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# **DL220**

## **Data Logger DL220**

### **Operating Manual and Installation Instructions**

Operating Manual: 73018926 SW version: from V1.30  
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Mainz-Kastel, September 2007

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## I Safety information

- ☞ *The connections of the DL220 are freely accessible during setting up. In order to avoid damage to the component, make sure that no electrostatic discharge (ESD) can occur.  
The person carrying out the installation can, for example, discharge himself/herself by touching the potential equalisation line.*
- ☞ *To avoid erroneous operation and problems, the operating manual must be read before putting the DL220 into operation. In particular the descriptions in Chapter 5 should be followed.*

In the device there are modules which are approved as "**associated electrical equipment**" for Ex Zone I through intrinsically safe circuits (see Appendix A:2). This means that the DL220 is suitable for the connection of pulse generators and signals which are located in areas subject to explosion hazards.

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

- ☞ *Follow the regulations in the relevant standards, in particular DIN EN60079-14/VDE 0165.*
- ☞ *For the installation and operation of the DL220 follow the DVGW guidelines for the construction and operation of gas measurement systems.*
- ☞ *Make sure that the limits quoted in Appendix B for the devices to be connected are not exceeded.*
- ☞ *When connecting a device placed to Ex Zone 1 to one or both of Inputs I1 and/or I2 it is mandatory that the switching voltage at Output 1 and Output 2 do not exceed 30V even in case of a failure.*

## II Items supplied and accessories

### II-1 Items supplied

The following items are included with the DL220:

- a) Data Logger DL220 (where applicable with GSM modem and antenna)
- b) Dispatch list
- c) Design data book
- d) Operating Manual
- e) Bag of accessories

### II-2 Ordering information and accessories

#### Data Logger DL220

- Complete device 834 80 060

#### Accessories

- GSM antenna, 900/1800/1900 MHz, 2db, SMA, 5m 730 19 581
- GSM antenna, 900/1800/1900 MHz, 2db, SMA, 10m 730 19 582
- SMA Interface for external antenna 730 19 427
- GSM antenna housing (for ext. antenna) 730 17 320
- Top-hat rail bracket 041 95 063
- Wall-mounting bracket 041 95 035
- Control panel mounting frame 041 95 064
- Universal retaining angle for pipe mounting 730 18 057
- Operating manual, English 730 17 707
- Bag of accessories DL2xx 730 18 291
- Battery module, 16.5 Ah (for basic device) 730 15 774
- Battery module, 13 Ah (for GSM modem) 730 17 964
- IR readout head (with 6-pole Binder plug) 730 15 883
- KD-100/PS2 readout cable 730 15 152
- Interface cable for internal connection 730 17 970
- IR readout head with DSUB socket 730 17 812
- IR readout head with USB connection incl. driver CD 041 15 530





# Part 1

## Device description

# 1 Brief description

## 1.1 Functions and performance features

### General remarks:

The Data Logger DL220 is intended to be used as a battery operated, compact device for the acquisition and storage of metering pulses and / or level changes for various types of energy.

- Two separate metering/signalling inputs (common ground!) for common connection to a generator from the Ex area or outside of the Ex area.
- Acquisition and archiving of meter readings and maxima separately for each channel.
- System monitoring (signalling function) with appropriate reactions via Input 2: Entry in the measurement period archive of Input 1 and/or message via remote data transfer (SMS message) to up to two recipients.

### Approvals:

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

### Operator interface:

- 2-line, 16-place LCD, plain-text description of the values
- Operation via 4 cursor keys, special functions by operation of two keys.
- Programming via keypad possible.
- Access to the device via different levels possible:  
Programming (switch in device, possibility of sealing), manufacturer, supplier or customer.
- Selectable write and read rights for various values.

### Power supply:

- Battery operation for basic unit; service life depending on operating mode  $\geq 8$  years.
- Battery operation for GSM modem unit; service life depending on operating mode  $\geq 4$  years.  
Optional: Additional battery for GSM modem
- Battery replacement possible without loss of data and without violation of seals.
- Data back-up of all system data and relevant billing data (e.g. month-end readings, maxima...) without battery supply using EEPROM.

### Data interface:

- Optical interface according to IEC 1107.
- internal GSM modem.

### Pulse / signal inputs:

- 2 intrinsically safe inputs (programmable as pulse or signal inputs).

- Connection possibility provided for reed contacts and transistor switches.
- Maximum metering frequency 10 Hz.
- Calibrated meter, adjustable meter (under supplier's lock), incrementing measurement period meter and day meter separate for each input.

**Pulse / signal outputs:**

- 2 transistor outputs (switching to ground), 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)

**Mechanical details / housing:**

- Wall-mounted housing, 122x122x91mm (WxHxD)
- Optional: External mounting feet, top-hat rail mounting or panel-mounting frame
- Mounting and device installation without breaking the seals.
- Temperature range for basic unit: -20°C...+60°C;  
temperature range with various options: see A-3.
- Class of protection: IP 64, non-condensing atmosphere.

**Software:**

- Two software variants (state when ordering):
    - a) Two metering channels (I1, I2), each with 6000 records (approx. 7.5 months memory depth with 60 min. measuring period - depending on other entries.
    - b) One metering channel (I1) with 10000 records (approx. 15 months memory depth with 60 min. measuring period) and a status channel (I2) with 1000 records.
  - Other archives available:
    - a) Month-end readings as well as day and measuring period maxima separately for each input for the last 15 months.
    - b) Logbook: 250 entries
    - c) Audit trail (changes logbook): 200 entries
    - d) PTB logbook: 50 entries
    - e) Day value archive for each Input: 500 entries
  - Event-controlled archiving of meter readings.
  - Backup of all system data in an EEPROM after changes.
  - Automatic saving of date and all meter 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.
  - Calibrated meter and adjustable meter saved in the archives.
  - 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.
- Display of the momentary flow.
- Measurement period of 1...60 min. and 1...24 h adjustable separately for each channel.
- Display of current and last day and measurement period consumptions on display.
- Provision of a measuring point identifier 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).

#### **GSM mode:**

- Remote data transmission in freely selectable time windows.
- Auto-login at start of the two possible call time windows
- Application of TWIN cards possible through different call time windows.
- Remote adjustment of all values possible depending on lock status.
- Access monitoring for readout and setting of values via locks.
- Different GSM antennas can be used depending on on-site requirements.
- PIN support for SIM card security.
- Display of network operator and reception strength.

#### **Sending short messages (SMS):**

- Ten different brief messages via SMS to a control station with GSM modem or a mobile phone based on messages occurring in the DL220.
- Sending of an SM to up to two recipients possible.
- Up to ten different customised lists each with up to 15 values per list which can be sent via SMS (incl. abbreviated designation and unit).
- SM initiation for test purposes possible on device.

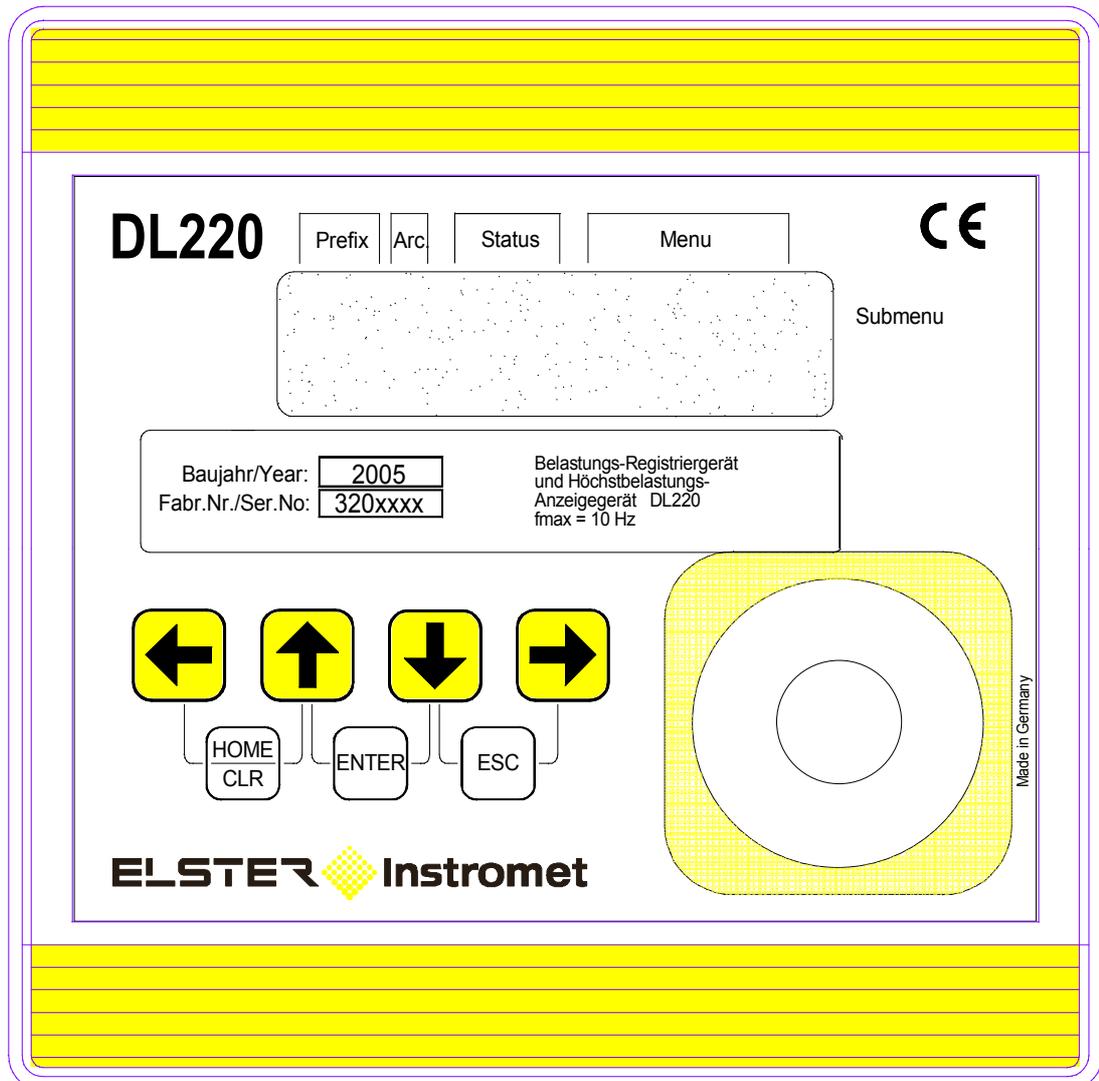
#### **Monitoring functions**

- Monitoring of signalling inputs with appropriate reactions (e.g. warning, entries in the logbook or measurement period archive, signal on outputs, sending a short message).
- Monitoring of programmable limits.
- Internal monitoring of the HW and SW functions in the unit.

## 2 Operation

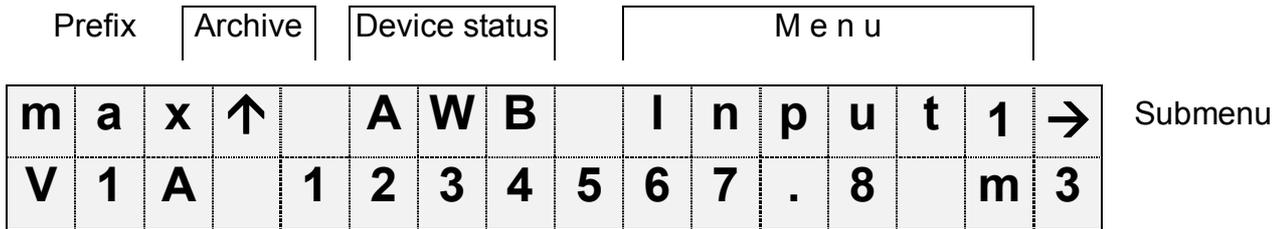
### 2.1 Front panel

For operation a two-line LCD display with 16 places per line and four cursor keys is provided on the front panel:



## 2.2 Display

Basic layout of the display:



Both lines in the display are subdivided into fields which are described below.

### 2.2.1 Line 1 = Labels

The first line is subdivided into the following five fields:

#### 1. Prefix (type of computation)

The type of computation identifies so-called "initial values" (also termed "capture values"). These are values which have been formed over a time period (e.g. the adjustable measurement period or one month). Labels:

- max    Maximum    – highest value within the time range
- min    Minimum    – lowest value within the time range
- Δ      Change      – volume within the time range
- Ø      Mean         – mean within the time range

#### 2. Archive

If an arrow points upwards to the label "Archive", then the displayed value is an archived value. This was frozen at a defined point in time and cannot be changed.

#### 3. Device status

Here a maximum of three of the most important items of status information are continually shown.

A flashing character signifies that the relevant state is still present and the relevant message is present in the momentary status.

A non-flashing character signifies that the relevant state is past, but the message in the status register has not yet been cleared.

Meaning of the letters:

- **A "Alarm"**  
At least one status message has occurred which is valid as an alarm. Alarm messages are copied into the status register and are retained here, even after rectification of the cause of the error, until they are manually cleared.
- **W "Warning"**  
At least one status message has occurred which is valid as a warning. Warning messages are copied into the status register and are retained here, even after rectification of the cause of the error, until they are manually cleared.
- **B "Battery low"**  
The remaining battery service life is less than 3 months.
- **P "Programming mode"**  
The programming lock is open.
- **L "PTB logbook"**  
The PTB logbook is full. Modification of the parameters which are taken into account in the PTB logbook are only possible with the programming lock open.
- **o "online"**  
A data transmission is running via OPTO- or modem communication. The other interface cannot then be used during this period.

☞ ***The programming lock can only be closed when the PTB logbook is not full!***

#### 4. Menu

Here is displayed to which list according to Chapter 2.4 the currently displayed value belongs. In submenus (indicated by an arrow to the left, see below) its name is displayed which is identical to the abbreviated designation of the entry point.

#### 5. Submenu

- → (Arrow to the right)  
indicates that the displayed value is the entry point of a submenu. This can be called with the key [ENTER].
- ← (Arrow to the left)  
indicates that you are located in a submenu which can be quit with the key [ESC]. On pressing [ESC] you are returned to the entry point of the submenu.

## 2.2.2 Line 2 = Value with name and unit

In the second line the name, value and (when available) the unit of the data are always shown.

Uncalibrated values are identified for the user with an asterisk ("\*") after the abbreviated designation.

For use outside of applications subject to calibration, the unit can also be obtained without the identification of uncalibrated values.

Example of uncalibrated values:

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V | 1 | . | P | * | 1 | 2 | 3 | 4 | 5 | 6 | 7 | . | 8 | m | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

Example of calibrated values:

|   |   |  |  |  |   |   |   |   |   |   |   |   |   |   |   |
|---|---|--|--|--|---|---|---|---|---|---|---|---|---|---|---|
| V | 1 |  |  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | . | 8 | m | 3 |
|---|---|--|--|--|---|---|---|---|---|---|---|---|---|---|---|

## 2.3 Operation

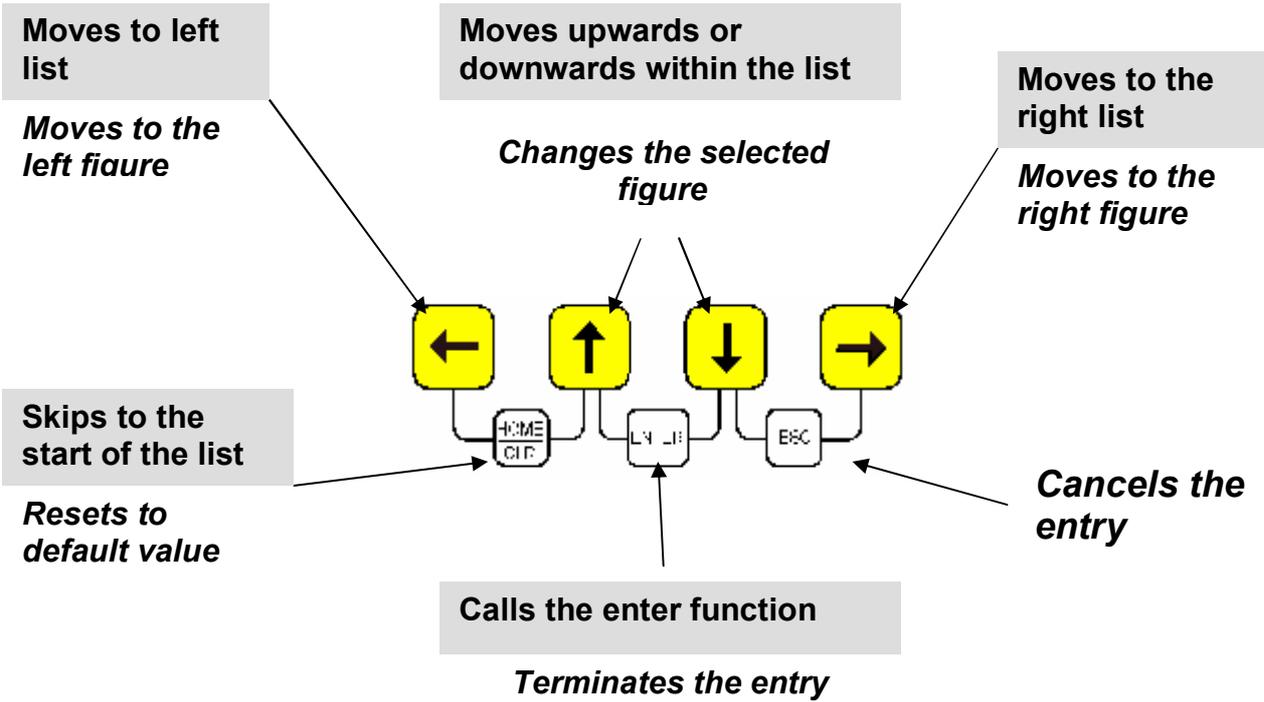
### 2.3.1 Movement within the list structure

| Key(s)  | Designation       | Action  |
|---|-------------------|---|
|  | Arrow key, top    | <b>Upwards movement</b> within the current list: From the first value in the list movement is then to the last value. |
|  | Arrow key, bottom | <b>Downwards movement</b> within the current list: From the end of the list movement is then to the first value.      |
|  | Arrow key, left   | <b>Skip</b> from any value within a table to the top value of the column to the <b>left</b> . <sup>1</sup>            |
|  | Arrow key, right  | <b>Skip</b> from any value within a table to the top value of the column to the <b>right</b> . <sup>1</sup>           |
|  | ENTER             | <b>Activate entry mode, open submenu or update measurements.</b>  |
|  | HOME/CLR          | <b>Skip to the first element of the list structure</b> or to the latest entry in an archive.                          |
|  | ESC               | <b>Skip from a submenu</b> to the menu immediately above.   |
|  | HELP              | <b>Calls the address</b> of the displayed value.  |

<sup>1</sup> With similar lists (e.g. Input 1-2) skipping to the similar value in the adjacent list occurs.

### 2.3.2 Meaning of the keypad

The meaning of the keypad depends on whether only values are being recalled (operation – highlighted in colour) or whether the DL220 is located in the input mode (shown in italics).



Note: The precise function of the keys during an entry is described in Chap. 2.5.2.

## 2.4 Formation of the list structure

The data display in the DL220 is structured in a tabular form. The individual columns in the table each contain associated values.

### 2.4.1 Summary charts, List Structure (1)

| Input x is meter input |           |  |           |
|------------------------|-----------|--|-----------|
| ↔<br>I1 to<br>"User"   | Vx        | Main meter Ex                            |           |
|                        | Vx.A      | Adjustable meter Ex                      |           |
|                        | Qx        | Flow rate Ex                             |           |
|                        | L.Mix     | Limit for monitoring Ex                  |           |
|                        | Md.Ix     | Mode Ex                                  |           |
|                        | MdMlx     | Mode for monitoring Ex                   |           |
|                        | SC.Ix     | Source for monitoring Ex                 |           |
|                        | cp.Ix     | cp value Ex                              |           |
|                        | SNM       | Serial number, meter x                   |           |
|                        | DS.Ca     | DS-100 – number for Vx                   |           |
|                        | DS.Cb     | DS-100 – number for Vx.A                 |           |
|                        | CuNo      | Customer number Ex                       |           |
|                        | Mp.Ix     | Measurement period Ex                    |           |
|                        | MP.Re     | Remain'g time in meas. period Ex         |           |
|                        | Δ Vx.Mp   | Incr. meas. period meter Ex              |           |
|                        | Δ VxM.L   | Last meas. period value Ex               |           |
|                        | max Vx.Mp | Max. meas. per. meter Ex current month * | <b>U1</b> |
|                        | max VxM.L | Max. meas. per. meter Ex last month *    | <b>U1</b> |
|                        | DB.Ix     | Day boundary for Ex                      |           |
|                        | Δ Vx.Dy   | Current day meter Ex                     |           |
|                        | Δ VxD.L   | Last day value Ex                        |           |
|                        | max Vx.Dy | Max. day meter Ex current month *        | <b>U2</b> |
|                        | max VxD.L | Max. day meter Ex last month*            | <b>U2</b> |
|                        | ArMox     | Month archive Ex                         | <b>U3</b> |
|                        | ArDyx     | Day archive Ex                           | <b>U4</b> |
|                        | ArMPx     | Meas. period archive Ex                  | <b>U4</b> |
|                        | FrMPx     | Meas. period archive Ex frozen           |           |

or

| Input x is signalling input |                          |
|-----------------------------|--------------------------|
| ST.Ix                       | Status signal input Ex   |
| Md.Ix                       | Mode input x             |
| MdMlx                       | Mode for monitoring Ex   |
| SC.Ix                       | Source for monitoring Ex |
| L.Mix                       | Limit for monitoring Ex  |
| Sp.Ix                       | Statuspointer            |

↔  
I2 to  
"Status"

#### Notes:

- "x" can assume the value 1 or 2; e.g.: V1 or V2
- For significance of the short designations: see Chap. 3 and Appendix C.
- Submenus are arranged under "U1" – "U4" (see Chapter: 2.4.3)
- \* for flow recording and high flow display

## 2.4.2 Summary charts, List Structure (2)

| Status |                             |    |
|--------|-----------------------------|----|
| S.Reg  | Total status register       | U5 |
| Stat   | Total momentary status      | U6 |
| Clr    | Clear total status register |    |
| Logb.  | Log book                    | U7 |
| AudTr  | List of modifications       | U8 |
| PLogb  | PTB logbook                 | U8 |
| ClrPL  | Clear PTB logbook           |    |

⇔

| System |                                      |
|--------|--------------------------------------|
| Time   | Time and with "→" to date            |
| MdTim  | Summer / winter time on/off          |
| MCyc   | Measurement cycle                    |
| Disp   | Permanent display on/off             |
| Aut.V  | Time to automatic display changeover |
| S.No   | Serial number DL220                  |
| Vers   | Software version                     |
| Check  | Checksum software                    |

⇔

| Service                           |   |
|-----------------------------------|---|
| Bat.R                             | Residual service life of battery                |
| Bat.C                             | Battery capacity                                |
| VBatM                             | Modem battery voltage                           |
| St.SL                             | Status of supplier's lock                       |
| Cod.S                             | Supplier's combination                          |
| St.CL                             | Status of customer's lock                       |
| Cod.C                             | Customer's combination                          |
| St.PL                             | Status programming lock                         |
| AdjTm                             | Correction factor, clock                        |
| Save                              | Backup of all data                              |
| Clr.A                             | Clear archives                                  |
| Clr.V                             | Clear meters (incl. archives and readout notes) |
| Clr.X                             | Execute restart                                 |
| Addr                              | User-specific display                           |
| diverse                           | Value of the user-specific display              |
| Display test (all segments flash) |   |

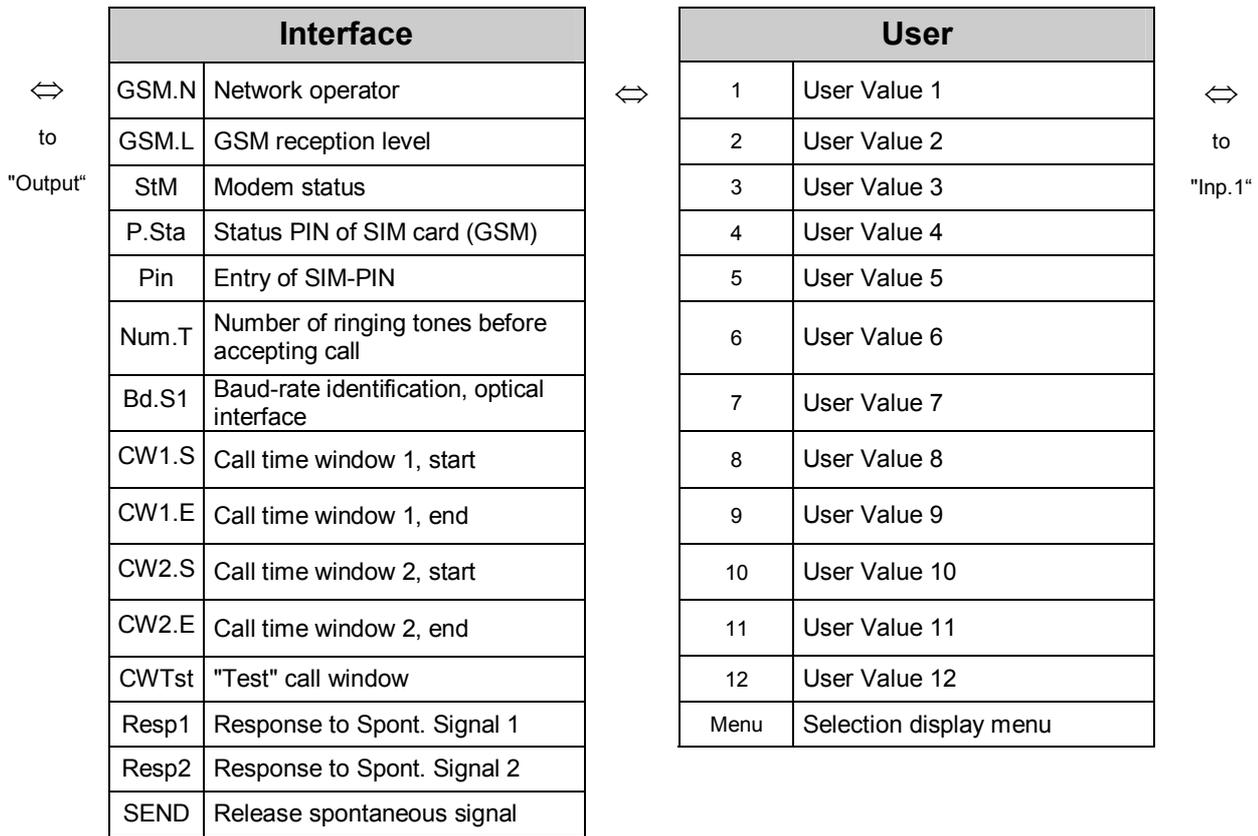
⇔

| Output |                             |
|--------|-----------------------------|
| Md.O1  | Mode, Signal Output 1       |
| SC.O1  | Source, Signal Output 1     |
| cp.O1  | cp value, Signal Output 1   |
| SpO1   | Signal for Status Output 1  |
| Bu.O1  | Output of pulse memory      |
| Md.O2  | Mode, Signal Output O2      |
| SC.O2  | Source, Signal Output O2    |
| cp.O2  | cp value, Signal Output O2  |
| Spo2   | Signal for Status Output O2 |
| Bu.O2  | Output of pulse memory      |

### Note:

- Meaning of the abbreviated designations: See Chapter 3 and Appendix C .
- Submenus are located under "U5" – "U8" (for explanation see Chapter: 2.4.3).

### 2.4.2 Summary charts, List Structure (3)



### 2.4.3 Summary charts, Submenus "U1" – "U8"

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

The entries marked in bold and italics depend on whether Input 1 (I1) or Input 2 (I2) is called.

#### U1 "Submenu: "Max. measurement period meter I1 or I2 in current month"

to Date 

|   |      |   |        |   |
|---|------|---|--------|---|
| ↔ | Time | ↔ | (Date) | ↔ |
|---|------|---|--------|---|

 to Time

#### U2 Submenu: "Max. day meter I1 or I2 in current month"

to Date 

|   |      |   |        |   |
|---|------|---|--------|---|
| ↔ | Time | ↔ | (Date) | ↔ |
|---|------|---|--------|---|

 to Time

#### U3 Archive: "Month archive I1 or I2"

to Check 

|   |      |   |      |   |        |   |           |   |             |   |
|---|------|---|------|---|--------|---|-----------|---|-------------|---|
| ↔ | ABNo | ↔ | Time | ↔ | (Date) | ↔ | <b>Vx</b> | ↔ | <b>Vx.A</b> | ↔ |
| ↔ | ABNo | ↔ | Time | ↔ | (Date) | ↔ | <b>Vx</b> | ↔ | <b>Vx.A</b> | ↔ |

 to VxM.L

to Z "b" 

|   |              |   |      |   |        |   |      |   |
|---|--------------|---|------|---|--------|---|------|---|
| ↔ | <b>VxM.L</b> | ↔ | Time | ↔ | (Date) | ↔ | Stat | ↔ |
| ↔ | <b>VxM.L</b> | ↔ | Time | ↔ | (Date) | ↔ | Stat | ↔ |

 to VxD.L

to STAT 

|   |              |   |      |   |        |   |      |   |      |   |       |   |       |   |
|---|--------------|---|------|---|--------|---|------|---|------|---|-------|---|-------|---|
| ↔ | <b>VxD.L</b> | ↔ | Time | ↔ | (Date) | ↔ | Stat | ↔ | ST.x | ↔ | St.Sy | ↔ | Check | ↔ |
| ↔ | <b>VxD.L</b> | ↔ | Time | ↔ | (Date) | ↔ | Stat | ↔ | ST.x | ↔ | St.Sy | ↔ | Check | ↔ |

 to ABNo

#### U4 Archive: "Measurement period archive" and "Day value archive" I1 or I2

to Check 

|   |      |   |      |   |        |   |           |   |             |   |
|---|------|---|------|---|--------|---|-----------|---|-------------|---|
| ↔ | ABNo | ↔ | Time | ↔ | (Date) | ↔ | <b>Vx</b> | ↔ | <b>Δ Vx</b> | ↔ |
| ↔ | ABNo | ↔ | Time | ↔ | (Date) | ↔ | <b>Vx</b> | ↔ | <b>Δ Vx</b> | ↔ |
| ↔ | ABNo | ↔ | Time | ↔ | (Date) | ↔ | <b>Vx</b> | ↔ | <b>Δ Vx</b> | ↔ |

 to Z "b"

to Δ "a" 

|   |             |   |               |   |      |   |       |   |    |   |       |   |
|---|-------------|---|---------------|---|------|---|-------|---|----|---|-------|---|
| ↔ | <b>Vx.A</b> | ↔ | <b>Δ Vx.A</b> | ↔ | St.x | ↔ | St.Sy | ↔ | Ev | ↔ | Check | ↔ |
| ↔ | <b>Vx.A</b> | ↔ | <b>Δ Vx.A</b> | ↔ | St.x | ↔ | St.Sy | ↔ | Ev | ↔ | Check | ↔ |
| ↔ | <b>Vx.A</b> | ↔ | <b>Δ Vx.A</b> | ↔ | St.x | ↔ | St.Sy | ↔ | Ev | ↔ | Check | ↔ |

 to ABNo

#### U5, U6 Status archive, explanation: See Chap. 3.3

#### U7 Archive: "Log book"

to Check 

|   |      |   |      |   |        |   |    |   |       |   |
|---|------|---|------|---|--------|---|----|---|-------|---|
| ↔ | ABNo | ↔ | Time | ↔ | (Date) | ↔ | Ev | ↔ | Check | ↔ |
| ↔ | ABNo | ↔ | Time | ↔ | (Date) | ↔ | Ev | ↔ | Check | ↔ |
| ↔ | ABNo | ↔ | Time | ↔ | (Date) | ↔ | Ev | ↔ | Check | ↔ |

 to ABNo

#### U8 Archive: "Audit trail" and "PTB logbook"

to Check 

|   |      |   |      |   |        |   |      |   |       |   |       |   |
|---|------|---|------|---|--------|---|------|---|-------|---|-------|---|
| ↔ | ABNo | ↔ | Time | ↔ | (Date) | ↔ | Addr | ↔ | "old" | ↔ | "new" | ↔ |
| ↔ | ABNo | ↔ | Time | ↔ | (Date) | ↔ | Addr | ↔ | "old" | ↔ | "new" | ↔ |
| ↔ | ABNo | ↔ | Time | ↔ | (Date) | ↔ | Addr | ↔ | "old" | ↔ | "new" | ↔ |

 to "St.PL"

to "new" 

|   |       |   |       |   |       |   |       |   |       |   |
|---|-------|---|-------|---|-------|---|-------|---|-------|---|
| ↔ | St.PL | ↔ | St.ML | ↔ | St.SL | ↔ | St.CL | ↔ | Check | ↔ |
| ↔ | St.PL | ↔ | St.ML | ↔ | St.SL | ↔ | St.CL | ↔ | Check | ↔ |
| ↔ | St.PL | ↔ | St.ML | ↔ | St.SL | ↔ | St.CL | ↔ | Check | ↔ |

 to ABNo

## 2.5 Changing values

### 2.5.1 Differentiating between values (data classes)

The methods of changing values differ depending on the value. These are therefore subdivided into so-called "data classes". Each value in a data class is treated identically on entry. The following data classes are present in the DL220:

| Type             | DC <sup>1</sup> | 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.  |
| Steady 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 meter).                       | 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 Data Classes 1-3.                          | No change possible.  |
| -                | 9               | Not used in the DL220.  |  |
| Headings         | 10 / 11         | Heading for archives (10) or submenus (11).   | Branching to the appropriate menu (submenu)  |

<sup>1</sup> DC: Data Class; each value is assigned to one of 11 data classes.

