



# CALEC<sup>®</sup> ST II

## KNX<sup>®</sup> TP1

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# 1 Allgemeine Informationen

## 1.1 Inhalt

Dieser Kommunikationsbeschrieb enthält ausschliesslich spezifische Informationen zum CALEC® ST II mit dem KNX® TP1-Modul. Weiterführende Informationen sind in der technischen Dokumentation des CALEC® ST II enthalten.



Weiterführende Dokumente finden Sie auf folgender Internetseite:  
<http://www.integra-metering.com/qr/prod/calec-st/11111.html>



Allgemeine Informationen zu KNX® finden Sie auf [www.knx.org](http://www.knx.org)

## 1.2 Definition

Als Feldbus der Gebäudeautomation, ist KNX® ein offener Standard für Haus- und Gebäudesystemtechnik. Er ist gemäss den europäischen Standards CENELEC EN 50090 und CEN EN 13321-1 wie auch als chinesischer Standard GB/T 20965 und internationaler Standard ISO/IEC 14543-3 anerkannt. Mit KNX® kann gewerkeübergreifend und bedarfsgerecht Heizung, Beleuchtung, Jalousien, Belüftung und Sicherheitstechnik gesteuert werden.

## 1.3 Eingetragene Schutzmarken und Handelsnamen

**KNX®**, sowie das **KNX®-Logo** sind eingetragene Schutzmarken der KNX-Association in Brüssel. Der Name der **KNX-Association** ist ein eingetragener Handelsname.

## 1.4 Zertifizierung nach KNX® Standard

Der CALEC® ST II mit dem KNX® TP1-Modul ist zertifiziert nach folgenden Test Standards:

### Test Standards

08\_07\_01 System Conformance Testing - Interworking Tests v01.02.01 AS

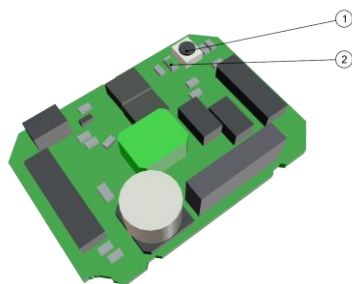
## 2 Hardware

### 2.1 Die Kommunikationsschnittstelle

Die INTEGRA METERING AG verwendet eine von der KNX®-Technologie vorgegebene Kommunikationsschnittstelle in der Twisted-Pair Verdrahtung (2-Leiter).

CALEC® ST II: Übersicht unterstützter Funktionen			
Funktion	Parameter	Wert Beschreibung	Weitere Informationen
Hersteller-ID	403	-	Diese Kennung gilt für INTEGRA METERING AG
Gerätetyp	050.060	-	-
Physikalische Adresse	15.15.255	Werkseinstellung	-
Datenprotokoll	KNX® TP1	-	TP1 (2-Draht twisted pair)
Version	0xc0 Volumen 0xc1 Masse 0xc2 Flow 0xc4 BDE 0xc7 TGR 0xc8 BDV 0xc9 DTF	-	-
Programmversion	1.1	-	-
Baudrate	9600 Bit/s	-	-
Busstrom	10 mA	-	-

### 2.2 Programmierknopf und Geräte LED



① Programmierknopf

② Geräte LED

Auf dem Print ist eine Geräte LED bestückt. Über diese lässt sich der Systemzustand über folgende Blinkcodes interpretieren:

Blinkcodes der Geräte LED	
<b>A: Normal Operation</b> 	Beim Einschalten leuchtet die LED kurz auf (ca. 1 Sek.) und erlischt dann. Der KNX® -Controller ist konfiguriert und arbeitet korrekt.
<b>B: Programmiermodus (Physikalische Adresse)</b> 	Nach Betätigung des Programmierknopfes leuchtet die LED bis der Programmiervorgang abgeschlossen wurde.
<b>C: Programmieren (Applikationsprogramm)</b> 	Nach Beendigung des Ladevorganges leuchtet die LED kurz auf (ca. 1 Sek.) und erlischt dann.

## 3 Inbetriebnahme

### 3.1 Inbetriebsetzung des CALEC® ST II mit der KNX® TP1-Schnittstelle

Nach dem Anschliessen des KNX®-Kabels an die Anschlüsse 98a(rot) und 99b(schwarz) müssen folgende Schritte durchgeführt werden:

Schrittanleitung		
Schritt	Massnahme	Beschreibung
1	Konfiguration des CALEC® ST II zur Nutzung der Anwendung	Die entsprechenden Informationen finden Sie in der Bedienungsanleitung des CALEC® ST II.
2	Konfiguration des CALEC® ST II zur KNX®-Nutzung	Dieser Schritt muss nicht durchgeführt werden. Sämtliche Parameter werden über die ETS5® eingestellt. Der CALEC® ST II verfügt über kein KNX-Menü.
3	Konfiguration des KNX®-Moduls über die ETS5®	Gemäss dieser Beschreibung Die Befehle, Parameter und Kommunikationsobjekte sind in den folgenden Kapiteln beschrieben

### 3.2 CALEC® ST II KNX® Befehle

Neben den internen zyklischen Funktionen stehen dem Netzwerk-Anwender folgende Befehle zur Verfügung:

#### 3.2.1 Geräte LED: „Blinken – Befehl“

Zur Auffindung eines Gerätes, dessen physikalische Adresse bekannt ist, stellt die KNX® - Technik einen sogenannten „Blinken-Befehl“ zur Verfügung. Wird dieser über die ETS5® ausgeführt, reagiert der angesprochene Knoten optisch. Der CALEC® ST II unterstützt das Netzwerk - Kommando „Blinken“ mit folgendem Verhalten:

- Die Geräte - LED blinkt im 3 Hz-Takt solange, bis der „Blinken-Befehl“ über die ETS5® beendet wird.

