INTEGRA METERING

CALEC® ST III

KNX® TP1

Table of contents

1 General information

1.1 Content

This communication description includes only specific information about CALEC® ST III with the KNX® TP1 module. Further information is available in the technical documentation of CALEC® ST III.

REFERENCE!

You will find **further documentation** on our websites.

International clients:	https://integra-metering.com/product/calec-st-iii-standard-smart/
German clients:	https://aquametro.de/product/calec-st-iii-standard-smart/
Swiss Clients (DE):	https://aquametro.com/product/calec-st-iii-standard-smart/
Swiss Clients (FR):	https://aquametro.com/fr/product/calec-st-iii-standard-smart/

General information about KNX® can be found at www.knx.org

1.2 Definition

As a fieldbus for building automation, KNX® is an open standard for home and building system technology. It is approved according to European standards CENELEC EN 50090 and CEN EN 13321-1 as well as the Chinese standard GB/T 20965 and international standard ISO/IEC 14543-3. With KNX® heating, lighting, blinds, ventilation and safety technology can be controlled across all systems and requirements.

1.3 Registered trademark and brand names

KNX®, as well as the **KNX® logo** are registered trademarks of the KNX Association in Brussels. The name of **KNX Association** is a registered trademark.

1.4 Certification according to KNX® standard

CALEC® ST III with the KNX® TP1 module is certified according to the following test standards:

Test standards
08_07_01 System Conformace Testing - Interworking Tests v01.02.01 AS

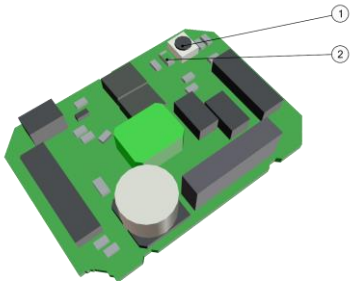
2 Hardware

2.1 Communication interface

INTEGRA METERING AG uses a communication interface defined by the KNX® technology with twisted-pair wiring (2-wire).

CALEC® ST III: Overview of supported functions			
Function	**Parameter**	**Value description**	**More information**
Manufacturer ID	403	-	This identification is valid for INTREGA METERING AG
Device type	050.060	-	-
Individual address	15.15.255	Factory setting	-
Data protocol	KNX® TP1	-	TP 1 (2-line twisted pair)
Version	0xc0 Volume 0xc1 Mass 0xc2 Flow 0xc4 BDE 0xc7 TGR 0xc8 BDV 0xc9 DTF	-	-
Program version	1.1	-	-
Baud rate	9600 Bit/s	-	-
Bus power	10 mA	-	-

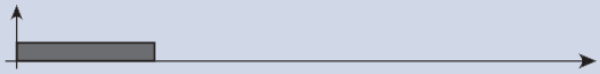
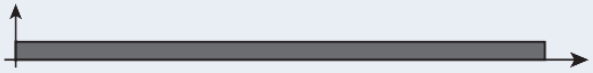
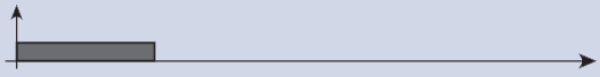
2.2 Programming button and device LED



① Programming button

② Device LED

On the print a device LED is located. It can be used to interpret the system status via the following blink codes:

Flash codes of the device LED	
A: Normal operation 	When switched on, the LED lights up briefly (about 1 sec.) and then goes out. The KNX® controller is configured and works correctly.
B: Programming mode (individual address) 	After pressing the programming button the LED lights up until the programming process is completed.
C: Programming (application) 	After the loading process is over, the LED lights up briefly (about 1 sec.) and then goes out.

3 Commissioning

3.1 Commissioning of CALEC® ST III with the KNX® TP1 interface

After connecting the KNX cable to the terminals A11 (red) and B11 (black) module #1 or A21 (red) and B21 (black) module #2 or also still possible daisy chain connections on terminals A12 (red) B12 (black) for module #1.
A22 (red) B22 (black) for module #2, the following steps must be carried out:

Step-by-step guide		
Step	**Measure**	**Description**
1	Configuration of CALEC® ST III for use of the application	The respective information can be found in the operating instructions of CALEC® ST III.
2	Configuration of CALEC® ST III for KNX® use	This step must not be performed. All parameters are set via ETS5®. CALEC® ST III has no KNX menu.
3	Configuration of the KNX® module via ETS5®	According to this description The commands, parameters and communication objects are described in the following chapters

3.2 CALEC® ST III KNX® commands

In addition to the internal cyclic functions, the following commands are available to the network user:

3.2.1 Device LED: "Flashing command"

To locate a device whose individual address is known, the KNX® technology provides a so-called "flashing command". If this is executed via the ETS5®, the addressed node reacts optically. CALEC® ST III supports the network command "flashing" with the following procedure:

- The device LED flashes in a 3 Hz cycle until the "flashing command" is ended via the ETS5®.

"Flash" can be used as an aid in service work to facilitate finding the desired device.

3.2.2 Device LED: "On / Off command"

Also, the device LED can be statically turned on and off. CALEC® ST III supports the network command "on/off" with the following procedure:

- The device LED lights up when pressing the "On" button
- The device LED goes out when pressing the "Off" button

The "On / Off function" can be used as an aid in service work to facilitate finding the desired device.

3.2.3 Freeze command

Via the communication object "CO 134 Freeze CO" (see chapter 4.2 Supported KNX® communication objects) CALEC® ST III starts an instant freeze of meter values.
If the 'freeze' command is sent via the network, the calculator immediately saves the save date and all active meter readings. The frozen values can be read out using the "CO 135 Query datas CO" communication object via the value 0. A delay of up to 6 seconds needs to be considered.
The freeze data are not available via the display of the calculator.

3.2.4 Relay remote control command

If the functional programming of the two relays is set as follows:

Operating menu: OUTPUTS ↵ NR: 1 or 2 ↵ FCT: M-BUS ↵

these can be switched on or off via remote command:

Relay 1	The communication object "CO 137 Relay 1 - Switch On/Off" controls the condition of relay 1
Relay 2	The communication object "CO 139 Relay 2 - Switch On/Off" controls the condition of relay 2

3.3 Memory values

Under KNX®, CALEC® ST III is not providing all the memory data sets available in the calculator as variables.