## 2.5.2 Entry function

Depending on the data class slight differences exist for the entry of values. The following points are the same for all data classes:

- **ENTER**  +  activates the entry mode (appropriate numbers flash) and terminates the entry of a value with acceptance of the valid value.
- **ESC**  +  cancels an entry; the previous value is retained.
- After termination of the entry the display mode is again active.

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

| DC | Action  | Function   |
|----|---|--|
| 1  |  +  ENTER   | Entry not possible (constant)  |
| 2  |  +  ENTER   | Entry not possible; only refreshing of measurement   |
| 3  |  +  ENTER   | Entry mode is activated, the most significant figure flashes.  |
|    |  ,  ,  ,  | The value of the flashing figure can be changed from 0 to 9 via the keys  ,  . Further figures to be changed are selected with the keys  ,  . Acceptance of the changed numerical value occurs with ENTER. |
|    |  +  HOME/CLR  | The value is described with its default setting, refer to field "Default" in Appendix C.   |
| 4  |  +  ENTER   | Entry mode is activated, the complete figure flashes.  |
|    |  ,  ,  ,  | The next higher, respectively lower, valid value is superimposed. Acceptance of the changed numerical value occurs with ENTER. No reaction to:  ,    |
|    |  +  HOME/CLR  | The value is described with its default setting, refer to field "Default" in the description of the individual lists.  |
| 5  |  +  ENTER   | Entry mode is activated, the complete figure flashes.  |
|    |  ,  ,  ,  | The display can be set to its initial value with  and  . Acceptance of the value with ENTER. No reaction to:  ,    |
|    |  +  HOME/CLR  | The value is described with its default setting, refer to field "Default" in the description of the individual lists.  |
| 6  |  +  ENTER   | Entry mode is activated, "0" or "1" flashes.   |
|    |  ,  ,  ,  | Toggling between "0" and "1" can be carried out with  or  . With "1" the function is executed with ENTER. The successful execution of the function is indicated with "OK", and an error with "Error".  |
|    |  +  HOME/CLR  | No function.   |
| 7  |  +  ENTER   | After ENTER the hidden entry mode is activated.  |

| DC | Action         | Function   |
|----|----------------|--|
|    | ↓, ↑, ←, →     | Entry similar as for data class 3, but hidden. An accurate description is given under the list "System". |
|    | ← + ↑ HOME/CLR | No function.   |
| 8  | ↓ + ↑ ENTER    | Entry not possible (e.g. archive values) in archive: initiation of the skip function (see Chap. 0).      |
| 9  | ↓ + ↑ ENTER    | Data class not present.  |
| 10 | ↓ + ↑ ENTER    | After ENTER branching occurs to the corresponding submenu.   |
| /  | ↓, ↑, ←, →     | No function.   |
| 11 | ← + ↑ HOME/CLR | No function.   |

### 2.5.3 Entry errors

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

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          | The required lock is closed.<br>An attempt has been made to change a value protected by a lock (e.g. programming or supplier's lock), although it is closed.   |
| 6          | Entered value is outside the permissible value range.  |
| 7          | The entered supplier's combination is not correct.   |
| 8          | No Find function (e.g.: in the archive) is possible.   |
| 11         | This message can have two causes:<br><ul style="list-style-type: none"> <li>- The queue of the messages to be sent is full.<br/>Up to ten messages can be temporarily saved. Clearing the messages: refer to Chapter 3.7.1 from page 86.</li> <li>- The definitions needed for sending the message (Short Message "SM") are not complete or are incorrect. E.g. the "SMS mode" must be "1" or "2", a correct telephone number must be entered for the receiver and provider, etc., (refer to Chapter 3.7.5 from page 91).</li> </ul> |
| 12         | Address entry is rejected, because the value cannot be monitored.  |
| 13         | Function "CLR.X" cannot be executed, because date is not located on default date (see Chap. 3.5.1).  |
| 21         | PTB-logbook is full (see Chap. 2.6.2)  |





## 2.6 Securing the values (access rights)

Within the DL220 a setting can be made for each existing value of whether it can be read and/or written by the appropriate access parties. This enables the DL220 to be used in a very flexible manner. In the field subject to calibration regulations, the rights are appropriately preset.

The following access parties are defined in the DL220:

- **Programming**            **"P"**       Access via the programming button accommodated in the DL220.
- **PTB logbook:**         **"PL"**       Access via supplier's combination when the PTB logbook is not full.
- **Supplier**               **"S"**       Access via supplier's combination
- **Customer**             **"C"**       Access via customer's combination

For each value it can be defined whether the above-mentioned access party may read the value or write to it. Under which lock the desired value (for the factory setting) is located is described in the following chapters (refer to Chap. 3 and following pages).

These are to be followed, because WinPADS can be installed as a manufacturer's, supplier's or customer's version and access to the device occurs accordingly.

☞ **If, for example, the supplier's lock is open (factory setting), the customer can also change the supplier's values!**

### 2.6.1 Programming lock

The highest ranking lock for securing the parameters is the programming lock. All values, for example which are used for the processing and storage of volume meters, are subject to this lock. The programming 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. 2.5.3).

The programming switch is realised as a pushbutton and is located inside the DL220 next to the battery and can be sealed with a sealing label.

The programming lock is opened by actuating the button once (a flashing "P" appears in the display under the membrane label "Status") and also closed again (flashing "P" goes out).

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

### 2.6.2 Access lock "PTB logbook"

The DL220 has a logbook in which changes of parameters subject to the programming lock are saved. Parameters which are written into the logbook during a change are identified in the menu list of the function description (Chapter 3) with the access right "PL". When the PTB logbook is not full, these parameters can only be changed with the

supplier's lock open. If the PTB logbook is full, these parameters can only be changed with the programming lock open.

- **With a full PTB logbook an open programming lock cannot be closed. In this case the PTB logbook must first be deleted (see Chap.: 3.3.1)!**

### 2.6.3 Supplier and customer locks

The supplier and customer locks are used to protect all data which are 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 respective lock is locked, all attempts to set or read values are acknowledged with an appropriate error message (see Chap. 2.5.3).

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.

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

- ☞ **It is essential to close the supplier lock because otherwise it is possible to change values protected by the lock „PTB-logbook”!**

## 2.6.4 Opening, changing and closing the supplier's lock

### Displaying the current status of the supplier's lock

The supplier's lock is located in the Service list.

To display the current status select the Service list (top right of display: "Serv.") with the keys  or .

Then press the key  three times so that the following display appears:

|   |   |   |   |   |   |   |   |  |   |   |   |   |   |  |   |
|---|---|---|---|---|---|---|---|--|---|---|---|---|---|--|---|
|   |   |   |   |   | o | k | . |  | S | e | r | v | . |  |   |
| S | t | . | S | L |   |   |   |  |   |   |   |   |   |  | 0 |

The display of "0" indicates a closed supplier's lock.

### Opening the supplier's lock

To open the lock the key  must be pressed once more so that the following display appears:

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|   |   |   |   |   | o | k | . |   | S | e | r | v | . |   |   |
| C | o | d | . | S |   |   |   | - | - | - | - | - | - | - | - |

Press the keys  or  **simultaneously** (skip to entry function). Now the first figure flashes and all others are not displayed.

|   |   |   |   |   |  |  |  |   |   |   |   |   |   |   |   |
|---|---|---|---|---|--|--|--|---|---|---|---|---|---|---|---|
| C | o | d | . | S |  |  |  |   |   |   |   |   |   |   |   |
|   |   |   |   |   |  |  |  | 0 | - | - | - | - | - | - | - |

This figure can be set to the desired value with the key  or .

The next figure is selected (it then flashes) with the key  and can be entered according to the specified lock. The same procedure is used with all figures until the correct code has been entered. Here, it need not be entered right-justified, i.e. the code "1234" can be entered directly in the first four left segments; it is then automatically moved to the right.

Once the entry of the code is concluded, the keys  and  must be pressed **simultaneously** again. The entry is then concluded.

If the code is correct, the display "Cod.S" (see above) is again shown and by pressing the key  once, the status of the supplier's lock is displayed again:

|   |   |   |   |   |   |   |   |  |   |   |   |   |   |  |   |
|---|---|---|---|---|---|---|---|--|---|---|---|---|---|--|---|
|   |   |   |   |   | o | k | . |  | S | e | r | v | . |  |   |
| S | t | . | S | L |   |   |   |  |   |   |   |   |   |  | 1 |

The display of "1" now indicates an open supplier's lock.

If the code is not correct, the message "----7---" appears briefly and the entry must be repeated.

### Changing the supplier's lock

If the supplier's lock is open, a new supplier's combination is entered under the display:

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|   |   |   |   |   | o | k | . |   | S | e | r | v | . |   |   |
| C | o | d | . | S |   |   |   | - | - | - | - | - | - | - | - |

in the same manner. To do this, press the keys  and  **simultaneously** (skip to entry function). The first figure flashes. All other figures are now displayed. This figure can be set to the desired value with the key  or .

The next figure can be selected with the  and entered as described above.

Once the entry of the code is concluded, the keys  and  must be pressed **simultaneously** again. That then concludes the entry and the supplier's combination has been changed.

### Closing the supplier's lock

To close the supplier's lock the status of the supplier's lock must again be recalled in the "Service" list (select the Service list with the keys  or  and press the key  three times), so that the following display appears:

|   |   |   |   |   |   |   |   |  |   |   |   |   |   |  |   |
|---|---|---|---|---|---|---|---|--|---|---|---|---|---|--|---|
|   |   |   |   |   | o | k | . |  | S | e | r | v | . |  |   |
| S | t | . | S | L |   |   |   |  |   |   |   |   |   |  | 1 |

The display of "1" indicates that the supplier's lock is still open.

Press the keys  and  **simultaneously** (skip to entry function). Now the right figure flashes:

|   |   |   |   |   |  |  |  |  |  |  |  |  |  |  |   |
|---|---|---|---|---|--|--|--|--|--|--|--|--|--|--|---|
| S | t | . | S | L |  |  |  |  |  |  |  |  |  |  | 1 |
|---|---|---|---|---|--|--|--|--|--|--|--|--|--|--|---|

Set this figure to the value "0" with the key  or .

Once the entry is concluded, press the keys  and  **simultaneously** again. The entry is then concluded and the supplier's lock is closed.

### 2.6.5 Opening, changing and closing the customer's lock

The customer's lock is located in the "Service" list. The procedure for opening, changing and closing corresponds to that of the supplier's lock. Here, the following displays are recalled:

**Display of the status and closing of the customer's lock:**

|   |   |   |   |   |   |   |   |  |   |   |   |   |   |  |   |
|---|---|---|---|---|---|---|---|--|---|---|---|---|---|--|---|
|   |   |   |   |   | o | k | . |  | S | e | r | v | . |  |   |
| S | t | . | C | L |   |   |   |  |   |   |   |   |   |  | 0 |

**Opening the customer's lock and changing the combination:**

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|   |   |   |   |   | o | k | . |   | S | e | r | v | . |   |   |
| C | o | d | . | C |   |   |   | - | - | - | - | - | - | - | - |

### 3 Functional description

The data display is structured in tabular form (list structure) - see Chapter 2.4. The individual columns in the table each contain associated values. The following functional description is orientated to this list structure.

#### 3.1 Metering or signal input 1

##### 3.1.1 Input 1 set as metering input

| Name      | Address | Designation / value   | Cal.                                       | Acc | Default | DC   |
|-----------|---------|---|--|-----|---------|------|
| V1        | 1:200   | Main meter input 1  | No   | PL  | 0       | 3    |
| V1.P      | 1:203   | Adjustable meter input 1  | No   | S   | 0       | 3    |
| Q1        | 1:210   | Flow rate input 1   | -  | -   | -       | 2    |
| L.MI1     | 12:150  | Limit for monitoring input 1                                    | No   | S   | 50000   | Var. |
| Md.I1     | 1:207   | Mode input 1  | No   | PL  | 1       | 4    |
| MdMI1     | 12:157  | Mode for monitoring input 1                                     | No   | S   | 2       | 4    |
| SC.I1     | 12:154  | Source for monitoring input 11                                  | No   | S   | 1:160   | Var. |
| cp.I1     | 1:253   | Cp value input 1  | No   | PL  | 1       | 3    |
| SNM       | 1:222   | Serial number of meter on input 1                               | No   | S   | 2       | 3    |
| DS.Ca     | 1:22E   | DS-100 number for Meter V1                                      | No   | S   | see SNo | 3    |
| DS.Cb     | 1:22F   | DS-100 number for Meter V1.A                                    | No   | S   | see SNo | 3    |
| CuNo      | 1:21A   | Customer number input 1   | No   | S   | 1       | 3    |
| Mp.I1     | 5:150   | Measurement period input 1                                      | No   | PL  | 60      | 3    |
| MP.Re     | 5:15A   | Residual measurement period input 1                             | -  | -   | -       | 2    |
| Δ V1.Mp   | 1:160   | Meter reading of curr. meas. period I1                          | No   | -   | -       | 2    |
| Δ V1M.L   | 1:161   | Meter reading of last meas. period I1                           | No   | P   | -       | 2    |
| max V1.Mp | 3:160   | Maximum of meas. period meter reading in current month input 1* | Skip to submenu for display of date / time |     |         | 11   |
| max V1M.L | 3:161   | Max. meas. per. meter input 1, last month*                      | Skip to submenu for display of date / time |     |         | 11   |
| DB.I1     | 5:141   | Day boundary input 1  | No   | P   | 06:00   | 3    |
| Δ V1.Dy   | 2:160   | Incr. day meter input 1   | No   | -   | -       | 2    |
| Δ V1D.L   | 2:161   | Last day meter input 1  | No   | P   | -       | 2    |
| maxV1.Dy  | 4:160   | Max. day meter input 1 in curr. month*                          | Skip to submenu for display of date / time |     |         | 11   |
| maxV1D.L  | 4:161   | Max. day meter input 1, last month*                             | Skip to submenu for display of date / time |     |         | 11   |
| ArMo1     | 1:A30   | Month archive I1  | Skip to "Month archive I1"                 |     |         | 10   |
| ArDy1     | 13:A30  | Day value archive I1  | Skip to "Day value archive I1"             |     |         | 10   |
| ArMP1     | 2:A30   | Measurement period archive I1                                   | Skip to "Measurement period archive I1"    |     |         | 10   |
| FrMP1     | 2:A50   | Freeze measurement period archive I1                            | No   | S   | -       | 6    |

**DC** = Data class (for description see Chap. 2.5)

**Acc** = The displayed value is subject to: "**P**": Programming lock "**PL**": PTB-Logbook "**S**": Supplier's lock "**C**": Customer's lock "-": Value cannot be changed.

\* = for flow recording and high flow display

### 3.1.2 Input 2 set as metering input

| Name      | Address | Designation / value   | Cal.                                       | Acc | Default | DC   |
|-----------|---------|---|--|-----|---------|------|
| V2        | 2:200   | Main meter input 2  | No   | PL  | 0       | 3    |
| V2.P      | 2:203   | Adjustable meter input 2  | No   | S   | 0       | 3    |
| Q2        | 2:210   | Flow rate input 2   | -  | -   | -       | 2    |
| L.MI2     | 13:150  | Limit for monitoring input 2                                    | No   | S   | 50000   | Var. |
| Md.I2     | 2:207   | Mode input 2  | No   | PL  | 1       | 4    |
| MdMI2     | 13:157  | Mode for monitoring input 2                                     | No   | S   | 2       | 4    |
| SC.I2     | 13:154  | Source for monitoring input 2                                   | No   | S   | 5:160   | Var. |
| cp.I2     | 2:253   | Cp value input 2  | No   | PL  | 1       | 3    |
| SNM       | 2:222   | Serial number of meter on input 2                               | No   | S   | 2       | 3    |
| DS.Ca     | 2:22E   | DS-100 number for Meter V2                                      | No   | S   | see SNo | 3    |
| DS.Cb     | 2:22F   | DS-100 number for Meter V2.A                                    | No   | S   | see SNo | 3    |
| CuNo      | 2:21A   | Customer number input 2   | No   | S   | 1       | 3    |
| Mp.I2     | 6:150   | Measurement period input 2                                      | No   | P   | 60      | 3    |
| MP.Re     | 6:15A   | Residual measurement period input 2                             | -  | -   | -       | 2    |
| Δ V2.Mp   | 5:160   | Meter reading of curr. meas period input 2                      | No   | -   | -       | 2    |
| Δ V2M.L   | 5:161   | Meter reading of last meas. period input 2                      | No   | PL  | -       | 2    |
| max V2.Mp | 7:160   | Maximum of meas. period meter reading in current month input 2* | Skip to submenu for display of date / time |     |         | 11   |
| max V2M.L | 7:161   | Max. meas. per. meter input 2, last month*                      | Skip to submenu for display of date / time |     |         | 11   |
| DB.I2     | 6:141   | Day boundary input 2  | No   | P   | 06:00   | 3    |
| Δ V2.Dy   | 6:160   | Incr. day meter input 2   | No   | -   | -       | 2    |
| Δ V2D.L   | 6:161   | Last day meter input 2  | No   | P   | -       | 2    |
| max V2.Dy | 8:160   | Max. day meter input 2 in curr. month*                          | Skip to submenu for display of date / time |     |         | 11   |
| max V2D.L | 8:161   | Max. day meter input 2, last month*                             | Skip to submenu for display of date / time |     |         | 11   |
| ArMo2     | 3:A30   | Month archive I2  | Skip to "Month archive I2"                 |     |         | 10   |
| ArDy2     | 14:A30  | Day value archive I2  | Skip to "Day value archive I2"             |     |         | 10   |
| ArMP2     | 4:A30   | Measurement period archive I2                                   | Skip to "Measurement period archive I2"    |     |         | 10   |
| FrMP2     | 4:A50   | Freeze measurement period archive I2                            | No   | S   | -       | 6    |

**DC** = Data class (for description see Chap. 2.5)

**Acc** = The displayed value is subject to: "**P**": Programming lock "PL": PTB-Logbook "**S**": Supplier's lock "**C**": Customer's lock "-": Value cannot be changed.

\* = for flow recording and high flow display

### 3.1.3 Input 1 set as signal input

| Name   | Address | Designation / value      | Cal. | Acc. | Default   | DC   |
|--------|---------|--------------------------|------|------|-----------|------|
| St.I1  | 1:228   | Status I1                | -    | -    | -         | 2    |
| Md.I1  | 1:207   | Mode I1                  | No   | PL   | 2         | 4    |
| Md.MI1 | 12:157  | Mode for monitoring I1   | No   | S    | 2         | 4    |
| SC.I1  | 12:154  | Source for monitoring I1 | No   | S    | 1:0160    | Var. |
| L.MI1  | 12:150  | Limit for monitoring I1  | No   | S    | 50000     | Var. |
| SpM1   | 12:153  | Status pointer           | No   | S    | 12_01:1.1 | 4    |

### 3.1.4 Input 2 set as signal input

| Name   | Address | Designation / value      | Cal. | Acc. | Default   | DC   |
|--------|---------|--------------------------|------|------|-----------|------|
| St.I2  | 2:228   | Status I2                | -    | -    | -         | 2    |
| Md.I2  | 2:207   | Mode input 2             | No   | PL   | 2         | 4    |
| Md.MI2 | 13:157  | Mode for monitoring I2   | No   | S    | 2         | 4    |
| SC.I2  | 13:154  | Source for monitoring I2 | No   | S    | 2:0228    | Var. |
| L.MI2  | 13:150  | Limit for monitoring I2  | No   | S    | 1         | Var. |
| SpM2   | 13:153  | Status pointer I2        | No   | S    | 13_02:1.1 | 4    |

**DC** = Data class (for description see Chap. 2.5)

**Acc** = The displayed value is subject to: "**P**": Programming lock "**PL**": PTB-Logbook "**S**": Supplier's lock "**C**": Customer's lock "-": Value cannot be changed.

### 3.1.5 Description of the values

The values are described for Input 1 as an example. The corresponding values in the list for Input 2 have the same function.

#### V1 Main meter Input 1

This meter counts the incoming pulses and converts them into a volume by means of the set  $C_P$  value.

With an open programming lock the value can be changed as described in Chapter 2.5.2. The display occurs during entry in the full format of nine predecimal and four post-decimal places. Otherwise this value is displayed with 9 places before the decimal point. Pressing the key "→" displays the 4 post-decimal places.

#### V1.A Adjustable meter Input 1

With the supplier's lock open the adjustable meter can be set via the keypad or interface to any value. The incrementing and display correspond to the main meter V1.

#### Q1 Flow Input 1

Momentary flow rate at the input converted to  $m^3/h$  (not calibrated). The display is given in full cubic metres (without post-decimal places).

**St.I1 Status Input 1**

Momentary status of the input if it is programmed as a signalling input ("0" = open; "1" = closed).

**L.MI1 Limit for monitoring function**

Limit for the value on the present input defined by **MdMI1**. The representation of the limit occurs according to the set mode **MdMI1**.

**Md.I1 Modus, Signal input 1**

Each signal input on the DL240 can be assigned with two different input modes. The following modes are realised:

**"0" = Input switched off**

The input has no function.

**"1" = Metering input**

Pulses on the input are counted as volume pulses.

**"2" = Status input**

Here the 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 mode for monitoring **MdMI1**.

**MdMI1 Mode for monitoring**

Various modes for monitoring can be programmed. The following modes are possible:

| Mode for monitoring |                         | Explanation                             |
|---------------------|-------------------------|---|
| 0                   | Switched off            | No monitoring.                          |
| 1                   | >L.MIx                  | Limit exceeded (value > L.MIx)          |
| 2                   | ≥ L.MIx                 | Limit exceeded (value ≥ L.MIx)          |
| 3                   | < L.MIx                 | Limit undercut (value < L.MIx)          |
| 4                   | ≤ L.MIx                 | Limit undercut (value ≤ L.MIx)          |
| 5                   | Time-synchronised input | Time-synchronised input, rising edge    |
| 9                   | ≥ LIM1 AND < LIM2       | Time within value range                 |
| 10                  | ≥ LIM1 OR < LIM2        | Time outside value range                |
| 17                  | Pulse comparison        | Comparison input for input SC.Ix        |
| 21                  | Single value            | E.g.: Meas. period, day or month meter  |
| 23                  | In range                | In permissible range (e.g. for weekend) |
| 33                  | With self-holding       |   |

**SC.I1 Source for monitoring**

With activated monitoring and in dependence of the programmed mode (MdMI1), 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.Mlx                 | All meters, the flow rate and the status of Input 1 (1:200; 1:203; 1:210; 1:160; 2:160; and 1:228) |
| 2                   | ≥ L.Mlx                 |  |
| 3                   | < L.Mlx                 |  |
| 4                   | ≤ L.Mlx                 |  |
| 5                   | Time-synchronised input | Input status for Input 1: 1:228  |
| 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 meter of <u>another</u> input (e.g.: 2:228, if comparison with Input 2 is to be made)    |
| 21                  | Single pitch            | e.g.: Monthly meter 02:0143  |
| 23                  | In pitch range          | e.g.: Sec. meter, (affected by summer time) 01:0400_1  |

**cp.I1 cp value, Signal input 1**

The  $c_p$  value indicates the pulse value e.g. in the unit **pulses per m<sup>3</sup>** 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 meter readings. They are always displayed with nine predecimal and four post-decimal places.

**SNM Serial number of the meter (4 + 8 places)**

Here the 12-figure serial number of the meter connected to this signal input is displayed. Ex-works 000000000002 is the default.

**DS.Ca DS-100 number, Meter V1**

To differentiate between the two meters V1 and V1.A in the archives for the Elster Evaluation Software WinVIEW, a so-called "DS-100 number" is needed for each meter. This number is set ex-works based on the serial number of the DL220 and does not need to be changed.

**DS.Cb DS-100 number, Meter V1.A**

See "DS.Ca"

**CuNo Customer number (4 + 8 places)**

Here the 12-figure customer number of the connected meter is displayed. Ex-works "000000000001" is the default.

**Mp.I1 Measurement period, Input 1**

Setting of the measurement period for saving the data records (meter readings) in the archive of Input 1. The output is given right-justified in minutes.

**MP.Re Remaining time measurement period**

Display of remaining time for the current measurement period for the user's information. The output is given right-justified in minutes.

**Δ V1Mp Measurement period meter input 1**

Display of the meter input volume measured during the current measurement period (momentary reading for measurement period consumption). The display occurs as described under "Main meter".

**Δ V1M.L Last measurement period meter input 1**

Displays the last measurement period consumption

**max V1Mp Max. measurement period meter in current month input 1 for flow recording and maximum flow display**

The maximum of the measurement period found on the meter input till now in the current month. The display is described under "Main meter".

This display item is also the entry into the *submenu* in which the corresponding date and time can be called.

**max V1M.L Max. measurement period meter in the last month input 1 for flow recording and maximum flow display**

The maximum of the measurement period found on the meter input in the last month. The display is described under "Main meter".

This display item is also the entry into the *submenu* in which the corresponding date and time can be called.

**DB.I1 Day boundary input 1**

A separate day boundary can be defined for each input. It is entered right justified in the form hh:mm. It affects the change of day and, where applicable, archiving in the monthly archive.

**Δ V1.Dy Day meter input 1**

The volume of the metering input (current level of day's consumption) found during the current day depending on the day boundary DB.I1. The display occurs as described under "Main meter".

**Δ V1D.L Last day meter input 1**

Displays the consumption of the last day.

**max V1.Dy Maximum day meter input 1 in current month for flow recording and maximum flow display**

Day maximum found till now on meter input in the current month depending on the day boundary. The display is described under "Main meter".

This display item is also the entry into the *submenu* in which the corresponding date and time can be called.

**max V1D.L Maximum day meter input 1 in last month for flow recording and maximum flow display**

Day maximum found on the meter input in the last month depending on the day boundary. The display is described under "Main meter".

This display item is also the entry into the *submenu* in which the corresponding date and time can be called.

**ArMo1 Month archive I1**

Entry possibility into the month archive of Input 1, if this is programmed as meter input or encoding input (for structure see Chapter 3.2.2).

**ArDy1 Day value archive I1**

Entry possibility into the day value archive of Input 1, if it is programmed as a metering or encoding input (for structure see Chapter 3.2.3).

**ArMP1 Measurement period archive I1**

Entry possibility into the archive of measurement period values (meter reading response, or load profile) of Input 1, if this is programmed as meter or encoder input (for structure see Chapter 3.2.3).

**FrMP1 Freeze measurement period archive I1**

Manual method of saving a data record of the measurement period archive (independent of the measurement 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: FrMP1↑ = Freeze command).

The following other values are also available for each input:

**Measuring point designation to AA**

Address: **1:221**

A 33-place designation of the measuring point can be saved in the DL220. As a result, the requirements of the Association Agreement (AA) can be optimally considered.

**Unit**

Address: **1:208**

Each input can be assigned a unit (default: "m3") which is composed of five characters and can only be displayed. Any text string can be entered here, which though has no effect on the meter readings, etc.

**SW debounce**Address of period: **1:232**Address for pulse duration: **1:233**

When the connected meter outputs fluctuating pulses, a software debounce can be activated under the above addresses with the programming lock open. It is adjustable with a pitch of 63 ms. Further information can be obtained from Elster Handel GmbH.

## 3.2 Archives in the DL220

There are six different archives in the DL220.

- a) Measurement period archive
- b) Day value archive
- c) Month archive
- d) Logbook
- e) Changes archive
- f) PTB logbook

Apart from the PTB logbook all archives are structured as a ring buffer memory, so that the latest data is always available. The oldest data is overwritten by a new entry. For Input 1 there is a measurement period, day value and month archive. Along with the PTB logbook, the device provides a general logbook and a changes archive.

Description of the archives in detail:

- About a) The measurement period archive contains the meter readings (meter reading response) which have been saved by the event "End of measurement period" or other events (meter reading change, time change, other signals). As standard the calibrated meter V1 and the adjustable meter V1.A are saved in the measurement period archive. In the encoder mode the encoder original meter Vo can also be saved instead of V1.A.
- About b) The day value archive contains the meter readings (meter reading response) from the above mentioned meters which have been saved by the event "End of day" or other events (meter reading change, time change, other signals).
- About c) The month archive contains the month end readings of the above mentioned meters as well as the day and measurement period maxima formed. These are saved when the event "End of month" occurs.
- About d) The logbook saves the last 250 non-periodic events (i.e. changes of status messages). For a description of the logbook: See Chapter: 0.
- About e) The changes archive saves the last 200 parameter changes (before / after) which have been made via the keypad, opt. interface or modem communication. Description of the changes archive: See Chapter: 0.

About f) The PTB logbook saves the 50 changes of parameters which may be changed with an appropriate entry into this logbook with the programming lock closed and the supplier's lock open. The parameter changes made (before / after) are saved via the keyboard, opt. interface or modem communication. The structure of this archive corresponds to the changes archive: See Chapter: 3.3.6.

### 3.2.1 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 meter 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.

#### **ABNo 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 metering starts from "0". The block numbers of all archives are set to 1 by the trigger function "Clear meters (incl. archives)".

#### **Time Time / Date**

The time and date at the time of saving a data record in the corresponding "Archive row".

#### **St.Sy Momentary status**

Saved momentary status when creating the data record.

#### **Check 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:

"CRC ok" = No errors in data record

"CRC 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 DL220 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 DL220 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.

### 3.2.2 Structure of the month archive Input 1 or 2

Under "ArMox" (x=1..2) a skip to the input month archive can take place in each metering channel. In the month archive the month-end readings of the meters Vx and Vx.A (see below) and the day and measurement period maxima found by the DL220 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 meter inputs!

The following values are saved in this archive:

| Data record no. | ABNo | Time (time of day) | Time (date) | Meter Vx | Meter Vx.A | VxM.L max | Time (time of day) | Time (date) |
|-----------------|------|--------------------|-------------|----------|------------|-----------|--------------------|-------------|
| Explanation     | (1)  | (2)                | (3)         | (4)      | (5)        | (6)       | (7)                | (8)         |
| 1               | 1    | 06:00:00           | 01.02.04    | 11111111 | 00000123   | 00000123  | 12:00:00           | 15.01.04    |
| 2               | 2    | 06:00:00           | 01.03.04    | 22222222 | 00000456   | 00000234  | 07:00:00           | 12.02.04    |
| 3               | 3    | 06:00:00           | 01.04.04    | 33333333 | 00000789   | 00000345  | 18:00:00           | 25.03.04    |
| ...             |      |                    |             |          |            |           |                    |             |

| Data record no. | Stat  | VxD.L max | Time (time of day) | Time (date) | Stat  | St.x  | St.Sy | Check |
|-----------------|-------|-----------|--------------------|-------------|-------|-------|-------|-------|
| Explanation     | (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    |
| 3               | x.y.z | 00034567  | 06:00:00           | 25.03.99    | x.y.z | x.y.z | x.y.z | OK    |
| ...             |       |           |                    |             |       |       |       |       |

Meaning of the displayed values:

|                   |             |  |
|-------------------|-------------|--|
| <b>ABNo</b>       | <b>(1)</b>  | Internal archive block number  |
| <b>Time</b>       | <b>(2)</b>  | Time of saving (at end of month)   |
| <b>Time</b>       | <b>(3)</b>  | Date of saving (at end of month)   |
| <b>Meter Vx</b>   | <b>(4)</b>  | Calibrated meters V1 and V2<br>Meter reading of the meter at the time of saving.   |
| <b>Meter Vx.A</b> | <b>(5)</b>  | Calibrated meters V1 and V2<br>Meter reading of the meter at the time of saving.   |
| <b>VxM.Lmax</b>   | <b>(6)</b>  | Last measurement period maximum<br>The measurement period maximum found at end of month.   |
| <b>Time</b>       | <b>(7)</b>  | Time of the measurement period maximum<br>The time of day determined when the measurement period maximum was saved.                                      |
| <b>Time</b>       | <b>(8)</b>  | Date of the measurement period maximum<br>The date determined at the time of saving the measurement period maximum.                                      |
| <b>Stat</b>       | <b>(9)</b>  | Status at the measurement period maximum<br>All signals on this input occurring during the measurement period maximum (for structure see Chapter 3.3.9). |
| <b>VxD.Lmax</b>   | <b>(10)</b> | Last day maximum<br>The day maximum found at end of month.   |
| <b>Time</b>       | <b>(11)</b> | Time of the day maximum<br>The time of day determined when the day maximum was saved.  |
| <b>Time</b>       | <b>(12)</b> | Date of the day maximum<br>The date determined at the time of saving the day maximum.  |
| <b>Stat</b>       | <b>(13)</b> | Status at the day maximum Ex<br>All signals on this input occurring during the day of the day maximum (for structure see Chapter 3.3.9).                 |
| <b>ST.x</b>       | <b>(14)</b> | Status register of the input Ex at time of saving (for structure see Chap. 3.3.9).   |
| <b>ST.Sy</b>      | <b>(15)</b> | Momentary status of the system (complete device) at time of saving (for structure see Chapter 3.3.9).  |
| <b>Check</b>      | <b>(16)</b> | Checksum evaluation<br>Display of whether the data row is correct (CRC ok) or faulty (CRC Error).  |

### 3.2.3 Structure of meas. period and day value archives, Input x

Under "ArMP1" skipping into the measurement period archive and under "ArDy1" skipping into the day value archive can occur. Here the readings of the Meters Vx and Vx.A (see below) are saved (= "taking meter readings"). The consumption values ( $\Delta Vx$  or  $\Delta Vx.A$ ) are determined for the display in the DL220 or calculated by the evaluation software based on the differences in meter readings.