Das „Blinken“ kann als Hilfsmittel bei Service-Arbeiten zur leichteren Auffindung des gesuchten Gerätes benutzt werden.

#### 3.2.2 Geräte LED: „Ein / Aus - Befehl“

Ebenfalls, kann die Geräte LED statisch ein- und auch ausgeschaltet werden. Der CALEC® ST II unterstützt das Netzwerk - Kommando „Ein / Aus“ mit folgendem Verhalten:

- Die Geräte LED leuchtet bei Betätigung der Taste „Ein“
- Die Geräte LED erlischt bei Betätigung der Taste „Aus“

Die „Ein / Aus - Funktion“ kann als Hilfsmittel bei Service-Arbeiten zur leichteren Auffindung des gesuchten Gerätes benutzt werden.

#### 3.2.3 Freeze - Befehl

Über das Kommunikationsobjekt „CO 134 Freeze CO“ (siehe Kapitel 4.2 Unterstützte KNX®-Kommunikationsobjekte) führt der CALEC® ST II ein sofortiges Einfrieren der Zählerstände durch. Erfolgt über das Netzwerk der Befehl 'freeze', werden im Rechenwerk sofort Speicherdatum und alle aktiven Zählerstände gespeichert. Die somit eingefrorenen Werte können dann mit dem Kommunikationsobjekt „CO 135 Query datas CO“ über den Wert 0 ausgelesen werden. Dabei ist eine Verzögerung von bis zu 6 Sekunden zu beachten.

Die Freeze-Daten sind über die Anzeige des Rechenwerks nicht verfügbar.

### 3.2.4 Relais - Fernsteuerbefehle

Sind die Schalter 'S1', 'S2' auf dem Basisprint des CALEC® ST II auf "OUT" eingestellt, stehen zwei Relaisausgänge zur Verfügung. Ist die Funktions-Programmierung der beiden Relais folgendermassen eingestellt:

Bedienungs Menü: OUTPUTS ⬅ NR: 1 oder 2 ⬅ FCT: M-BUS ⬅

können diese via Fernsteuerbefehle ein- oder ausgeschalten werden:

Relais 1	Das Kommunikationsobjekt „CO 137 Relay 1 – Switch On/Off“ steuert den Zustand des Relais 1
Relais 2	Das Kommunikationsobjekt „CO 139 Relay 2 – Switch On/Off“ steuert den Zustand des Relais 2

### 3.3 Die Speicherwerte

Der CALEC® ST II stellt unter KNX® nicht alle im Rechenwerk verfügbaren Speicherdatensätze als Variablen zur Verfügung.

Neben den Zählerständen und den Momentanwerten werden folgende Datensätze zur Verfügung gestellt:

- Die Loggerdaten für alle 500 Datenlogger. Die Auslesung erfolgt über das Kommunikationsobjekt „CO 135 Query datas CO“ im Wertebereich 1 - 500
- Die Freeze-Daten (eingefrorene Werte). Die Auslesung erfolgt über das Kommunikationsobjekt „CO 135 Query datas CO“ über den Wert 0

## 4 CALEC® ST II KNX® Parameter und Objekte

### 4.1 Unterstützte KNX®-Parameter

Der CALEC® ST II mit KNX® TP1 unterstützt folgende Parameter. Diese werden zur Konfiguration der Kommunikationsobjekte des KNX®-Moduls zur Verfügung gestellt. Die Parametrierung erfolgt ausschließlich über die ETS5® und wird Gerätevariantenabhängig zur Verfügung gestellt.

General		
Parameter	Wert	Beschreibung
Device type	Standard Mass Flow BDE TGR BDV DTF	Auswahl der CALEC® ST II Gerätevariante
Customer text field	Yes No	Aktiviert oder deaktiviert die Konfiguration der Parameter Text field 1 bis Text field 4
Text field 1	A<- L1 ->B	Freies Textfeld mit max. 10 Zeichen
Text field 2	C<- L2 ->D	Freies Textfeld mit max. 10 Zeichen
Text field 3	E<- L3 ->F	Freies Textfeld mit max. 10 Zeichen
Text field 4	G<- L4 ->H	Freies Textfeld mit max. 10 Zeichen
Delay before starting to send after restart	1s ..... 4min	Einstellbar
Delay for cyclical sending	No cyclical sending 1s ..... 18h	Einstell- und deaktivierbar

General / Sending		
Parameter	Wert	Beschreibung
Kommunikationsobjekte „General“ <b>CO - Nummer 0</b>	Never On restart On restart + cyclic	Sendeverhalten der Kommunikationsobjekte „General“
Kommunikationsobjekte „General“ <b>CO - Nummer 1 – 16</b>	Never On restart On restart + cyclic On restart + on change	Sendeverhalten der Kommunikationsobjekte „General“
Sendrate limitation für Kommunikationsobjekte „General“ <b>CO - Nummer 1 – 2</b> <b>CO - Nummer 4 – 16</b>	No limitation 1s ..... 1min	Einstell- und deaktivierbar