Besides the current values and the instant values the following data sets are made available:

- The log data for all 500 data loggers. The readout takes place via the communication object "CO 135 Query data CO" in the value range 1 - 500
- The freeze data (frozen values). The readout takes place via the communication object "CO 135 Query data CO" with the value 0

4 CALEC® ST III KNX® parameters and objects

4.1 Supported KNX® parameters

CALEC® ST III with KNX® TP1 supports the following parameters. These are made available for configuration of communication objects of the KNX® module. The parameterisation takes exclu-sively place via the ETS5® and is provided depending on the device version.

General		
Parameters	**Value**	**Description**
Device type	Standard Mass Flow BDE TGR BDV DTF	Selection of CALEC® ST III device variant
Customer text field	Yes No	Acivates or deactivates the configuration of the parameters Text field 1 to Text field 4
Text field 1	A<- L1 ->B	Empty text field with max. 10 characters
Text field 2	C<- L2 ->D	Empty text field with max. 10 characters
Text field 3	E<- L3 ->F	Empty text field with max. 10 characters
Text field 4	G<- L4 ->H	Empty text field with max. 10 characters
Delay before starting to send after restart	1s ….. 4min	Adjustable
Delay for cyclical sending	No cyclical sending 1s ….. 18h	Configurable and adjustable

General / Sending		
Parameters	**Value**	**Description**
Communication object "General" **CO - number 0**	Never On restart On restart + cyclic	Transmission behaviour of the communication objects "Gen-eral"
Communication object "General" **CO - number 1 - 16**	Never On restart On restart + cyclic On restart + on change	Transmission behaviour of the communication objects "Gen-eral"
Transmission rate limitation for communication ob-jects "General" **CO - number 1 - 2** **CO - number 4 - 16**	No limitation 1s ….. 1min	Configurable and adjustable

Standard type		
Parameters	**Value**	**Description**
Sending current and instant values	Yes No	Activates or deactivates the meter readings and current values
Sending logger values	Yes No	Activates or deactivates the logger values
Sending freeze values	Yes No	Activates or deactivates the freezer values

Standard type / Current and Instant values		
Parameters	**Value**	**Description**
Communication object "Current values" **CO - number 17 - 44**	Never On restart On restart + cyclic On restart + on change	Transmission behaviour of the communication objects "Current values"
Transmission rate limitation for communication objects "Current values" **CO - number 17 - 44**	No limitation 1s ….. 1min	Configurable and adjustable
Communication object "Instant values" **CO - number 45 - 51**	Never On restart On restart + cyclic On restart + on change	Transmission behaviour of the communication objects "Instant values"
Transmission rate limitation for communication objects "Instant values" **CO - number 45 - 51**	No limitation 1s ….. 1min	Configurable and adjustable

Standard type / Logger values		
Parameters	**Value**	**Description**
Communication object "Logger" **CO - number 52 - 92**	Never On request	Transmission behaviour of the communication objects "Logger"
Transmission rate limitation for communication objects "Logger" **CO - number 52 - 92**	No limitation 1s ….. 1min	Configurable and adjustable

Standard type / Freeze values		
Parameters	**Value**	**Description**
Communication object "Freeze" **CO - number 93 - 133**	Never On request	Transmission behaviour of the communication objects "Freeze"
Transmission rate limitation for communication objects "Freeze" **CO - number 93 - 133**	No limitation 1s ….. 1min	Configurable and adjustable

Relay 1		
Parameters	**Value**	**Description**
Use relay **CO - number 137**	Yes No	Activates or deactivates the switch contact relay 1

Relay 2		
Parameters	**Value**	**Description**
Use relay **CO - number 139**	Yes No	Activates or deactivates the switch contact relay 2

4.2 Supported KNX® communication objects

CALEC® ST III with KNX® TP1 supports the following communication objects. These are made available depending on the device variant.

General information

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
0	**General - Device operating status**	**Inactive / Active**	**1 bit, 1.002**	**R/C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**

1: Device is running
0: Device is not running
The KNX option board can send "1" for signalling activity. This CO can be used for monitoring the device if set to be sent cyclically, so failing devices can be detected.

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
1	**General - Communication failure status**	**Alarm / No alarm**	**1 bit, 1.002**	**R/C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**

0: Communication between KNX option board and calculator is OK
1: Communication between KNX option board and calculator is erroneous

The KNX option board is constantly communicating with the calculator. If communication is erroneous, KNX option board will try to repair it (for ex. If communication speed has been changed manually in calculator, the KNX option board will set it back to initial speed).
Actual communication status is available on this CO.

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
2	**General - Device type status**	**Calculator type (ASCII)**	**Max. 14 chars, 16.000**	**R/C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**

"Standard":	Calculator type is 0xC0,	standard energy calculator with volume display
"Mass":	Calculator type is 0xC1,	standard energy calculator with mass display
"Flow":	Calculator type is 0xC2,	flowmeter
"BDE":	Calculator type is 0xC4,	bidirectional energy measurement driven by temperature difference
"TGR":	Calculator type is 0xC7,	energy calculator with reference temperature controlled tariffs
"BDV":	Calculator type is 0xC8,	bidirectional energy measurement driven by an external control signal
"DTF":	Calculator type is 0xC9,	double-tariff energy calculator
"Unknown":	Calculator type is none of above, or could not be read out	

KNX option board is constantly communicating with calculator. Also device type of calculator is queried, and displayed as user readable ASCII string.

Rem.: The monitored device type is the real one communicated by calculator, and can be different from type set by user within parameters.
Rem.: If device type could not be read out of calculator (missing power supply, faulty communication, …), this CO will display "Unknown" as device type.

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
3	**General - Medium type status**	**Metering medium type**	**1 byte, 20.114**	**R/C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**

4: Heat (outlet)
7: Water meter
12: Heat (inlet)
$FF: Medium could not be read out

Rem.: If device medium could not be read out of calculator (missing power supply, faulty communication, …), this CO will send value $FF as device type.