The measurement period archive is only available for meter inputs!

Structure of the measurement period archive:

| Data record no. | ABNo  | Time (time of day) | Time (date) | Meter Vx | $\Delta Vx$ | Meter Vx.A | $\Delta Vx.A$ | ST.x  | St.Sy | Ev      | Check |
|-----------------|-------|--------------------|-------------|----------|-------------|------------|---------------|-------|-------|---------|-------|
| Explanation     | (1)   | (2)                | (3)         | (4)      | (5)         | (6)        | (7)           | (8)   | (9)   | (10)    | (11)  |
| 1               | 11111 | 06:00:00           | 01.04.04    | 33333333 | x           | 44444444   | X             | x.y.z | x.y.z | xx.yy:z | OK    |
| 2               | 11112 | 07:00:00           | 01.04.04    | 33333444 | 111         | 44444444   | 0             | x.y.z | x.y.z | xx.yy:z | OK    |
| 3               | 11113 | 08:00:00           | 01.04.04    | 33333499 | 55          | 44444489   | 45            | x.y.z | x.y.z | xx.yy:z | OK    |
| 4               | 11114 | 09:00:00           | 01.04.04    | 33333555 | 56          | 44444523   | 34            | x.y.z | x.y.z | xx.yy:z | OK    |
| ...             |       |                    |             |          |             |            |               |       |       |         |       |

|                                 |             |  |
|---------------------------------|-------------|--|
| <b>ABNo</b>                     | <b>(1)</b>  | Internal archive block number  |
| <b>Time</b>                     | <b>(2)</b>  | Time of day  |
| <b>Time</b>                     | <b>(3)</b>  | Date   |
| <b>Meter Vx</b>                 | <b>(4)</b>  | Calibrated meters V1 and V2<br>Meter reading at the time of saving.  |
| <b><math>\Delta Vx</math></b>   | <b>(5)</b>  | Meter increment of calibrated meters V1 and V2<br>Difference value at conclusion of meas. period (e.g. consumption)    |
| <b>Meter Vx.A</b>               | <b>(6)</b>  | Adjustable meter V1.A or V2.A<br>Meter reading at time of saving   |
| <b><math>\Delta Vx.A</math></b> | <b>(7)</b>  | Meter increment of adjustable meter V1.A or V2.A<br>Difference value at termination of meas. period (e.g. consumption) |
| <b>ST.x</b>                     | <b>(8)</b>  | Status register Input x at time of saving (see Chapter 3.3.7 )   |
| <b>St.Sy</b>                    | <b>(9)</b>  | Momentary system status Input x at time of saving (for structure see Chapter 3.3.7).                                   |
| <b>Ev</b>                       | <b>(10)</b> | Triggering event<br>E.g. appearance of a warning (for structure see Chapter 3.3.12).                                   |
| <b>Check</b>                    | <b>(11)</b> | Checksum evaluation<br>Display of whether the data row is correct (OK) or faulty (ERROR).                              |

### 3.2.4 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 tables give an idea of the memory depth. They also depend on the DL220 version.

☞ **When setting the measurement period it is essential to take into account the DL220 "measurement cycle". See "MCyc" in Chapter 0.**

#### 3.2.4.1 DL220 version: 2 channels (input 1 and input 2: each of 6000 rows)

In this version the memory available is equally divided between both inputs. This then gives the following memory depth (without additional messages, which are retained in the archive):

| Memory depth | Measurement period <b>Mp.I1</b> resp. <b>Mp.I2</b> in minutes |    |     |    |     |     |     |
|--------------|---|----|-----|----|-----|-----|-----|
|              | 2   | 5  | 10  | 15 | 20  | 30  | 60  |
| Days         | 8   | 20 | 41  | 62 | 83  | 125 | 250 |
| Months       | -   | -  | 1.3 | 2  | 2.7 | 4   | 8.2 |

#### 3.2.4.2 DL220 version: 1 channel (input 1: 11000 + input 2: 1000 rows)

In this version the memory available is used almost exclusively for Input 1. However, with a 60 min. measurement period Input 2 can still be used for standard billing purposes. This then gives the following memory depth (without additional messages, which are retained in the archive):

| Memory depth | Measurement period <b>Mp.I1</b> in minutes |      |     |     |     |     |     |
|--------------|--|------|-----|-----|-----|-----|-----|
|              | 2  | 5    | 10  | 15  | 20  | 30  | 60  |
| Days         | 15   | 38   | 76  | 114 | 152 | 229 | 458 |
| Months       | -  | 1.25 | 2.5 | 3.7 | 5   | 7.5 | 15  |

| Memory depth | Measurement period <b>Mp.I2</b> in minutes |     |     |    |    |    |     |
|--------------|--|-----|-----|----|----|----|-----|
|              | 2  | 5   | 10  | 15 | 20 | 30 | 60  |
| Days         | 1.3  | 3.4 | 6.9 | 10 | 13 | 20 | 41  |
| Months       | -  | -   | -   | -  | -  | -  | 1.3 |

### 3.2.5 Application as flow recording device

With the function "Flow recording device" the meter readings are contained in the **measurement period archives** for Inputs 1 and 2.

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

The calibrated meters (V1 and V2) and the adjustable meters (V1.A and V2.A) are saved in the archive.

The values of the measurement period archive can only be cleared with the programming lock open.

The following uncalibrated values are in the archive:

| ABNo | Time      | DAT       | Vx        | $\Delta Vx$ | Vx.A      | $\Delta Vx.A$ | ST.x      | St.Sy     | Ev        | Check |
|------|-----------|-----------|-----------|-------------|-----------|---------------|-----------|-----------|-----------|-------|
| -    | uncalib'd | uncalib'd | uncalib'd | uncalib'd   | uncalib'd | uncalib'd     | uncalib'd | uncalib'd | uncalib'd | -     |

The meaning of the individual settings are described in Chapter 3.2.3.

#### 3.2.5.1 Display of meter increment (flow value)

The entries of the measurement period archive can be called into the display. Here the increments of the meters in comparison to the corresponding previous entry are also included. They are identified with a " $\Delta$ ". Normally, with a meter 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 meter, appearance of an important status message). Then the segment " $\Delta$ " and the abbreviated designation flash for the displayed meter 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.

#### 3.2.5.2 Calling up archive entries

Since the measurement period archive may have up to 11000 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
- Meter reading

The entry takes place initially by selecting the desired column (block number, date/time or meter 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.

### 3.2.6 Application as high flow display device

With the function "High flow display device" the end-readings from both meters and the maxima (measurement period and day maxima) formed in the DL220 are included in the **month archives** of the inputs.

The meter 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 DL220 display. At the end of each month the meter reading and the highest of these two flow values for each input are saved in the corresponding month archive. The month archives each have a depth of 15 entries so that 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 programming lock open.

The calibrated meters (V1 and V2) and the adjustable meters (V1.A and V2.A) are saved in the archive.

The following uncalibrated values are in the archive:

| ABNo | Date/<br>time  | Vx             | Vx.A           | VxM.L<br>max   | Date/<br>time  | STAT           | VxD.L<br>max   | Date/<br>time  | STAT           | ST.x           | St.Sy          | Check |
|------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------|
| -    | un-<br>calib'd | -     |

The meanings of the individual settings are described in Chapter 3.2.2.

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 **calibrated main meter** of Input 1 or 2. Settings of meters via the keypad or interface are neutralised for the formation of the consumption values and therefore also have no influence over the maxima.

### 3.2.7 System interface

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

① Each DL220 has two inputs.

This means that a max. of two different customers or two different meters can be connected to the DL220.

For example, "3221234" (②) is taken as the serial number.

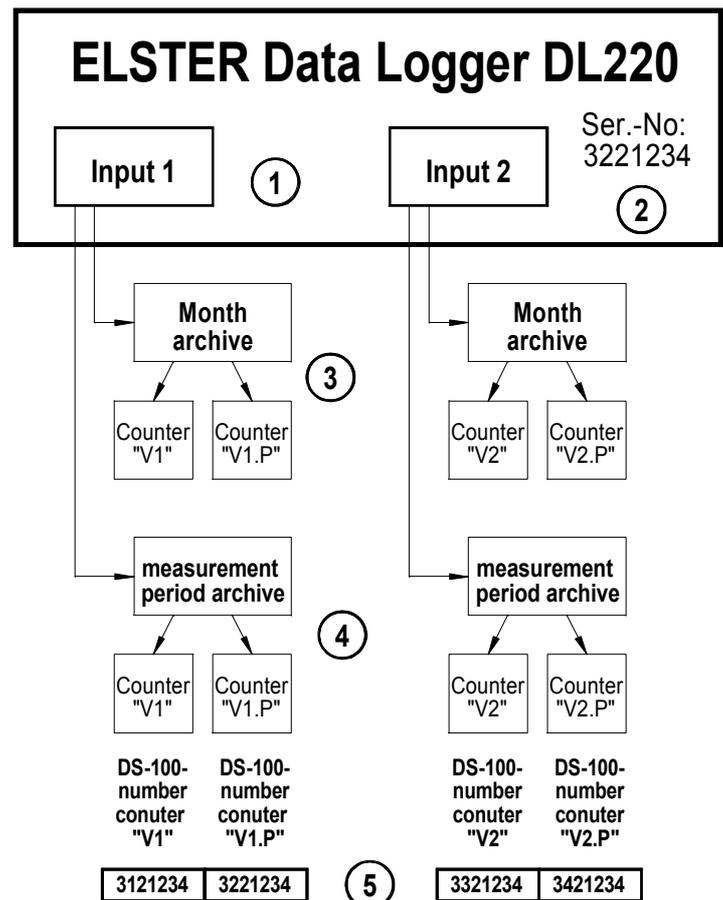
Each input has a month archive (③) and a measurement period archive (④). The month archive cannot currently be processed by WinVIEW, because this archive only contains the month-end reading and no consumption data.

As already described in Chaps. 3.2.2 and 3.2.3, two different meters (Meters "a" and "b") can be saved in each of the two archives. These are set in the DL220 at the factory with the main meter "V1" and the adjustable meter "V1.A" (or "V2" and "V2.A" in Channel 2). Since the evaluation software must differentiate between the two meters,

each meter is unambiguously identified based on the above DS-100 number (⑤).

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

☞ **To prevent a "meter" that is not required from being processed in WinVIEW, 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 DL220, in the AS-200 and in WinPADS or WinCOMS software.

| Input | DL220 display | Archive no. for AS-200 | Designation                | Archive content   | Meters | DS-100 number*1 |
|-------|---------------|------------------------|----------------------------|---|--------|-----------------|
| 1     | ArMo1         | 1                      | Month archive              | Month-end reading of the calibrated and adjustable meter, and measurement period and day maxima | V1     | -               |
|       |               |                        |                            |   | V1.A   | -               |
|       | ArDy1         | 13                     | Day value archive          | Day-end reading of the calibrated meter (V1) and the adjustable meter (V1.A)                    | V1     | 3521234         |
|       |               |                        |                            |   | V1.A   | 3621234         |
|       | ArMP1         | 2                      | Measurement period archive | Meter reading of the calibrated meter (V1) and the adjustable meter (V1.A)                      | V1     | 3121234         |
|       |               |                        |                            |   | V1.A   | 3221234         |
| 2     | ArMo2         | 3                      | Month archive              | Month-end reading of the calibrated and adjustable meter, and measurement period and day maxima | V2     | -               |
|       |               |                        |                            |   | V2.A   | -               |
|       | ArDy2         | 14                     | Measurement period archive | Day-end reading of the calibrated meter (V2) and the adjustable meter (V2.A)                    | V2     | 3721234         |
|       |               |                        |                            |   | V2.A   | 3821234         |
|       | ArMP2         | 4                      | Measurement period archive | Meter reading of the calibrated meter (V2) and the adjustable meter (V2.A)                      | V2     | 3321234         |
|       |               |                        |                            |   | V2.A   | 3421234         |
| -     | Logb.         | 10                     | Logbook                    | Status messages   | -      | -               |
| -     | AudTr         | 11                     | Changes archive            | Change of parameters  | -      | -               |
| -     | PLogb.        | 12                     | PTB Logbook                | Parameters changed with the programming lock closed and the supplier's lock open                | -      | -               |

\*1 Example based on DL220 serial number: 3221234

#### Explanation:

The column "**DL220 display**" is used in the DL220 display.

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

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

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

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

### 3.2.8 Reading out archives

There are a number of ways of reading out the above mentioned archives in the DL220:

- AS-200/S2 (from version **V8.4**) on site (with entry of mech. meter reading possible).  
At the time of printing this operating manual the day value archives and the PTB-Logbook of the DL220 cannot yet be read out!
- PDA on site; obtain further information from Elster.
- WinPADS parameterisation software for DL200 series with optical readout head, via remote data transfer or via Ethernet (from version **V2.80**)
- Manual recall via the WinCOMS PC readout software (from version **V2.14**).
- 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.

### 3.2.8.1 Readout parties

In the DL220 the following four different readout parties can be defined:

| Readout party    | Access   | Readout mode adjustable under | Notes for archive                  |
|------------------|----------|-------------------------------|------------------------------------|
| Supplier         | Supplier | 01:0B02                       | Month archive Input 1              |
|                  |          | 13:0B02                       | Day value archive Input 1          |
|                  |          | 02:0B02                       | Measurement period archive Input 1 |
|                  |          | 03:0B02                       | Month archive Input 2              |
|                  |          | 14:0B02                       | Day value archive Input 2          |
|                  |          | 04:0B02                       | Measurement period archive Input 2 |
|                  |          | 10:0B02                       | Logbook                            |
|                  |          | 11:0B02                       | Audit trail                        |
| Customer         | Customer | 01:0B03                       | Month archive Input 1              |
|                  |          | 13:0B03                       | Day value archive Input 1          |
|                  |          | 02:0B03                       | Measurement period archive Input 1 |
|                  |          | 03:0B03                       | Month archive Input 2              |
|                  |          | 14:0B03                       | Day value archive Input 2          |
|                  |          | 04:0B03                       | Measurement period archive Input 2 |
|                  |          | 10:0B03                       | Logbook                            |
|                  |          | 11:0B03                       | Audit trail                        |
| Maintenance      | Supplier | 01:0B04                       | Month archive Input 1              |
|                  |          | 13:0B04                       | Day value archive Input 1          |
|                  |          | 02:0B04                       | Measurement period archive Input 1 |
|                  |          | 03:0B04                       | Month archive Input 2              |
|                  |          | 14:0B04                       | Day value archive Input 2          |
|                  |          | 04:0B04                       | Measurement period archive Input 2 |
|                  |          | 10:0B04                       | Logbook                            |
|                  |          | 11:0B04                       | Audit trail                        |
| Network operator | Customer | 01:0B05                       | Month archive Input 1              |
|                  |          | 13:0B05                       | Day value archive Input 1          |
|                  |          | 02:0B05                       | Measurement period archive Input 1 |
|                  |          | 03:0B05                       | Month archive Input 2              |
|                  |          | 14:0B05                       | Day value archive Input 2          |
|                  |          | 04:0B05                       | Measurement period archive Input 2 |
|                  |          | 10:0B05                       | Logbook                            |
|                  |          | 11:0B05                       | Audit trail                        |
|                  |          | 12:0B05                       | PTB logbook                        |

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. This produces the following settings.

|            |            |  |
|------------|------------|--|
| 01:B02 (0) | 03:B02 (0) | Month archives input 1 - 2, logbook and "audit trail"<br>"do not read out" |
| 10:B02 (0) | 11:B02 (0) |  |
| 02:B02 (1) | 14:B02 (1) | Measurement period archive Input 1 and 2<br>read out "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 AS-200 Readout Unit and the WinCOMS evaluation software when in the "**automatic mode**". During manual operation or when reading out the archives with WinPADS for the DL200 – series all archives can be read out, also in other modes where applicable.

### 3.2.8.2 Reading out with the AS-200

The DL220 archives can be read out in various ways with the AS-200/S2 (from version V8.4):

- Automatic - Use the readout notes given in Chap. 3.2.8.1.
- Preset - here the noted values in the DL220 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 DL220. This can be done easily with WinPADS for the DL200 – series 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 DL220 is ensured independent of the number of inputs used.

### **3.2.8.3 Reading out under WinPADS for the DL200 series**

On reading out with the WinPADS PC software for the DL200 series (from version V2.80), the DL220 archives can with be read out on site using the optical interface or by remote data transfer. In this respect there is also the possibility of reading out the archives based on the readout notes (from V2.50 of WinPADS). In addition, desired time periods and a readout of all archives can be carried out with WinPADS for the DL200, even if they are deactivated.

### **3.2.8.4 Reading out with WinCOMS**

The program "WinCOMS" combines both methods of reading out, i.e. automatically based on the readout notes and by targeted selection of the appropriate archives. It also offers the possibility of selecting a device and reading it out 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 DL220. This can be done easily with WinPADS for the DL200 series or with the AS-200 with restrictions. 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 DL220 is ensured independent of the number of inputs used.

### **3.2.8.5 Reading out with 3<sup>rd</sup> party systems / follow-on systems**

Since the data and therefore also the archives are interrogated via the internationally standardised IEC 1107 protocol, it is possible to link the DL220 to "3<sup>rd</sup> party or tracing systems" very easily.

Information about which 3<sup>rd</sup> party systems can read out the DL220 can be obtained on request from Elster GmbH. Also, a summary of the requirements placed on 3<sup>rd</sup> party/tracing systems for reading out all Elster LIS-200 devices can be obtained here.

### 3.3 Status list

| Name  | Address | Designation / value   | Explanation  | Acc. | DC |
|-------|---------|-----------------------|--|------|----|
| 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 momentary status and skip to the menu: "Momentary status" | -    | 11 |
| Clr   | 4:130   | Clear status register | Clear the "status register"  | S    | 6  |
| Logb. | 10:A30  | Logbook               | Skip to archive: "Logbook"   | -    | 10 |
| AudTr | 11:A30  | Changes archive       | Skip to archive: "Audit trail"   | -    | 10 |
| PLogb | 12:A30  | PTB logbook           | Skip to archive: "PTB logbook"   | -    | 10 |
| ClrPL | 12:A52  | Clear PTB logbook     | Clear the "PTB logbook"  | P    | 6  |

**DC** = Data class (for description see Chap. 2.5)

**Acc** = The displayed value is subject to: "**P**": Programming lock "PL": PTB-Logbook "**S**": Supplier's lock "**C**": Customer's lock "-": Value cannot be changed.

#### 3.3.1 Description of the values

##### S.Reg Status register

In this status display all group status messages which have occurred in the DL220 since the last deletion are displayed in the form the message 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). Here the messages are displayed in plain text.

##### Stat Momentary status

Here all the currently applied group messages (momentary status) 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). Here the messages are displayed plain text.

##### Clr Clear status

The status register can be cleared under this menu point (see Chap. 3.3.11). If messages are still current, then they are recorded again directly.

##### Logb. Logbook

Branching to the logbook can be carried out under this display using ENTER.

**AudTr Changes archive (audit trail)**

The displayed value is used as a method of entering the changes archive. Here, all changes are saved, which have been made to the device programming.

**PLogb PTB logbook**

The PTB logbook contains the values which have been changed with the programming lock closed and the supplier's lock open.

☞ **If the PTB logbook is full, these values can only be changed with the programming lock open. An open programming lock can only be closed when the PTB logbook is not full. This must be cleared if necessary before closing the programming lock.**

**CirPL Clear PTB logbook**

The PTB logbook can be cleared under this menu item with the programming lock open.

### 3.3.2 Submenu: Status register

Under "S.Reg" skipping into the submenu: "Status register" can be made with "ENTER" (press arrow keys  and  simultaneously). Here, all prior (past) messages are displayed which however have not been acknowledged.

The message number, an abbreviation of the message in plain text and the corresponding entity which has generated the message are given.

The key  can be used to branch to any other applied messages or the arrow key  to the previous message.

The status register can be quit with "ESC" (press arrow keys  and  simultaneously).

Explanation of the messages: see Chap.: 3.3.8.

### 3.3.3 Submenu: Momentary status

Under "STAT" skipping into the submenu: "Momentary status" can be made with "ENTER" (press arrow keys  and  simultaneously). There, only the messages of the system and entities 1 ..4 which are currently valid are saved (e.g.: inputs 1 – 2 or outputs 1 – 2).

The message number, an abbreviation of the message in plain text and the corresponding entity which has generated the message are given.

The key  can be used to branch to any other applied messages or the arrow key  to the previous message.

The momentary status can be quit again with "ESC" (press arrow keys  and  simultaneously).

Explanation of the messages: see Chap.: 3.3.8.

### 3.3.4 Submenu: Logbook

The logbook is a chronological listing of all events which can occur in the DL220. Each change leads to a corresponding entry in the logbook:

- Signal "arrives"      Display "↑"
- Signal "goes"        Display "↓"

The structure is as follows:

| Data record no. | ABNo | Time<br>(time of day) | Time<br>(date) | Ev<br>(event) | Check |
|-----------------|------|-----------------------|----------------|---------------|-------|
| 1               | 4711 | 12:00:00              | 16.02.2004     | Supp.lock o.↑ | OK    |
| 2               | 4712 | 12:15:22              | 16.02.2004     | online ↓      | OK    |
| 3               | 4713 | 12:17:53              | 16.02.2004     | online ↑      | OK    |

Description of the displayed values in the logbook:

- 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 metering starts from "0".
  
- Time**     **Time**  
Storage time of the data record in the corresponding "archive row".
  
- Time**     **Date**  
Storage date of the data record in the corresponding "archive row".
  
- Ev**        **Triggering event**  
Event which causes the saving of this data record (structure: See Chap. 3.3.12).
  
- Check**    **Checksum evaluation**  
Display of whether the data row is correct (OK) or faulty (ERROR).

### 3.3.5 Submenu: Changes archive (audit trail)

The changes archive (termed "Audit trail" at Elster) contains the last 200 changes made in the device. This includes parameter changes and also opening and closing the locks. The value before (old = "a") and after the change (new = "n") is retained as well as the status of the locks and date/time of the change:

| Data record no. | ABNo | Time (time of day) | Time (date) | Addr (Address) | a | n  |
|-----------------|------|--------------------|-------------|----------------|---|----|
| 1               | 4711 | 12:00:00           | 16.02.2004  | 0004:B04_0     | 0 | 3  |
| 2               | 4712 | 12:15:22           | 16.02.2004  | "Md.O1"        | 1 | 1  |
| 3               | 4713 | 12:17:53           | 16.02.2004  | "CP.O1"        | 1 | 10 |
| ...             |      |                    |             |                |   |    |



| Data record no. | St.PL | St.ML | St.SL | St.CL | Check |
|-----------------|-------|-------|-------|-------|-------|
| 1               | 1     | 0     | 1     | 1     | OK    |
| 2               | 1     | 0     | 1     | 1     | OK    |
| 3               | 0     | 0     | 1     | 1     | OK    |
| ...             |       |       |       |       |       |

### 3.3.6 Submenu: PTB logbook

The PTB logbook contains the last 50 changes made to parameters which are subject to the access right "PL" (see Functional description, operating lists, Chapter 3). Changes to these parameters may only be carried out with the supplier's lock open. Changes made with the programming lock open are not considered in the PTB logbook. If the PTB logbook is full, the parameters subject to the access right "PL" can only be changed with the programming lock open. Clearing the PTB logbook can also only occur with the programming lock open.

In the PTB logbook the value before (old = "a") and after the change (new = "n"), as well as the states of the locks and appropriate information about the date and time of the change are retained:

| Data record no. | ABNo | Time (time of day) | Time (date) | Addr (Address) | a  | n  |
|-----------------|------|--------------------|-------------|----------------|----|----|
| 1               | 4711 | 13:00:00           | 16.02.2004  | "MP.11"        | 60 | 10 |
| 2               | 4712 | 13:15:22           | 16.02.2004  | "Md.11"        | 1  | 5  |
| 3               | 4713 | 13:17:53           | 16.02.2004  | "CP.11"        | 1  | 10 |
| ...             |      |                    |             |                |    |    |

| Data record no. | St.PL | St.ML | St.SL | St.CL | Check |
|-----------------|-------|-------|-------|-------|-------|
| 1               | 0     | 0     | 1     | 0     | OK    |
| 2               | 0     | 0     | 1     | 0     | OK    |
| 3               | 0     | 0     | 1     | 0     | OK    |
| ...             |       |       |       |       |       |

Description of values shown in the audit trail and PTB logbook:

|              |  |
|--------------|--|
| <b>ABNo</b>  | <b>Internal archive block number</b><br>This is a number (constant from 1 to 65535) which is used as a label for <b>one</b> 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 metering starts from "1" again. |
| <b>Time</b>  | <b>Time</b><br>Storage time of the data record in the corresponding "archive row".   |
| <b>Time</b>  | <b>Date</b><br>Storage date of the data record in the corresponding "archive row".   |
| <b>Time</b>  | <b>Time</b><br>Storage time of the data record in the corresponding "archive row".   |
| <b>Addr</b>  | <b>Address of the changed value</b><br>Display of the address or the short designation of the changed value  |
| <b>a</b>     | <b>Old value</b><br>The original valid value before the change.  |
| <b>n</b>     | <b>New value</b><br>The changed value which is now valid.  |
| <b>St.PL</b> | <b>Status of programming lock</b><br>The status of the programming lock during the change.   |
| <b>St.ML</b> | <b>Status of manufacturer's lock</b><br>The status of the manufacturer's lock during the change.   |
| <b>St.SL</b> | <b>Status of supplier's lock</b><br>The status of the supplier's lock during the change.   |
| <b>St.CL</b> | <b>Status of customer's lock</b><br>The status of the customer's lock during the change.   |
| <b>Check</b> | <b>Checksum of the data row</b><br>Indicates whether the archive row has been correctly saved.   |

### 3.3.7 The status register

#### 3.3.7.1 Types of message

A differentiation is made between four types of message:

- |                    |   |
|--------------------|---|
| <b>Alert</b>       | is only used in the DL220 for "Restart".  |
| <b>Warning</b>     | affects all signals which are so important that the user must be informed about the signal and must therefore acknowledge it. |
| <b>Report</b>      | less "important" than "Warning", does not need acknowledging.   |
| <b>Information</b> | is only needed for internal functions for the labelling of operating states (usually time modes).                             |

#### 3.3.7.2 Status register and momentary status

The status display in the DL220 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.

### 3.3.8 Overview of the message numbers

| Momentary status |                   | Stat           | St.Sy          | St.1         | St.2         | St.3          | St.4          |
|------------------|-------------------|----------------|----------------|--------------|--------------|---------------|---------------|
| Status register  |                   | S.Reg          | SR.Sy          | SR.1         | SR.2         | SR.3          | SR.4          |
| No.              | Type <sup>1</sup> | Group message  | System message | Status 1     | Status 2     | Status 3      | Status 4      |
| 01               | A                 | Any message 01 | Restart        | -            | -            | -             | -             |
| 02               | A                 | Any message 02 | -              | -            | -            | -             | -             |
| 03               | W                 | Any message 03 | Data restore   | -            | -            | -             | -             |
| 04               | W                 | Any message 04 | -              | Outp.1 Error | Outp.2 Error | -             | -             |
| 05               | W                 | Any message 05 | -              | I1 Pulse cmp | I2 Pulse cmp | -             | -             |
| 06               | W                 | Any message 06 | -              | I1 Warn Lim. | I2 Warn Lim. | -             | -             |
| 07               | W                 | Any message 07 | -              | -            | -            | -             | -             |
| 08               | W                 | Any message 08 | Sett. error    | I1 Warn.sig. | I2 Warn.sig. | -             | -             |
| 09               | R                 | Any message 09 | Batt. Low      | -            | -            | -             | Batt. 2 low   |
| 10               | R                 | Any message 10 | -              | -            | -            | -             | -             |
| 11               | R                 | Any message 11 | Clock n. set   | -            | -            | -             | -             |
| 12               | R                 | Any message 12 | PLogb full     | Lim. I1      | Lim. I2      | -             | -             |
| 13               | R                 | Any message 13 | Online         | I1 Rep.sig.  | I2 Rep.sig.  | -             | -             |
| 14               | R                 | Any message 14 | -              | Cal. lock o. | Man. lock o. | Supp. Lock o. | Cust. lock o. |
| 15               | I                 | Any message 15 | Bat. operat.   | -            | -            | -             | -             |
| 16               | I                 | Any message 16 | Dayl.Sav.Tim   | Call Win.1   | Call Win.2   | -             | -             |

<sup>1</sup> A = Alert; W = Warning; R = Report; I = Information

### 3.3.9 Explanation of the messages

| Code                   | Plain text display | Type <sup>1</sup> | Description  |
|------------------------|--------------------|-------------------|--|
| <b>Group message</b>   |                    |                   |  |
| -                      | Group message      | -                 | Combination of all messages (system, inputs 1-2, outputs, locks) in the form of status register S.Reg or momentary status STAT in main menu.<br>Example: All "04" messages in the system and I1 and O1 are combined under "04". If one or more "04" messages occurs, the group message "04" becomes active.                                    |
| <b>System messages</b> |                    |                   |  |
| 01                     | Restart            | A                 | During run-up no correct data was detected in the RAM and the DL220 starts with default values. Then all parameters are read from the E <sup>2</sup> PROM. The date/time and meter readings however do not correspond to the actual status, but instead to the last saving to E <sup>2</sup> PROM (written once each day at about 00:00 hrs.). |
| 02                     | -                  | -                 | -  |
| 03                     | Data restore       | W                 | The date/time had to be read back out of the E <sup>2</sup> PROM, because, for example, the battery was discharged. The difference to the current time corresponds to the duration of the power failure.   |
| 04                     | -                  | -                 | -  |
| 05                     | -                  | -                 | -  |
| 06                     | -                  | -                 | -  |
| 07                     | -                  | -                 | -  |
| 08                     | Sett. 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                     | Batt. low          | W                 | The notice appears when the battery service life computed by the DL220 has fallen below the limit of 3.0 months.   |
| 10                     | -                  | -                 | -  |
| 11                     | Clock n. set       | R                 | The correction factors needed for the internal clock are not correct or have not yet been entered.   |
| 12                     | PLogb full         | R                 | The PTB logbook is full. Changes to these parameters may only be carried out with the programming lock open.   |
| 13                     | online             | R                 | A data transmission (e.g. via modem) is currently active.  |
| 14                     | -                  | -                 | -  |
| 15                     | Batt. operat.      | -                 | Device is currently in the battery mode.   |

<sup>1</sup> A = Alert; W = Warning; R = Report; I = Information

| Code   | Plain text display  | Type <sup>1</sup> | Description  |
|--|---|-------------------|--|
| 16   | Dayl.Sav.Tim  | I                 | The display of the time occurs in summer time (CEST).  |
| <b>Status messages Status 1, Status 2, Status 3 und Status 4</b> |   |                   |  |
| 01   | -   | -                 | -  |
| 02   | -   | -                 | -  |
| 03   | -   | -                 | -  |
| 04   | Output 1 error<br>Output 2 error                                | W                 | The pulse buffer of Output O1...2 has overflowed and output pulses have therefore been lost.               |
| 05   | I1 Pulse cmp<br>I2 Pulse cmp                                    | W                 | In Input I1...2 a deviation from a comparison input was detected.  |
| 06   | I1 Warn Lim.<br>I2 Warn Lim.                                    | W                 | A set warning limit in Input I1...2 has been violated.   |
| 07   | -   | -                 | -  |
| 08   | I1 Warn.sig.<br>I2 Warn.sig.                                    | W                 | A warning has occurred in the Status Input I1...2 (e.g.: tampering detected, volume corrector alert).      |
| 09   | Batt. 2 low   | R                 | The modem battery voltage has dropped below the permissible value. The modem battery should be replaced.   |
| 10   | -   | -                 | -  |
| 11   | -   | -                 | -  |
| 12   | Lim. Input 1<br>Lim. Input 2                                    | R                 | In inputs I1...2 the set limit for monitoring (e.g. measurement period or day limit) has been exceeded.    |
| 13   | RepSig.I1<br>RepSig.I2  | W                 | The report signal is active on status input I1...2.  |
| 14   | Cal. lock o.<br>Man. lock o.<br>Suppl. lock o.<br>Cust. lock o. | R                 | Lock open (ST1= programming lock, ST2 = manufacturer's lock, ST3 = supplier's lock, ST4= customer's lock). |
| 15   | -   | -                 | -  |
| 16   | Call Win1<br>Call Win2  | I                 | ST1=Call time window 1 currently active,<br>ST2=Call time window 2 currently active.                       |



### 3.3.11 Clearing an alert or a warning

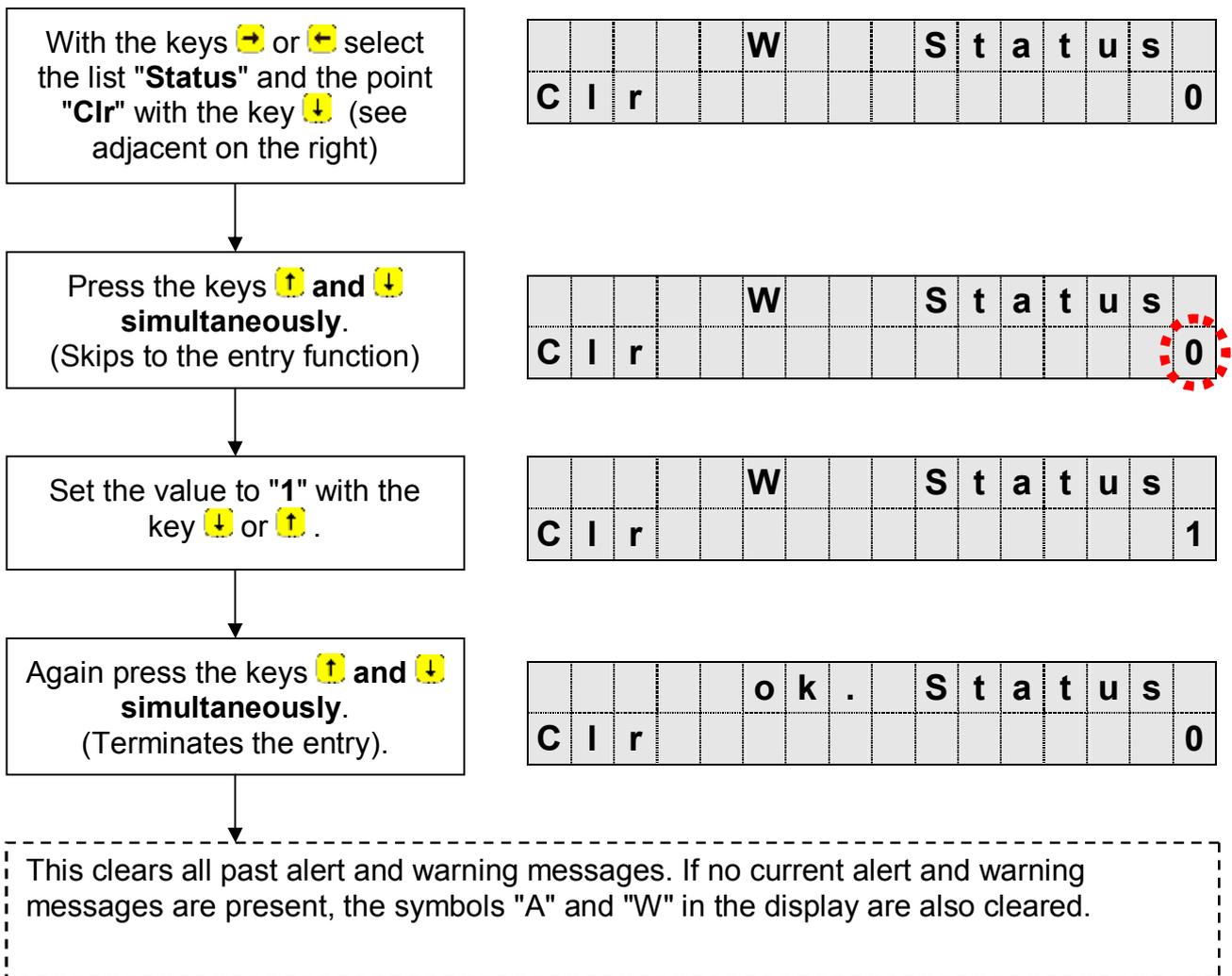
The clearing of all past (!) messages in the status register S.Reg occurs in the list "Status" under the display: "Clr". Clearing messages is only possible with an open programming, manufacturer's or supplier's lock.