Standard type		
Parameter	Wert	Beschreibung
Sending current and instant values	Yes No	Aktiviert oder deaktiviert die Zählerstände und Momentanwerte
Sending logger values	Yes No	Aktiviert oder deaktiviert die Logger-Werte
Sending freeze values	Yes No	Aktiviert oder deaktiviert die Freeze-Werte

Standard type / Current and Instant values		
Parameter	Wert	Beschreibung
Kommunikationsobjekte „Current values“ <b>CO - Nummer 17 – 44</b>	Never On restart On restart + cyclic On restart + on change	Sendeverhalten der Kommunikationsobjekte „Current values“
Sendrate limitation für Kommunikationsobjekte „Current values“ <b>CO - Nummer 17 – 44</b>	No limitation 1s ..... 1min	Einstell- und deaktivierbar
Kommunikationsobjekte „Instant values“ <b>CO - Nummer 45 – 51</b>	Never On restart On restart + cyclic On restart + on change	Sendeverhalten der Kommunikationsobjekte „Instant values“
Sendrate limitation für Kommunikationsobjekte „Instant values“ <b>CO - Nummer 45 – 51</b>	No limitation 1s ..... 1min	Einstell- und deaktivierbar

Standard type / Logger values		
Parameter	Wert	Beschreibung
Kommunikationsobjekte „Logger“ <b>CO - Nummer 52 – 92</b>	Never On request	Sendeverhalten der Kommunikationsobjekte „Logger“
Sendrate limitation für Kommunikationsobjekte „Logger“ <b>CO - Nummer 52 – 92</b>	No limitation 1s ..... 1min	Einstell- und deaktivierbar

Standard type / Freeze values		
Parameter	Wert	Beschreibung
Kommunikationsobjekte „Freeze“ <b>CO - Nummer 93 – 133</b>	Never On request	Sendeverhalten der Kommunikationsobjekte „Freeze“
Sendrate limitation für Kommunikationsobjekte „Freeze“ <b>CO - Nummer 93 – 133</b>	No limitation 1s ..... 1min	Einstell- und deaktivierbar

## Relay 1

Parameter	Wert	Beschreibung
Use relay <b>CO - Nummer 137</b>	Yes No	Aktiviert oder deaktiviert den Schaltkontakt Relais 1

## Relay 2

Parameter	Wert	Beschreibung
Use relay <b>CO - Nummer 139</b>	Yes No	Aktiviert oder deaktiviert den Schaltkontakt Relais 2



## 4.2 Unterstützte KNX®-Kommunikationsobjekte

Der CALEC® ST II mit KNX® TP1 unterstützt folgende Kommunikationsobjekte. Diese werden Gerätevariantenabhängig zur Verfügung gestellt.

General information											
Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
					X	X	X	X	X	X	X
0	General - Device operating status	Inactive / Active	1 bit, 1.002	R/C/T	X	X	X	X	X	X	X
<p>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.</p>											
1	General - Communication failure status	Alarm / No alarm	1 bit, 1.002	R/C/T	X	X	X	X	X	X	X
<p>0: Communication between KNX option board and calculator is OK            1: Communication between KNX option board and calculator is erroneous</p> <p>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.</p>											
2	General - Device type status	Calculator type (ASCII)	Max. 14 chars, 16.000	R/C/T	X	X	X	X	X	X	X
<p>"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</p> <p>KNX option board is constantly communicating with calculator. Also device type of calculator is queried, and displayed as user readable ASCII string.</p> <p>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.</p>											
3	General - Medium type status	Metering medium type	1 byte, 20.114	R/C/T	X	X	X	X	X	X	X
<p>4: Heat (outlet)            7: Water meter            12: Heat (inlet)            \$FF: Medium could not be read out</p> <p>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.</p>											
4	General - State of counters status	Counter status	1 byte, 21.001	R/C/T	X	X	X	X	X	X	X
<p>0: Counter is OK            1: Counter is out of service            2: Counter is faulty            8: Counter is in alarm</p> <p>The Status is cyclically read out of calculator.            Status "Out of service" can also indicate communication between KNX option board and calculator is erroneous</p>											