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
4	**General - State of counters status**	**Counter status**	**1 byte, 21.001**	**R/C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**

0: Counter is OK
1: Counter is out of service
2: Counter is faulty
8: Counter is in alarm

The Status is cyclically read out of calculator.
Status "Out of service" can also indicate communication between KNX option board and calculator is erroneous

General information

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
5	General - Actual date and time / Actual date and time status	Actual date and time	8 bytes, 19.001	R/W/C /T/U	X	X	X	X	X	X	X
This object monitors the internal date and time counter that are continuously running within calculator. Also, this object can be used to update internal date and time of calculator.											
6	General - Operating time counter status	Calculator operating time counter	4 bytes, 13.100	R/C/T	X	X	X	X	X	X	X
This object monitors calculator operating time. Value is in seconds. Rem.: The calculator's operating time counter has 1 hour resolution. So, only values of complete hours (3600 sec., 7200 sec.) will be sent on KNX bus. Rem.: 2147483647 Sec. (approx. 68 years) denotes invalid value (for example, value could not be read out of calculator)											
7	General - Time-off counter status	Calculator time-off counter	4 bytes, 13.100	R/C/T	X	X	X	X	X	X	X
This object monitors calculator off-time. Value is in seconds. Rem.: The calculator's off time counter has 1 hour resolution. So, only values of complete hours (3600 sec., 7200 sec.) will be sent on KNX bus. Rem.: 2147483647 Sec. (approx. 68 years) denotes invalid value (for example, value could not be read out of calculator)											
8	General - Alarm counter status	Calculator alarm time counter	4 bytes, 13.100	R/C/T	X	X	X	X	X	X	X
This object monitors calculator alarm time. Value is in seconds. Rem.: The calculator's alarm time counter has 1 hour resolution. So, only value of complete hours (3600 sec., 7200 sec.) will be sent on KNX bus. Rem.: 2147483647 Sec. (approx. 68 years) denotes invalid value (for example, value could not be read out of calculator)											
9	General - Serial number status	Calculator serial number	14 bytes, 16.000	R/C/T	X	X	X	X	X	X	X
This object monitors actual serial number read out of calculator. KNX option board is constantly communicating with calculator. Also, serial number of calculator is queried, and displayed as user readable ASCII string. The serial number will be preceded by "Ser.". E.g: "Ser.05476107" Rem.: "Unknown" denotes invalid value (for example, value could not be read out of calculator)											
10	General - Manufacturing date status	Manufacturing date	8 bytes, 19.001	R/C/T	X	X	X	X	X	X	X
This object monitors manufacturing date read out of calculator. KNX option board is constantly communicating with calculator. Also, manufacturing date of calculator is queried, and displayed on KNX bus. Rem.: Value 0x00 00 00 00 00 00 BE 00 denotes invalid value (for example, value could not be read out of calculator). Value will be noticed as faulty.											
11	General - Customer text field 1 status	Custom text field 1/4	14 bytes, 16.000	R/C/T	X	X	X	X	X	X	X
KNX option board is constantly communicating with calculator. Also, customer text of calculator is queried, and displayed as user readable ASCII string. Rem.: The customer text contains 40 chars, using 4 lines of 10 chars. This object will monitor the first line only. Rem.: In case string could not be read out of calculator, value "Unknown" will be used.											

General information

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
12	**General - Customer text field 2 status**	**Custom text field 2/4**	**14 bytes, 16.000**	**R/C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
KNX option board is constantly communicating with calculator. Also, customer text of calculator is queried, and displayed as user readable ASCII string. Rem.: The customer text contains 40 chars, using 4 lines of 10 chars. This object will monitor the second line only. Rem.: In case string could not be read out of calculator, value “Unknown” will be used.											
13	**General - Customer text field 3 status**	**Custom text field 3/4**	**14 bytes, 16.000**	**R/C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
KNX option board is constantly communicating with calculator. Also, customer text of calculator is queried, and displayed as user readable ASCII string. Rem.: The customer text contains 40 chars, using 4 lines of 10 chars. This object will monitor the third line only. Rem.: In case string could not be read out of calculator, value “Unknown” will be used.											
14	**General - Customer text field 4 status**	**Custom text field 4/4**	**14 bytes, 16.000**	**R/C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
KNX option board is constantly communicating with calculator. Also, customer text of calculator is queried, and displayed as user readable ASCII string. Rem.: The customer text contains 40 chars, using 4 lines of 10 chars. This object will monitor the last line only. Rem.: In case string could not be read out of calculator, value “Unknown” will be used.											
15	**General - Hardware version status**	**Hardware version**	**14 bytes, 16.000**	**R/C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
KNX option board is constantly communicating with calculator. Also, hardware version of calculator is queried, and displayed as user readable ASCII string. The hardware version will be preceded by “HW ”. E.g: “HW 02.12.00.00” Rem.: In case string could not be read out of calculator, value “Unknown” will be used.											
16	**General - Firmware version status**	**Firmware version**	**14 bytes, 16.000**	**R/C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
KNX option board is constantly communicating with calculator. Also, firmware version of calculator is queried, and displayed as user readable ASCII string. The firmware version will be preceded by “FW ”. E.g: “FW 02.00.06” Rem.: In case string could not be read out of calculator, value “Unknown” will be used.											

Current values

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
17	**Current values - Energy status**	**Current energy**	**4 bytes, 13.013**	**R/C/T**	**X**	**X**			**X**		**X**
This object monitors current energy calculated by device. Value is in kWh. Rem.: If value cannot be read out of calculator, value “0” will be used instead.											
18	**Current values - Energy register status**	**Current energy**	**6 bytes, 229.001**	**R/C/T**	**X**	**X**			**X**		**X**
This object monitors current energy calculated by device. It is the same value as CO Nr. 17, but using different format, including additional information’s (resolution, status) Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
19	**Current values - Energy positive status**	**Current positive energy**	**4 bytes, 13.013**	**R/C/T**				**X**		**X**	
This object monitors current positive energy calculated by device. Value is in kWh. Rem.: If value cannot be read out of calculator, value “0” will be used instead.											
20	**Current values - Energy positive register status**	**Current positive energy**	**6 bytes, 229.001**	**R/C/T**				**X**		**X**	
This object monitors current positive energy calculated by device. It is the same value as CO Nr. 19, but using different format, including additional information’s (resolution, status) Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
21	**Current values - Energy negative status**	**Current negative energy**	**4 bytes, 13.013**	**R/C/T**				**X**		**X**	
This object monitors current negative energy calculated by device. Value is in kWh. Rem.: If value cannot be read out of calculator, value “0” will be used instead.											
22	**Current values - Energy negative register status**	**Current negative energy**	**6 bytes, 229.001**	**R/C/T**				**X**		**X**	
This object monitors current negative energy calculated by device. It is the same value as CO Nr. 21, but using different format, including additional information’s (resolution, status) Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
23	**Current values - Energy tarif 1 status**	**Current tarif 1 energy**	**4 bytes, 13.013**	**R/C/T**					**X**		**X**
This object monitors current tarif 1 energy calculated by device. Value is in kWh. Rem.: If value cannot be read out of calculator, value “0” will be used instead.											
24	**Current values - Energy tarif 1 register status**	**Current tarif 1 energy**	**6 bytes, 229.001**	**R/C/T**					**X**		**X**
This object monitors current tarif 1 energy calculated by device. It is the same value as CO Nr. 23, but using different format, including additional information’s (resolution, status) Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
25	**Current values - Energy tarif 2 status**	**Current tarif 2 energy**	**4 bytes, 13.013**	**R/C/T**					**X**		
This object monitors current tarif 2 energy calculated by device. Value is in kWh. Rem.: If value cannot be read out of calculator, value “0” will be used instead.											