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.

Example:

Once the message is recognised (see previous chapter), it should also be cleared.



### 3.3.12 Events in the DL220

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 occurs outside of the momentary status; e.g. "month limit" or "meter reading set",
- manual triggering of data backup using "Save" in the service list.

The individual columns in the following table have the following meaning:

- **Display:** Plain text of status messages and events in the DL220 display.
- **Event:** Name of the triggering event.
- **Keypad entry:** These values can be entered via the keypad to, for example, program the behaviour of an output.
- **Interface:** After reading out the archives these values are located in the corresponding archive files and are needed for parameterisation.
- **Description:** Explanation of the factory-set events.

#### 3.3.12.1 Summary of all events and their meaning

| Display  | Event             | Keypad entry | Interface | Description                       |
|--|-------------------|--------------|-----------|-----------------------------------|
| <b>Individual messages in the status registers ST.1 – ST.4</b> |                   |              |           |                                   |
| Outp.1 error↓  | Message 4 in St.1 | 04_01:1.0    | 0301      | O1: Error (overload)              |
| Outp.1 error↑  |                   | 04_01:1.1    | 2301      |                                   |
| Outp.2 error↓  | Message 4 in St.2 | 04_02:1.0    | 0302      | O2: Error (overload)              |
| Outp.2 error↑  |                   | 04_02:1.1    | 2302      |                                   |
| I1 Pulse cmp↓  | Message 5 in St.1 | 05_01:1.0    | 0401      | I1: Deviation on pulse comparison |
| I1 Pulse cmp↑  |                   | 05_01:1.1    | 2401      |                                   |
| I2 Pulse cmp↓  | Message 5 in St.2 | 05_02:1.0    | 0402      | I2: Deviation on pulse comparison |
| I2 Pulse cmp↑  |                   | 05_02:1.1    | 2402      |                                   |
| I1 Warn lim.↓  | Message 6 in St.1 | 06_01:1.0    | 0501      | I1: Warning limit violated        |
| I1 Warn lim.↑  |                   | 06_01:1.1    | 2501      |                                   |
| I2 Warn lim.↓  | Message 6 in St.2 | 06_02:1.0    | 0502      | I2: Warning limit violated        |
| I2 Warn lim.↑  |                   | 06_02:1.1    | 2502      |                                   |
| I1 Warn.sig.↓  | Message 8 in St.1 | 08_01:1.0    | 0701      | I1: Warning signal active         |
| I1 Warn.sig.↑  |                   | 08_01:1.1    | 2701      |                                   |

| Display   | Event                  | Keypad entry | Interface | Description               |        |
|---|------------------------|--------------|-----------|---------------------------|--------|
| I2 Warn.sig.↓                                       | Message 8<br>in St.2   | 08_02:1.0    | 0702      | I2: Warning signal active | ends   |
| I2 Warn.sig.↑                                       |                        | 08_02:1.1    | 2702      |                           | starts |
| Batt2 low↓  | Message 9<br>in St.4   | 09_01:1.0    | 0804      | Warning, modem battery    | ends   |
| Batt2 low↑  |                        | 09_01:1.1    | 2804      |                           | starts |
| Lim.I1↓   | Message 12<br>in St.1  | 12_01:1.0    | 0B01      | I1: Limit violated        | ends   |
| Lim.I1↑   |                        | 12_01:1.1    | 2B01      |                           | starts |
| Lim.I2↓   | Message 12<br>in St.2  | 12_02:1.0    | 0B02      | I2: Limit violated        | ends   |
| Lim.I2↑   |                        | 12_02:1.1    | 2B02      |                           | starts |
| I1 Rep.sig.↓  | Message 13<br>in St.1  | 13_01:1.0    | 0C01      | I1: Report signal active  | ends   |
| I1 Rep.sig.↑  |                        | 13_01:1.1    | 2C01      |                           | starts |
| I2 Rep.sig.↓  | Message 13<br>in St.2  | 13_02:1.0    | 0C02      | I2: Report signal active  | ends   |
| I2 Rep.sig.↑  |                        | 13_02:1.1    | 2C02      |                           | starts |
| Cal.lock o.↓  | Message 14<br>in St.1  | 14_01:1.0    | 0D01      | Programming lock open     | ends   |
| Cal.lock o.↑  |                        | 14_01:1.1    | 2D01      |                           | starts |
| Man.lock o.↓  | Message 14<br>in St.2  | 14_02:1.0    | 0D02      | Manufacturer's lock open  | ends   |
| Man.lock o.↑  |                        | 14_02:1.1    | 2D02      |                           | starts |
| Supp.lock o.↓                                       | Message 14<br>in St.3  | 14_03:1.0    | 0D03      | Supplier's lock open      | ends   |
| Supp.lock o.↑                                       |                        | 14_03:1.1    | 2D03      |                           | starts |
| Cust.lock o.↓                                       | Message 14<br>in St.4  | 14_04:1.0    | 0D04      | Customer's lock open      | ends   |
| Cust.lock o.↑                                       |                        | 14_04:1.1    | 2D04      |                           | starts |
| Call Win.1↓   | Message 16<br>in St.1  | 16_01:1.0    | 0F01      | Call time window 1        | ends   |
| Call Win.1↑   |                        | 16_01:1.1    | 2F01      |                           | starts |
| Call Win.2↓   | Message 16<br>in St.2  | 16_02:1.0    | 0F02      | Call time window 2        | ends   |
| Call Win.2↑   |                        | 16_02:1.1    | 2F02      |                           | starts |
| <b>System messages in the status register St.Sy</b> |                        |              |           |                           |        |
| Restart↓  | Message 1 in<br>St.Sy  | 01_02:2.0    | 1002      | Restart                   | ends   |
| Restart↑  |                        | 01_02:2.1    | 3002      |                           | starts |
| Dat. restore ↓                                      | Message 3 in<br>St.Sy  | 03_02:2.0    | 1202      | Data restored             | ends   |
| Dat. restore ↑                                      |                        | 03_02:2.1    | 3202      |                           | starts |
| HW fault↓   | Message 6 in<br>St.Sy  | 06_02:2.0    | 1502      | Hardware fault            | ends   |
| HW fault↑   |                        | 06_02:2.1    | 3502      |                           | starts |
| SW fault↓   | Message 7 in<br>St.Sy  | 07_02:2.0    | 1602      | Software fault            | ends   |
| SW fault↑   |                        | 07_02_2.1    | 3602      |                           | starts |
| Sett. error↓  | Message 8 in<br>St.Sy  | 08_02:2.0    | 1702      | Settings fault            | ends   |
| Sett. error↑  |                        | 08_02:2.1    | 3702      |                           | starts |
| Batt. low↓  | Message 9 in<br>St.Sy  | 09_02:2.0    | 1802      | Battery warning           | ends   |
| Batt. low↑  |                        | 09_02:2.1    | 3802      |                           | starts |
| Clock n. set↓                                       | Message 11<br>in St.Sy | 11_02:2.0    | 1A02      | Clock not set             | ends   |
| Clock n. set↑                                       |                        | 11_02:2.1    | 3A02      |                           | starts |

| Display   | Event                  | Keypad entry | Interface | Description                  |        |
|---|------------------------|--------------|-----------|------------------------------|--------|
| PLogb full ↓  | Message 12<br>in St.Sy | 12_02:2.0    | 1B02      | The PTB logbook is<br>full.  | ends   |
| PLogb full ↑  |                        | 12_02:2.1    | 3B02      |                              | starts |
| online ↓  | Message 13<br>in St.Sy | 13_02:2.0    | 1C02      | Data transmission<br>running | ends   |
| online ↑  |                        | 13_02:2.1    | 3C02      |                              | starts |
| Batt. operat. ↓   | Message 15<br>in St.Sy | 15_02:2.0    | 1E02      | Battery operation            | ends   |
| Batt. operat. ↑   |                        | 15_02:2.1    | 3E02      |                              | starts |
| Dayl.Sav.Tim ↓  | Message 16<br>in St.Sy | 16_02:2.0    | 1F02      | Summer time                  | ends   |
| Dayl.Sav.Tim ↑  |                        | 16_02:2.1    | 3F02      |                              | starts |
| <b>Group messages of all single and system messages (St.Sy, St.1, St.2, St.3, St.4)</b> |                        |              |           |                              |        |
| Message1 ↓  | Message 1 in<br>Stat   | 01_01:2.0    | 1001      | Any<br>Status message 1      | ends   |
| Message1 ↑  |                        | 01_01:2.1    | 3001      |                              | starts |
| Message2 ↓  | Message 2 in<br>Stat   | 02_01:2.0    | 1101      | Any<br>Status message 2      | ends   |
| Message2 ↑  |                        | 02_01:2.1    | 3101      |                              | starts |
| Message3 ↓  | Message 3 in<br>Stat   | 03_01:2.0    | 1201      | Any<br>Status message 3      | ends   |
| Message3 ↑  |                        | 03_01:2.1    | 3201      |                              | starts |
| Message4 ↓  | Message 4 in<br>Stat   | 04_01:2.0    | 1301      | Any<br>Status message 4      | ends   |
| Message4 ↑  |                        | 04_01:2.1    | 3301      |                              | starts |
| Message5 ↓  | Message 5 in<br>Stat   | 05_01:2.0    | 1401      | Any<br>Status message 5      | ends   |
| Message5 ↑  |                        | 05_01:2.1    | 3401      |                              | starts |
| Message6 ↓  | Message 6 in<br>Stat   | 06_01:2.0    | 1501      | Any<br>Status message 6      | ends   |
| Message6 ↑  |                        | 06_01:2.1    | 3501      |                              | starts |
| Message7 ↓  | Message 7 in<br>Stat   | 07_01:2.0    | 1601      | Any<br>Status message 7      | ends   |
| Message7 ↑  |                        | 07_01:2.1    | 3601      |                              | starts |
| Message8 ↓  | Message 8 in<br>Stat   | 08_01:2.0    | 1701      | Any<br>Status message 8      | ends   |
| Message8 ↑  |                        | 08_01:2.1    | 3701      |                              | starts |
| Message9 ↓  | Message 9 in<br>Stat   | 09_01:2.0    | 1801      | Any<br>Status message 9      | ends   |
| Message9 ↑  |                        | 09_01:2.1    | 3801      |                              | starts |
| Message10 ↓   | Message 10<br>in Stat  | 10_01:2.0    | 1901      | Any<br>Status message 10     | ends   |
| Message10 ↑   |                        | 10_01:2.1    | 3901      |                              | starts |
| Message11 ↓   | Message 11<br>in Stat  | 11_01:2.0    | 1A01      | Any<br>Status message 11     | ends   |
| Message11 ↑   |                        | 11_01:2.1    | 3A01      |                              | starts |
| Message12 ↓   | Message 12<br>in Stat  | 12_01:2.0    | 1B01      | Any<br>Status message 12     | ends   |
| Message12 ↑   |                        | 12_01:2.1    | 3B01      |                              | starts |
| Message13 ↓   | Message 13<br>in Stat  | 13_01:2.0    | 1C01      | Any<br>Status message 13     | ends   |
| Message13 ↑   |                        | 13_01:2.1    | 3C01      |                              | starts |
| Message14 ↓   | Message 14<br>in Stat  | 14_01:2.0    | 1D01      | Any<br>Status message 14     | ends   |
| Message14 ↑   |                        | 14_01:2.1    | 3D01      |                              | starts |

| Display   | Event                   | Keypad entry | Interface | Description                             |        |
|---|-------------------------|--------------|-----------|---|--------|
| Message15↓  | Message 15<br>in Stat   | 15_01:2.0    | 1E01      | Any<br>Status message 15                | ends   |
| Message15↑  |                         | 15_01:2.1    | 3E01      |   | starts |
| Message16↓  | Message 16<br>in Stat   | 16_01:2.0    | 1F01      | Any<br>Status message 16                | ends   |
| Message16↑  |                         | 16_01:2.1    | 3F01      |   | starts |
| <b>Message groups of the status registers St.1 - St.4</b> |                         |              |           |   |        |
| ST.1:M1-4↓  | Message 1-4<br>in St.1  | 1,04_01:1.0  | 4301      | Any message between<br>1 and 4 in St.1  | ends   |
| ST.1:M1-4↑  |                         | 1,04_01:1.1  | 6301      |   | starts |
| ST.2:M1-4↓  | Message 1-4<br>in St.2  | 1,04_02:1.0  | 4302      | Any message between<br>1 and 4 in St.2  | ends   |
| ST.2:M1-4↑  |                         | 1,04_02:1.1  | 6302      |   | starts |
| ST.1:M1-5↓  | Message 1-5<br>in St.1  | 1,05_01:1.0  | 4401      | Any message between 1<br>and 5 in St.1  | ends   |
| ST.1:M1-5↑  |                         | 1,05_01:1.1  | 6401      |   | starts |
| ST.2:M1-5↓  | Message 1-5<br>in St.2  | 1,05_02:1.0  | 4402      | Any message between 1<br>and 5 in St.2  | ends   |
| ST.2:M1-5↑  |                         | 1,05_02:1.1  | 6402      |   | starts |
| ST.3:M1-5↓  | Message 1-5<br>in St.3  | 1,05_03:1.0  | 4403      | Any message between 1<br>and 5 in St.3  | ends   |
| ST.3:M1-5↑  |                         | 1,05_03:1.1  | 6403      |   | starts |
| ST.4:M1-5↓  | Message 1-5<br>in St.4  | 1,05_04:1.0  | 4404      | Any message between<br>1 and 5 in St.4  | ends   |
| ST.4:M1-5↑  |                         | 1,05_04:1.1  | 6404      |   | starts |
| ST.1:M1-6↓  | Message 1-6<br>in St.1  | 1,06_01:1.0  | 4501      | Any message between<br>1 and 6 in St.1  | ends   |
| ST.1:M1-6↑  |                         | 1,06_01:1.1  | 6501      |   | starts |
| ST.2:M1-6↓  | Message 1-6<br>in St.2  | 1,06_02:1.0  | 4502      | Any message between<br>1 and 6 in St.2  | ends   |
| ST.2:M1-6↑  |                         | 1,06_02:1.1  | 6502      |   | starts |
| ST.3:M1-6↓  | Message 1-6<br>in St.3  | 1,06_03:1.0  | 4503      | Any message between<br>1 and 6 in St.3  | ends   |
| ST.3:M1-6↑  |                         | 1,06_03:1.1  | 6503      |   | starts |
| ST.4:M1-6↓  | Message 1-6<br>in St.4  | 1,06_04:1.0  | 4504      | Any message between<br>1 and 6 in St.4  | ends   |
| ST.4:M1-6↑  |                         | 1,06_04:1.1  | 6504      |   | starts |
| ST.1:M1-7↓  | Message 1-7<br>in St.1  | 1,07_01:1.0  | 4601      | Any message between<br>1 and 7 in St.1  | ends   |
| ST.1:M1-7↑  |                         | 1,07_01:1.1  | 6601      |   | starts |
| ST.1:M1-8↓  | Message 1-8<br>in St.1  | 1,08_01:1.0  | 4701      | Any message between<br>1 and 8 in St.1  | ends   |
| ST.1:M1-8↑  |                         | 1,08_01:1.1  | 6701      |   | starts |
| ST.2:M1-8↓  | Message 1-8<br>in St.2  | 1,08_02:1.0  | 4702      | Any message between<br>1 and 8 in St.2  | ends   |
| ST.2:M1-8↑  |                         | 1,08_02:1.1  | 6702      |   | starts |
| ST.3:M1-8↓  | Message 1-8<br>in St.3  | 1,08_03:1.0  | 4703      | Any message between<br>1 and 8 in St.3  | ends   |
| ST.3:M1-8↑  |                         | 1,08_03:1.1  | 6703      |   | starts |
| ST.4:M1-8↓  | Message 1-8<br>in St.4  | 1,08_04:1.0  | 4704      | Any message between<br>1 and 8 in St.4  | ends   |
| ST.4:M1-8↑  |                         | 1,08_04:1.1  | 6704      |   | starts |
| ST.1:M1-12↓   | Message 1-12<br>in St.1 | 1,12_01:1.0  | 4701      | Any message between<br>1 and 12 in St.1 | ends   |
| ST.1:M1-12↑   |                         | 1,12_01:1.1  | 6B01      |   | starts |
| ST.2:M1-12↓   | Message 1-12<br>in St.2 | 1,12_02:1.0  | 4B02      | Any message between<br>1 and 12 in St.2 | ends   |
| ST.2:M1-12↑   |                         | 1,12_02:1.1  | 6B02      |   | starts |

| Display  | Event                     | Keypad entry | Interface | Description                             |        |
|--|---------------------------|--------------|-----------|---|--------|
| ST.3:M1-12↓  | Message 1-12<br>in St.3   | 1,12_03:1.0  | 4B03      | Any message between<br>1 and 12 in St.3 | ends   |
| ST.3:M1-12↑  |                           | 1,12_03:1.1  | 6B03      |   | starts |
| ST.4:M1-12↓  | Message 1-12<br>in St.4   | 1,12_04:1.0  | 4B04      | Any message between<br>1 and 12 in St.4 | ends   |
| ST.4:M1-12↑  |                           | 1,12_04:1.1  | 6B04      |   | starts |
| ST.1:M1-13↓  | Message 1-13<br>in St.1   | 1,13_01:1.0  | 4C01      | Any message between<br>1 and 13 in St.1 | ends   |
| ST.1:M1-13↑  |                           | 1,13_01:1.1  | 6C01      |   | starts |
| ST.2:M1-13↓  | Message 1-13<br>in St.2   | 1,13_02:1.0  | 4C02      | Any message between<br>1 and 13 in St.2 | ends   |
| ST.2:M1-13↑  |                           | 1,13_02:1.1  | 6C02      |   | starts |
| ST.3:M1-13↓  | Message 1-13<br>in St.3   | 1,13_03:1.0  | 4C03      | Any message between<br>1 and 13 in St.3 | ends   |
| ST.3:M1-13↑  |                           | 1,13_03:1.1  | 6C03      |   | starts |
| ST.4:M1-13↓  | Message 1-13<br>in St.4   | 1,13_04:1.0  | 4C04      | Any message between<br>1 and 13 in St.4 | ends   |
| ST.4:M1-13↑  |                           | 1,13_04:1.1  | 6C04      |   | starts |
| ST.1:M1-14↓  | Message 1-14<br>in St.1   | 1,14_01:1.0  | 4D01      | Any message between<br>1 and 14 in St.1 | ends   |
| ST.1:M1-14↑  |                           | 1,14_01:1.1  | 6D01      |   | starts |
| ST.2:M1-14↓  | Message 1-14<br>in St.2   | 1,14_02:1.0  | 4D02      | Any message between 1<br>and 14 in St.2 | ends   |
| ST.2:M1-14↑  |                           | 1,14_02:1.1  | 6D02      |   | starts |
| ST.3:M1-14↓  | Message 1-14<br>in St.3   | 1,14_03:1.0  | 4D03      | Any message between<br>1 and 14 in St.3 | ends   |
| ST.3:M1-14↑  |                           | 1,14_03:1.1  | 6D03      |   | starts |
| ST.4:M1-14↓  | Message 1-14<br>in St.4   | 1,14_04:1.0  | 4D04      | Any message between<br>1 and 14 in St.4 | ends   |
| ST.4:M1-14↑  |                           | 1,14_04:1.1  | 6D04      |   | starts |
| ST.1:M1-16↓  | Message 1-16<br>in St.1   | 1,16_01:1.0  | 4F01      | Any message between<br>1 and 16 in St.1 | ends   |
| ST.1:M1-16↑  |                           | 1,16_01:1.1  | 6F01      |   | starts |
| ST.2:M1-16↓  | Message 1-16<br>in St.2   | 1,16_02:1.0  | 4F02      | Any message between<br>1 and 16 in St.2 | ends   |
| ST.2:M1-16↑  |                           | 1,16_02:1.1  | 6F02      |   | starts |
| ST.3:M1-16↓  | Message 1-16<br>in St.3   | 1,16_03:1.0  | 4F03      | Any message between<br>1 and 16 in St.3 | ends   |
| ST.3:M1-16↑  |                           | 1,16_03:1.1  | 6F03      |   | starts |
| <b>Message groups of the status register St.Sy</b> |                           |              |           |   |        |
| St.Sy:M1-1↓  | Message 1 in<br>St.Sy     | 1,01_02:2.0  | 5002      | Message 1 in St.Sy                      | ends   |
| St.Sy:M1-1↑  |                           | 1,01_02:2.1  | 7002      |   | starts |
| St.Sy:M1-3↓  | Message 1 –<br>3 in St.Sy | 1,03_02:2.0  | 4202      | Any message between 1<br>and 3 in St.Sy | ends   |
| St.Sy:M1-3↑  |                           | 1,03_02:2.1  | 7202      |   | starts |
| St.Sy:M1-4↓  | Message 1 –<br>4 in St.Sy | 1,04_02:2.0  | 4302      | Any message between 1<br>and 4 in St.Sy | ends   |
| St.Sy:M1-4↑  |                           | 1,04_02:2.1  | 7302      |   | starts |
| St.Sy:M1-5↓  | Message 1 –<br>5 in St.Sy | 1,05_02:2.0  | 4402      | Any message between 1<br>and 5 in St.Sy | ends   |
| St.Sy:M1-5↑  |                           | 1,05_02:2.1  | 7402      |   | starts |
| St.Sy:M1-6↓  | Message 1 –<br>6 in St.Sy | 1,06_02:2.0  | 4502      | Any message between 1<br>and 6 in St.Sy | ends   |
| St.Sy:M1-6↑  |                           | 1,06_02:2.1  | 7502      |   | starts |

| Display   | Event                      | Keypad entry | Interface | Description                              |        |
|---|----------------------------|--------------|-----------|--|--------|
| St.Sy:M1-7↓   | Message 1 –<br>7 in St.Sy  | 1,07_02:2.0  | 4602      | Any message between 1<br>and 7 in St.Sy  | ends   |
| St.Sy:M1-7↑   |                            | 1,07_02:2.1  | 7602      |  | starts |
| St.Sy:M1-8↓   | Message 1 –<br>8 in St.Sy  | 1,08_02:2.0  | 4702      | Any message between 1<br>and 8 in St.Sy  | ends   |
| St.Sy:M1-8↑   |                            | 1,08_02:2.1  | 7702      |  | starts |
| St.Sy:M1-9↓   | Message 1 –<br>9 in St.Sy  | 1,09_02:2.0  | 4802      | Any message between 1<br>and 9 in St.Sy  | ends   |
| St.Sy:M1-9↑   |                            | 1,09_02:2.1  | 7802      |  | starts |
| St.Sy:M1-10↓  | Message 1 –<br>10 in St.Sy | 1,10_02:2.0  | 4902      | Any message between 1<br>and 10 in St.Sy | ends   |
| St.Sy:M1-10↑  |                            | 1,10_02:2.1  | 7902      |  | starts |
| St.Sy:M1-11↓  | Message 1 –<br>11 in St.Sy | 1,11_02:2.0  | 4A02      | Any message between 1<br>and 11 in St.Sy | ends   |
| St.Sy:M1-11↑  |                            | 1,11_02:2.1  | 7A02      |  | starts |
| St.Sy:M1-13↓  | Message 1 –<br>13 in St.Sy | 1,13_02:2.0  | 4C02      | Any message between 1<br>and 13 in St.Sy | ends   |
| St.Sy:M1-13↑  |                            | 1,13_02:2.1  | 7C02      |  | starts |
| St.Sy:M1-15↓  | Message 1 –<br>15 in St.Sy | 1,15_02:2.0  | 4E02      | Any message between 1<br>and 15 in St.Sy | ends   |
| St.Sy:M1-15↑  |                            | 1,15_02:2.1  | 7E02      |  | starts |
| St.Sy:M1-16↓  | Message 1 –<br>16 in St.Sy | 1,16_02:2.0  | 4F02      | Any message between 1<br>and 16 in St.Sy | ends   |
| St.Sy:M1-16↑  |                            | 1,16_02:2.1  | 7F02      |  | starts |
| <b>Message groups in the group messages in Stat</b> |                            |              |           |  |        |
| Stat:M1-1↓  | Message 1 - 1<br>in Stat   | 1,01_01:2.0  | 5001      | Message 1 in Stat                        | ends   |
| Stat:M1-1↑  |                            | 1,01_01:2.1  | 7001      |  | starts |
| Stat:M1-2↓  | Message 1 –<br>2 in Stat   | 1,02_01:2.0  | 5101      | Any message between 1<br>and 2 in Stat   | ends   |
| Stat:M1-2↑  |                            | 1,02_01:2.1  | 7101      |  | starts |
| Stat:M1-3↓  | Message 1 –<br>3 in Stat   | 1,03_01:2.0  | 5201      | Any message between 1<br>and 3 in Stat   | ends   |
| Stat:M1-3↑  |                            | 1,03_01:2.1  | 7201      |  | starts |
| Stat:M1-4↓  | Message 1 –<br>4 in Stat   | 1,04_01:2.0  | 5301      | Any message between 1<br>and 4 in Stat   | ends   |
| Stat:M1-4↑  |                            | 1,04_01:2.1  | 7301      |  | starts |
| Stat:M1-5↓  | Message 1 –<br>5 in Stat   | 1,05_01:2.0  | 5401      | Any message between 1<br>and 5 in Stat   | ends   |
| Stat:M1-5↑  |                            | 1,05_01:2.1  | 7401      |  | starts |
| Stat:M1-6↓  | Message 1 –<br>6 in Stat   | 1,06_01:2.0  | 5501      | Any message between 1<br>and 6 in Stat   | ends   |
| Stat:M1-6↑  |                            | 1,06_01:2.1  | 7501      |  | starts |
| Stat:M1-7↓  | Message 1 –<br>7 in Stat   | 1,07_01:2.0  | 5601      | Any message between 1<br>and 7 in Stat   | ends   |
| Stat:M1-7↑  |                            | 1,07_01:2.1  | 7601      |  | starts |
| Stat:M1-8↓  | Message 1 –<br>8 in Stat   | 1,08_01:2.0  | 5701      | Any message between 1<br>and 8 in Stat   | ends   |
| Stat:M1-8↑  |                            | 1,08_01:2.1  | 7701      |  | starts |
| Stat:M1-9↓  | Message 1 –<br>9 in Stat   | 1,09_01:2.0  | 5801      | Any message between 1<br>and 9 in Stat   | ends   |
| Stat:M1-9↑  |                            | 1,09_01:2.1  | 7801      |  | starts |
| Stat:M1-10↓   | Message 1 –<br>10 in Stat  | 1,10_01:2.0  | 5901      | Any message between 1<br>and 10 in Stat  | ends   |
| Stat:M1-10↑   |                            | 1,10_01:2.1  | 7901      |  | starts |
| Stat:M1-11↓   | Message 1 –<br>11 in Stat  | 1,11_01:2.0  | 5A01      | Any message between 1<br>and 11 in Stat  | ends   |
| Stat:M1-11↑   |                            | 1,11_01:2.1  | 7A01      |  | starts |

| Display     | Event                     | Keypad entry | Interface | Description                             |        |
|-------------|---------------------------|--------------|-----------|---|--------|
| Stat:M1-12↓ | Message 1 –<br>12 in Stat | 1,12_01:2.0  | 5B01      | Any message between 1<br>and 12 in Stat | ends   |
| Stat:M1-12↑ |                           | 1,12_01:2.1  | 7B01      |   | starts |
| Stat:M1-13↓ | Message 1 –<br>13 in Stat | 1,13_01:2.0  | 5C01      | Any message between 1<br>and 13 in Stat | ends   |
| Stat:M1-13↑ |                           | 1,13_01:2.1  | 7C01      |   | starts |
| Stat:M1-14↓ | Message 1 –<br>14 in Stat | 1,14_01:2.0  | 5D01      | Any message between 1<br>and 14 in Stat | ends   |
| Stat:M1-14↑ |                           | 1,14_01:2.1  | 7D01      |   | starts |
| Stat:M1-15↓ | Message 1 –<br>15 in Stat | 1,15_01:2.0  | 5E01      | Any message between 1<br>and 15 in Stat | ends   |
| Stat:M1-15↑ |                           | 1,15_01:2.1  | 7E01      |   | starts |
| Stat:M1-16↓ | Message 1 –<br>16 in Stat | 1,16_01:2.0  | 5F01      | Any message between 1<br>and 16 in Stat | ends   |
| Stat:M1-16↑ |                           | 1,16_01:2.1  | 7F01      |   | starts |

| Display                  | Event    | Keypad entry | "Interface" | Description                |  |
|--------------------------|----------|--------------|-------------|----------------------------|--|
| <b>Programmed events</b> |          |              |             |                            |  |
| Backup↓                  | Event 1  | -            | 8001        | Backup time                | changes                                |
| Backup↑                  |          | -            | 8101        |                            | becomes larger                         |
| I1 Meas.per.↓            | Event 5  | -            | 8005        | Measurement period input 1 | Change of measurement period backwards |
| I1 Meas.per.↑            |          | -            | 8105        |                            | End of meas. period                    |
| I2 Meas.per.↓            | Event 6  | -            | 8006        | Measurement period input 2 | Change of measurement period backwards |
| I2 Meas.per.↑            |          | -            | 8106        |                            | End of meas. period                    |
| Call Win1↓               | Event 10 | -            | 800A        | Call time window 1         | changes                                |
| Call Win1↑               |          | -            | 810A        |                            | becomes larger                         |
| Call Win2↓               | Event 11 | -            | 800B        | Call time window 2         | changes                                |
| Call Win2↑               |          | -            | 810B        |                            | becomes larger                         |
| Monit.:V1Mp↓             | Event 12 | -            | 800C        | Monitoring I1              | changes                                |
| Monit.:V1Mp↑             |          | -            | 810C        |                            | becomes larger                         |
| Monit.:V2Mp↓             | Event 13 | -            | 800D        | Monitoring I2              | changes                                |
| Monit.:V2Mp↑             |          | -            | 810D        |                            | becomes larger                         |
| Month bdy._I1↓           | Event 17 | -            | 8011        | Month boundary input 1     | Correction backwards                   |
| Month bdy._I1↑           |          | -            | 8111        |                            | Month expired                          |
| Month bdy._I2↓           | Event 18 | -            | 8012        | Month boundary input 2     | Correction backwards                   |
| Month bdy._I2↑           |          | -            | 8112        |                            | Month expired                          |
| Day bdy._I1↓             | Event 21 | -            | 8015        | Day boundary I1            | Day change backwards                   |
| Day bdy._I1↑             |          | -            | 8115        |                            | Day expired                            |
| Day bdy._I2↓             | Event 22 | -            | 8016        | Day boundary I2            | Day change backwards                   |
| Day bdy._I2↑             |          | -            | 8116        |                            | Day expired                            |

| Display   | Event                 | Keypad entry | "Interface" | Description  |                   |
|---|-----------------------|--------------|-------------|--|-------------------|
| <b>Data change (e.g. change of meter reading or time)</b> |                       |              |             |  |                   |
| Value change↓   | Change of archive 1   | -            | 8201        | Value for month archive 1 was changed              | After change      |
| Value change↑   |                       | -            | 8301        |  | Before change     |
| Value change↓   | Change of archive 2   | -            | 8202        | Value for measurement period archive 1 was changed | After change      |
| Value change↑   |                       | -            | 8302        |  | Before change     |
| Value change↓   | Change of archive 3   | -            | 8203        | Value for month archive 2 was changed              | After change      |
| Value change↑   |                       | -            | 8303        |  | Before change     |
| Value change↓   | Change of archive 4   | -            | 8204        | Value for measurement period archive 2 was changed | After change      |
| Value change↑   |                       | -            | 8304        |  | Before change     |
| Value change↓   | Change of archive 10  | -            | 820A        | Value for logbook was changed                      | After change      |
| Value change↑   |                       | -            | 830A        |  | Before change     |
| Value change↓   | Change of archive 13  | -            | 820D        | Value for day value archive1 was changed           | After change      |
| Value change↑   |                       | -            | 830D        |  | Before change     |
| Value change↓   | Change of archive 14  | -            | 820E        | Value for day value archive 2 was changed          | After change      |
| Value change↑   |                       | -            | 830E        |  | Before change     |
| <b>Freeze command</b>                                     |                       |              |             |  |                   |
| FrMP1   | Freeze com. archive 2 | -            | 8502        | Meas. period archive 1                             | Saving the values |
| FrMP2   | Freeze com. archive 4 | -            | 8504        | Meas. period archive 2                             | Saving the values |

### 3.4 System list

| Name  | Address | Designation / value   | Cal. | Acc | Default | DC |
|-------|---------|---|------|-----|---------|----|
| Time  | 1:400   | Time and with  to date | No   | S   | -       | 2  |
| MdTim | 1:407   | Summer / winter time on/off   | -    | S   | 1       | 4  |
| MCyc  | 1:1F0   | Measurement cycle   | -    | S   | 300 s   | 3  |
| Disp  | 2:1A0   | Continuous display on/off   | -    | S   | 2 min.  | 4  |
| Aut.V | 1:1A0   | Time up to automatic display changeover   | -    | S   | 1 min.  | 3  |
| SNo   | 1:180   | DL220 fabrication number  | -    | P   | -       | 3  |
| Vers  | 2:190   | Software version "Application software"   | No   | -   | -       | 1  |
| Chk   | 2:191   | Checksum, "Application software"  | No   | -   | -       | 1  |

**DC** = Data class (for description see Chap. 2.5)

**Acc** = The displayed value is subject to: "P": Programming lock "PL": PTB-Logbook "S": Supplier's lock "C": Customer's lock "-": Value cannot be changed.