## General information

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
5	<b>General - Actual date and time / Actual date and time status</b>	<b>Actual date and time</b>	<b>8 bytes, 19.001</b>	<b>R/W/C /T/U</b>	X	X	X	X	X	X	X
<p>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.</p>											
6	<b>General - Operating time counter status</b>	<b>Calculator operating time counter</b>	<b>4 bytes, 13.100</b>	<b>R/C/T</b>	X	X	X	X	X	X	X
<p>This object monitors calculator operating time. Value is in seconds.</p> <p>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.</p> <p>Rem.: 2147483647 Sec. (approx. 68 years) denotes invalid value (for example, value could not be read out of calculator)</p>											
7	<b>General - Time-off counter status</b>	<b>Calculator time-off counter</b>	<b>4 bytes, 13.100</b>	<b>R/C/T</b>	X	X	X	X	X	X	X
<p>This object monitors calculator off-time. Value is in seconds.</p> <p>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.</p> <p>Rem.: 2147483647 Sec. (approx. 68 years) denotes invalid value (for example, value could not be read out of calculator)</p>											
8	<b>General - Alarm counter status</b>	<b>Calculator alarm time counter</b>	<b>4 bytes, 13.100</b>	<b>R/C/T</b>	X	X	X	X	X	X	X
<p>This object monitors calculator alarm time. Value is in seconds.</p> <p>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.</p> <p>Rem.: 2147483647 Sec. (approx. 68 years) denotes invalid value (for example, value could not be read out of calculator)</p>											
9	<b>General - Serial number status</b>	<b>Calculator serial number</b>	<b>14 bytes, 16.000</b>	<b>R/C/T</b>	X	X	X	X	X	X	X
<p>This object monitors actual serial number read out of calculator.</p> <p>KNX option board is constantly communicating with calculator. Also, serial number of calculator is queried, and displayed as user readable ASCII string.</p> <p>The serial number will be preceded by "Ser.". E.g: "Ser.05476107"</p> <p>Rem.: "Unknown" denotes invalid value (for example, value could not be read out of calculator)</p>											
10	<b>General - Manufacturing date status</b>	<b>Manufacturing date</b>	<b>8 bytes, 19.001</b>	<b>R/C/T</b>	X	X	X	X	X	X	X
<p>This object monitors manufacturing date read out of calculator.</p> <p>KNX option board is constantly communicating with calculator. Also, manufacturing date of calculator is queried, and displayed on KNX bus.</p> <p>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.</p>											
11	<b>General - Customer text field 1 status</b>	<b>Custom text field 1/4</b>	<b>14 bytes, 16.000</b>	<b>R/C/T</b>	X	X	X	X	X	X	X
<p>KNX option board is constantly communicating with calculator. Also, customer text of calculator is queried, and displayed as user readable ASCII string.</p> <p>Rem.: The customer text contains 40 chars, using 4 lines of 10 chars. This object will monitor the first line only.</p> <p>Rem.: In case string could not be read out of calculator, value "Unknown" will be used.</p>											

## General information

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
					X	X	X	X	X	X	X
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
<p>KNX option board is constantly communicating with calculator. Also, customer text of calculator is queried, and displayed as user readable ASCII string.</p> <p>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.</p>											
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
<p>KNX option board is constantly communicating with calculator. Also, customer text of calculator is queried, and displayed as user readable ASCII string.</p> <p>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.</p>											
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
<p>KNX option board is constantly communicating with calculator. Also, customer text of calculator is queried, and displayed as user readable ASCII string.</p> <p>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.</p>											
15	General - Hardware version status	Hardware version	14 bytes, 16.000	R/C/T	X	X	X	X	X	X	X
<p>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"</p> <p>Rem.: In case string could not be read out of calculator, value "Unknown" will be used.</p>											
16	General - Firmware version status	Firmware version	14 bytes, 16.000	R/C/T	X	X	X	X	X	X	X
<p>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"</p> <p>Rem.: In case string could not be read out of calculator, value "Unknown" will be used.</p>											

## Current values

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

## Current values

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

## 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					
<p>This object monitors current mass calculated by device. Value is in kg.</p> <p>Rem.: If value cannot be read out of calculator, value "0" will be used instead.</p>											
36	Current values - Mass register status	Current mass	6 bytes, 229.001	R/C/T		X					
<p>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)</p> <p>Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.</p>											
37	Current values - Submeter 1 status	Current submeter 1 pulses	4 bytes, 13.001	R/C/T			X				
<p>This object monitors current submeter 1 calculated by device. Value is in counter pulses.</p> <p>Rem.: If value cannot be read out of calculator, value "0" will be used instead.</p>											
38	Current values - Submeter 1 register status	Current submeter 1 pulses	6 bytes, 229.001	R/C/T			X				
<p>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)</p> <p>Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.</p>											
41	Current values - Submeter 2 status	Current submeter 2 pulses	4 bytes, 13.001	R/C/T	X	X	X	X	X	X	X
<p>This object monitors current submeter 2 calculated by device. Value is in counted pulses.</p> <p>Rem.: If value cannot be read out of calculator, value "0" will be used instead.</p>											
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
<p>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)</p> <p>Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.</p>											
43	Current values - Submeter 3 status	Current submeter 3 pulses	4 bytes, 13.001	R/C/T	X	X	X	X	X	X	X
<p>This object monitors current submeter 3 calculated by device. Value is in counted pulses.</p> <p>Rem.: If value cannot be read out of calculator, value "0" will be used instead.</p>											
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
<p>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)</p> <p>Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.</p>											

## 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
<p>This object monitors instant power calculated by device. Value is in W heat flow rate.</p> <p>Rem.: If value cannot be read out of calculator, value "0" will be used instead.</p>											
46	Instant values - Volume flowrate status	Instant volume flowrate	2 bytes, 9.025	R/C/T	X		X	X	X	X	X
<p>This object monitors instant volume flowrate calculated by device. Value is in l/h.</p> <p>Rem.: If value cannot be read out of calculator, value "0" will be used instead.</p>											
47	Instant values - Mass flowrate status	Instant mass flowrate	4 bytes, 14.052	R/C/T		X					
<p>This object monitors instant mass flowrate calculated by device. Value is in kg/s.</p> <p>Rem.: If value cannot be read out of calculator, value "0" will be used instead.</p>											
48	Instant values - Flow temperature status	Instant flow temperature	2 bytes, 9.001	R/C/T	X	X		X	X	X	X
<p>This object monitors instant flow temperature measured by device. Value is in °C.</p> <p>Rem.: Value 0x7FFF (670760.96°C) denotes invalid value.</p> <p>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.</p>											
49	Instant values - Return temperature status	Instant return temperature	2 bytes, 9.001	R/C/T	X	X		X	X	X	X
<p>This object monitors instant flow temperature measured by device. Value is in °C.</p> <p>Rem.: Value 0x7FFF (670760.96°C) denotes invalid value.</p> <p>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.</p>											
50	Instant values - Temperature difference status	Instant temperature difference	2 bytes, 9.002	R/C/T	X	X		X	X	X	X
<p>This object monitors instant temperature difference between flow and return, calculated by device. Value is in °K.</p> <p>Rem.: Value 0x7FFF (670760.96°C) denotes invalid value.</p> <p>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.</p>											
51	Instant values - Density status	Instant density	4 bytes, 14.017	R/C/T	X	X		X	X	X	X
<p>This object monitors instant liquid density, calculated by device. Value is in Kg/m<sup>3</sup>.</p> <p>Rem.: If value cannot be read out of calculator, value "0" will be used instead.</p>											