Current values

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
26	**Current values - Energy tarif 2 register status**	**Current tarif 2 energy**	**6 bytes, 229.001**	**R/C/T**					**X**		
This object monitors current tarif 2 energy calculated by device. It is the same value as CO Nr. 25, but using different format, including additional information's (resolution, status) Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
27	**Current values - Volume status**	**Current volume**	**4 bytes, 14.076**	**R/C/T**	**X**				**X**		**X**
This object monitors current volume calculated by device. Value is in m^3. Rem.: If value cannot be read out of calculator, value "0" will be used instead.											
28	**Current values - Volume register status**	**Current volume**	**6 bytes, 229.001**	**R/C/T**	**X**				**X**		**X**
This object monitors current volume calculated by device. It is the same value as CO Nr. 27, but using different format, including additional information's (resolution, status) Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
29	**Current values - Volume positive status**	**Current positive volume**	**4 bytes, 14.076**	**R/C/T**				**X**		**X**	
This object monitors current positive volume calculated by device. Value is in m^3. Rem.: If value cannot be read out of calculator, value "0" will be used instead.											
30	**Current values - Volume positive register status**	**Current positive volume**	**6 bytes, 229.001**	**R/C/T**				**X**		**X**	
This object monitors current positive volume calculated by device. It is the same value as CO Nr. 29, but using different format, including additional information's (resolution, status) Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
31	**Current values - Volume negative status**	**Current negative volume**	**4 bytes, 14.076**	**R/C/T**				**X**		**X**	
This object monitors current negative volume calculated by device. Value is in m^3. Rem.: If value cannot be read out of calculator, value "0" will be used instead.											
32	**Current values - Volume negative register status**	**Current negative volume**	**6 bytes, 229.001**	**R/C/T**				**X**		**X**	
This object monitors current negative volume calculated by device. It is the same value as CO Nr. 31, but using different format, including additional information's (resolution, status) Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
33	**Current values - Volume tarif 1 status**	**Current tarif 1 volume**	**4 bytes, 14.076**	**R/C/T**							**X**
This object monitors current tarif 1 volume calculated by device. Value is in m^3. Rem.: If value cannot be read out of calculator, value "0" will be used instead.											

Current values

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
35	**Current values - Mass status**	**Current mass**	**4 bytes, 14.051**	**R/C/T**		**X**					
This object monitors current mass calculated by device. Value is in kg. Rem.: If value cannot be read out of calculator, value “0” will be used instead.											
36	**Current values - Mass register status**	**Current mass**	**6 bytes, 229.001**	**R/C/T**		**X**					
This object monitors current mass calculated by device. It is the same value as CO Nr. 35, but using different format, including additional information’s (resolution, status) Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
37	**Current values - Submeter 1 status**	**Current submeter 1 pulses**	**4 bytes, 13.001**	**R/C/T**			**X**				
This object monitors current submeter 1 calculated by device. Value is in counter pulses. Rem.: If value cannot be read out of calculator, value “0” will be used instead.											
38	**Current values - Submeter 1 register status**	**Current submeter 1 pulses**	**6 bytes, 229.001**	**R/C/T**			**X**				
This object monitors current submeter 1 calculated by device. It is the same value as CO Nr. 37, but using different format, including additional information’s (resolution, status) Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
41	**Current values - Submeter 2 status**	**Current submeter 2 pulses**	**4 bytes, 13.001**	**R/C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
This object monitors current submeter 2 calculated by device. Value is in counted pulses. Rem.: If value cannot be read out of calculator, value “0” will be used instead.											
42	**Current values - Submeter 2 register status**	**Current submeter 2 pulses**	**6 bytes, 229.001**	**R/C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
This object monitors current submeter 2 calculated by device. It is the same value as CO Nr. 41, but using different format, including additional information’s (resolution, status) Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
43	**Current values - Submeter 3 status**	**Current submeter 3 pulses**	**4 bytes, 13.001**	**R/C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
This object monitors current submeter 3 calculated by device. Value is in counted pulses. Rem.: If value cannot be read out of calculator, value “0” will be used instead.											
44	**Current values - Submeter 3 register status**	**Current submeter 3 pulses**	**6 bytes, 229.001**	**R/C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
This object monitors current submeter 3 calculated by device. It is the same value as CO Nr. 43, but using different format, including additional information’s (resolution, status) Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											