#### 3.4.1 Description of the values

##### Time Time

Details of internal clock in 24 format (e.g. 17:06:16). The date (format: DD.MM.YYYY) is displayed by pressing the cursor key . During entry the date and the time are displayed and can be changed.

##### MdTim Daylight saving mode

"0" to "2" 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".

 **With a change of the mode, the time in the DL220 is automatically corrected and should therefore be checked.**

**MCyc Measurement cycle**

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.

- ☞ **The shorter the time is selected, the more often the measurements are updated and the more the battery service life is reduced !**
- ☞ **The measurement cycle can only be set to a multiple or to an integer divisor of 60 seconds (e.g.: 15s, 60s, 120s, 180s, Default: 300s).**
- ☞ **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**

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**

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

AUT.V 0 No automatic selection.

AUT.V x Display switchover after x minutes.

**SNo Device number DL220**

The 12-place device number of the DL220 is displayed. The details correspond to the name-plate on the front membrane.

**Vers Version of the application software**

Version of the application software. The extension indicates the version.

Example:

"1.00.1" = Software V1.00 and single-channel version

"1.00.2" = Software V1.00 and dual-channel version

The size of the archive can be called by pressing "ENTER" and terminated again using "ESC".

**Chk Checksum of the application software**

Test sum of the loaded application software.

### 3.5 Service list

| Name    | Address | Designation / value                            | Cal.             | Acc | Default | DC |
|---------|---------|--|------------------|-----|---------|----|
| Bat.R   | 2:404   | Remaining battery service life                 | -                | -   | -       | 2  |
| Bat.C   | 1:1F3   | Battery capacity                               | -                | S   | 13.0 Ah | 3  |
| VBatM   | 4:410   | Battery voltage of GSM modem                   | -                | -   | -       | 2  |
| St.SL   | 3:170   | Supplier's lock status / close                 | -                | S   | 1       | 4  |
| Cod.S   | 3:171   | Supplier's combination, enter / change         | -                | S   | 0       | 7  |
| St.CL   | 4:170   | Customer's lock status / close                 | -                | C   | 1       | 4  |
| Cod.C   | 4:171   | Customer's combination, enter / change         | -                | C   | 0       | 7  |
| St.PL   | 1:170   | Programming lock status / close                | -                | P   | 0       | 4  |
| AdjTm   | 1:452   | Clock adjustment value                         | No               | P   | Var.    | 3  |
| Save    | 1:131   | Manual backup                                  | -                | S   | -       | 6  |
| Clr.A   | 1:8FD   | Clear archives                                 | -                | P   | -       | 6  |
| Clr.V   | 2:130   | Clear meters (incl. archive and readout notes) | -                | P   | -       | 6  |
| Clr.X   | 1:130   | Execute restart                                | -                | P   | -       | 6  |
| Addr    | 13:1C2  | User-specific value                            | -                | S   | -       | 3  |
| Various | Various | Displays the value set under "Add"             | Depends on value |     |         |    |
| -       | 1:1F7   | Display test                                   | -                | -   | -       | 6  |

**DC** = Data class (for description see Chap. 2.5)

**Acc** = The displayed value is subject to: "**P**": Programming lock "**PL**": PTB-Logbook "**S**": Supplier's lock "**C**": Customer's lock "-": Value cannot be changed.

#### 3.5.1 Description of the values

##### **Bat.R** Remaining battery service life

Display of the remaining battery service life in months. If this is less than three months, the "B" symbol in the display flashes and a status message is generated to indicate 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**).

**Bat.C** Battery capacity in Ah

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.

Since with operation over the complete ambient temperature range, the battery does not provide the full capacity, about 20 % of the specified capacity should be subtracted to ensure that the battery is not prematurely discharged; this means (specified battery capacity --> entry):

**Figures on the battery: 16.5 Ah -> Entry in DL220: 13.0 Ah**

This gives an approximate remaining service life (display: "BAT.R"):

**129 months**

**VBatM** Modem battery voltage in volts

Displays the present battery voltage of the installed modem battery in volts. If the battery voltage drops **below the figure 3.4 V**, the battery must be replaced. To display the present value a refreshed measurement of the voltage can be carried out with ENTER (press the keys  and  simultaneously). In running operation it is automatically updated at the next call time window. Consequently, it can also be later found out whether there is enough voltage available at the call time window. If it is too little, the GSM modem cannot log into the GSM network.

The service life of the modem battery essentially depends on the duration of the call time window; the shorter is the interrogation cycle and the longer the window is open, then the shorter the battery service life (see Chap. 3.7.3).

**St.SL** Supplier's lock status and close

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  or  and terminated with ENTER. Then the display "0" appears and the supplier's lock is closed.

**Cod.S** Enter supplier's combination and change combination

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.

The procedure for opening, changing and closing the supplier's lock is comprehensively described in Chapter : 2.6.4.

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.

**St.CL Customer's lock status and lock closed**

as above under St.SL, but for the customer's lock.

**Cod.C Enter customer's combination and change combination**

as above under Cod.S, but for the customer's lock.

**St.PL Programming lock status and lock closed**

as above under St.SL, but for the programming lock.

**Adj.Tm Clock adjustment**

Displays the clock correction value. Through the reciprocal the number of seconds can be established for the interval after which the DL220 automatically subtracts or adds 1 second to compensate the inaccuracy of the clock crystal.

It should be noted that the ambient temperature of the device has a very large influence on the clock accuracy. In particular low temperatures lead to the clock running slower and so the measurement period of the device is longer.

**Save Manual backup**

Here, it is possible for the user to carry out a manual backup of all system data, date, time, meter readings and the determination of the maxima in the current month. This is a 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.

**Clr.V Clear meters, incl. archives**

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



**This function may only be executed when there is no link (by remote data transfer or optical interface) to the DL220, because it would be uncontrollably interrupted.**

**Clr.X Execute restart**

With this function the DL220 can be reset to a defined initial status. The DL220 is completely cleared and "forgets" all settings (comparable to Format c:\ with a PC!) and the values in the archives.

- ☞ **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.**
- ☞ **This function may only be executed when there is no link (by remote data transfer or optical interface) to the DL220, 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. To do this, call the time, press "ENTER", reset the date to the start date using "HOME/CLR" and terminate using "ENTER" again.
2. The function "Clr.X" 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  or  to "1" and by terminating with "ENTER", all meter readings, all archives and the system data (all parameters) are cleared and the DL220 is restarted.
3. After the "busy" signal and checking the internal memory, the DL220 is reset and can be put into operation again.

**Addr User-specific value**

Here, a user-specific value (address) can be set, the result of which is displayed in the DL220 display using . Consequently, it is possible to bring *any* DL220 value into the display. This is, for example, of relevance during a calibration inspection. The value can of course also be changed in dependence of the locks.

- ☞ **The representation in the display depends on the selected value. For example, during the selection of a status message or an event, the display is formatted according to the Chapter 3.3.12.1, whereas the output occurs via the interface in hexadecimal representation. It is also represented in hexadecimal in the rating data book.**

**- Display test**

When this point is selected, all LCD segments flash at a frequency of 0.5 Hz until the next key depression.

### 3.6 Output list

| Name  | Address | Designation / value                           | Cal. | Acc. | Default | DC   |
|-------|---------|---|------|------|---------|------|
| Md.O1 | 1:605   | Mode, Signal Output 1                         | -    | S/C  | 1       | 4    |
| SC.O1 | 1:606   | Source, Signal Output 1 (for pulse output)    | -    | S/C  | 1:200   | Var. |
| cp.O1 | 1:611   | cp value, Signal Output 1 (for pulse output)  | -    | S/C  | 1.0     | 3    |
| SpO1  | 1:607   | Status mask Output 1 (only for status output) | -    | S/C  | -       | 3    |
| Bu.O1 | 1:619   | Level of output pulse memory                  | -    | -    | -       | 2    |
| Md.O2 | 2:605   | Mode, Signal Output 2                         | -    | S/C  | 1       | 4    |
| SC.O2 | 2:606   | Source, Signal Output 2 (for pulse output)    | -    | S/C  | 2:200   | Var. |
| cp.O2 | 2:611   | cp value, Signal Output 2 (for pulse output)  | -    | S/C  | 1.0     | 3    |
| SpO2  | 2:607   | Status mask Output 2 (only for status output) | -    | S/C  | -       | 3    |
| Bu.O2 | 2:619   | Level of output pulse memory                  | -    | -    | -       | 2    |

**DC** = Data class (for description see Chap. 2.5)

**Acc** = The displayed value is subject to: **"P"**: Programming lock **"PL"**: PTB-Logbook **"S"**: Supplier's lock **"C"**: Customer's lock **"-"**: Value cannot be changed.

#### 3.6.1 Setting as fixed value output (remote function)

##### Md.O1 Mode, Signal Output 1

##### Md.O2 Mode, Signal Output 2

In order to be able to use the DL220 output as a fixed value output, the output mode must be set as follows:

| Mode | Output function  | Meaning  |
|------|--|--|
| 1    | Pulse output with the logic "normally open" => active = closed | Output of the volume pulses of an input meter (defined under "SC.O1" / "SC.O2"), logic "normally open"   |
| 5    | Pulse output with the logic "normally closed" => active = open | Output of the volume pulses of an input meter (defined under "SC.O1" / "SC.O2"), logic "normally closed" |

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.O1** Mode, Signal Output 1

**Md.O2** Mode, Signal Output 2

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

| Mode | Output function | Meaning  |
|------|-----------------|--|
| 1    | Pulse output    | Output of the volume pulse of an input meter (defined under "SC.O1" / "SC.O2") |

**SC.O1 Source, Pulse Output 1**

**SC.O2 Source, Pulse Output 2**

The meter reading (the source) to be output must be set for the function "Pulse output". The following sources can be selected:

| Address | Meaning                     |
|---------|-----------------------------|
| 1:200   | Main meter of input 1       |
| 2:200   | Main meter of input 2       |
| 1:203   | Adjustable meter of input 1 |
| 2:203   | Adjustable meter of input 2 |

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.O1  $c_p$  value, Signal Output 1**

**cp.O2  $c_p$  value, Signal Output 2**

Setting of weighting for Pulse Output 1 or 2 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 corresponding output  $c_p$  values are automatically set to the next lower, decade  $c_p$  value and the output buffer cleared.

The following values can in addition be set using WinPADS:

**Time pitch for pulse Output 1 / 2**

The basis for the following values is provided by the so-called time pitch, in which changes are possible. With the DL220 the time pitch is set to 125 ms.

**Period for pulse Output 1 / 2**

The period duration 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  $2 \times 125 \text{ ms} = 250 \text{ ms}$  and so the output frequency is limited to a maximum of 4 Hz.

**Pulse duration for pulse Output 1 / 2**

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.

**3.6.3 Setting as switch output**

In the "Switch output" mode the DL220 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.O1** Mode, Signal Output 1

**Md.O2** Mode, Signal Output 2

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 <u>closed</u> when, and for as long as, the signal defined with SpOx (see below) is active in the momentary status.   |
| 3    | Time-synchronised output with the logic "N/O" => active = closed | The output is <u>closed</u> at the measurement period boundary or hourly for the set pulse duration.<br>Source for the measurement period end: See "Source signal output Ox" (see below). |
| 6    | Status output with the logic "N/C" => active = open.             | The output is <u>opened</u> when, and for as long as, the signal defined with SpOx (see below) is active in the momentary status.   |
| 7    | Time-synchronised output with the logic "N/C" => active = closed | The output is <u>opened</u> at the measurement period boundary or hourly for the set pulse duration.<br>Source for the measurement period end: See "Source signal output Ox" (see below). |

For modes 3 and 7 the period and pulse durations for each output under the addresses 1:617 and 2:617 (period duration) and 1:618 and 2:618 (pulse duration) are set as a multiple of 125 ms via the interfaces. The period duration must always be greater than the impulse duration.

**SpO1** Status mask, switching Output 1

**SpO2** Status mask, switching Output 2

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 3.3.10.

**SC.01 Source, Time-Synchronised Output 1****SC.02 Source, Time-synchronised Output 2**

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 on Input 1  |
| 6:156   | End of measurement period on Input 2  |

**3.7 Interface list**

| Name  | Address | Designation / value                                   | Cal. | Acc. | Default   | DC |
|-------|---------|---|------|------|-----------|----|
| GSM.N | 2:775   | Network operator in plain text                        | -    | -    | -         | 2  |
| GSM.L | 2:777   | Reception level                                       | -    | -    | 0         | 2  |
| StM   | 2:77C_1 | Modem status  | -    | -    | -         | 2  |
| P.Sta | 2:77A   | Status PIN of SIM card                                | -    | -    | PIN New   | 2  |
| Pin   | 2:772   | Entry of the PIN for the SIM card                     | -    | S    | -         | 3  |
| Num.T | 2:720   | Number of ringing tones before accepting call.        | -    | S    | 1         | 3  |
| Bd.S1 | 1:709   | Baud rate for optical interface                       | -    | S    | 9600 Bd   | 3  |
| CW1.S | 10:150  | Call time window 1, start                             | -    | S/C  | 01, 00:00 | 3  |
| CW1.E | 10:158  | Call time window 1, end                               | -    | S/C  | 01, 00:00 | 3  |
| CW2.S | 11:150  | Call time window 2, start                             | -    | S/C  | 01, 00:00 | 3  |
| CW2.E | 11:158  | Call time window 2, end                               | -    | S/C  | 01, 00:00 | 3  |
| CWTst | 2:727   | "Test" call window                                    | -    | S/C  | 0         | 3  |
| Resp1 | 2:742   | Response to Spontaneous Signal 1 (on telephone no. 1) | -    | -    | -         | 2  |
| Resp2 | 2:74A   | Response to Spontaneous Signal 2 (on telephone no. 2) | -    | -    | -         | 2  |
| Send  | 2:734   | Trigger spontaneous signal                            | -    | S/C  | 0         | 6  |

**DC** = Data class (for description see Chap. 2.5)

**Acc** = The displayed value is subject to: "**P**": Programming lock "**PL**": PTB-Logbook "**S**": Supplier's lock "**C**": Customer's lock "-": Value cannot be changed.

### 3.7.1 Description of the values

#### **GSM.N Display GSM network operator**

When using the GSM modem the network operator, in whose network the DL220 has logged in, is displayed in plain text. This display is also a way of ensuring that the DL220 is logged into the GSM network.

The network operator is found at the start of each call time window. Immediate updating can be carried out manually by pressing the "ENTER" key combination.

If the modem battery voltage is too low, the modem does not log into the network and the message "Low batt" is written to the display. Simultaneously, the message number 9 (see Chap. 3.3.8 and 3.3.9) is set in the momentary status St.4.

#### **GSM.L Display GSM reception level**

When using a GSM modem, the reception level can be displayed. The representation is in %:

0%     no reception  
100%   very good reception

For reliable data transmission a constant reception level > 50% is recommended!

The reception level is found at the start of each call time window. Immediate updating can be carried out manually by pressing the "ENTER" key combination.

#### **StM Modem status**

The modem status indicates the current log-in status of the GSM modem.

The possible messages are as follows:

| <b>Display messages</b> | <b>Description</b>  |
|-------------------------|---|
| Logged out              | The GSM modem is not currently logged in. Possible causes: Call time window is off, no SIM card inserted, SIM PIN has not been entered. |
| Own network             | The GSM is currently logged into its own network.   |
| Network search...       | The GSM modem is currently in the process of logging into its own or another network.   |
| Rejected                | The modem log-in has been rejected.   |
| Other network           | The GSM modem is currently logged into another (third party) network.   |

**P.Sta Status of PIN on SIM card**

When using a GSM modem, the PIN of the SIM card is supported. The possible SIM card messages are as follows:

|           |  |
|-----------|--|
| PIN NEW   | No PIN interrogation carried out yet or use of a SIM card without activated PIN interrogation. |
| PIN READY | Use of a SIM card without enabled PIN interrogation.   |
| PIN OK    | PIN is correctly set.  |
| PIN ERROR | PIN is incorrect   |
| SIM ERROR | Access violation, e.g. no SIM-card inserted  |

**Pin Entry of PIN for a SIM card**

In the DL220 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. Entry takes place concealed (as for example with the entry of the supplier's lock, see Chap. 2.6.4) and is described in Chapter 5.2.3. Only numbers from 0 to 9 can be entered.

**EvSM Event for triggering an SMS**

The DL220 can send a spontaneous message using SMS when a certain event occurs. This is sent immediately, irrespective of the validity of a time window. The triggering event is programmed under this address (possibilities of the events: see Chap. 3.3.12).

**Num.T Number of ringing tones before accepting call**

Setting for the number of ringing tones before the modem accepts an incoming call (can be set between 1 and 12 ringing tones).

**Bd.S1 Baud rate for optical head / direct readout cable**

Setting for the baud rate of the 1<sup>st</sup> serial interface. Practical values are located in the range from 1200 to 9600 baud.

**CW1.S Call acceptance window 1, start**  
A time is displayed (e.g. 01,07:30).

**CW1.E Call acceptance window 1, end**  
A time is displayed (e.g. 01,09:30).

**CW2.S Call acceptance window 2, start**  
A time is displayed (e.g. 01,12:00).

**CW2.E Call acceptance window 2, end**  
A time is displayed (e.g. 01,13:00).

The call acceptance windows are conceived in order to be able to only establish a connection. With the above example values for the call acceptance window incoming calls are only accepted on the 1<sup>st</sup> of the month between 07:30 hrs. and 09:30 hrs., and between 12:00 hrs. and 13:00 hrs.

The call acceptance window should be as short as possible so that the modem battery is not drained.

The sending of an SMS is not affected by call acceptance windows.

### **CWTst "Test" call time window**

The test call time window enables the GSM modem to be switched on for a parameterised period (e.g. 30 minutes) to facilitate, for example, test calls. The shortest possible entry is two minutes. The display is updated each minute once the function is triggered and it displays the remaining window open time.

This call time window is also opened for two minutes if the GSM parameters are to be updated in the display and in this period no call time window (1 or 2, see above) is open.

**Resp1** Last response to Spontaneous message 1  
Status of the last spontaneous message which was sent to Phone Number 1.

**Resp2** Last response to Spontaneous message 2  
Status of the last spontaneous message which was sent to Phone Number 2.

### **Send Triggering a spontaneous message**

A spontaneous signal can be triggered here for test purposes. A prerequisite for this is the correct parameterisation of the SMS setting of the readout and parameterisation program WinPADS200-DL.

To trigger the spontaneous message, the entry mode must be called with the key "ENTER", the value set to "1" and the entry terminated again with "ENTER". The DL220 then begins to send an SM, irrespective of the set result. The function of settings made can then be tested.



**The parameterisation necessary for using the SMS functions can only be carried out via the WinPADS program! Description of the parameters which can be set: Chap. 0**

### **3.7.2 Optical interface (Interface 1)**

All DL220 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 DL220 via the Elster software WinPADS (from V2.50). The connection of an AS-200 (from V8.4) with OPTO head 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 held on the read-out interface by a metal ring and a receptacle. In order to ensure the optimum data flow, the optical head should be positioned such that its connection cable points downwards (in the direction of the cable entries).

### **3.7.3 Modem operation in the DL220 (Interface 2)**

Normally, the DL220 is equipped with an integral GSM modem. All values can be called via this GSM modem and also changed in dependence of the locks. Primarily however, the modem is intended for the transfer of the consumption data (meter readings) in the measurement period archive or the end readings and maxima in the month archive to the control room.

A prerequisite for the operation of a GSM modem is the separate modem battery (option: two pieces). At the start of the call acceptance window and continuously during the transmission a check is made of whether this power supply is connected. If it is not connected, the link is immediately relinquished.

Since the DL220 is basically designed for GSM operation without an additional power supply, the frequency and duration of the call acceptance window is of decisive importance for the service life of the modem battery. The ambient temperature of the device, the on-site reception conditions (!), the number of transmitted SMS messages and the respective duration of the data transmission also have an effect.

The battery on the CPU board is exclusively responsible for any calibrated device function (pulse metering, processing and archiving). Therefore, these functions are completely independent of the state of the modem battery or batteries.

### 3.7.4 Call acceptance window – service life of the modem battery

- ☞ **The device battery is independent of the modem operation so that reliable operation of the DL220 is ensured even with the modem batteries discharged.**

The following should help the user to estimate the service life of the **modem battery**. The figures should however only be regarded as guide values, because in particular the ambient conditions on site (temperature and GSM reception), which cannot be taken into account, have substantial effects on the service life.

#### Service life of the modem battery (1 battery, 13 Ah, Elster Id. No.: 730 17 964)

| Mode  | Time window [h per month] | No. of SMS [per month] | Duration per transmission [min] | Service life Years |
|---|---------------------------|------------------------|---------------------------------|--------------------|
| Time window daily 1 h<br>(daily readout of 24 values)     | 30,5                      | 0                      | 4                               | approx. 2          |
| Time window daily 1 h + <b>SMS</b>                        | 30,5                      | <b>5</b>               | 4                               | approx. 2          |
| Time window daily 2 h<br>(daily readout of 24 values)     | 61                        | 0                      | 4                               | approx. 1          |
| Recall 1x weekly (2 h)<br>(weekly readout of 7x24 values) | 8,2                       | 0                      | 10                              | approx. 7          |
| Recall 1x weekly (4 h)<br>(weekly readout of 7x24 values) | 16,5                      | 0                      | 10                              | approx. 6          |
| Recall 1x monthly (4 h)<br>(readout of meas. per. arch.)  | 4                         | 0                      | 15                              | approx. 10         |
| Recall 1x monthly (4 h) +<br><b>SMS</b>                   | 4                         | <b>10</b>              | 15                              | approx. 10         |
| Recall 1x monthly (8 h)<br>(readout of meas. per. arch.)  | 8                         | 0                      | 15                              | approx. 10         |
| Recall 1x monthly (8 h) +<br><b>SMS</b>                   | 8                         | <b>10</b>              | 15                              | approx. 10         |
| Day meter reading by SMS                                  | 0                         | <b>30.5</b>            | 1                               | approx. 9          |

The figures relate to one modem battery; the service life can be almost doubled by the use of the second battery.

- ☞ **Since both batteries are operated in parallel, they must be replaced together. Also, retrofitting a second battery is not possible, because it would be immediately discharged!**
- ☞ **On leaving the factory the call acceptance window is switched off so that the modem battery is not unnecessarily loaded. When putting the device into operation, the required window must be set via WinPADS.**

### 3.7.5 Short messages in the DL220 (SMS function)

Short messages (SMs) can be sent to recipients over various networks using the SMS (Short Message Service). In the DL220 an SM can be used to give users information on a defined event. This may be, for example, an internal device message (alarm, warning), the switching of an input (tamper contact), exceeding of limits or also the end readings and the maxima formed in the DL220 at the end of the month.

With the DL220 SMs can be sent to mobile phones or to a control room equipped with a GSM receiver and an SM reception program (e.g.: dmail). Up to five different recipient and up to three different provider telephone numbers can be saved in the device.

#### 3.7.5.1 Basic set-up of the SMS function

**The parameters relevant to SMS can only be set via the interfaces.** Entry of the SMS parameters via the DL220 keypad is not provided. Entry is made with the WinPADS200-DL readout and parameterising program (possible via the local interface or via remote data transfer).

##### Number of transmission attempts

Address: **2:732**

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

 **The DL220 can only establish whether the SM has been properly accepted by the control room. It cannot establish whether it has actually reached the recipient. This should be borne in mind with application in safety-relevant equipment.**

##### 'SMS-to-e-mail' gateway number

Address: **2:739**

Telephone number of the 'SMS-to-e-mail' gateway of the device's own provider if it offers this service, e.g. "8000" for T-Mobile and "3400" for Vodafone. The precise requirements must however be taken from the respective provider's specification. 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                               |
| ,         | Dialling pause. Ex-works setting for most modems = 2 seconds |
| Space     | Space  |

##### 'SMS-to-fax' gateway number

Address: **2:73A**

Telephone number of the 'SMS-to-fax' gateway of the device's own provider if it offers this service, e.g. "99" for T-Mobile and Vodafone.

For further details refer above: "'SMS-to-e-mail' gateway number"

##### Type of SM transmission

Address: **2:740**

Type of transmission for the short message (0=Analogue, 1=Text mode or 2=PDU mode).

- 0 = Transmission via the provider's analogue access (e.g. analogue, ISDN modem)
- 1 = Pure text transmission without special characters on a mobile phone / PC
- 2 = Direct data transfer in binary form on a PC

**SMS service centre (own GSM network)**

Address: **2:743**

If the SMSC recorded on the SIM card is not to be used, an alternative number for the device's own provider can be entered here.

### 3.7.5.2 Content and form of an SM

An SM sent from the DL220 contains the following user data:

- Header information from SMSC (SMS centre).
- Content which is defined in the DL220.

The **header information** consists of the phone number of the SM sender (DL220) and the time/date of reception of the SM at the SMS centre. The recipient of the SM is shown these automatically.

The content of the respective SM can be chosen from either a list with permanently defined messages (Elster) or a list with user-defined messages and be sent to up to two different recipients from the internal telephone book.

**a) User-defined messages (free layout)**Address: **1:750 to 10:75E**

Up to ten "free" messages can be defined, each consisting of up to 15 variable values (measurements, parameters, etc.). The addresses of the values to be transferred are set to define the message. In this respect it should be noted that a normal message ("Short Message" or "SM") may consist of up to 160 characters.

Values from archives can be sent with "predefined messages" (page 94).

The following table gives an example of parameterisation which describes the message definition "2".

⌋ These addresses must be set.

| No. | Address | Value   | Meaning             | Example                  |
|-----|---------|---------|---------------------|--------------------------|
| 1   | 2:750   | 02:0181 | Manufacturer's name | Elster                   |
| 2   | 2:751   | 01:0181 | Device designation  | DL220                    |
| 3   | 2:752   | 01:0180 | Serial number       | 3221234                  |
| 4   | 2:753   | 01:0400 | Current time        | 2004-02-15,14:35:05      |
| 5   | 2:754   | 01:0100 | Current status      | 13;14;16                 |
| 6   | 2:755   | 01:021B | Customer name I1    | Müller Baker             |
| 7   | 2:756   | 01:08D0 | User text 1         | "Meter readings Input 1" |
| 8   | 2:757   | 01:0200 | Main Meter I1       | 000000123.0000 m3        |
| 9   | 2:758   | 01:0203 | Adjustable meter I1 | 000246577.0000 m3        |
| 10  | 2:759   | -       | -                   |                          |
| 11  | 2:75A   | -       | -                   |                          |
| 12  | 2:75B   | -       | -                   |                          |
| 13  | 2:75C   | -       | -                   |                          |
| 14  | 2:75D   | -       | -                   |                          |
| 15  | 2:75E   | -       | -                   |                          |

**The values (Nos. 1–15) must be assigned in ascending order and gaps between single values are not permitted.**

**Separator**

A separator (factory setting: "\*\*\*") is provided between each value. Depending on the mobile phone or reception program, this is converted into an appropriate character. Therefore the separator can be set for each recipient (see page 96).

**Customised message text**Address: **1:8D0 to 12:8D0**

If longer message texts are to be output, any texts (each of up to 62 characters) can be entered under the addresses given.

These can only be specified via the "WinPADS" parameterisation software and must then be programmed as a value to be transferred (see value 7 in the above table). It should be noted that a "normal" SM only permits up to 160 characters.

**b) Predefined messages ("fixed layout")**

Address: **12:750 to 15:75E**

The message definitions Nos. 12 to 15 are available for special purposes. In particular in this respect and in contrast to the "free messages" also values from archives can be sent. The message definition No. 11 (addresses 11:750 to 11:75E) is intended for future expansion.

**1. Load profile (message definition No. 12)**

Address: **12:750**

To obtain the load profile of the last day ("load profile from yesterday") the address of a meter is entered under the address 12:750. The load profile is then determined from the values for this meter entered in the measurement period archive.

The following conditions for this must be fulfilled:

- The measurement period "MP.I1" must be set continuously to 60 minutes.
- The meter entered here must be present in the measurement period archive.

In the DL220 as supplied the readings of the main meter "V1" and of the adjustable meter "V1.A" are recorded in the measurement period archive "ArMP1" according to Chapter 3.2.3 (page 45). The addresses of these meters are "1:0200" for "V1" and "1:0203" for "V1.A" (see Chapter 3.1.1, page 34). One of these two addresses can in this case be entered under 12:750.

If, for example, "1:0200" is entered under 12:750, the DL220 sends the load profile of the main meter "V1" when an event occurs for which the message definition "12" has been set (see page 96).

Using the "WinPADS" parameterisation software, you can set which meters are recorded in the measurement period archive.

**2. Alarm message (message definition No. 13)**

Address: **13:750 to 13:759**

Up to 10 addresses can be specified under the addresses 13:750 to 13:759, the values of which are to be transmitted when an alarm message occurs.

**3. Last archive entry (message definition No. 14)**

Address: **14:750**

To transmit the last (newest) data row of an archive by SMS the address of the block number of the respective archive is entered under the address 14:750. The address is formed from the archive number followed by ":0A20". (Archive numbers: see the table on page 49).

Example: To transmit the last archive entry in the measurement period archive the address "2:0A20" is entered under 14:750.

**4. Monthly billing (message definition No. 15)**

Address: **15:750 to 15:754**

With this definition the relevant data for a monthly invoice can be transmitted. This is the meter end reading and two so-called "capture values" (maximum or minimum with time stamp) of the previous month.

It is essential to parameterise the following parameters exactly in this sequence, so that the Elster evaluation software can interpret the data correctly.

└ Possible (practicable) entries

| Address | Meaning                            | Entry  | Meaning                                   |
|---------|------------------------------------|--------|---|
| 15:750  | Meter reading                      | 1:0200 | Main meter                                |
|         |                                    | 1:0203 | Adjustable meter                          |
|         |                                    | 1:0240 | Original meter (with connected encoder)   |
| 15:751  | First capture value                | 3:0161 | Max. measurement period consumption       |
|         |                                    | 4:0161 | Max. day consumption                      |
| 15:752  | Time stamp for first capture value | 3:0165 | Time of max. meas. period consumption     |
|         |                                    | 4:0165 | Time of max. day consumption              |
| 15:753  | Second capture value               |        | (as "First capture value")                |
| 15:754  | Relevant time stamp                |        | (As "Time stamp for first capture value") |

### 3.7.5.3 SM provider list

#### Provider's name

Address: **1:D10 to 3:D10**

Provider's name in plain text for the user guidance during configuration.

#### Dial-up number of network provider

Address: **1:D11 to 3:D11**

Dial-up number for the SMSC (SMS centre) for sending messages. If no dial-up number is entered (default!), the dial-up number on the SIM card set by the provider is used.

### 3.7.5.4 SM recipient list

Up to five different recipients can be saved in the device.