## 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
<p>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.</p> <p>This object indicates date and time associated to logged data's on CO's Nr. 53...92 that will be sent after same query.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p>											
53	Logger - Energy status	Energy value at storage	4 bytes, 13.013	C/T	X	X		X	X	X	X
<p>This object monitors logged energy value calculated by device. Value is in kWh.</p> <p>Rem.: Date and time of storing is available on CO Nr. 52.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p>											
54	Logger - Energy register status	Energy value at storage	6 bytes, 229.001	C/T	X	X		X	X	X	X
<p>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)</p> <p>Rem.: Date and time of storing is available on CO Nr. 52.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p> <p>Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.</p>											
55	Logger - Energy positive status	Positive energy value at storage	4 bytes, 13.013	C/T				X		X	
<p>This object monitors logged positive energy value calculated by device. Value is in kWh.</p> <p>Rem.: Date and time of storing is available on CO Nr. 52.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p>											
56	Logger - Energy positive register status	Positive energy value at storage	6 bytes, 229.001	C/T	X	X	X	X	X	X	X
<p>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)</p> <p>Rem.: Date and time of storing is available on CO Nr. 52.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p> <p>Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.</p>											
57	Logger - Energy negative status	Negative energy value at storage	4 bytes, 13.013	C/T				X		X	
<p>This object monitors logged negative energy value calculated by device. Value is in kWh.</p> <p>Rem.: Date and time of storing is available on CO Nr. 52.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p>											
58	Logger - Energy negative register status	Negative energy value at storage	6 bytes, 229.001	C/T				X		X	
<p>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)</p> <p>Rem.: Date and time of storing is available on CO Nr. 52.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p> <p>Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.</p>											



## 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
<p>This object monitors logged tarif 1 energy value calculated by device. Value is in kWh.</p> <p>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.</p>											
60	Logger - Energy tarif 1 register status	Tarif 1 energy value at storage	6 bytes, 229.001	C/T					X		X
<p>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)</p> <p>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.</p>											
61	Logger - Energy tarif 2 status	Tarif 2 energy value at storage	4 bytes, 13.013	C/T					X		
<p>This object monitors logged tarif 2 energy value calculated by device. Value is in kWh.</p> <p>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.</p>											
62	Logger - Energy tarif 2 register status	Tarif 2 energy value at storage	6 bytes, 229.001	C/T					X		
<p>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)</p> <p>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.</p>											
63	Logger - Volume status	Volume at storage	4 bytes, 14.076	C/T	X				X		X
<p>This object monitors logged volume value calculated by device. Value is in m<sup>3</sup>.</p> <p>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.</p>											
64	Logger - Volume register status	Volume at storage	6 bytes, 229.001	C/T	X				X		X
<p>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)</p> <p>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.</p>											
65	Logger - Volume positive status	Positive volume at storage	4 bytes, 14.076	C/T				X		X	
<p>This object monitors logged positive volume value calculated by device. Value is in m<sup>3</sup>.</p> <p>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.</p>											

## Logger values

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
66	<b>Logger - Volume positive register status</b>	<b>Positive volume at storage</b>	<b>6 bytes, 229.001</b>	<b>C/T</b>				X		X	
<p>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)</p> <p>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.</p>											
67	<b>Logger - Volume negative status</b>	<b>Negative volume at storage</b>	<b>4 bytes, 14.076</b>	<b>C/T</b>				X		X	
<p>This object monitors logged negative volume value calculated by device. Value is in m<sup>3</sup>.</p> <p>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.</p>											
68	<b>Logger - Volume negative register status</b>	<b>Negative volume at storage</b>	<b>6 bytes, 229.001</b>	<b>C/T</b>				X		X	
<p>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)</p> <p>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.</p>											
69	<b>Logger - Volume tarif 1 status</b>	<b>Tarif 1 volume at storage</b>	<b>4 bytes, 14.076</b>	<b>69</b>							X
<p>This object monitors logged tarif 1 volume value calculated by device. Value is in m<sup>3</sup>.</p> <p>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.</p>											
70	<b>Logger - Volume tarif 1 register status</b>	<b>Tarif 1 volume at storage</b>	<b>6 bytes, 229.001</b>	<b>C/T</b>							X
<p>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)</p> <p>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.</p>											
71	<b>Logger - Mass status</b>	<b>Mass at storage</b>	<b>4 bytes, 14.051</b>	<b>C/T</b>		X					
<p>This object monitors logged mass value calculated by device. Value is in kg.</p> <p>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.</p>											
72	<b>Logger - Mass register status</b>	<b>Mass at storage</b>	<b>6 bytes, 229.001</b>	<b>C/T</b>		X					
<p>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)</p> <p>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.</p>											