Instant values

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
45	**Instant values - Power status**	**Instant power**	**4 bytes, 14.036**	**R/C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
This object monitors instant power calculated by device. Value is in W heat flow rate. Rem.: If value cannot be read out of calculator, value “0” will be used instead.											
46	**Instant values - Volume flowrate status**	**Instant volume flowrate**	**2 bytes, 9.025**	**R/C/T**	**X**		**X**	**X**	**X**	**X**	**X**
This object monitors instant volume flowrate calculated by device. Value is in l/h. Rem.: If value cannot be read out of calculator, value “0” will be used instead.											
47	**Instant values - Mass flowrate status**	**Instant mass flowrate**	**4 bytes, 14.052**	**R/C/T**		**X**					
This object monitors instant mass flowrate calculated by device. Value is in kg/s. Rem.: If value cannot be read out of calculator, value “0” will be used instead.											
48	**Instant values - Flow temperature status**	**Instant flow temperature**	**2 bytes, 9.001**	**R/C/T**	**X**	**X**		**X**	**X**	**X**	**X**
This object monitors instant flow temperature measured by device. Value is in °C. Rem.: Value 0x7FFF (670760.96°C) denotes invalid value. Rem.: During data conversion there may be rounding errors or truncations, depending on data encoding Size and resolution. So, this value may differ slightly from value visible on calculator display.											
49	**Instant values - Return temperature status**	**Instant return temperature**	**2 bytes, 9.001**	**R/C/T**	**X**	**X**		**X**	**X**	**X**	**X**
This object monitors instant flow temperature measured by device. Value is in °C. Rem.: Value 0x7FFF (670760.96°C) denotes invalid value. Rem.: During data conversion there may be rounding errors or truncations, depending on data encoding Size and resolution. So, this value may differ slightly from value visible on calculator display.											
50	**Instant values - Temperature difference status**	**Instant temperature difference**	**2 bytes, 9.002**	**R/C/T**	**X**	**X**		**X**	**X**	**X**	**X**
This object monitors instant temperature difference between flow and return, calculated by device. Value is in °K. Rem.: Value 0x7FFF (670760.96°C) denotes invalid value. Rem.: During data conversion there may be rounding errors or truncations, depending on data encoding Size and resolution. So, this value may differ slightly from value visible on calculator display or calculated by difference of CO’s Nr. 48 and 49.											
51	**Instant values - Density status**	**Instant density**	**4 bytes, 14.017**	**R/C/T**	**X**	**X**		**X**	**X**	**X**	**X**
This object monitors instant liquid density, calculated by device. Value is in Kg/m^3. Rem.: If value cannot be read out of calculator, value “0” will be used instead.											

Logger values

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
52	**Logger - Date/Time status**	**Date/Time of Queried Datas**	**8 bytes, 19.001**	**C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
During normal operation, calculator can store plenty of values inside internal memory. These logger values can be read out by use of CO Nr. 135, Query Datas. This object indicates date and time associated to logged data's on CO's Nr. 53…92 that will be sent after same query. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
53	**Logger - Energy status**	**Energy value at storage**	**4 bytes, 13.013**	**C/T**	**X**	**X**		**X**	**X**	**X**	**X**
This object monitors logged energy value calculated by device. Value is in kWh. Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
54	**Logger - Energy register status**	**Energy value at storage**	**6 bytes, 229.001**	**C/T**	**X**	**X**		**X**	**X**	**X**	**X**
This object monitors logged energy value calculated by device. It is the same value as CO Nr. 53, but using different format, including additional information's (resolution, status) Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135. Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
55	**Logger - Energy positive status**	**Positive energy value at storage**	**4 bytes, 13.013**	**C/T**				**X**		**X**	
This object monitors logged positive energy value calculated by device. Value is in kWh. Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
56	**Logger - Energy positive register status**	**Positive energy value at storage**	**6 bytes, 229.001**	**C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
This object monitors logged positive energy value calculated by device. It is the same value as CO Nr. 55, but using different format, including additional information's (resolution, status) Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135. Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
57	**Logger - Energy negative status**	**Negative energy value at storage**	**4 bytes, 13.013**	**C/T**				**X**		**X**	
This object monitors logged negative energy value calculated by device. Value is in kWh. Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
58	**Logger - Energy negative register status**	**Negative energy value at storage**	**6 bytes, 229.001**	**C/T**				**X**		**X**	
This object monitors logged negative energy value calculated by device. It is the same value as CO Nr. 57, but using different format, including additional information's (resolution, status) Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135. Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											

Logger values

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
59	Logger - Energy tarif 1 status	Tarif 1 energy value at storage	4 bytes, 13.013	C/T					X		X
This object monitors logged tarif 1 energy value calculated by device. Value is in kWh. Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
60	Logger - Energy tarif 1 register status	Tarif 1 energy value at storage	6 bytes, 229.001	C/T					X		X
This object monitors logged tarif 1 energy value calculated by device. It is the same value as CO Nr. 59, but using different format, including additional information's (resolution, status) Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135. Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
61	Logger - Energy tarif 2 status	Tarif 2 energy value at storage	4 bytes, 13.013	C/T					X		
This object monitors logged tarif 2 energy value calculated by device. Value is in kWh. Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
62	Logger - Energy tarif 2 register status	Tarif 2 energy value at storage	6 bytes, 229.001	C/T					X		
This object monitors logged tarif 2 energy value calculated by device. It is the same value as CO Nr. 61, but using different format, including additional information's (resolution, status) Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135. Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
63	Logger - Volume status	Volume at storage	4 bytes, 14.076	C/T	X				X		X
This object monitors logged volume value calculated by device. Value is in m^3. Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
64	Logger - Volume register status	Volume at storage	6 bytes, 229.001	C/T	X				X		X
This object monitors logged volume value calculated by device. It is the same value as CO Nr. 63, but using different format, including additional information's (resolution, status) Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135. Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
65	Logger - Volume positive status	Positive volume at storage	4 bytes, 14.076	C/T				X		X	
This object monitors logged positive volume value calculated by device. Value is in m^3. Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											

Logger values

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
66	Logger - Volume positive register status	Positive volume at storage	6 bytes, 229.001	C/T				X		X	
This object monitors logged positive volume value calculated by device. It is the same value as CO Nr. 65, but using different format, including additional information's (resolution, status) Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135. Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
67	Logger - Volume negative status	Negative volume at storage	4 bytes, 14.076	C/T				X		X	
This object monitors logged negative volume value calculated by device. Value is in m^3. Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
68	Logger - Volume negative register status	Negative volume at storage	6 bytes, 229.001	C/T				X		X	
This object monitors logged negative volume value calculated by device. It is the same value as CO Nr. 67, but using different format, including additional information's (resolution, status) Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135. Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
69	Logger - Volume tarif 1 status	Tarif 1 volume at storage	4 bytes, 14.076	69							X
This object monitors logged tarif 1 volume value calculated by device. Value is in m^3. Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
70	Logger - Volume tarif 1 register status	Tarif 1 volume at storage	6 bytes, 229.001	C/T							X
This object monitors logged tarif 1 volume value calculated by device. It is the same value as CO Nr. 69, but using different format, including additional information's (resolution, status) Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135. Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
71	Logger - Mass status	Mass at storage	4 bytes, 14.051	C/T		X					
This object monitors logged mass value calculated by device. Value is in kg. Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
72	Logger - Mass register status	Mass at storage	6 bytes, 229.001	C/T		X					
This object monitors logged mass value calculated by device. It is the same value as CO Nr. 71, but using different format, including additional information's (resolution, status) Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135. Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											

