic display changeover		BAT.C	01:1F3	Battery capacity	
	Fa.No	01:**180**	DL240 serial number		BACK	01:131	Backup all data	
	VER.1	02:190	Software version, drivers		CLR.V	02:130	Clear counters (incl. archive)	
	VER.2	03:190	Software version, application		CLR.X	01:130	Execute restart	
	CHK.1	02:191	Checksum, drivers		Add	01:1C2	Application-specific display	
	CHK.2	03:191	Checksum, application		Misc	Various	Value of the user-specific display	

	Output				Interface			
⇔	MD.A1	01:605	Mode, Signal Output A1	⇔	MD.S2	02:705	Mode of internal interface	⇔
to "Service"	SC.A1	01:606	Source, Signal Output A1		DF.S2	02:707	Data format of internal interface	to "Log-book"
	CP.A1	01:611	c_p value, Signal Output A1		BD.S2	02:708	Init. baud rate of int. interface	
	SM.A1	01:607	Signal for Status Output A1		NUM.T	02:720	No. of ringing tones before accepting call	
	MD.A2	02:605	Mode, Signal Output A2		GSM.N	02:775	Display GSM network operator	
	SC.A2	02:606	Source, Signal Output A2		GSM.L	02:777	Display GSM recept. level	
	CP.A2	02:611	c_p value, Signal Output A2		RES.P	02:77A	Status of PIN on SIM card	
	SM.A2	02:607	Signal on Status Output A2		Bd.S1	01:709	Baud-rate identification optical interface	
					CA1.B	10:150	Call accept. window 1 begin	
					CA1.E	10:158	Call accept. window 1 end	
					CA2.B	11:150	Call accept. window 2 begin	
					CA2.E	11:158	Call accept. window 2 end	
					RES.1	02:742	Response to Spontaneous Signal 1	
					RES.2	02:74A	Response to Spontaneous Signal 2	
					SEND	02:734	Trigger spontaneous signal	

	Logbook				
⇔	S.REG	01:101	Status register	**U5**	⇔
to "Interface "	STAT	01:100	Momentary status	**U6**	to "E1"
	CLR	04:130	Clear status register		
	LOGB	10:A30	Logbook	**U7**	

Ux Skip to submenu possible

G Index