## 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				
<p>This object monitors logged submeter 1 value calculated by device. Value is in counted pulses.</p> <p>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.</p>											
74	Logger - Submeter 1 register status	Submeter 1 at storage	6 bytes, 229.001	C/T			X				
<p>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)</p> <p>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.</p>											
77	Logger - Submeter 2 status	Submeter 2 at storage	4 bytes, 13.001	C/T	X	X	X	X	X	X	X
<p>This object monitors logged submeter 2 value calculated by device. Value is in counted pulses.</p> <p>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.</p>											
78	Logger - Submeter 2 register status	Submeter 2 at storage	6 bytes, 229.001	C/T	X	X	X	X	X	X	X
<p>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)</p> <p>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.</p>											
79	Logger - Submeter 3 status	Submeter 3 at storage	4 bytes, 13.001	C/T	X	X	X	X	X	X	X
<p>This object monitors logged submeter 3 value calculated by device. Value is in counted pulses.</p> <p>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.</p>											
80	Logger - Submeter 3 register status	Submeter 3 at storage	6 bytes, 229.001	C/T	X	X	X	X	X	X	X
<p>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)</p> <p>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.</p>											
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
<p>This object monitors logged calculator off-time value.</p> <p>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.</p>											

## Logger values

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
82	<b>Logger - Alarm counter status</b>	<b>Calculator alarm time at storage</b>	<b>4 bytes, 13.100</b>	<b>C/T</b>	X	X	X	X	X	X	X
<p>This object monitors logged calculator alarm time value.</p> <p>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.</p> <p>Rem.: Date and time of storing is available on CO Nr. 52.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p>											
83	<b>Logger - Maximum power status</b>	<b>Maximum instant power at storage</b>	<b>4 bytes, 14.036</b>	<b>C/T</b>	X	X	X	X	X	X	X
<p>This object monitors logged maximum instant power calculated by device. Value is in W heat flow rate.</p> <p>Rem.: Date and time of storing is available on CO Nr. 52.</p> <p>Rem.: Date and time of maximum power event is available on CO Nr. 84.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p>											
84	<b>Logger - Timestamp power max. status</b>	<b>Timestamp for maximum power at storage</b>	<b>8 bytes, 19.001</b>	<b>C/T</b>	X	X	X	X	X	X	X
<p>This object indicates date and time associated to logged maximum instant power.</p> <p>Rem.: Date and time of storing is available on CO Nr. 52.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p>											
85	<b>Logger - Maximum volume flowrate status</b>	<b>Maximum instant volume flowrate at storage</b>	<b>2 bytes, 9.025</b>	<b>C/T</b>	X	X	X	X	X	X	X
<p>This object monitors logged maximum instant volume flowrate calculated by device. Value is in l/h.</p> <p>Rem.: Date and time of storing is available on CO Nr. 52.</p> <p>Rem.: Date and time of maximum volume flowrate event is available on CO Nr. 86.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p>											
86	<b>Logger - Timestamp max. volume flowrate status</b>	<b>Timestamp for maximum volume flowrate at storage</b>	<b>8 bytes, 19.001</b>	<b>C/T</b>	X	X	X	X	X	X	X
<p>This object indicates date and time associated to logged maximum instant volume flowrate.</p> <p>Rem.: Date and time of storing is available on CO Nr. 52.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p>											
87	<b>Logger - Maximum mass flowrate status</b>	<b>Maximum instant mass flowrate at storage</b>	<b>4 bytes, 14.052</b>	<b>C/T</b>		X					
<p>This object monitors logged maximum instant mass flowrate calculated by device. Value is in kg/s.</p> <p>Rem.: Date and time of storing is available on CO Nr. 52.</p> <p>Rem.: Date and time of maximum mass flowrate event is available on CO Nr. 88.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p>											
88	<b>Logger - Timestamp max. mass flowrate status</b>	<b>Timestamp for maximum mass flowrate at storage</b>	<b>8 bytes, 19.001</b>	<b>C/T</b>		X					
<p>This object indicates date and time associated to logged maximum instant mass flowrate.</p> <p>Rem.: Date and time of storing is available on CO Nr. 52.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p>											

## 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
<p>This object monitors logged maximum instant flow temperature measured by device. Value is in °C.</p> <p>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.</p>											
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
<p>This object indicates date and time associated to logged maximum instant flow temperature.</p> <p>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.</p>											
91	Logger - Maximum return temperature status	Maximum instant return temperature at storage	2 bytes, 9.001	C/T	X	X		X	X	X	X
<p>This object monitors logged maximum instant return temperature measured by device. Value is in °C.</p> <p>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.</p>											
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
<p>This object indicates date and time associated to logged maximum instant return temperature.</p> <p>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.</p>											