Logger values

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
73	**Logger - Submeter 1 status**	**Submeter 1 at storage**	**4 bytes, 13.001**	**C/T**			**X**				
This object monitors logged submeter 1 value calculated by device. Value is in counted pulses. Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
74	**Logger - Submeter 1 register status**	**Submeter 1 at storage**	**6 bytes, 229.001**	**C/T**			**X**				
This object monitors logged submeter 1 value calculated by device. It is the same value as CO Nr. 73, but using different format, including additional information's (resolution, status) Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135. Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
77	**Logger - Submeter 2 status**	**Submeter 2 at storage**	**4 bytes, 13.001**	**C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
This object monitors logged submeter 2 value calculated by device. Value is in counted pulses. Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
78	**Logger - Submeter 2 register status**	**Submeter 2 at storage**	**6 bytes, 229.001**	**C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
This object monitors logged submeter 2 value calculated by device. It is the same value as CO Nr. 77, but using different format, including additional information's (resolution, status) Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135. Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
79	**Logger - Submeter 3 status**	**Submeter 3 at storage**	**4 bytes, 13.001**	**C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
This object monitors logged submeter 3 value calculated by device. Value is in counted pulses. Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
80	**Logger - Submeter 3 register status**	**Submeter 3 at storage**	**6 bytes, 229.001**	**C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
This object monitors logged submeter 3 value calculated by device. It is the same value as CO Nr. 77, but using different format, including additional information's (resolution, status) Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135. Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
81	**Logger - Time off counter status**	**Calculator time-off counter at storage**	**4 bytes, 13.100**	**C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
This object monitors logged calculator off-time value. Rem.: The calculator's off time counter has 1 hour resolution. So, only values of complete hours (3600 sec., 7200 sec.) will be sent on KNX bus. Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											

Logger values

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
82	**Logger - Alarm counter status**	**Calculator alarm time at storage**	**4 bytes, 13.100**	**C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
This object monitors logged calculator alarm time value. Rem.: The calculator's alarm time counter has 1 hour resolution. So, only value of complete hours (3600 sec., 7200 sec.) will be sent on KNX bus. Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
83	**Logger - Maximum power status**	**Maximum instant power at storage**	**4 bytes, 14.036**	**C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
This object monitors logged maximum instant power calculated by device. Value is in W heat flow rate. Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Date and time of maximum power event is available on CO Nr. 84. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
84	**Logger - Timestamp power max. status**	**Timestamp for maximum power at storage**	**8 bytes, 19.001**	**C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
This object indicates date and time associated to logged maximum instant power. Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
85	**Logger - Maximum volume flowrate status**	**Maximum instant volume flowrate at storage**	**2 bytes, 9.025**	**C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
This object monitors logged maximum instant volume flowrate calculated by device. Value is in l/h. Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Date and time of maximum volume flowrate event is available on CO Nr. 86. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
86	**Logger - Timestamp max. volume flowrate status**	**Timestamp for maximum volume flowrate at storage**	**8 bytes, 19.001**	**C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
This object indicates date and time associated to logged maximum instant volume flowrate. Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
87	**Logger - Maximum mass flowrate status**	**Maximum instant mass flowrate at storage**	**4 bytes, 14.052**	**C/T**		**X**					
This object monitors logged maximum instant mass flowrate calculated by device. Value is in kg/s. Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Date and time of maximum mass flowrate event is available on CO Nr. 88. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
88	**Logger - Timestamp max. mass flowrate status**	**Timestamp for maximum mass flowrate at storage**	**8 bytes, 19.001**	**C/T**		**X**					
This object indicates date and time associated to logged maximum instant mass flowrate. Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											

Logger values

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
89	**Logger - Maximum flow temperature status**	**Maximum instant flow temperature at storage**	**2 bytes, 9.001**	**C/T**	**X**	**X**		**X**	**X**	**X**	**X**
This object monitors logged maximum instant flow temperature measured by device. Value is in °C. Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Date and time of maximum mass flowrate event is available on CO Nr. 90. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
90	**Logger - Timestamp max. flow temperature status**	**Timestamp for maximum flow temperature at storage**	**8 bytes, 19.001**	**C/T**	**X**	**X**		**X**	**X**	**X**	**X**
This object indicates date and time associated to logged maximum instant flow temperature. Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
91	**Logger - Maximum return temperature status**	**Maximum instant return temperature at storage**	**2 bytes, 9.001**	**C/T**	**X**	**X**		**X**	**X**	**X**	**X**
This object monitors logged maximum instant return temperature measured by device. Value is in °C. Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Date and time of maximum mass flowrate event is available on CO Nr. 92. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
92	**Logger - Timestamp max. return temperature status**	**Timestamp for maximum return temperature at storage**	**8 bytes, 19.001**	**C/T**	**X**	**X**		**X**	**X**	**X**	**X**
This object indicates date and time associated to logged maximum instant return temperature. Rem.: Date and time of storing is available on CO Nr. 52. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											

Freeze values

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
93	**Freeze - Date/Time status**	**Date/Time of frozen Datas**	**8 bytes, 19.001**	**C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
At any time, actual values of calculator can be frozen. These frozen values can be read out by use of CO Nr. 135, Query Datas. This object indicates date and time associated to frozen data's on CO's Nr. 93…134 that will be sent after same query. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
94	**Freeze - Energy status**	**Energy value at freezing**	**4 bytes, 13.013**	**C/T**	**X**	**X**		**X**	**X**		**X**
This object monitors frozen energy value calculated by device. Value is in kWh. Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
95	**Freeze - Energy register status**	**Energy value at freezing**	**6 bytes, 229.001**	**C/T**	**X**	**X**		**X**	**X**		**X**
This object monitors frozen energy value calculated by device. It is the same value as CO Nr. 84, but using different format, including additional information's (resolution, status) Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135. Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
96	**Freeze - Energy positive status**	**Positive energy value at freezing**	**4 bytes, 13.013**	**C/T**				**X**		**X**	
This object monitors frozen positive energy value calculated by device. Value is in kWh. Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
97	**Freeze - Energy positive register status**	**Positive energy value at freezing**	**6 bytes, 229.001**	**C/T**				**X**		**X**	
This object monitors logged positive energy value calculated by device. It is the same value as CO Nr. 96, but using different format, including additional information's (resolution, status) Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135. Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
98	**Freeze - Energy negative status**	**Negative energy value at freezing**	**4 bytes, 13.013**	**C/T**				**X**		**X**	
This object monitors frozen negative energy value calculated by device. Value is in kWh. Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
99	**Freeze - Energy negative register status**	**Negative energy value at freezing**	**6 bytes, 229.001**	**C/T**				**X**		**X**	
This object monitors frozen negative energy value calculated by device. It is the same value as CO Nr. 98, but using different format, including additional information's (resolution, status) Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135. Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											