#### Name of the recipient

Address: **1:D20 to 5:D20**

Recipient's name in plain text for the user guidance during configuration.

#### Telephone number

Address: **1:D22 to 5:D22**

Recipient's telephone number.

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                               |
| ,         | Dialling pause. Ex-works setting for most modems = 2 seconds |
| Space     | Space  |

#### E-mail address

Address: **1:D23 to 5:D23**

Recipient's e-mail address in the format: name@host.xxx.

**Message format**

Address: **1:D24 to 5:D24**

Definition of whether the message is to be sent as text or in binary representation (0 = text, 1 = binary). With the "binary" format the SM is sent compressed for a PC recipient. This recipient must then decompress the SM.

**SM separator**

Address: **1:D25 to 5:D25**

Character for delimiting a text message into its single fields. It should be noted that this must be entered in "decimal" (extract from the ASCII table):

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

**3.7.5.5 SM event list**

Up to ten different trigger events can be saved in the device on the occurrence of which a short message (SM) is sent. For each single event the recipient, the message to be sent and the transmission path are defined.

**Event for triggering an SM**

Address: **1:D00-10:D00**

To send an SM, the event must be defined due to which the SM is to be sent. Description of the events: See Chap. 3.3.12.

**SMS mode**

Address: **1:D01-10:D01**

In the DL220 it is possible to send an SM to up to two different recipients. This is set in the "SMS mode":

| Value | Meaning  |
|-------|--|
| 0     | No SM transmission                                       |
| 1     | SM to Recipient 1; if unsuccessful, also to Recipient 2. |
| 2     | SMS to Recipient 1 <b>and</b> Recipient 2.               |

**Message definition (layout)**

Address: **1:D02-10:D02**

Here the number of the message definition is entered according to which the message is to be sent on the occurrence of the above mentioned event.

This is either a number from 1 to 10 for "User-defined messages" (page 93) or a number from 11 to 15 for "Pre-defined messages" (page 94).

**SM Recipient 1**

Address: **1:D04-10:D04**

**SM Recipient 2**

Address: **1:D05-10:D05**

Number of the entry in the SM recipient list. This defines Recipients 1 and 2 to whom an SM is to be sent.

**Transmission path to SM Recipient 1**Address: **1:D06-10:D06****Transmission path to SM Recipient 2**Address: **1:D07-10:D07**

Definition of the transmission path of the message to the respective recipient:

- 0 = Direct The recipient receives the message on the same path on which it was sent (via SMS).
- 1 = E-mail The recipient receives the message as e-mail. Assumptions:
- the recipient's e-mail address is entered under the address 01...05:D23 (see page 95).
  - the telephone number of the "SMS-to-e-mail" gateway is entered under the address 02:0739. (see page 91).
- 2 = FAX The recipient receives the message as a fax. Assumption:
- the telephone number of the "SMS-to-fax" gateway is entered under the address 02:073A. (see page 91)

**Delay range**Address: **1:D0A-10:D0A**

In order to relieve the recipient of regular short messages within an interconnection of devices, it is possible in the DL220 to delay the sending of an SM depending on the device. The delay range corresponds in this respect to the maximum desired delay in minutes. If, for example, a delay range of 60 minutes is set, the message is sent some time within 60 minutes of the occurrence of the triggering event. The values sent in the message are however values valid at the time of the triggering event.

### 3.7.6 Standard output data records for process data ("3-min. values")

Process data can be synchronously temporarily stored in short cycles (e.g. 3 minutes) and interrogated over the interface. To output these data records the mode "Data readout" in "Mode C" according to IEC 62056-21<sup>1</sup> is used.

In order to obtain practicable values, buffer storage of the process data has to be activated. In this respect

- the value "21" is written to the address "09:0157.0" via the interface and
- the operating cycle *MCyc* (→) is set to an integer divisor of 3 minutes.

Through these measures the battery service life of the DL220 is slightly reduced. The expected remaining service life is displayed under *Bat.R* (→).

#### Output of the data records

The data records are labelled on recalling with the addresses 1:01CD ... 15:01CD. (Other addresses are used to set the content, see below.)

In the factory setting the following data are output:

| Nr. | Adresse | Belegung | Bedeutung                      | Beispiel  |
|-----|---------|----------|--------------------------------|---|
| 1.  | 01:01CB | 01:0181  | Device designation             | 01:01CB.10(DL220)                                     |
| 2.  | 02:01CB | 01:0180  | Serial number                  | 02:01CB.12(3210012)                                   |
| 3.  | 03:01CB | 01:021B  | Customer name 1                | 03:01CB.12(Kunde_x)                                   |
| 4.  | 04:01CB | 01:0100  | Total momentary status Stat    | 04:01CB.12(13)(14)                                    |
| 5.  | 05:01CB | 01:0200  | Main meter V1                  | 05:01CB.12(134560*m3)                                 |
| 6.  | 06:01CB | 01:0203  | Adjustable meter V1.P          | 06:01CB.12(134560*m3)                                 |
| 7.  | 07:01CB | 07:0161  | Measurement period maximum E1  | 07:01CB.11(395*m3)(2007-06-18,21:26:48)(0)(0001:0200) |
| 8.  | 08:01CB | 02:021B  | Customer name 2                | 08:01CB.11(Kunde_x)                                   |
| 9.  | 09:01CB | 02:0100  | System - momentary status StSy | 09:01CB.11(13)(15)                                    |
| 10. | 10:01CB | 02:0200  | Main meter V2                  | 10:01CB.11(134560*m3)                                 |
| 11. | 11:01CB | 02:0203  | Adjustable meter V2.P          | 11:01CB.11(134560*m3)                                 |
| 12. | 12:01CB | 08:0161  | Measurement period maximum E2  | 12:01CB.11(395*m3)(2007-06-18,21:26:48)(0)(0002:0200) |
| 13. | 13:01CB | 00:0000  | Not used                       | 13:01CB.13()  |
| 14. | 14:01CB | 00:0000  | Not used                       | 14:01CB.13()  |

#### Setting the data record content

You can freely set the content of the process data with the aid of the "WinPADS" Parameterising Software". The addresses 1:01CF ... 15:01CF are used for setting values.

#### Archiving the data records

For tracing (e.g. after a mains failure) the last 200 process data records can be saved in Archive 10. Archiving starts once the buffer storage of the process data has been activated (see above).

<sup>1</sup> IEC 62056-21: formerly IEC 1107 or EN 61107

### 3.8 User list

| Name  | Address | Designation / value        | Cal. | Acc. | Default | DC |
|-------|---------|----------------------------|------|------|---------|----|
| V1.A  | 01:0203 | Adjustable meter input 1   | No   | L    | 0       | 3  |
| V1    | 01:0200 | Main meter input 1         | No   | PL   | 0       | 3  |
| Q1    | 01:0210 | Flow on Input 1            | -    | -    | -       | 2  |
| CP.I1 | 01:0253 | cp value Input 1           | No   | PL   | 1       | 3  |
| MP.I1 | 05:0150 | Measurement period Input 1 | No   | PL   | 60      | 3  |
| Md.I1 | 01:0207 | Mode for input 1           | No   | PL   | 1       | 4  |
| V2.A  | 02:0203 | Adjustable meter input 2   | No   | L    | 0       | 3  |
| V2    | 02:0200 | Main meter input 2         | No   | PL   | 0       | 3  |
| Q2    | 02:0210 | Flow on Input 2            | -    | -    | -       | 2  |
| CP.I2 | 02:0253 | cp value Input 2           | No   | PL   | 1       | 3  |
| MP.I2 | 06:0150 | Measurement period Input 2 | No   | PL   | 60      | 3  |
| Md.I2 | 02:0207 | Mode for input 2           | No   | PL   | 1       | 4  |
| Menu  | 01:01A1 | Selection display menu     | -    | L    | 1       | 7  |

**DC** = Data class (for description see Chap. 2.5)

**Acc** = The displayed value is subject to: "**P**": Programming lock "PL": PTB-Logbook "**S**": Supplier's lock "**C**": Customer's lock "-": Value cannot be changed.

With exception of the last value, this list is application-specific, i.e. the user can himself set which values in this list are displayed. Ex-works, these are the above-mentioned values (default) which are also all displayed in another list and described in the corresponding chapters.

The setting of the values to be displayed occurs by entering the addresses of the values to be displayed with the parameterisation software "WinPADS" - "Configuration", "Display" under the addresses "1:1C2" to "12:1C2".

With *Menu* the complete display structure of the DL220 can be switched between "complete" and "simple".

| Menu = | Meaning                     |
|--------|-----------------------------|
| 1      | Complete display structure  |
| 2      | Only " <i>User</i> " column |

*Menu* = 1 corresponds to the standard setting which is described in this manual.

With the setting *Menu* = 2, the display is limited to the column "User" described here. All other columns cannot be called.



## 4 Putting into operation

### 4.1 Setting the parameters on site

For each input the input mode (metering or signal input), cp value, measurement period and, where applicable, the reading of the main and adjustable meters must be set.

- ☞ ***Before changing values, the programming lock must be opened by pressing the programming button in the device (symbol "P" flashes in the display). Values identified with "PL" can be changed with the supplier's lock open provided the PTB logbook is not full. (See Chap. 3.3.6, page 59).***

### 4.2 Checking the set values

Checking the set parameters can take place directly on the unit by means of the keypad, see Chap. 2.4 or conveniently via the WinPADS parameterisation software.

The software can be obtained free of charge as a download via [www.Elster.com](http://www.Elster.com) in the section "Download", "Software Download"; the product code can be requested via the Electronics hot-line (Tel.: 06134 / 605-123 or at [support@Elster.com](mailto:support@Elster.com)).

In the rating data book the associated parameters are clearly described by quoting the address. Values not directly available in the DL220 display can be called in the Service list under the "User-specific value" (see Chap. 3.8).

The correctness of the set parameters is ensured by comparison of the details in the rating data book with the called values in the operator list, see Chapter 3 or the WinPADS parameterisation software.

## 4.3 Protection against manipulation

### 1. Closing and securing the programming lock

Once all values subject to calibration have been changed, the programming lock is closed by pressing the button or by operation on the DL220 ("St.PL" in the "Service" list) (*the symbol "P" goes out*) and the opening can be sealed with an adhesive label.

### 2. Securing the inputs

The required inputs can be secured against tampering by covering caps. Sealing is provided by an adhesive label on the relevant covering cap.

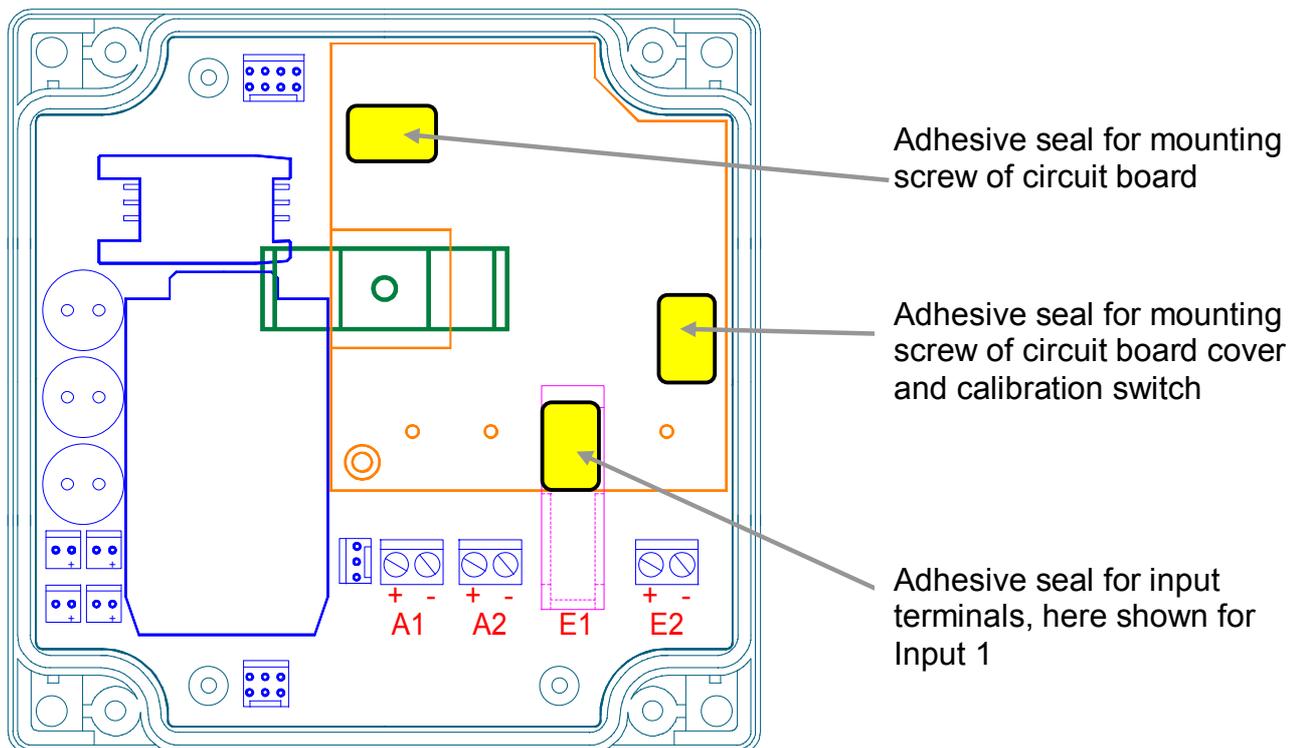
### 3. Close the housing

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

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

☞ **Ensure that the screws are securely tightened so that no moisture can penetrate the DL220.**

## 4.4 Seal layout



# **Part 2**

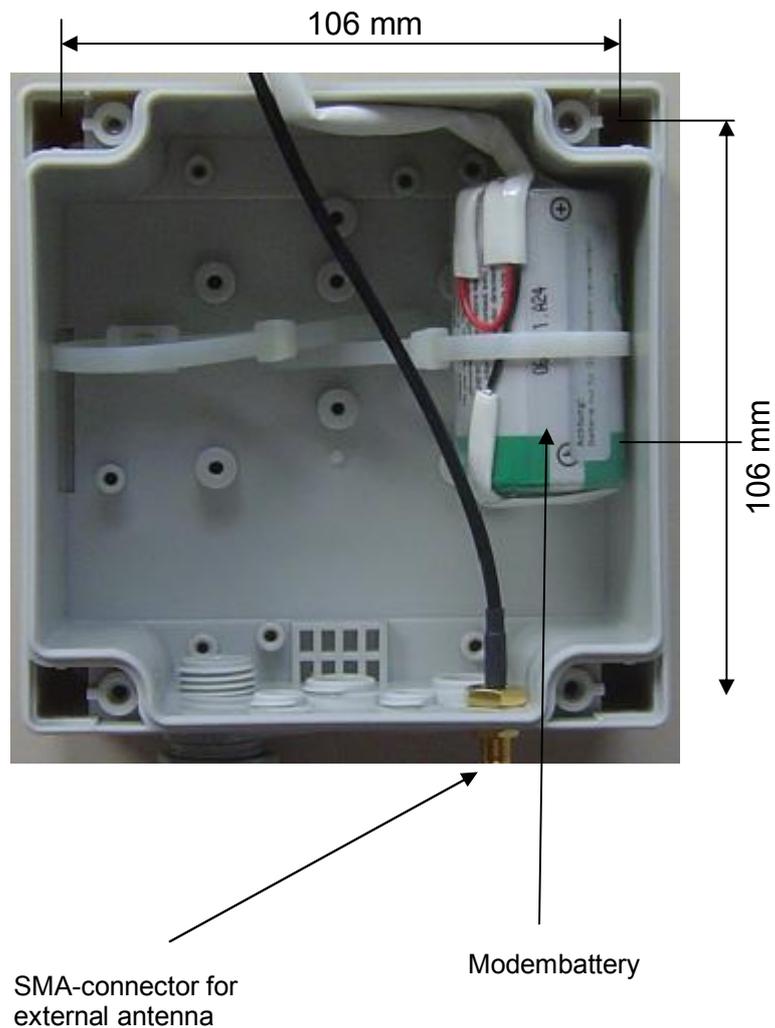
## **Description of the Initial operation**

## 5 Installation

The DL220 is normally intended for mounting on a wall.

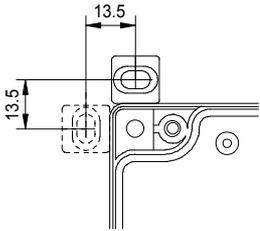
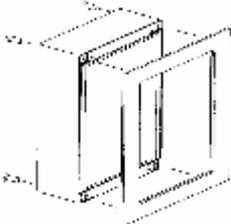
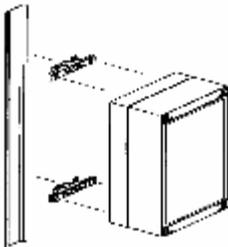
After removal of the two covering strips and opening the housing cover, the holes for wall mounting become accessible

The drilling dimensions can be taken from the adjacent illustration.



### 5.1 Mounting options

In addition, the following options can be obtained for mounting the DL220:

| Designation   | Order number | Drawing  |
|---|--------------|--|
| Wall-mounting bracket   | 04195035     |    |
| Control panel mounting frame  | 04195064     |    |
| Top-hat rail holder   | 04195063     |  |
| Pipe mounting<br>(universal retaining angle with suitable pipe clamp) | 73018057     |  |



## 5.2 Installation procedure

- ☞ ***The installation and any modification must only be carried out by appropriately trained personnel. Therefore, it is essential that you follow the safety instructions in the preface.***

### 5.2.1 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. Cable routing for inputs and outputs

Bring in the cables for the inputs and outputs into the housing via one of the lower cable glands (length in DL220 approx. 15 cm).

- ☞ ***With intrinsically safe inputs take note of the specifications of DIN EN60079-14/VDE 0165 (e.g. blue labels on the cables).***

#### 4. External antenna for GSM modem

The external antenna will be connected to the SMA-connector, see the picture above.

#### 5. Mounting the GSM antenna

The external antenna should first only be fixed temporarily so that the best location can be found during initial operation.

#### 6. 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.

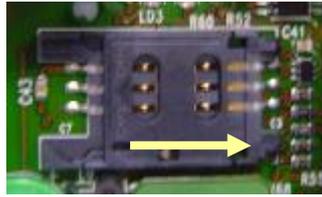
#### 7. Installing the SIM card

Insert the SIM card with release for data transmission into the SIM card holder. A card with PIN interrogation can be used.

- ☞ ***The card must be pushed in with contacts downwards. Do not touch the contacts with the fingers.***

- ☞ ***Before installing the SIM card, it must be ensured that no modem battery is connected to X38 and X40.***

Open SIM  
card holder



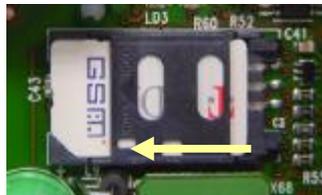
Push the SIM card holder to the right and swivel up.

Insert the SIM  
card



Push the SIM card in the swivelled-up part of the holder. Make sure that the bevelled corner of the SIM card is at the lower left and the contacts point downwards.

Close SIM  
card holder



Swivel the holder with the SIM card shut and push to the left

## 8. Connect all cables to the circuit board

Fit the introduced input cables to the intrinsically input terminals (blue) and the output cables to the output terminals (black) with the aid of conductor ferrules (see 5.2.2).



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



*Make sure that the maximum characteristic data for the inputs and outputs (see A-3-3 and -4) is not exceeded due to the connection of components.*

## 9. Connecting the modem batteries

The modem battery is connected to X38 after inserting the SIM card. If a second modem battery is used, it should be connected to X40. When using two batteries, it is essential to ensure the same type and batch (adhesive label: BMT week / year) and to only change both batteries simultaneously.

## 10. Checking components

- Check whether all connections have been made correctly and the connecting cables are relieved of strain.
- Is the SIM card inserted correctly?
- Is the antenna plug firmly seated on the modem?
- Are the batteries connected correctly?

## 11. Fix the cover to the base section with two mounting screws.

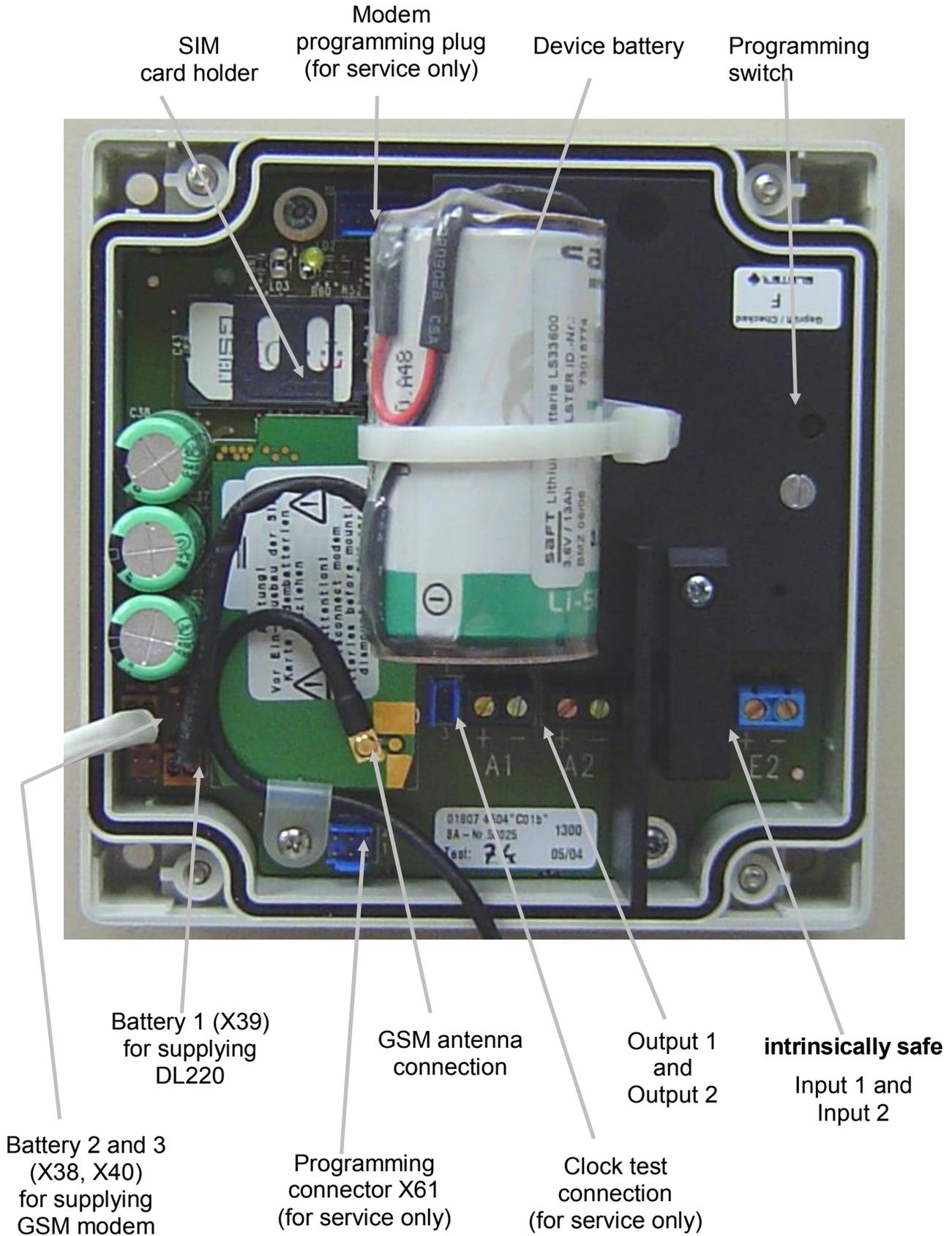


*Make sure that no cables are crushed when fitting the cover.*



*Ensure that the screws are securely tightened so that no moisture can penetrate the DL220.*

### 5.2.2 Terminal layout



### 5.2.3 Setting modem operation

#### 1. Programming the SIM PIN

Programming the PIN for release of the SIM card occurs in the interface list, similar to entering the supplier's combination (see Chapter 0). After branching to the entry mode by pressing "Enter", the first figure of the PIN is entered by pressing  or  (left-justified entry). Then, you change for the entry of the next figure using . In this way combinations of numbers with up to eight places can be entered. If the PIN to be entered is shorter (normally, 4-figure), the entry mode is quit with "Enter" after setting the last place.

#### 2. Setting the time window

**At the factory the Call windows 1 and 2 (for the battery mode) are switched off so as not to load the modem battery unnecessarily. When putting the device into operation, the required window must be set via the WinPADS parameterisation software.**

To ensure the maximum battery service life the GSM modem is only ready for communication within a time window parameterised by the user. Two independent time windows are available. The setting using the keypad is described in Chapter 0. It is more convenient however to carry it out using WinPADS200-DL. Generally the communications time window should be kept as short as possible, because the modem battery service life is very significantly affected by the frequency and duration of the set time window (see Chapter 3.7.4).

 ***Adjustment of the time window period to daily, weekly or monthly can only be implemented using the WinPADS200-DL program. The default setting is monthly.***

#### 3. Setting an event for an SMS spontaneous message

The DL220 offers the possibility of programming an event which results in the sending of an SMS irrespective of the set time windows (see Chapter 3.7.5). Also in this case, the more often such a spontaneous message is triggered, the shorter is the service life of the modem battery. This function should therefore be primarily used for alert messages.

## 5.2.4 Setting the customer-specific parameters

### 1. Putting into operation

All parameters can be set 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.

☞ ***When using the Elster WinVIEW evaluation software, it is essential to set certain values. Refer to Chapter: 5.2.6!***

## 5.2.5 Functional testing

### 1. Functional tests

The LCD is switched on by key depression and the inputs and outputs can be checked (see Chapter 2).

### 2. Setting the time

Set the time in the device using WinPADS200-DL or the keypad.

### 3. Test of pulse metering

The pulse transfer from the meter to the DL220 must be checked for proper functioning.

### 4. Checking the GSM reception / network operator

Under "Interface" – "GSM.N" press the key combination "ENTER". Once logging in is complete, the name of the network operator is displayed.

### 5. Checking the connection set-up

Open the test call time window by entering a value (e.g. ten minutes) (see Chapter 3.7.1). Establish a call with the connected modem using WinPADS.

☞ ***Ensure that during the attempt to establish a connection, the display of the remaining time of the test time window is not "0".***

## 5.2.6 Setting for interfacing to WinVIEW & WinLIS evaluation software

Some settings must be made for the correct interface to the Elster evaluation software, WinVIEW. They can be set via the keypad on the DL220, using the AS-200 or via the WinPADS software:

| Address          | LIS-200 designation             | LIS-100 (DS-100) designation | Remarks   | Setting by                   |            |            | Rights <sup>1</sup> |
|------------------|---------------------------------|------------------------------|---|------------------------------|------------|------------|---------------------|
|                  |                                 |                              |   | Keypad                       | AS-200     | WinPADS    |                     |
| 1:21A<br>2:21A   | Customer number                 | Customer number              | Needed for WinVIEW.   | <b>CuNo</b>                  | <b>Yes</b> | <b>Yes</b> | <b>S</b>            |
| 1:22E<br>2:22E   | DS-100 designation<br>V1,V2     | Device no.                   | Allocation of meters Vx in the Measurement period archive to the DS-100 channels.<br>x1xxxxx = V1                      x3xxxxx = V2       | <b>DS.Ca</b>                 | <b>No</b>  | <b>Yes</b> | <b>S</b>            |
| 1:22F<br>2:22F   | DS-100 designation<br>V1.A,V2.A | Device no.                   | Allocation of meters Vx.A in the Measurement period archive to the DS-100 channels.<br>X2xxxxx = V1.A                      x4xxxxx = V2.A |                              |            |            |                     |
| 13:CF2<br>14:CF2 | DS-100 designation<br>V1,V2     | Device no.                   | Allocation of meters Vx in the Day value archive to the DS-100 channels.<br>X5xxxxx = V1                      x7xxxxx = V2                | <b>No</b>                    | <b>No</b>  | <b>Yes</b> | <b>S</b>            |
| 13:CF3<br>14:CF3 | DS-100 designation<br>V1.A,V2.A | Device no.                   | Allocation of meters Vx.A in the Day value archive to the DS-100 channels.<br>X6xxxxx = V1.A                      x8xxxxx = V2.A          | <b>No</b>                    |            |            |                     |
| 1:222<br>2:222   | Meter no.                       | Meter no.                    | Needed for WinVIEW.   | <b>SNM</b>                   | <b>Yes</b> | <b>Yes</b> | <b>S</b>            |
| 1:21C<br>2:21C   | Meas. point no                  | -                            | Not used in the WinVIEW   | <b>No</b>                    | <b>Yes</b> | <b>Yes</b> | <b>S</b>            |
| 1:203<br>2:203   | Adjustable meter                | Adjustable meter             | Corresponds, for example to mech. reading of the meter.   | <b>V1.P</b><br><b>V2.P</b>   | <b>Yes</b> | <b>Yes</b> | <b>S</b>            |
| 5:150<br>6:150   | Meas. period                    | Interval period              | When interfacing to WinVIEW, the values are restricted to 5, 10, 15, 20, 30, 60 minutes or the day value (=1440 minutes).                 | <b>Mp.I1</b><br><b>Mp.I2</b> | <b>No</b>  | <b>Yes</b> | <b>PL</b>           |
| 1:253<br>2:253   | cp value                        | cp / cpz value               | When interfacing to WinVIEW, only the following decade values are possible: 0.01; 0.1; 1; 10; 100.  | <b>cp.I1</b><br><b>cp.I2</b> | <b>Yes</b> | <b>Yes</b> | <b>PL</b>           |
| 5:141<br>6:141   | Day boundary                    | Day boundary                 | Set ex-works to 06:00 hours.  | <b>DB.I1</b><br><b>DB.I2</b> | <b>No</b>  | <b>Yes</b> | <b>P</b>            |
| 1:208<br>2:208   | Unit                            | -                            | Set ex-works to "m3".   | <b>No</b>                    | <b>No</b>  | <b>Yes</b> | <b>S</b>            |
| -                | -                               | I/O mark                     | Formed by the readout notices in the DL220 (separate for supplier and customer) and adjustable by readout modes in AS-200 and WinPADS.    | <b>No</b>                    | <b>Yes</b> | <b>Yes</b> | <b>U</b>            |

<sup>1</sup> Value is subject: P = calibration lock; PL=PTB-Logbook; S = supplier's lock; U = supplier's or customer's lock

## 5.3 Maintenance

Apart from battery replacement the DL220 operates largely without needing maintenance.

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.

### 5.3.1 Battery replacement (basic unit)

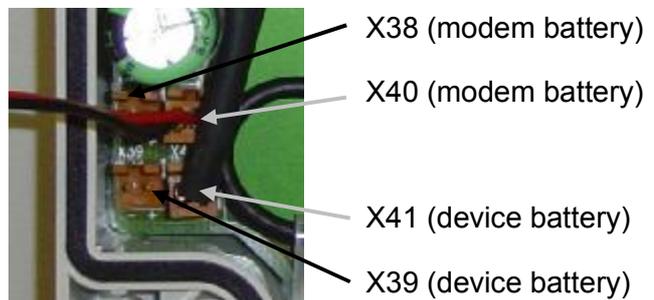
During operation a check must be made from time to time of whether the battery needs to be replaced. A display of the remaining battery service life is provided for this in the DL220 under the list "Service".

- ☞ *With the specified standard operating mode (see A-32), 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.*
- ☞ *DL220 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 even after a power failure.*
- ☞ *Generally, replacement should only be carried out by Elster Service or by specially trained personnel.*

#### 5.3.1.1 Carrying out battery replacement

- ☞ So that no data is lost, a manual backup must be carried out under "Service" – "Save" (Save, address: 1:131). *The date, time and all meter 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 side and identification number of the new battery match the device battery mounted on the cover plate. Normally, the device battery has a black connecting cable.
- (3) If one or two modem batteries are present and if these must also be replaced, then this should be carried out first (see Chapter 5.3.1).



- (4) The new device battery is connected to the free plug X39 or X41. The connectors are fitted with polarity reversal protection and a mech. interlock.

- (5) The old device battery can now be pulled off terminal X39 (X41).
- (6) Reclose the device (make sure that the cable is not pinched).
- (7) Check in the display that no message "3" is entered under "Status"!
- (8) The capacity of the new device battery minus about 30% must be entered under "Service - "Battery capacity" (BAT.C, address: 1:1F3) (**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.
- (9) This successfully concludes the battery replacement.

### 5.3.1.2 Voltage failure during battery replacement

- ☞ *An operating error during battery replacement (e.g. very brief disconnection of the battery) may result in the short designations in the DL220 display not being correctly displayed.*
- ☞ *In this case the battery must be disconnected again for at least 30 s so that reliable initialisation of the DL220 can take place. After starting, the DL220 should start with "Init Device" and "Reset Database". This then ensures reliable operation.*
- ☞ *After the start the DL220 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 2.6.4- Cod.S).*
  - *Time (in the DL220 the time for automatic saving at 00:00 hrs. or for manual saving was restored- see Chap.3.4 - Time).*
  - *Acknowledgement of the error message in the status register (see Chap. 3.3.11).*
  - *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 DL220 could not be acquired. The backed up meter readings are restored and therefore do not, for example, correspond to the mech. metering mechanism. It must, if applicable, be matched under the programming lock.*
- ☞ *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.*

### 5.3.2 Battery replacement (modem battery)

During operation a check must be made from time to time of whether the modem battery needs to be replaced. A display of the modem battery voltage (VbatM) is provided for this in the DL220 under the list "Service". If this voltage is below 3.3V, the modem battery must be replaced.