## 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
<p>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.</p> <p>This object indicates date and time associated to frozen data's on CO's Nr. 93...134 that will be sent after same query.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p>											
94	Freeze - Energy status	Energy value at freezing	4 bytes, 13.013	C/T	X	X		X	X		X
<p>This object monitors frozen energy value calculated by device. Value is in kWh.</p> <p>Rem.: Date and time of storing is available on CO Nr. 93.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p>											
95	Freeze - Energy register status	Energy value at freezing	6 bytes, 229.001	C/T	X	X		X	X		X
<p>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)</p> <p>Rem.: Date and time of storing is available on CO Nr. 93.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p> <p>Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.</p>											
96	Freeze - Energy positive status	Positive energy value at freezing	4 bytes, 13.013	C/T				X		X	
<p>This object monitors frozen positive energy value calculated by device. Value is in kWh.</p> <p>Rem.: Date and time of storing is available on CO Nr. 93.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p>											
97	Freeze - Energy positive register status	Positive energy value at freezing	6 bytes, 229.001	C/T				X		X	
<p>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)</p> <p>Rem.: Date and time of storing is available on CO Nr. 93.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p> <p>Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.</p>											
98	Freeze - Energy negative status	Negative energy value at freezing	4 bytes, 13.013	C/T				X		X	
<p>This object monitors frozen negative energy value calculated by device. Value is in kWh.</p> <p>Rem.: Date and time of storing is available on CO Nr. 93.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p>											
99	Freeze - Energy negative register status	Negative energy value at freezing	6 bytes, 229.001	C/T				X		X	
<p>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)</p> <p>Rem.: Date and time of storing is available on CO Nr. 93.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p> <p>Rem.: During data conversion there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.</p>											

## 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
<p>This object monitors frozen tarif 1 energy value calculated by device. Value is in kWh.</p> <p>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.</p>											
101	Freeze - Energy tarif 1 register status	Tarif 1 energy value at freezing	6 bytes, 229.001	C/T					X		X
<p>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)</p> <p>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.</p>											
102	Freeze - Energy tarif 2 status	Tarif 2 energy value at freezing	4 bytes, 13.013	C/T					X		
<p>This object monitors frozen tarif 2 energy value calculated by device. Value is in kWh.</p> <p>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.</p>											
103	Freeze - Energy tarif 2 register status	Tarif 2 energy value at freezing	6 bytes, 229.001	C/T					X		
<p>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)</p> <p>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.</p>											
104	Freeze - Volume status	Volume at freezing	4 bytes, 14.076	C/T	X				X		X
<p>This object monitors frozen volume value calculated by device. Value is in m<sup>3</sup>.</p> <p>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.</p>											
105	Freeze - Volume register status	Volume at freezing	6 bytes, 229.001	C/T	X				X		X
<p>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)</p> <p>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.</p>											
106	Freeze - Volume positive status	Positive volume at freezing	4 bytes, 14.076	C/T				X		X	
<p>This object monitors frozen positive volume value calculated by device. Value is in m<sup>3</sup>.</p> <p>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.</p>											

## 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	
<p>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)</p> <p>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.</p>											
108	Freeze - Volume negative status	Negative volume at freezing	4 bytes, 14.076	C/T				X		X	
<p>This object monitors frozen negative volume value calculated by device. Value is in m3.</p> <p>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.</p>											
109	Freeze - Volume negative register status	Negative volume at freezing	6 bytes, 229.001	C/T				X		X	
<p>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)</p> <p>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.</p>											
110	Freeze - Volume tarif 1 status	Tarif 1 volume at freezing	4 bytes, 14.076	C/T							X
<p>This object monitors frozen tarif 1 volume value calculated by device. Value is in m<sup>3</sup>.</p> <p>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.</p>											
111	Freeze - Volume tarif 1 register status	Tarif 1 volume at freezing	6 bytes, 229.001	C/T							X
<p>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)</p> <p>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.</p>											
112	Freeze - Mass status	Mass at freezing	4 bytes, 14.051	C/T		X					
<p>This object monitors frozen mass value calculated by device. Value is in kg.</p> <p>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.</p>											
113	Freeze - Mass register status	Mass at freezing	6 bytes, 229.001	C/T		X					
<p>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)</p> <p>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.</p>											



## 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				
<p>This object monitors frozen submeter 1 value calculated by device. Value is in counted pulses.</p> <p>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.</p>											
115	Freeze - Submeter 1 register status	Submeter 1 at freezing	6 bytes, 229.001	C/T			X				
<p>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)</p> <p>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.</p>											
118	Freeze - Submeter 2 status	Submeter 2 at freezing	4 bytes, 13.001	C/T	X	X	X	X	X	X	X
<p>This object monitors frozen submeter 2 value calculated by device. Value is in counted pulses.</p> <p>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.</p>											
119	Freeze - Submeter 2 register status	Submeter 2 at freezing	6 bytes, 229.001	C/T	X	X	X	X	X	X	X
<p>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)</p> <p>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.</p>											
120	Freeze - Submeter 3 status	Submeter 3 at freezing	4 bytes, 13.001	C/T	X	X	X	X	X	X	X
<p>This object monitors frozen submeter 3 value calculated by device. Value is in counted pulses.</p> <p>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.</p>											
121	Freeze - Submeter 3 register status	Submeter 3 at freezing	6 bytes, 229.001	C/T	X	X	X	X	X	X	X
<p>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)</p> <p>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.</p>											
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
<p>This object monitors frozen calculator off-time value.</p> <p>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.</p>											