Freeze values

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
100	Freeze - Energy tarif 1 status	Tarif 1 energy value at freezing	4 bytes, 13.013	C/T					X		X
This object monitors frozen tarif 1 energy value calculated by device. Value is in kWh. Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
101	Freeze - Energy tarif 1 register status	Tarif 1 energy value at freezing	6 bytes, 229.001	C/T					X		X
This object monitors frozen tarif 1 energy value calculated by device. It is the same value as CO Nr. 100, but using different format, including additional information's (resolution, status) Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135. Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
102	Freeze - Energy tarif 2 status	Tarif 2 energy value at freezing	4 bytes, 13.013	C/T					X		
This object monitors frozen tarif 2 energy value calculated by device. Value is in kWh. Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
103	Freeze - Energy tarif 2 register status	Tarif 2 energy value at freezing	6 bytes, 229.001	C/T					X		
This object monitors frozen tarif 2 energy value calculated by device. It is the same value as CO Nr. 102, but using different format, including additional information's (resolution, status) Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135. Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
104	Freeze - Volume status	Volume at freezing	4 bytes, 14.076	C/T	X				X		X
This object monitors frozen volume value calculated by device. Value is in m^3. Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
105	Freeze - Volume register status	Volume at freezing	6 bytes, 229.001	C/T	X				X		X
This object monitors frozen volume value calculated by device. It is the same value as CO Nr. 104, but using different format, including additional information's (resolution, status) Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135. Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
106	Freeze - Volume positive status	Positive volume at freezing	4 bytes, 14.076	C/T				X		X	
This object monitors frozen positive volume value calculated by device. Value is in m^3. Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											

Freeze values

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
107	Freeze - Volume positive register status	Positive volume at freezing	6 bytes, 229.001	C/T				X		X	
This object monitors frozen positive volume value calculated by device. It is the same value as CO Nr./ 106, but using different format, including additional information's (resolution, status) Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135. Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
108	Freeze - Volume negative status	Negative volume at freezing	4 bytes, 14.076	C/T				X		X	
This object monitors frozen negative volume value calculated by device. Value is in m3. Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
109	Freeze - Volume negative register status	Negative volume at freezing	6 bytes, 229.001	C/T				X		X	
This object monitors frozen negative volume value calculated by device. It is the same value as CO Nr. 108, but using different format, including additional information's (resolution, status) Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135. Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
110	Freeze - Volume tarif 1 status	Tarif 1 volume at freezing	4 bytes, 14.076	C/T							X
This object monitors frozen tarif 1 volume value calculated by device. Value is in m^3. Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
111	Freeze - Volume tarif 1 register status	Tarif 1 volume at freezing	6 bytes, 229.001	C/T							X
This object monitors frozen tarif 1 volume value calculated by device. It is the same value as CO Nr. 110, but using different format, including additional information's (resolution, status) Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135. Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
112	Freeze - Mass status	Mass at freezing	4 bytes, 14.051	C/T		X					
This object monitors frozen mass value calculated by device. Value is in kg. Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
113	Freeze - Mass register status	Mass at freezing	6 bytes, 229.001	C/T		X					
This object monitors frozen mass value calculated by device. It is the same value as CO Nr. 112, but using different format, including additional information's (resolution, status) Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135. Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											

Freeze values

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
114	**Freeze - Submeter 1 status**	**Submeter 1 at freezing**	**4 bytes, 13.001**	**C/T**			**X**				
This object monitors frozen submeter 1 value calculated by device. Value is in counted pulses. Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
115	**Freeze - Submeter 1 register status**	**Submeter 1 at freezing**	**6 bytes, 229.001**	**C/T**			**X**				
This object monitors frozen submeter 1 value calculated by device. It is the same value as CO Nr. 114, but using different format, including additional information's (resolution, status) Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135. Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
118	**Freeze - Submeter 2 status**	**Submeter 2 at freezing**	**4 bytes, 13.001**	**C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
This object monitors frozen submeter 2 value calculated by device. Value is in counted pulses. Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
119	**Freeze - Submeter 2 register status**	**Submeter 2 at freezing**	**6 bytes, 229.001**	**C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
This object monitors frozen submeter 2 value calculated by device. It is the same value as CO Nr. 118, but using different format, including additional information's (resolution, status) Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135. Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
120	**Freeze - Submeter 3 status**	**Submeter 3 at freezing**	**4 bytes, 13.001**	**C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
This object monitors frozen submeter 3 value calculated by device. Value is in counted pulses. Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
121	**Freeze - Submeter 3 register status**	**Submeter 3 at freezing**	**6 bytes, 229.001**	**C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
This object monitors frozen submeter 3 value calculated by device. It is the same value as CO Nr. 120, but using different format, including additional information's (resolution, status) Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135. Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.											
122	**Freeze - Time off counter status**	**Calculator time-off counter at freezing**	**4 bytes, 13.100**	**C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
This object monitors frozen calculator off-time value. Rem.: The calculator's off time counter has 1 hour resolution. So, only values of complete hours (3600 sec., 7200 sec.) will be sent on KNX bus. Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											