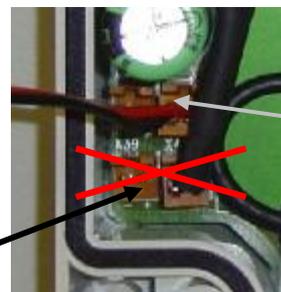
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### 5.3.2.1 Carrying out battery replacement

1. Open up the front cover with the electronics and swivel downwards. The batteries are then accessible in the bottom of the housing.
2. Check whether the size and identification number of the new battery match the modem battery mounted in the bottom of the housing. Normally, the modem battery has a white connecting cable.

☞ *When using two modem batteries, it is essential to ensure that they are of the same type and originate from the same batch (battery adhesive label: BMT week / year). Both modem batteries must always be replaced at the same time.*

3. Pull off the existing modem battery or batteries from the terminals X38 and X40 and plug on the new battery or batteries to these terminals. The connectors are fitted with polarity reversal protection and a mech. interlock.



terminals of the modem batteries

Attention: Don't pull off the device batterie!

4. Reclose the device (make sure that the cable is not pinched).
5. Check in the display that no message "3" is entered under "Status".
6. Under "Interface" – "Network provider" (GSM.N, address: 2:775) press the key combination "Enter" (press the keys  and  simultaneously). The network provider should be displayed after a short time.
7. The voltage figure 3.6V should now be displayed under "Service" – "Modem battery voltage" (VBatM, address: 4:410).
8. This successfully concludes the battery replacement.

# Appendix



**Declaration of Conformance** (Translation of original document)

according to the Directive 89/336/EEC of the Council of 3rd May 1989 and the changes 392L0031, 393L0068, incorporated through 294A0103(52) about the electromagnetic compatibility (EMC)

No. **KCE114**

**Supplier:** ELSTER GmbH  
**Address:** Steinernstrasse 19-21  
D-55252 Mainz-Kastel  
**Product:** Data Logger DL220

The product described above conforms to:

| <b>Document No.</b> | <b>Title</b>  | <b>Issue / publishing date</b> |
|---------------------|---|--------------------------------|
| DIN EN 61326        | Electrical equipment for measurement, control and laboratory use - EMC requirements | March 2002                     |

**Additional details**

Interference emission "Class B",  
Interference immunity according to classification for "Continuous non-supervised operation"

Mainz-Kastel, 16.02.2004

(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"**

ZERTIFIKAT • CERTIFICATE • 認許証書 • CERTIFICADO • CERTIFICAT

(1) EC Type Examination Certificate



(2) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres – **Directive 94/9/EC**

(3) EC Type Examination Certificate Number:

**TPS 04 ATEX 1 001 X**



(4) Equipment: Datalogger DL220  
 (5) Manufacturer: Flster GmbH  
 (6) Address: Steinernstraße 19-21; 55252 Mainz-Kastel; Germany

(7) This equipment and any acceptable variation thereof are specified in the schedule to this certificate and the documents therein referred to.

(8) TÜV Product Service, TÜV SÜD Group, notified body No. 0123 In accordance with Article 9 of the Council Directive 94/9/EC of March 23<sup>rd</sup> 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II of the Directive. The examination and test results are recorded in the confidential report EM64961T

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

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

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC Type Examination Certificate relates only to the design and the construction of the specified equipment in accordance with Directive 94/9/EC. Further requirements of this Directive apply to the manufacture and supply of this equipment.

(12) The marking of the equipment shall include the following:

II (2) G [EEx ib] IIC

Office of certification of explosion protection

Munich, 2004-09-29

J. Blum



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EC Type Examination Certificate without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by TÜV Product Service, TÜV SÜD Group. In case of dispute, the German text shall prevail.  
 The document is internally administrated under the following number: Ex5 04 09 523B2 001 X

**TÜV PRODUCT SERVICE GMBH • Zertifizierstelle • Ridlerstrasse 65 • D-80339 München  
 Gruppe TÜV Süddeutschland**



- (13) **Schedule**
- (14) **EC Type Examination Certificate TPS 04 ATEX 1 001 x**
- (15) Description of equipment:  
 The intrinsically safe entrances E1 and E2 are use to connect a passive sensor which is placed in Zone 1.  
 Ambient temperature:  $-25^{\circ}\text{C} \leq T_a \leq +80^{\circ}\text{C}$
- Electrical data:  
 Exits A1, A2:  $U_m \leq 30\text{V}$  (single fail safe)  
 Entrances E1, E2:  $U_0=10,5\text{V}$ ;  $I_0=0,1\text{mA}$ ;  $P_0=0,75\text{mW}$ ;  $C_0= 2,4\mu\text{F}$ ;  $L_0=\infty$
- (16) Test report: EM64961T
- (17) Special conditions for safe use:  
 If the entrances E1 and E2 are used as associated intrinsically safe supply, it is coercively necessary that the exits A1 and A2 are supplied single fail safe.  
 Only both entrances (E1 and E2) may be used together intrinsically safe or non-intrinsically safe.  
 Further plugs, e.g. connections intended for the case of service, may not be contacted, if one of the two intrinsically safe entrances (E1, E2) is connected with circuit points in the ex area.
- (18) Essential health and safety requirements:  
 met by standards

Office of certification of explosion protection

Munich, 2004-09-29

J. Blum

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EC Type Examination Certificate without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by TÜV Product Service, TÜV SÜD Group. In case of dispute, the German text shall prevail.  
 The document is internally administrated under the following number: Ex5 04 09 52982 001 X

**TÜV PRODUCT SERVICE GMBH • Zertifizierstelle • Ridlerstrasse 65 • D-80339 München**  
**Gruppe TÜV Süddeutschland**

## A-3 Manufacturer's declaration for application of the DL220 in Ex Zone 2

### **Konformitätserklärung**

**zum Einsatz in explosionsgefährdeten Bereichen, Zone 2**

Konformitätserklärung Nr. KX2106

**Der Datalogger**

**DL220**

**ist zum Einsatz in Zone 2**

**für Gase der Temperaturklasse T1 geeignet**

Erläuterungen:

Konformitätserklärung gemäß DIN EN 60079-14 (VDE 0165 Teil 1) in der aktuellen Fassung, Abschnitt 5.2.3, insbes. 5.2.3 c)

Das og. Gerät besitzt im ungestörten Betrieb keine zündfähigen heißen Oberflächen über 450°C und erzeugt bei ungestörtem Betrieb keine Lichtbogen oder Funken.

Gase der Temperaturklasse T1 besitzen eine Zündtemperatur über 450°C. Dazu zählt z.B. Erdgas.

Hinweise:

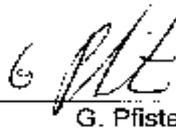
Während aller Montage-, Installations-, Anschlußarbeiten und Steckvorgängen ist sicherzustellen, daß keine explosionsfähige Atmosphäre vorhanden ist und alle Kabel und anzuschließenden Teile frei von Energie (spannungsfrei) sind !

Alle Sicherheitshinweise in der Betriebsanleitung sind zu befolgen !

Diese Konformitätserklärung gilt nur bei Einsatz des Gerätes unter allen in der Betriebsanleitung genannten, geeigneten Betriebsbedingungen wie z.B. Umgebungsbedingungen, Grenzwerte für Spannungen und Ströme usw.



O. Pfaff  
Leiter Elektronik Entwicklung



G. Pfister  
Elektronik Entwicklung

Mainz-Kastel, den 17. Mai 2005

ELSTER GmbH, Steinernstraße 19-21, D-55252 Mainz-Kastel,  
Telefon: +49-(0)6134-605-0, Telefax: +49-(0)6134-605-390

**Translation of original document:****Declaration of Conformance****for use in areas subject to explosion hazards, Zone 2**

Declaration of Conformance No. KX2106

**The Datalogger****DL220****is suitable for use in Zone 2****for gases in the Temperature Class T1**Explanations:

Declaration of conformance according to EN 60079-14 in the current version, section 5.2.3, in particular 5.2.3 c).

In undisturbed operation the above device has no hot surfaces over 450°C capable of causing ignition and in undisturbed operation does not generate any arcs or sparks.

Gases in the Temperature Class T1 have an ignition temperature above 450°C. This includes, for example, natural gas.

Notes:

During all mounting, installation and wiring work and when plugging and unplugging, it must be ensured that no explosive atmosphere is present and that all cables and parts to be connected are not energised (free of voltage).

All safety information in the operating manual must be followed.

This declaration of conformance only applies when using the device under all the suitable operating conditions quoted in the operating manual, such as ambient conditions, limits for voltages and currents, etc.

\_\_\_\_\_  
O. Pfaff  
Manager of Electronics Development

\_\_\_\_\_  
G. Pfister  
Electronics Development

Mainz-Kastel, 17 May 2005

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

Telefon: +49-(0)6134-605-0, Telefax: +49-(0)6134-605-390

## Appendix B: Technical data

### B-1 General data (mechanical)

|                        |   |
|------------------------|---|
| Housing/construction   | Wall-mounted housing, ABS plastic<br>(Material durability: see Chap. 5.3)               |
| Dimensions (W x H x T) | approx. 120 x 120 x 90 mm   |
| Weight                 | approx. 720 g (with one modem battery)  |
| Protection             | IP 64 according to EN60529  |
| Ambient temperature    | DL220 basic unit: -25 °C ... +60 °C<br>with int. GSM modem (Wavecom): -20 °C ... +55 °C |
| Relative humidity      | ≤ 93 % (non-condensing)   |
| Mounting               | Using corrosion-protected screws where possible   |

### B-2 Power supply

|                |  |
|----------------|--|
| Device battery | Lithium battery module, 3.6V, 16.5 Ah; Order no.: 73015774 |
| Modem battery  | Lithium battery module, 3.6V, 13 Ah; Order no.: 73017964   |
| Battery option | Second modem battery module 13 Ah possible                 |

The min. service life of eight years for the basic device is guaranteed for the following **standard operating mode**:

|                        |  |
|------------------------|--|
| Display active         | 1 h / month                                    |
| Measurement 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 <sub>A</sub> = 20 °C                         |

For the modem battery the service life can be estimated based on the table in Chap. 3.7.4

### B-3 Pulse / signal inputs

2 signal inputs with common ground for reed contacts or transistor switches. No extraneous voltages or currents should be fed in. Both inputs can only be used together as intrinsically safe or non-intrinsically safe inputs.

|                   |  |
|-------------------|--|
| Designation       | “E1” (input 1) and “E2” (input 2)  |
| Cable connection  | Plug-in terminals; 0.5 ... 1.5 mm <sup>2</sup> (solid);<br>With flexible cable use wire-end sleeves. |
| Special features  | Each input can be parameterised and sealed separately.   |
| Max. cable length | approx. 100 m depending on ambient conditions (EMC)  |

#### Nominal data



***When connecting the DL220 to Ex Zone 1, the limits quoted in the certificate of conformance must also be followed (see Appendix A:2).***

|                       |   |
|-----------------------|---|
| Open-circuit voltage  | $U_0 \approx 2 \text{ V}$                               |
| Internal resistance   | $R_i \approx 500 \text{ k}\Omega$                       |
| Short-circuit current | $I_s \approx 4 \text{ }\mu\text{A}$                     |
| Switching level "on": | $R_e \leq 100 \text{ k}\Omega$ or $U_e < 0.8 \text{ V}$ |
| Switching level "off" | $R_a \geq 2 \text{ M}\Omega$                            |
| Pulse duration        | $t_e \geq 50 \text{ ms}$                                |
| Space duration        | $t_a \geq 50 \text{ ms}$                                |
| Metering frequency    | $f \leq 10 \text{ Hz}$                                  |

## B-4 Signal and pulse outputs

The two signal and pulse outputs are transistor (MOSFET) outputs which operate separately from one another, but have a common ground.

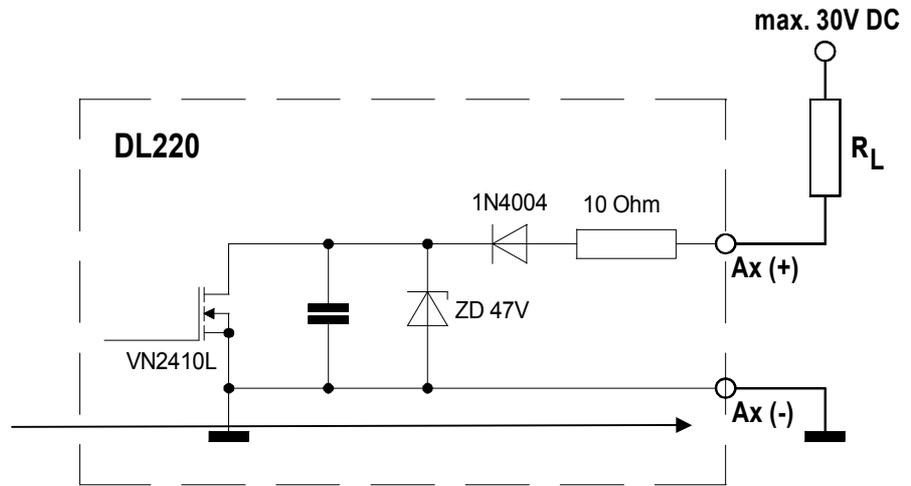
 *When connecting a device placed to Ex Zone 1 to one or both of Inputs I1 and/or I2 it is mandatory that the switching voltage at Output 1 and Output 2 do not exceed 30V even in case of a failure.*

|                     |   |
|---------------------|---|
| Designation         | “A1” (output 1) and “A2” (output 2)   |
| Cable connection    | Plug-in terminals; 0.5 ... 1.5 mm <sup>2</sup> (solid);<br>With flexible cable use wire-end sleeves.  |
| Max. cable length   | approx. 100 m depending on ambient conditions (EMC)   |
| Rated data          | Max. switching voltage $U_0 \leq 30 \text{ V DC}$<br>Max. switching current $I_0 \leq 100 \text{ mA DC}$<br>Voltage drop $\leq 1.7 \text{ V}$ at 50 mA DC<br>Leakage current (for "Off" signal) $\leq 0.001 \text{ mA}$ (at $U_0 = 24 \text{ V}$ ). |
| 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); $T > t_p$ !  |
| Output frequency    | Max. 4 Hz, accuracy of pulse duration +/- 10 %;<br>temporary buffer for 65,535 pulses   |

**Output circuit:**

(Ground is switched !)

The ground points of Outputs 1 and 2 are connected together.



**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 changeover to 9600 Bd (adjustable)   |
| Format     | 1 start, 7 data, 1 parity (even) and 1 stop bit.   |
| Connection | Optical readout head on device front plate (automatic positioning / fixing by magnet)<br>or<br>in device via connector (X61) |

**B-6 Measurement uncertainty**

|                                      |   |
|--------------------------------------|---|
| Volume meter ( $V_x$ )               | No loss of pulses   |
| Momentary flow rate ( $Q_x$ )        | < 5.0 % of measurement (display is not calibrated)              |
| Measurement period flow ( $V_x.Mp$ ) | < 0.1 % of measurement; display in $m^3$ per measurement period |
| Daily flow ( $V_x.Dy$ )              | < 0.1 % of measurement; display in $m^3$ per measurement period |

## Data list

Below all values are listed which can be called via the keypad or interface and also changed depending on the status of the locks.

Via the interface all values must be accessed by means of the "address". On the device the address of the displayed value can be superimposed by pressing the key combination  + .

Explanation of the addresses:

An address consists of an entity, colon and object. The entity and object should be considered as numbers (entity decimal, object hexadecimal) whose leading zeroes can be omitted. Example: The addresses "01:0100" and "1:100" have identical meanings.

Some objects have "sub-objects" whose "sub-object number" is appended to the address with an underscore "\_" (e.g. "1:0140\_1"). This sub-object number should be regarded as a figure after the decimal point: If it is "0", it can be omitted. Example: The addresses "1:100\_0" and "1:100" have identical meanings.

| Adress<br>Instance : Object | Short name |          | Meaning                                    | Version<br>(empty=all) |
|-----------------------------|------------|----------|--|------------------------|
|                             | german     | englisch |  |                        |
| 1...16:0011                 |            |          | Available objects 010x...01Fx              |                        |
| 1...16:0012                 |            |          | Available objects 020x...02Fx              |                        |
| 1...16:0014                 |            |          | Available objects 040x...04Fx              |                        |
| 1...16:0016                 |            |          | Available objects 060x...06Fx              |                        |
| 1...16:0017                 |            |          | Available objects 070x...07Fx              |                        |
| 1...16:0018                 |            |          | Available objects 080x...08Fx              |                        |
| 1...16:001A                 |            |          | Available objects 0A0x...0AFx              |                        |
| 1...16:001B                 |            |          | Available objects 0B0x...0BFx              |                        |
| 1...16:001C                 |            |          | Available objects 0C0x...0CFx              | 1.20                   |
| 1...16:001D                 |            |          | Available objects 0C0x...0CFx              | 1.20                   |
| 1...16:0021                 |            |          | Available entities for objects 010x...01Fx |                        |
| 1...16:0022                 |            |          | Available entities for objects 020x...02Fx |                        |
| 1...16:0024                 |            |          | Available entities for objects 040x...04Fx |                        |
| 1...16:0026                 |            |          | Available entities for objects 060x...06Fx |                        |
| 1...16:0027                 |            |          | Available entities for objects 070x...07Fx |                        |
| 1...16:0028                 |            |          | Available entities for objects 080x...08Fx |                        |
| 1...16:002C                 |            |          | Available entities for objects 0C0x...0CFx | 1.30                   |
| 1...16:002D                 |            |          | Available entities for objects 0D0x...0DFx | 1.20                   |
| 1:0030                      |            |          | Available entities for objects 0Axx        |                        |
| 2:0030                      |            |          | Available entities for objects 0Bxx        |                        |
| 3:0030                      |            |          | Available entities for objects 0Cxx        |                        |
| 1:0040                      |            |          | Available attributes for working objects   |                        |
| 2:0040                      |            |          | Available attributes for archive objects   |                        |
| 1:0050                      |            |          | Number of access parties with own rights   |                        |
| 2:0050                      |            |          | Maximum length of short designations       |                        |
| 3:0050                      |            |          | Maximum length of units                    |                        |
| 1:0100                      | Stat       | Stat     | Total momentary status                     |                        |

| Adress<br>Instance : Object | Short name |          | Meaning  | Version<br>(empty=all) |
|-----------------------------|------------|----------|--|------------------------|
|                             | german     | englisch |  |                        |
| 2:0100                      | StSy       | StSy     | System - momentary status                          |                        |
| 1:0101                      | SReg       | SReg     | Total status register                              |                        |
| 2:0101                      | SRSy       | SRSy     | System status register                             |                        |
| 1...8:0110                  | St.1...8   | St.1...8 | Momentary status 1...8                             |                        |
| 1...8:0111                  | SR.1...8   | SR.1...8 | Status registers 1...8                             |                        |
| 1:0130                      | Clr.X      | Clr.X    | Initialise device                                  |                        |
| 2:0130                      | Clr.V      | Clr.V    | Clear meters (incl. archives and readout notices)  |                        |
| 3:0130                      | Clr.S      | Clr.S    | Clear system data                                  |                        |
| 4:0130                      | Clr        | Clr      | Clear status register                              |                        |
| 1:0131                      | Sich       | Save     | Manual backup (save data)                          |                        |
| 1:0140                      |            |          | Date + time based on system day boundary           |                        |
| 5:0140                      |            |          | Date + time based on day boundary for Input 1      |                        |
| 6:0140                      |            |          | Date + time based on day boundary for Input 2      |                        |
| 1:0140_1                    | jährl      | year     | Date based on system day boundary                  |                        |
| 5:0140_1                    | jährl      | year     | Date based on day boundary for Input 1             |                        |
| 6:0140_1                    | jährl      | year     | Date based on day boundary for Input 2             |                        |
| 1:0140_2                    | montl      | month    | Day and hour based on system day boundary          |                        |
| 5:0140_2                    | montl      | month    | Day and hour based on day boundary for Input 1     |                        |
| 6:0140_2                    | montl      | month    | Day and hour based on day boundary for Input 2     |                        |
| 1:0140_3                    | tägl.      | dayly    | Hour/minute based on system day boundary           |                        |
| 5:0140_3                    | tägl.      | dayly    | Hour / minute based on day boundary for Input 1    |                        |
| 6:0140_3                    | tägl.      | dayly    | Hour / minute based on day boundary for Input 2    |                        |
| 1:0140_4                    | wöch.      | week     | Weekday...second based on system day boundary      |                        |
| 5:0140_4                    | wöch.      | week     | Weekday...second based on day boundary for Input 1 |                        |
| 6:0140_4                    | wöch.      | week     | Weekday...second based on day boundary for Input 2 |                        |
| 1:0140_5                    | montl      | montl    | Day...second based on system day boundary          |                        |
| 5:0140_5                    | montl      | montl    | Day...second based on day boundary for Input 1     |                        |
| 6:0140_5                    | montl      | montl    | Day...second based on day boundary for Input 2     |                        |
| 1:0140_6                    | stün.      | hour     | Minute...second based on system day boundary       | 1.10                   |
| 5:0140_6                    | stün.      | hour     | Minute...second based on day boundary for Input 1  | 1.10                   |
| 6:0140_6                    | stün.      | hour     | Minute...second based on day boundary for Input 2  | 1.10                   |
| 1:0141                      | TG.Sy      | DB.Sy    | System day boundary (only hour)                    |                        |
| 5:0141                      | TG.E1      | DB.I1    | Day boundary Input 1 (only hour)                   |                        |
| 6:0141                      | TG.E2      | DB.I2    | Day boundary Input 2 (only hour)                   |                        |
| 1:0141_1                    | TG.Sy      | DB.Sy    | System day boundary (represented as time)          |                        |
| 5:0141_1                    | TG.E1      | DB.I1    | Day boundary Input 1 (represented as time)         |                        |
| 6:0141_1                    | TG.E2      | DB.I2    | Day boundary Input 2 (represented as time)         |                        |
| 1:0142                      |            |          | Days meter (days since 01.01.1970)                 |                        |
| 5:0142                      |            |          | Day meter Input 1                                  |                        |
| 6:0142                      |            |          | Day meter Input 2                                  |                        |
| 1:0143                      |            |          | Months meter (months since 01.01.1970)             |                        |
| 5:0143                      |            |          | Month meter Input 1                                |                        |
| 6:0143                      |            |          | Month meter Input 2                                |                        |
| 1:0150                      | SICH       | SAVE     | Backup time  |                        |
| 3:0150                      |            |          | SMS-Cycle  |                        |
| 4:0150                      |            |          | (Not used)   |                        |
| 5:0150                      | MP.E1      | MP.I1    | Measurement period Input 1                         |                        |
| 6:0150                      | MP.E2      | MP.I2    | Measurement period Input 2                         |                        |
| 9:0150                      |            |          | (Not used)   |                        |

| Adress<br>Instance : Object | Short name |          | Meaning  | Version<br>(empty=all) |
|-----------------------------|------------|----------|--|------------------------|
|                             | german     | englisch |  |                        |
| 10:0150                     | An1.B      | Cw1.S    | Call acceptance window 1, begin                |                        |
| 11:0150                     | An2.B      | Cw2.S    | Call acceptance window 2, begin                |                        |
| 12:0150                     | GWÜE1      | L.MI1    | Limit Input 1                                  |                        |
| 13:0150                     | GWÜE2      | L.MI2    | Limit Input 2                                  |                        |
| 17:0150                     | MG.E1      | MB.I1    | Month boundary Input 1                         |                        |
| 18:0150                     | MG.E2      | MB.I2    | Month boundary Input 2                         |                        |
| 21:0150                     | TG.E1      | DB.I1    | Day boundary Input 1                           |                        |
| 22:0150                     | TG.E2      | DB.I2    | Day boundary Input 2                           |                        |
| 1...24:0151                 |            |          | Event: Base 1 (for special applications)       |                        |
| 1...24:0153                 |            |          | Event: Status pointer                          |                        |
| 1...24:0154                 |            |          | Source 1 (address) for derivation of the event |                        |
| 1...24:0155                 |            |          | Events designation                             |                        |
| 1...24:0156                 |            |          | Event meter for cyclical events                |                        |
| 1:0157                      |            |          | Mode Event 1                                   |                        |
| 3:0157                      |            |          | Mode Event 3                                   |                        |
| 4:0157                      |            |          | Mode Event 4                                   |                        |
| 5:0157                      |            |          | Mode Event 5                                   |                        |
| 6:0157                      |            |          | Mode Event 6                                   |                        |
| 9:0157                      |            |          | Mode Event 9                                   |                        |
| 10:0157                     |            |          | Mode Event 10                                  |                        |
| 11:0157                     |            |          | Mode Event 11                                  |                        |
| 12:0157                     | MdÜE1      | MdMI1    | Mode for monitoring input 1                    |                        |
| 13:0157                     | MdÜE2      | MdMI2    | Mode for monitoring input 2                    |                        |
| 17:0157                     |            |          | Mode Event 17                                  |                        |
| 18:0157                     |            |          | Mode Event 18                                  |                        |
| 21:0157                     |            |          | Mode Event 21                                  |                        |
| 22:0157                     |            |          | Mode Event 22                                  |                        |
| 1:0158                      |            |          | (Not used)                                     |                        |
| 3:0158                      |            |          | (Not used)                                     |                        |
| 4:0158                      |            |          | (Not used)                                     |                        |
| 5:0158                      |            |          | (Not used)                                     |                        |
| 6:0158                      |            |          | (Not used)                                     |                        |
| 9:0158                      |            |          | (Not used)                                     |                        |
| 10:0158                     | An1.E      | CW1.E    | Call acceptance window 1, end                  |                        |
| 11:0158                     | An2.E      | CW2.E    | Call acceptance window 2, end                  |                        |
| 12:0158                     |            |          | (Not used)                                     |                        |
| 13:0158                     |            |          | (Not used)                                     |                        |
| 17:0158                     |            |          | (Not used)                                     |                        |
| 18:0158                     |            |          | (Not used)                                     |                        |
| 21:0158                     |            |          | (Not used)                                     |                        |
| 22:0158                     |            |          | (Not used)                                     |                        |
| 1...24:0159                 |            |          | Event: Base 2 (for special applications)       |                        |
| 1...24:015A                 | MP.Re      | Mp.Re    | Remaining period to expiry of cyclical event   |                        |
| 1...24:015C                 |            |          | Source 2 (address) for generating the event    |                        |
| 1...24:015D                 |            |          | Source 3 (address) for generating the event    | 1.30                   |
| 1:0160                      | V1MP       | V1.Mp    | Measurement period meter input1                |                        |
| 2:0160                      | V1TG       | V1.Dy    | Day meter input 1                              |                        |

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| Adress<br>Instance: Object | Short name |          | Meaning  | Version<br>(empty=all) |
|----------------------------|------------|----------|--|------------------------|
|                            | german     | englisch |  |                        |
| 3:0160                     | V1MP       | V1.Mp    | Max. meas. Per. count. input 1 current month   |                        |
| 4:0160                     | V1TG       | V1.Dy    | Max. day meter input 1 in curr. month          |                        |
| 5:0160                     | V2MP       | V2.Mp    | Measurement period meter input 2               |                        |
| 6:0160                     | V2TG       | V2.Dy    | Day meter input 2                              |                        |
| 7:0160                     | V2MP       | V2.Mp    | Max. meas. Per. count. input 2 current month   |                        |
| 8:0160                     | V2TG       | V2.Dy    | Max. day meter input 2 in curr. month          |                        |
| 9:0160                     |            |          | (Not used)                                     | 1.10                   |
| 10:0160                    |            |          | (Not used)                                     | 1.10                   |
| 11:0160                    |            |          | (Not used)                                     | 1.30                   |
| 12:0160                    |            |          | (Not used)                                     | 1.30                   |
| 1:0161                     | V1ML       | V1M.L    | Last measurement period value E1               |                        |
| 2:0161                     | V1TL       | V1D.L    | Last day consumption input 1                   |                        |
| 3:0161                     | V1ML       | V1M.L    | Max. meas. per. count. input 1 last month      |                        |
| 4:0161                     | V1TL       | V1D.L    | Max. day meter input 1, last month             |                        |
| 5:0161                     | V2ML       | V2M.L    | Last measurement period value E2               |                        |
| 6:0161                     | V2TL       | V2D.L    | Last day consumption input 2                   |                        |
| 7:0161                     | V2ML       | V2M.L    | Max. meas. per. count. input 2 last month      |                        |
| 8:0161                     | V2TL       | V2D.L    | Max. day meter input 2, last month             |                        |
| 9:0161                     |            |          | (Not used)                                     | 1.10                   |
| 10:0161                    |            |          | (Not used)                                     | 1.10                   |
| 11:0161                    |            |          | (Not used)                                     | 1.30                   |
| 12:0161                    |            |          | (Not used)                                     | 1.30                   |
| 1...12:0162                |            |          | Mode for trap value 1...12                     |                        |
| 1...12:0163                |            |          | Source (address) for generating the trap value |                        |
| 1...12:0164                | Zeit       | Time     | Time stamp for current trap value              |                        |
| 1...12:0164_1              | Datum      | Date     | Date stamp for current trap value              |                        |
| 1...12:0164_2              | Zeit       | Time     | Time of current trap value                     |                        |
| 1...12:0165                | Zeit       | Time     | Time stamp for last trap value                 |                        |
| 1...12:0165_1              | Datum      | Date     | Time of time stamp of last trap value          |                        |
| 1...12:0165_2              | Zeit       | Time     | Time of time stamp of last trap value          |                        |
| 1...12:0166                |            |          | Mode for time stamp for trap value             |                        |
| 1...12:0167                |            |          | Event for starting the next trap value         |                        |
| 1...12:0168                | Stat       | Stat     | Time of current trap value                     |                        |
| 1...12:0169                | Stat       | Stat     | Status for last trap value                     |                        |
| 1...12:016A                |            |          | Mode for status of trap value                  |                        |
| 1...12:016C                |            |          | Block number for current trap value            |                        |
| 1...12:016D                |            |          | Block number for last trap value               |                        |
| 1...12:016E                |            |          | Mode for block number for trap value           |                        |
| 1...12:016F                |            |          | Trap value designation                         |                        |
| 1:0170                     | St.ES      | St.PL    | Programming lock: status / close               |                        |
| 3:0170                     | St.LS      | St.SL    | Supplier's lock: status/close                  |                        |
| 4:0170                     | St.KS      | St.CL    | Customer's lock: status / close                |                        |
| 5:0170                     | St.S5      | St.S5    | Lock 5: status / close                         | 1.30                   |
| 6:0170                     | St.S6      | St.S6    | Lock 6: status / close                         | 1.30                   |
| 7:0170                     | St.S7      | St.S7    | Lock 7: status / close                         | 1.30                   |
| 8:0170                     | St.PL      | St.PL    | PTB-Logbook lock: status                       | 1.30                   |
| 3:0171                     | Cod.L      | Cod.S    | Supplier's combination, enter / change         |                        |
| 4:0171                     | Cod.K      | Cod.C    | Customer's combination, enter / change         |                        |
| 5:0171                     | Cod.5      | Cod.5    | (Not used)                                     | 1.30                   |

| Adress<br>Instance : Object | Short name |           | Meaning   | Version<br>(empty=all) |
|-----------------------------|------------|-----------|---|------------------------|
|                             | german     | englisch  |   |                        |
| 6:0171                      | Cod.6      | Cod.6     | (Not used)  | 1.30                   |
| 7:0171                      | Cod.7      | Cod.7     | (Not used)  | 1.30                   |
| 8:0171                      |            |           | (Not used)  | 1.30                   |
| 1:0180                      | GNr        | Sno       | Serial number   |                        |
| 2:0180                      |            |           | Manufacturer number   |                        |
| 3:0180                      |            |           | Station number  |                        |
| 1:0181                      |            |           | Device designation  |                        |
| 2:0181                      |            |           | Manufacturer's name   |                        |
| 3:0181                      |            |           | Station name  |                        |
| 1:0182                      |            |           | DLMS device number  |                        |
| 1...3:018A                  |            |           | Databook: device data                                       | 1.30                   |
| 1:018A_1                    | B.art      | B.art     | Databook: model   | 1.30                   |
| 2:018A_1                    | PrDat      | PrDat     | Databook: date of technical chek                            | 1.30                   |
| 3:018A_1                    | Auftr      | Auftr     | Databook: order number                                      | 1.30                   |
| 1:018A_2                    | Bauj.      | Bauj.     | Databook: year of manufacture                               | 1.30                   |
| 2:018A_2                    |            |           | (Not used)  | 1.30                   |
| 3:018A_2                    |            |           | (Not used)  | 1.30                   |
| 1:018A_3                    | HW-V.      | HW-V.     | Databook: Hardware Version                                  | 1.30                   |
| 2:018A_3                    |            |           | (Not used)  | 1.30                   |
| 3:018A_3                    |            |           | (Not used)  | 1.30                   |
| 1:018A_4                    | Herst      | Herst     | Databook: manufacturer                                      | 1.30                   |
| 2:018A_4                    | PrSta      | PrSta     | Databook: test plant  | 1.30                   |
| 3:018A_4                    |            |           | (Not used)  | 1.30                   |
| 1:018A_5                    |            |           | (Not used)  | 1.30                   |
| 2:018A_5                    |            |           | (Not used)  | 1.30                   |
| 3:018A_5                    |            |           | (Not used)  | 1.30                   |
| 1:018A_6                    |            |           | (Not used)  | 1.30                   |
| 2:018A_6                    |            |           | (Not used)  | 1.30                   |
| 3:018A_6                    | Kunde      | Kunde     | Databook: customer  | 1.30                   |
| 2:0190                      | Vers       | Vers      | Software version number                                     |                        |
| 2:0190_1                    | Vers       | Vers      | Software version number                                     |                        |
| 2:0191                      | Chk        | Chk       | Software checksum   |                        |
| 2:0192                      | V.HW       | V.HW      | Board version   |                        |
| 2:0193                      | SN.HW      | SN.HW     | Board serial number   |                        |
| 1:019A                      |            |           | File-name basic setting                                     |                        |
| 2:019A                      |            |           | File-name country and language setting                      |                        |
| 3:019A                      |            |           | File-name customer setting                                  |                        |
| 1:019B                      |            |           | Date manufactured, basic setting                            |                        |
| 2:019B                      |            |           | Date manufactured, country and language setting             |                        |
| 3:019B                      |            |           | Date manufactured, customer setting                         |                        |
| 1:01A0                      | Aut.V      | Aut.V     | Time to changeover to standard display                      |                        |
| 2:01A0                      | Disp       | Disp      | Time before display switches off                            |                        |
| 1:01A1                      | Menü       | Menu      | Menu option   | 1.10                   |
| 2:01A1                      |            |           | (Not used)  | 1.10                   |
| 1...15:01C0                 |            |           | Main menu headings  |                        |
| 1...15:01C2                 | UsD1...15  | UsD1...15 | Addresses for adjustable display values (user column, etc.) |                        |
| 1...15:01CB                 |            |           | Addresses for standard output data                          | 1.10                   |