## 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
<p>This object monitors frozen calculator alarm time value.</p> <p>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.</p> <p>Rem.: Date and time of storing is available on CO Nr. 93.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p>											
124	Freeze - Maximum power status	Maximum instant power at freezing	4 bytes, 14.036	C/T	X	X	X	X	X	X	X
<p>This object monitors frozen maximum instant power calculated by device. Value is in W heat flow rate.</p> <p>Rem.: Date and time of freezing is available on CO Nr. 93.</p> <p>Rem.: Date and time of maximum power event is available on CO Nr. 125.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p>											
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
<p>This object indicates date and time associated to frozen maximum instant power.</p> <p>Rem.: Date and time of freezing is available on CO Nr. 93.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135</p>											
126	Freeze - Maximum volume flowrate status	Maximum instant volume flowrate at freezing	2 bytes, 9.025	C/T	X		X	X	X	X	X
<p>This object monitors frozen maximum instant volume flowrate calculated by device. Value is in l/h.</p> <p>Rem.: Date and time of storing is available on CO Nr. 93.</p> <p>Rem.: Date and time of maximum volume flowrate event is available on CO Nr. 127.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p>											
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
<p>This object indicates date and time associated to frozen maximum instant volume flowrate.</p> <p>Rem.: Date and time of storing is available on CO Nr. 93.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p>											
128	Freeze - Maximum mass flowrate status	Maximum instant mass flowrate at freezing	4 bytes, 14.052	C/T		X					
<p>This object monitors frozen maximum instant mass flowrate calculated by device. Value is in kg/s.</p> <p>Rem.: Date and time of storing is available on CO Nr. 93.</p> <p>Rem.: Date and time of maximum mass flowrate event is available on CO Nr. 129.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p>											
129	Freeze - Timestamp max. mass flowrate status	Timestamp for maximum mass flowrate at freezing	8 bytes, 19.001	C/T		X					
<p>This object indicates date and time associated to frozen maximum instant mass flowrate.</p> <p>Rem.: Date and time of storing is available on CO Nr. 93.</p> <p>Rem.: Transmission of this data must be initiated by sending according value on CO Nr. 135.</p>											

## 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
<p>This object monitors frozen maximum instant flow temperature measured by device. Value is in °C.</p> <p>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.</p>											
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
<p>This object indicates date and time associated to frozen maximum instant flow temperature.</p> <p>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.</p>											
132	Freeze - Maximum return temperature status	Maximum instant return temperature at freezing	2 bytes, 9.001	C/T	X	X		X	X	X	X
<p>This object monitors frozen maximum instant return temperature measured by device. Value is in °C.</p> <p>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.</p>											
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
<p>This object indicates date and time associated to frozen maximum instant return temperature.</p> <p>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.</p>											
134	Freeze - Freeze CO	Freeze	1 bit, 1.017	C/T	X	X	X	X	X	X	X
<p>0: Triggers freezing of data's  1: Triggers freezing of data's</p> <p>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.</p> <p>Rem.: by freezing data's, previously frozen data's will be overwritten.</p>											
135	Query - Query datas CO	Query frozen or logger data's	2 bytes, 7.001	C/T	X	X	X	X	X	X	X
<p>Sending of frozen or logged data's must be initiated by sending according data on CO Nr. 135.</p> <p>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.  &gt;500: Query is ignored</p> <p>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-&gt;2, 2-&gt;3, ...).</p> <p>Rem.: If queried frozen or logged data's are not available (no answer or no communication with calculator), no answer will be sent.</p>											

## Relay 1

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
					X	X	X	X	X	X	X
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 II 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 II)

## Relay 2

Nr.	Name	Function	Length	Flags	Volume	Mass	Flow	BDE	TGR	BDV	DTF
					X	X	X	X	X	X	X
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 II 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 II)

## 5 KNX®-Verbindungen, z.B. mit Wasser- und Ölzählern

Es sind zwei Hilfeingänge verfügbar um Impulse von anderen Zählern, wie Wasser- und Ölzähler mit Impulssignalen zu messen und das Ergebnis direkt an das KNX® TP1-Netzwerk zu übermitteln.

## 6 Alarm

Die CALEC® ST II-Statusmeldungen sind mit den KNX®-Kommunikationsobjekten verbunden. INTEGRA METERING AG unterscheidet zwischen folgenden Typen von Statusmeldungen:

### Gerätestatus „Fehler“

Alle wichtigen Gerätefehler wie „Systemfehler“ müssen einschliesslich des Fehlercodes überprüft werden.

### Messwertstatus „Alarm“:

Spezielle Meldungen wie „dt Alarm“ müssen mit dem Alarmcode überprüft werden (weiterführende Informationen finden Sie im Abschnitt „Fehlermeldungen, Alarme“ in der Bedienungsanleitung des CALEC® ST II).

## 7 KNX® Produktdatenbank für CALEC® ST II

Das KNX® Produktdatenbank des CALEC® ST II finden Sie auf [www.integra-metering.com](http://www.integra-metering.com).



Die KNX® Produktdatenbank finden Sie auf folgender Internetseite:  
<http://www.integra-metering.com/qr/prod/calec-st/11111.html>



## 8 Problembehandlung

Kommunikationsfehler			
Nr.	Fehler / Störung	Mögliche Ursache	Lösung
1	CALEC® ST II kommuniziert nicht im KNX® TP1-Netzwerk	Verkabelung des Netzwerks Konfiguration des CALEC® ST II Konfiguration ETS5®	Prüfen Sie, ob die KNX® TP1-Geräte korrekt verbunden sind. Prüfen Sie, ob die Bus-Topologie in Ordnung ist. Prüfen Sie, ob die physikalische Adresse korrekt konfiguriert ist und im Netzwerk eindeutig vergeben wurden