Freeze values

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
123	**Freeze - Alarm counter status**	**Calculator alarm time at freezing**	**4 bytes, 13.100**	**C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
This object monitors frozen calculator alarm time value. Rem.: The calculator's alarm time counter has 1 hour resolution. So, only value of complete hours (3600 sec., 7200 sec.) will be sent on KNX bus. Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
124	**Freeze - Maximum power status**	**Maximum instant power at freezing**	**4 bytes, 14.036**	**C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
This object monitors frozen maximum instant power calculated by device. Value is in W heat flow rate. Rem.: Date and time of freezing is available on CO Nr. 93. Rem.: Date and time of maximum power event is available on CO Nr. 125. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
125	**Freeze - Timestamp power max. status**	**Timestamp for maximum power at freezing**	**8 bytes, 19.001**	**C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
This object indicates date and time associated to frozen maximum instant power. Rem.: Date and time of freezing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135											
126	**Freeze - Maximum volume flowrate status**	**Maximum instant volume flowrate at freezing**	**2 bytes, 9.025**	**C/T**	**X**		**X**	**X**	**X**	**X**	**X**
This object monitors frozen maximum instant volume flowrate calculated by device. Value is in l/h. Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Date and time of maximum volume flowrate event is available on CO Nr. 127. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
127	**Freeze - Timestamp max. volume flowrate status**	**Timestamp for maximum volume flowrate at freezing**	**8 bytes, 19.001**	**C/T**	**X**		**X**	**X**	**X**	**X**	**X**
This object indicates date and time associated to frozen maximum instant volume flowrate. Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
128	**Freeze - Maximum mass flowrate status**	**Maximum instant mass flowrate at freezing**	**4 bytes, 14.052**	**C/T**		**X**					
This object monitors frozen maximum instant mass flowrate calculated by device. Value is in kg/s. Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Date and time of maximum mass flowrate event is available on CO Nr. 129. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
129	**Freeze - Timestamp max. mass flowrate status**	**Timestamp for maximum mass flowrate at freezing**	**8 bytes, 19.001**	**C/T**		**X**					
This object indicates date and time associated to frozen maximum instant mass flowrate. Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											

Freeze values

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
130	**Freeze - Maximum flow temperature status**	**Maximum instant flow temperature at freezing**	**2 bytes, 9.001**	**C/T**	**X**	**X**		**X**	**X**	**X**	**X**
This object monitors frozen maximum instant flow temperature measured by device. Value is in °C. Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Date and time of maximum mass flowrate event is available on CO Nr. 131. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
131	**Freeze - Timestamp max. flow temperature status**	**Timestamp for maximum flow temperature at freezing**	**8 bytes, 19.001**	**C/T**	**X**	**X**		**X**	**X**	**X**	**X**
This object indicates date and time associated to frozen maximum instant flow temperature. Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
132	**Freeze - Maximum return temperature status**	**Maximum instant return temperature at freezing**	**2 bytes, 9.001**	**C/T**	**X**	**X**		**X**	**X**	**X**	**X**
This object monitors frozen maximum instant return temperature measured by device. Value is in °C. Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Date and time of maximum mass flowrate event is available on CO Nr. 133. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
133	**Freeze - Timestamp max. return temperature status**	**Timestamp for maximum return temperature at freezing**	**8 bytes, 19.001**	**C/T**	**X**	**X**		**X**	**X**	**X**	**X**
This object indicates date and time associated to frozen maximum instant return temperature. Rem.: Date and time of storing is available on CO Nr. 93. Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.											
134	**Freeze - Freeze CO**	**Freeze**	**1 bit, 1.017**	**C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
0: Triggers freezing of data's 1: Triggers freezing of data's At any time, actual values of calculator can be frozen by sending telegram (either "0" or "1") on CO Nr. 134. These frozen values can be read out by use of CO Nr. 135, Query Datas. This object is used to indicate the calculator to freeze actual data's. Transmission of frozen data's must be initiated by sending according value on CO Nr. 135. Rem.: by freezing data's, previously frozen data's will be overwritten.											
135	**Query - Query datas CO**	**Query frozen or logger data's**	**2 bytes, 7.001**	**C/T**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Sending of frozen or logged data's must be initiated by sending according data on CO Nr. 135. 0: Queries sending of frozen data's stored in calculator. Data's will be sent on CO's Nr. 93…133. 1…500: Queries sending of logged data's stored in calculator . Data's will be sent on CO's Nr. 52…92. >500: Query is ignored Logger memory is made of up to 500 logger events. At each logging, new data's are stored in logger space 1, and already existing logger data's are shifted to next logger space (1->2, 2->3, …). Rem.: If queried frozen or logged data's are not available (no answer or no communication with calculator), no answer will be sent.											

Relay 1

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
137	Relay 1 - Switch On/Off	Switch relay 1 On/Off	1 bit, 1.001	C/T	X	X	X	X	X	X	X

0: Switch relay 1 Off
1: Switch relay 1 On

CO Nr. 137 can be used to switch relay Nr. 1 of Calec ST III device.

Rem.: In order relay to be switchable by CO, function must be set accordingly within calculator.
Rem.: In order relay to have incidence on Calec terminals, function must be set to output (Switch S1 within CALEC® ST III)

Relay 2

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
139	Relay 2 - Switch On/Off	Switch relais 2 On/Off	1 bit, 1.001	C/T	X	X	X	X	X	X	X

0: Switch relay 2 Off
1: Switch relay 2 On

CO Nr. 139 can be used to switch relay Nr. 2 of Calec ST III device.

Rem.: In order relay to be switchable by CO, function must be set accordingly within calculator.
Rem.: In order relay to have incidence on Calec terminals, function must be set to output (Switch S2 within CALEC® ST III)

5 KNX® connections, e.g. with water and oil meters

There are two auxiliary inputs available to measure pulses from other meters, such as water and oil meters with pulse signals and to directly communicate the result to the KNX® TP1 network.

6 Alarm

CALEC® ST III status messages are linked with the KNX® communication objects. INTEGRA METERING AG differs between the following types of status messages:

Device status "error"
All important device errors such as "system error" need to be verified including their error codes.

Measurement value status "alarm":
Specific messages such as "dt alarm" have to be verified (further information can be found in the section "Error messages, alarms" in the operating instructions of CALEC® ST III).

7 Troubleshooting

Communication errors			
No.	**Error / malfunction**	**Possible reason**	**Correction**
1	CALEC® ST III does not communicate in the KNX® TP1 network	Wiring of the network Configuration of CALEC® ST III Configuration ETS5®	Check, if the KNX® TP1 devices are correctly connected. Check, if the bus topology is okay. Check, if the individual address is correctly configured and clearly assigned in the network

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info@integra-metering.com
www.integra-metering.com