| Adress<br>Instance: Object | Short name |           | Meaning   | Version<br>(empty=all) |
|----------------------------|------------|-----------|---|------------------------|
|                            | german     | englisch  |   |                        |
| 1...15:01CC                |            |           | basic capture value: emerging value                         | 1.30                   |
| 1...15:01CD                |            |           | basic capture value: last value                             | 1.30                   |
| 1...15:01CE                |            |           | basic capture value: mode                                   | 1.30                   |
| 1...15:01CF                |            |           | basic capture value: source                                 | 1.30                   |
| 1...2:01D0                 |            |           | Designation of the data memory 1...2                        |                        |
| 1:01D1                     | ArEEP      | ArEEP     | Size of the archive range in memory 1                       |                        |
| 2:01D1                     | ArRAM      | ArRAM     | Size of the archive range in memory 2                       |                        |
| 1:01D4                     | SzEEP      | SzEEP     | Overall size of memory 1 (EEPROM)                           |                        |
| 2:01D4                     | SzRAM      | SzRAM     | Overall size of memory 2 (RAM)                              |                        |
| 1...7:01E0                 |            |           | Text for time units (seconds ... years; '7:1E0' = not used) |                        |
| 1...7:01E1                 |            |           | Short text for weekdays (Su...Sa)                           |                        |
| 1:01F0                     | MZyk       | MCyc      | Measurement cycle   |                        |
| 1:01F2                     |            |           | Display changeover target                                   |                        |
| 1:01F3                     | Bat.K      | Bat.C     | Battery capacity  |                        |
| 1:01F7                     |            |           | Display test  |                        |
| 1:01F8                     | GONr       | GBNo      | Global block number for archive                             |                        |
| 1:01F9                     |            |           | Backup event  |                        |
| 1:01FA                     | FInfo      | EInfo     | Information on error '8' in system status                   |                        |
| 1:01FA_1                   | FInf1      | EInf1     | Error text 1 for error '8' in system status                 |                        |
| 1:01FA_2                   | FInf2      | EInf2     | Error text 2 for error '8' in system status                 |                        |
| 1:01FA_3                   | FInf3      | EInf3     | Error text 3 for error '8' in system status                 |                        |
| 1:01FA_4                   | FInf4      | EInf4     | Error text 4 for error '8' in system status                 |                        |
| 1:01FB                     |            |           | Remain continually active with ext. power: yes / no         |                        |
| 1:01FD                     |            |           | event pointer value takeover for basic capture value        | 1.30                   |
| 1...2:0200                 | V1...2     | V1...2    | Main meter input 1...2                                      |                        |
| 1...2:0203                 | V1.P       | V1.A      | Adjustable meter input 1...2                                |                        |
| 1...2:0207                 | Md.E1...2  | Md.I1...2 | Mode for input 1...2  |                        |
| 1...2:0208                 |            |           | Unit for input 1...2  |                        |
| 1...2:0210                 | Q1...2     | Q1...2    | Flow on input 1...2   |                        |
| 1...2:0216                 |            |           | Measurement format (no. of dec. places)                     |                        |
| 1...2:0218                 |            |           | Unit for flow input 1...2                                   |                        |
| 1...2:021A                 | KNr        | CuNo      | Customer number, input 1...2                                |                        |
| 1...2:021B                 |            |           | Customer name, input 1...2                                  |                        |
| 1...2:021C                 |            |           | Measuring point number, input 1...2                         |                        |
| 1...2:021D                 |            |           | Measuring point name, input 1...2                           |                        |
| 1...2:021E                 |            |           | Medium (accord. to "EDIS") for input 1...2                  |                        |
| 1...2:021F                 |            |           | Input designations  |                        |
| 1...2:0220                 |            |           | Databook entries Input 1...2                                | 1.30                   |
| 1...2:0220_1               | B.art      | B.art     | meter designation Input 1...2                               | 1.30                   |
| 1...2:0220_2               | Bauj.      | Bauj.     | manufacturing date of the meter Input 1...2                 | 1.30                   |
| 1...2:0220_3               | Herst      | Herst     | manufacturer of tehe meter Input 1...2                      | 1.30                   |
| 1...2:0220_4               | Typ        | Typ       | Type of meter Input 1...2                                   | 1.30                   |
| 1...2:0220_5               | Imp.w      | Imp.w     | Pulse value of the meter Input 1...2                        | 1.30                   |
| 1...2:0221                 | Me.VV      | Me.AA     | Meas. point designation accord. to AA for input 1...2       |                        |
| 1...2:0222                 | SNZ        | SNM       | Serial number of the meter on input 1...2                   |                        |
| 1...2:0226                 |            |           | Raw pulse meter, input 1...2                                |                        |
| 1...2:0227                 |            |           | Frequency, input 1...2                                      |                        |
| 1...2:0228                 | St.E1...2  | St.I1...2 | Status on input 1...2                                       |                        |
| 1...2:022E                 | DS.Za      | DS.Ca     | DS-100 device number for main meter, input 1...2            |                        |

| Adress<br>Instance : Object | Short name |           | Meaning   | Version<br>(empty=all) |
|-----------------------------|------------|-----------|---|------------------------|
|                             | german     | englisch  |   |                        |
| 1...2:022F                  | DS.Zb      | DS.Cb     | DS-100 device number for adjust. meter, input 1...2                         |                        |
| 1...2:0230                  |            |           | Time pitch for SW debouncing in ms  |                        |
| 1...2:0232                  |            |           | SW debounce time period   |                        |
| 1...2:0233                  |            |           | SW debounce-time pulse duration   |                        |
| 1...2:0253                  | CP.E1...2  | cp.l1...2 | cp value input 1...2  |                        |
| 1:0400                      | Zeit       | Time      | Date and time   |                        |
| 1:0400_1                    |            |           | Seconds since 1970 (affected by daylight saving)                            |                        |
| 1:0400_2                    | Datum      | Date      | Date (affected by daylight saving)  |                        |
| 1:0400_3                    | Zeit       | Time      | Time (affected by daylight saving)  |                        |
| 1:0402                      |            |           | Minutes meter (free of daylight saving)                                     |                        |
| 1:0403                      |            |           | Hours meter (free of daylight saving)                                       |                        |
| 2:0404                      | Bat.R      | Bat.R     | Remaining battery service life  |                        |
| 2:0404_1                    | BatRS      | BatRS     | Remaining battery service life in seconds                                   |                        |
| 2:0405                      |            |           | Residual capacity of the battery  |                        |
| 1:0407                      | Mod.Z      | MdTim     | Daylight saving changeover: on / off  |                        |
| 1:040F                      | ZeitZ      | TimeZ     | Time Zone   | 1.20                   |
| 2:040F                      |            |           | (not used)  | 1.20                   |
| 4:0410                      | UBatM      | VBatM     | Modem battery voltage   |                        |
| 4:0416                      |            |           | Data format for modem battery voltage                                       |                        |
| 4:0418                      |            |           | Unit for modem battery voltage  |                        |
| 4:041A                      |            |           | Event 1 for execution of measurement  |                        |
| 4:041B                      |            |           | Event 2 for execution of measurement  |                        |
| 1:0452                      | Jus.Z      | AdjTm     | Adjustment value, clock (crystal inaccuracy)                                |                        |
| 1:0455                      |            |           | Clock adjustment mode   |                        |
| 1:045A                      |            |           | Time adjustment - Reference value   |                        |
| 1:04A0                      |            |           | Summer time, begin  |                        |
| 2:04A1                      |            |           | Battery warning limit (months)  |                        |
| 1:04A8                      |            |           | Summer time, end  |                        |
| 4:04A9                      |            |           | Warning limit for battery voltage   |                        |
| 1...2:0600                  |            |           | Status of output 1...2 (active / inactive)                                  |                        |
| 1...2:0605                  | Md.A1...2  | Md.O1...2 | Mode for Output 1...2   |                        |
| 1...2:0606                  | Qu.A1...2  | Sc.O1...2 | Source Output 1...2   |                        |
| 1...2:0607                  | SzA1...2   | SpO1...2  | Status pointer, Output 1...2  |                        |
| 1...2:060E                  |            |           | Databook: output calibrated?  | 1.30                   |
| 1...2:060F                  |            |           | Designation of Output 1...2   |                        |
| 1...2:0611                  | CP.A1...2  | cp.O1...2 | cp value for Output 1...2   |                        |
| 1...2:0614                  |            |           | switch off output impuls with 'event-output' 1...2                          | 1.30                   |
| 1...2:0615                  |            |           | Aktiv duration for 'event-output' 1...2                                     | 1.30                   |
| 1...2:0616                  |            |           | Time pitch for Output 1...2   |                        |
| 1...2:0617                  |            |           | Period, Output 1...2 (No. of time pitches)                                  |                        |
| 1...2:0618                  |            |           | Pulse duration of output (spec. figure multiplied by time pitch for output) |                        |
| 1...2:0619                  | Pu.A1...2  | Bu.O1...2 | Pulse memory of Output 1...2  |                        |
| 1:0705                      | Md.S1      | Md.S1     | Optical interface mode  |                        |
| 2:0705                      | Md.S2      | Md.S2     | Internal interface mode   |                        |
| 1:0707                      | DF.S1      | DF.S1     | Data format, optical interface  |                        |
| 2:0707                      | DF.S2      | DF.S2     | Data format, internal interface   |                        |

| Adress<br>Instance: Object | Short name |          | Meaning  | Version<br>(empty=all) |
|----------------------------|------------|----------|--|------------------------|
|                            | german     | englisch |  |                        |
| 1:0708                     | BdSt1      | BdSt1    | Initial baud rate of optical interface         |                        |
| 2:0708                     | Bd.S2      | Bd.S2    | Baud rate, internal interface                  |                        |
| 1:0709                     | Bd.S1      | Bd.S1    | Baud rate, optical interface                   |                        |
| 2:0709                     | BdId2      | BdId2    | Baud-rate identification, int. interface       |                        |
| 1...2:070E                 |            |          | Device address (blank = not used)              |                        |
| 1...2:070F                 |            |          | Interface designation                          |                        |
| 1...2:0710                 |            |          | Character timeout (ms)                         |                        |
| 1...2:0711                 |            |          | Response timeout (ms)                          |                        |
| 1...2:0712                 |            |          | Inactivity timeout (s)                         |                        |
| 1...2:0713                 |            |          | Protocol timeout (s)                           |                        |
| 1:0715                     |            |          | (not used)                                     | 1.10                   |
| 2:0715                     |            |          | Timeout GSM-Registration                       | 1.10                   |
| 1:0716                     |            |          | Adressing mode for standard output             | 1.30                   |
| 2:0716                     |            |          | Adressing mode for standard output             | 1.30                   |
| 2:0720                     | Anz.T      | Num.T    | Number of ringing tones before accepting call. |                        |
| 2:0721                     |            |          | Modem initialisation string                    |                        |
| 2:0722                     |            |          | Pointer to status "Time window 1"              |                        |
| 2:0723                     |            |          | Pointer to status "Time window 2"              |                        |
| 2:0727                     | AnTst      | CwTst    | Test call window                               | 1.10                   |
| 2:0728                     | M.INI      | M.INI    | Initialise modem                               |                        |
| 2:0729                     |            |          | Modem termination string                       |                        |
| 2:0731                     | MD.W       | MD.W     | Dialling method mode                           |                        |
| 2:0732                     | ANZ.V      | ANZ.V    | Max. number of dialling attempts               |                        |
| 2:0733                     |            |          | Max waiting time for carrier signal            |                        |
| 2:0734                     | SEND       | Send     | Trigger spontaneous signal (for test)          |                        |
| 2:0734_1                   | SEND       | Send     | Trigger spontaneous signal (for test)          | 1.20                   |
| 2:0736                     | TNr.G      | TNo.D    | Own phone number                               |                        |
| 2:0738                     |            |          | Own modem type                                 | 1.20                   |
| 2:0739                     |            |          | Phone no. of gateway SMS to e-mail             | 1.20                   |
| 2:073A                     |            |          | Phone no. of gateway SMS to fax                | 1.20                   |
| 2:0740                     | SP1.T      | SP1.T    | Recipient Type 1                               |                        |
| 2:0742                     | ANT1       | Resp1    | Last response to Spontaneous Signal 1          |                        |
| 2:0743                     |            |          | SMS centre Access Number 1                     |                        |
| 2:074A                     | ANT2       | Resp2    | Last response to Spontaneous Signal 2          |                        |
| 1...15:0750                |            |          | Short message layouts 1...15: Value 1          | 1.20                   |
| 1...15:0751                |            |          | Short message layouts 1...15: Value 2          | 1.20                   |
| 1...15:0752                |            |          | Short message layouts 1...15: Value 3          | 1.20                   |
| 1...15:0753                |            |          | Short message layouts 1...15: Value 4          | 1.20                   |
| 1...15:0754                |            |          | Short message layouts 1...15: Value 5          | 1.20                   |
| 1...15:0755                |            |          | Short message layouts 1...15: Value 6          | 1.20                   |
| 1...15:0756                |            |          | Short message layouts 1...15: Value 7          | 1.20                   |
| 1...15:0757                |            |          | Short message layouts 1...15: Value 8          | 1.20                   |
| 1...15:0758                |            |          | Short message layouts 1...15: Value 9          | 1.20                   |
| 1...15:0759                |            |          | Short message layouts 1...15: Value 10         | 1.20                   |
| 1...15:075A                |            |          | Short message layouts 1...15: Value 11         | 1.20                   |
| 1...15:075B                |            |          | Short message layouts 1...15: Value 12         | 1.20                   |
| 1...15:075C                |            |          | Short message layouts 1...15: Value 13         | 1.20                   |
| 1...15:075D                |            |          | Short message layouts 1...15: Value 14         | 1.20                   |
| 1...15:075E                |            |          | Short message layouts 1...15: Value 15         | 1.20                   |

| Adress<br>Instance : Object | Short name |          | Meaning                                   | Version<br>(empty=all) |
|-----------------------------|------------|----------|---|------------------------|
|                             | german     | englisch |   |                        |
| 1...15:0761                 |            |          | Name of short message layouts 1...15      | 1.30                   |
| 2:0770                      |            |          | Command for reading PIN (SIM card)        |                        |
| 2:0771                      |            |          | Command for setting PIN (SIM card)        |                        |
| 2:0772                      | PIN        | Pin      | Entry of PIN for SIM card                 |                        |
| 2:0773                      |            |          | Command for auto-login                    |                        |
| 2:0774                      |            |          | Command for reading network operator      |                        |
| 2:0775                      | GSM.N      | GSM.N    | GSM network operator                      |                        |
| 2:0776                      |            |          | Command for read'g recept. level (GSM)    |                        |
| 2:0777                      | GSM.P      | GSM.L    | GSM reception level                       |                        |
| 2:0778                      |            |          | Waiting time for connection formation     |                        |
| 2:077A                      | ANT.P      | P.Sta    | Status PIN of SIM card (GSM)              |                        |
| 2:077B                      |            |          | Command-String: read registration info    | 1.10                   |
| 2:077C                      | StM        | StM      | Modem-Status GSM (Code)                   | 1.10                   |
| 2:077C_1                    | StM        | StM      | Modem-Status GSM (Text)                   | 1.10                   |
| 2:0780                      | APN        | APN      | GPRS access point name („APN“)            | 1.10                   |
| 2:0781                      | UName      | UName    | GPRS SIM-card user name („ID“)            | 1.10                   |
| 2:0782                      | GP.Pw      | GP.Pw    | GPRS SIM-card password                    | 1.10                   |
| 2:0783                      | IPAdr      | IPAdr    | GPRS IP Address                           | 1.10                   |
| 2:0784                      | Port       | Port     | GPRS Port Address                         | 1.10                   |
| 2:0785                      |            |          | GPRS Provider (for manually login)        | 1.10                   |
| 2:0786                      | IPRem      | IPRem    | GPRS IPAdrRemote                          | 1.10                   |
| 2:0787                      |            |          | GPRS T_TxDelay                            | 1.10                   |
| 2:0788                      |            |          | GPRS MultiSlot                            | 1.10                   |
| 2:0789                      |            |          | GPRS T_Log                                | 1.10                   |
| 2:078A                      |            |          | GPRS T_Unlog                              | 1.10                   |
| 2:078B                      |            |          | GPRS T_Mod                                | 1.10                   |
| 2:078C                      | MAtt       | Matt     | GPRS M_Attach                             | 1.10                   |
| 2:078D                      | MSta       | Msta     | GPRS M_Start                              | 1.10                   |
| 2:078E                      | MLis       | Mlis     | GPRS M_Listening                          | 1.10                   |
| 2:0790                      | MOpen      | MOpen    | GPRS M_OpenSocket                         | 1.10                   |
| 2:0791                      | MClos      | MClos    | GPRS M_CloseSocket                        | 1.10                   |
| 2:0792                      | GP.St      | GP.St    | GPRS Status                               | 1.10                   |
| 1:0810                      | Adr        | Add      | Audit Trail: Address of the changed value |                        |
| 1:0811                      | a          | o        | Audit Trail: Old value                    |                        |
| 1:0812                      | n          | n        | Audit Trail: New value                    |                        |
| 1:0840                      | #1         | #1       | Text for message 1 in Stat and S.Reg      |                        |
| 2:0840                      | #1         | #1       | Text for message 1 in St.Sy and SR.Sy     |                        |
| 1:0841                      | #2         | #2       | Text for message 2 in Stat and S.Reg      |                        |
| 2:0841                      | #2         | #2       | Text for message 2 in St.Sy and SR.Sy     |                        |
| 1:0842                      | #3         | #3       | Text for message 3 in Stat and S.Reg      |                        |
| 2:0842                      | #3         | #3       | Text for message 3 in St.Sy and SR.Sy     |                        |
| 1:0843                      | #4         | #4       | Text for message 4 in Stat and S.Reg      |                        |
| 2:0843                      | #4         | #4       | Text for message 4 in St.Sy and SR.Sy     |                        |
| 1:0844                      | #5         | #5       | Text for message 5 in Stat and S.Reg      |                        |
| 2:0844                      | #5         | #5       | Text for message 5 in St.Sy and SR.Sy     |                        |
| 1:0845                      | #6         | #6       | Text for message 6 in Stat and S.Reg      |                        |
| 2:0845                      | #6         | #6       | Text for message 6 in St.Sy and SR.Sy     |                        |

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| Adress<br>Instance: Object | Short name |          | Meaning                                      | Version<br>(empty=all) |
|----------------------------|------------|----------|--|------------------------|
|                            | german     | englisch |  |                        |
| 1:0846                     | #7         | #7       | Text for message 7 in Stat and S.Reg         |                        |
| 2:0846                     | #7         | #7       | Text for message 7 in St.Sy and SR.Sy        |                        |
| 1:0847                     | #8         | #8       | Text for message 8 in Stat and S.Reg         |                        |
| 2:0847                     | #8         | #8       | Text for message 8 in St.Sy and SR.Sy        |                        |
| 1:0848                     | #9         | #9       | Text for message 9 in Stat and S.Reg         |                        |
| 2:0848                     | #9         | #9       | Text for message 9 in St.Sy and SR.Sy        |                        |
| 1:0849                     | #10        | #10      | Text for message 10 in Stat and S.Reg        |                        |
| 2:0849                     | #10        | #10      | Text for message 10 in St.Sy and SR.Sy       |                        |
| 1:084A                     | #11        | #11      | Text for message 11 in Stat and S.Reg        |                        |
| 2:084A                     | #11        | #11      | Text for message 11 in St.Sy and SR.Sy       |                        |
| 1:084B                     | #12        | #12      | Text for message 12 in Stat and S.Reg        |                        |
| 2:084B                     | #12        | #12      | Text for message 12 in St.Sy and SR.Sy       |                        |
| 1:084C                     | #13        | #13      | Text for message 13 in Stat and S.Reg        |                        |
| 2:084C                     | #13        | #13      | Text for message 13 in St.Sy and SR.Sy       |                        |
| 1:084D                     | #14        | #14      | Text for message 14 in Stat and S.Reg        |                        |
| 2:084D                     | #14        | #14      | Text for message 14 in St.Sy and SR.Sy       |                        |
| 1:084E                     | #15        | #15      | Text for message 15 in Stat and S.Reg        |                        |
| 2:084E                     | #15        | #15      | Text for message 15 in St.Sy and SR.Sy       |                        |
| 1:084F                     | #16        | #16      | Text for message 16 in Stat and S.Reg        |                        |
| 2:084F                     | #16        | #16      | Text for message 16 in St.Sy and SR.Sy       |                        |
| 1...8:0850                 | #1         | #1       | Text for message 1 in St.1...4 and SR.1...8  |                        |
| 1...8:0851                 | #2         | #2       | Text for message 2 in St.1...4 and SR.1...8  |                        |
| 1...8:0852                 | #3         | #3       | Text for message 3 in St.1...4 and SR.1...8  |                        |
| 1...8:0853                 | #4         | #4       | Text for message 4 in St.1...4 and SR.1...8  |                        |
| 1...8:0854                 | #5         | #5       | Text for message 5 in St.1...4 and SR.1...8  |                        |
| 1...8:0855                 | #6         | #6       | Text for message 6 in St.1...4 and SR.1...8  |                        |
| 1...8:0856                 | #7         | #7       | Text for message 7 in St.1...4 and SR.1...8  |                        |
| 1...8:0857                 | #8         | #8       | Text for message 8 in St.1...4 and SR.1...8  |                        |
| 1...8:0858                 | #9         | #9       | Text for message 9 in St.1...4 and SR.1...8  |                        |
| 1...8:0859                 | #10        | #10      | Text for message 10 in St.1...4 and SR.1...8 |                        |
| 1...8:085A                 | #11        | #11      | Text for message 11 in St.1...4 and SR.1...8 |                        |
| 1...8:085B                 | #12        | #12      | Text for message 12 in St.1...4 and SR.1...8 |                        |
| 1...8:085C                 | #13        | #13      | Text for message 13 in St.1...4 and SR.1...8 |                        |
| 1...8:085D                 | #14        | #14      | Text for message 14 in St.1...4 and SR.1...8 |                        |
| 1...8:085E                 | #15        | #15      | Text for message 15 in St.1...4 and SR.1...8 |                        |
| 1...8:085F                 | #16        | #16      | Text for message 16 in St.1...4 and SR.1...8 |                        |
| 1...6:0860                 |            |          | Text for 'Modem-Status GSM' (77C_1)          | 1.10                   |
| 1...10:0890                |            |          | LIS200-Adress for OBIS-Code                  | 1.30                   |
| 1...10:0891                |            |          | OBIS-Code                                    | 1.30                   |
| 1:08AF                     |            |          | Statusword according Selma                   | 1.30                   |
| 1...12:08D0                |            |          | Free user texts (each max. 62 characters)    |                        |
| 1...2:08F0                 |            |          | Manufacturer diagnostic informationen        | 1.30                   |
| 1...2:08F1                 |            |          | Manufacturer diagnostic informationen        | 1.30                   |
| 1:08F9                     |            |          | Keyboard simulation                          | 1.10                   |
| 2:08F9                     |            |          | (not used)                                   | 1.10                   |
| 1:08FA                     |            |          | Display content line 1                       | 1.10                   |
| 2:08FA                     |            |          | Display content line 2                       | 1.10                   |
| 1:08FD                     | Clr.A      | Clr.A    | Clear measurement archives                   | 1.10                   |
| 2:08FD                     |            |          | (not used)                                   | 1.10                   |

| Adress<br>Instance : Object | Short name |          | Meaning  | Version<br>(empty=all) |
|-----------------------------|------------|----------|--|------------------------|
|                             | german     | englisch |  |                        |
| 2:08FF                      |            |          | Labelling "Value not calibrated"                                 |                        |
| 1...15:0A00                 |            |          | Memory no. in which the archive is located                       |                        |
| 1...15:0A01                 | ArSiz      | ArSiz    | Archive memory depth (no. of data records)                       |                        |
| 1...15:0A20                 | AONr       | ABNo     | Internal archive block number                                    |                        |
| 1...15:0A21                 | Check      | Check    | Checksum, archive data record (CRC)                              |                        |
| 1...15:0A22                 | Er         | Ev       | Trigger event for last archive data record                       |                        |
| 1:0A30                      | ArMo1      | ArMo1    | Display of month archive input 1                                 |                        |
| 2:0A30                      | ArMP1      | ArMP1    | Display of measurement period archive input 1                    |                        |
| 3:0A30                      | ArMo2      | ArMo2    | Display of month archive input 2                                 |                        |
| 4:0A30                      | ArMP2      | ArMP2    | Display of measurement period archive input 2                    |                        |
| 10:0A30                     | Logb.      | Logb.    | Display of logbook   |                        |
| 11:0A30                     | ArAen      | AudTr    | Display of audit trail   |                        |
| 12:0A30                     | PLogb      | PLogb    | Display of PTB-Logbook   | 1.30                   |
| 13:0A30                     | ArTg1      | ArDy1    | Display of day archive 1   | 1.30                   |
| 14:0A30                     | ArTg2      | ArDy2    | Display of day archive 2   | 1.30                   |
| 1...15:0A32                 |            |          | Archive data record type (for WinLIS, WinView)                   |                        |
| 1...15:0A33                 |            |          | Text for event 'Change of archive-relevant data'                 |                        |
| 1...15:0A35                 |            |          | event for determination the day boundary                         | 1.30                   |
| 2:0A50                      | FrMP1      | FrMP1    | Command 'Save data record' in meas. per. arch. input 1           |                        |
| 4:0A50                      | FrMP2      | FrMP2    | Command 'Save data record' in meas. per. arch. input 2           |                        |
| 12:0A51                     |            |          | Stop PTB logbook   | 1.30                   |
| 12:0A52                     | ClrPL      | ClrPL    | Clear PTB-Logbook  | 1.30                   |
| 12:0A53                     |            |          | Time of last clearing of PTB logbook                             | 1.30                   |
| 1...15:0A60                 |            |          | Trigger event 1 for the relevant archive                         |                        |
| 1...15:0A61                 |            |          | Trigger event 2 for the relevant archive                         |                        |
| 1...15:0A62                 |            |          | Trigger event 3 for the relevant archive                         |                        |
| 1...15:0A63                 |            |          | Trigger event 4 for the relevant archive                         |                        |
| 1...15:0A64                 |            |          | Trigger event 5 for the relevant archive                         |                        |
| 1...15:0A65                 |            |          | Trigger event 6 for the relevant archive                         |                        |
| 1...15:0B02                 |            |          | Readout control: Code for readout time period - supplier         |                        |
| 1...15:0B03                 |            |          | Readout control: Code for readout time period - customer         |                        |
| 1...15:0B04                 |            |          | Readout control: Code for readout time period - maintenance      |                        |
| 1...15:0B05                 |            |          | Readout control: Code for readout time period – network operator |                        |
| 1...15:0B12                 |            |          | Readout control: Position of note value - supplier               |                        |
| 1...15:0B13                 |            |          | Readout control: Position of note value - customer               |                        |
| 1...15:0B14                 |            |          | Readout control: Position of note value - maintenance            |                        |
| 1...15:0B15                 |            |          | Readout control: Position of note value – network operator       |                        |
| 1...15:0B22                 |            |          | Readout control: Note value - supplier                           |                        |
| 1...15:0B23                 |            |          | Readout control: Note value - customer                           |                        |
| 1...15:0B24                 |            |          | Readout control: Note value - maintenance                        |                        |
| 1...15:0B25                 |            |          | Readout control: Note value – network operator                   |                        |
| 1...15:0B32                 |            |          | Readout control: Note text - supplier                            |                        |
| 1...15:0B33                 |            |          | Readout control: Note text - customer                            |                        |
| 1...15:0B34                 |            |          | Readout control: Note text - maintenance                         |                        |
| 1...15:0B35                 |            |          | Readout control: Note text – network operator                    |                        |
| 1:0C00                      |            |          | 1 <sup>st</sup> meter in month archive input 1                   |                        |
| 2:0C00                      |            |          | 1 <sup>st</sup> meter in measuring period archive input 1        |                        |

| Adress<br>Instance: Object | Short name |          | Meaning   | Version<br>(empty=all) |
|----------------------------|------------|----------|---|------------------------|
|                            | german     | englisch |   |                        |
| 3:0C00                     |            |          | 1 <sup>st</sup> meter in month archive input 2            |                        |
| 4:0C00                     |            |          | 1 <sup>st</sup> meter in measuring period archive input 2 |                        |
| 13:0C00                    |            |          | 1 <sup>st</sup> meter in day archive input 1              | 1.30                   |
| 14:0C00                    |            |          | 1 <sup>st</sup> meter in day archive input 2              | 1.30                   |
| 1:0C01                     |            |          | 2 <sup>nd</sup> meter in month archive input 1            |                        |
| 2:0C01                     |            |          | 2 <sup>nd</sup> meter in measuring period archive input 1 |                        |
| 3:0C01                     |            |          | 2 <sup>nd</sup> meter in month archive input 2            |                        |
| 4:0C01                     |            |          | 2 <sup>nd</sup> meter in measuring period archive input 2 |                        |
| 13:0C01                    |            |          | 2 <sup>nd</sup> meter in day value archive input 1        | 1.30                   |
| 14:0C01                    |            |          | 2 <sup>nd</sup> meter in day value archive input 2        | 1.30                   |
| 13:0CF0                    |            |          | Measurement period of the day value archive Input 1       | 1.30                   |
| 14:0CF0                    |            |          | Measurement period of the day value archive Input 2       | 1.30                   |
| 13:0CF1                    |            |          | Start of day of the day value archive Input 1             | 1.30                   |
| 14:0CF1                    |            |          | Start of day of the day value archive Input 2             | 1.30                   |
| 13:0CF2                    |            |          | DS-100 device no. for day value archive Input 1, value 1  | 1.30                   |
| 14:0CF2                    |            |          | DS-100 device no. for day value archive Input 2, value 1  | 1.30                   |
| 13:0CF3                    |            |          | DS-100 device no. for day value archive Input 1, value 2  | 1.30                   |
| 14:0CF3                    |            |          | DS-100 device no. for day value archive Input 2, value 2  | 1.30                   |
| 1...10:0D00                |            |          | Event for sending the short message 1...10                | 1.20                   |
| 1...10:0D01                |            |          | Number of recipients for short message 1...10             | 1.20                   |
| 1...10:0D02                |            |          | Layout number of SM for short message 1...10              | 1.20                   |
| 1...10:0D04                |            |          | Recipient 1 for short message 1...10                      | 1.20                   |
| 1...10:0D05                |            |          | Recipient 2 for short message 1...10                      | 1.20                   |
| 1...10:0D06                |            |          | Type of delivery to recipient 1 for short message 1...10  | 1.20                   |
| 1...10:0D07                |            |          | Type of delivery to recipient 2 for short message 1...10  | 1.20                   |
| 1...10:0D08                |            |          | Result of SM to recipient 1 for short message 1...10      | 1.20                   |
| 1...10:0D09                |            |          | Result of SM to recipient 2 for short message 1...10      | 1.20                   |
| 1...10:0D0A                |            |          | Delay range for short message 1...10                      | 1.20                   |
| 1...3:0D10                 |            |          | Name of network provider for GSM network 1...3            | 1.20                   |
| 1...3:0D11                 |            |          | Dial-up number for analogue trans. for GSM network 1...3  | 1.20                   |
| 1...3:0D12                 |            |          | Data format for analogue modem for GSM network 1...3      | 1.20                   |
| 1...3:0D13                 |            |          | Data format for GSM network 1...3                         | 1.20                   |
| 1...3:0D14                 |            |          | Baud rate for GSM network 1...3                           | 1.20                   |
| 1...3:0D15                 |            |          | Supplement to modem init. string for GSM network 1...3    | 1.20                   |
| 1...5:0D20                 |            |          | Name of recipient for destination 1...5                   | 1.20                   |
| 1...5:0D21                 |            |          | Network provider for destination 1...5                    | 1.20                   |
| 1...5:0D22                 |            |          | Phone no. of recipient for destination 1...5              | 1.20                   |
| 1...5:0D23                 |            |          | E-mail addr. for SMS-to-e-mail for destination 1...5      | 1.20                   |
| 1...5:0D24                 |            |          | Message format for destination 1...5                      | 1.20                   |
| 1...5:0D25                 |            |          | SMS separator for destination 1...5                       | 1.20                   |
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