

CALEC® ST III Advanced - CST-III ADV

Technical data sheet

Product description

CALEC® ST III is a high-end energy meter used in the areas of:

- commercial buildings / building technology
- near and district heating / district cooling
- residential construction / sanitary

The main applications of the product are:

- System integration component

With the versatile interfaces of CALEC® ST III the energy data of all thermal applications can be easily integrated in subordinate energy management and building control systems.

- Heating / cooling transmission station

Together with the various flow meters of INTEGRA Metering, the energy calculator CALEC® ST III offers the per-fect combination for the determination of performance data in medium heating applications, in particular for distribution stations and larger buildings.



Technical data

Housing and operating conditions	
Dimension	
Ambient temperature	+5 ... +55 °C, EN 1434 class C
Storage temperature	0...60 °C
Humidity	Max. 95 %
Operating altitude	Up to 2000 m above sea level
Protection class	IP54 according to EN 60529
Terminals	Signal connection: 1.5 mm ² screw terminals Power connection: 2.5 mm ² screw terminals
Lifetime	Operational period 15 years, includes 3 cycles of calculator-module and thermal probes replacement.
Protection against mechanical stress	Vibrations / shock according to EN 1434 - 7.23
Mounting	Wall mounting with 3 points DIN-rail mounting (DIN-EN 50222)
Cable inlets	2x Ø 4-8 mm power port 8x Ø 2.5-5 mm signal port 2x Ø 4-8 mm signal port

Basic data for calculator	
Temperature measuring range	0...+200 °C (heat carrier: water) -40...+180 °C (special heat carrier)
Temperature difference	0...199 K Type approval 3...190 K On demand 1...199 K and 2...199 K
Temperature sensor	Pt 100, Pt 500, Pt1000 according to IEC 751 paired in accordance with EN 1434 2-wire or 4-wire connection. Max. sensor cable length 2-wire connection: 10 m Max. sensor cable length 4-wire connection: 100 m
Temperature measurement resolution	20 bit resolution, typical ± 0.005 K ($T_a = 5...55$ °C)
Installation side	Hot or cold side
Pulse value of the flow meter	0.001...9999.999 liters or m ³
Pulse values and units for auxiliary inputs and contact outputs	Volume: 0.001...9999.999 ml, l, m ³ , GAL Energy: 0.001...9999.999 Wh, kWh, MWh, MJ, GJ, KBTU, MBTU Mass: 0.001...9999.999 T, Kg Unitless mode possible: 0.001...9999.999
Error limits	Better than those required for calculators in accordance with EN 1434-1. Suitable for combined class 2 heat meters in accordance with EN 1434-1 when used with suitable volume metering units
NFC interface	For commissioning / parametrization: 13.56 MHz
Bluetooth interface	For commissioning / parametrization: 2.4 GHz - chip antenna Class III (1mW)
Display	
Display type	Backlit multi-function LCD display with 8 digits for meter reading. Symbols and short texts for user operation purposes.
Display size	15 mm x 68 mm
Display resolution and units volume	1 – 0.001 m ³ , US Gal
Display resolution and units energy	1 – 0.001 kWh, MWh, MJ, GJ, KBTU, MBTU
Display resolution and units mass	1 – 0.001 T
Error display	Visible fault state indicator in display. Display blinks red in case of an error. See Troubleshooting for details.
Additional functions	
Data logger	500 values from all readings with a time stamp, stored in ring memory, logger interval, 1 minute, 1 hour, 1 day, 1 week, 1 month
Billing data values	12 freely programmable billing dates to memorize indexes (e.g. monthly) for defined dates. Indexes can be consulted any time.
Flow rate configuration	Specific configuration for flow rate measurement purposes only. It can be 1 channel, 2 channels or 2-channel pulse collector to calculate the total sum. Temperature measurement is disabled; no temperatures are detected or displayed.
Glycol-based medium	The "Glycol-based heat transfer medium" (GLY) option offers an excellent solution for solar-power thermal systems.
On-site settings	One-time on-site setting for calibration-relevant input values "IMP EBS"
Simultaneous readout	The specific "freeze" command makes it possible to store the desired values, which can then be read out one by one from the system.
Bi-directional energy metering BDE	The BDE option allows emitted energy to be measured even in twin-conduit networks that perform a combined heating and cooling function. The measurement readings for heating and cooling are recorded separately for their corresponding cost calculation purposes.
Combined heat- / cold meters BDV	The BDV option allows the measuring of energy exchange (draw/supply) for interlinked networks and charging / discharging in heat accumulators. The measurement of positive and negative are recorded separately for their corresponding energy consumption.

Additional functions							
Heat- / cold meters with two parallel flow sensors TWIN-V	The Twin-V option is suitable for summer / winter metering where heating and cooling meters have two parallel flow sensors.						
Heat- / cold meters DTF	The DTF option allows the measuring of energy heating or cooling meter with external tariff control for two tariff registers.						
Heat- / cold meters Twin-E	The Twin-E option allows a measurement of parallel consumers composed of one closed circulation and one open circulation with reference temperature.						
Heat- / cold meters TGR	The TGR option allows a measurement with bonus / malus tariff management including reference temperature control.						
Heat- / cold meters eight tariffs	This option allows the management of up to eight different tariffs with reference temperature control. The measurement is split into different registers.						
Data backup in the event of a power failure	In EERPOM >10 years						
Adjustable low temperature difference ΔT cut-off (LFCO)	Function for stopping the energy calculation when the temperature difference is too low, ΔT LFCO adjustable $\Delta T = 0-2.99$ K.						
Limit value monitoring	One-sided or two-sided, hysteresis 0 - 10 %, action of the output signal is selectable.						
Mains version							
Power supply	12 W / 110-240 VAC, 50-60 Hz (according to EN 1434).						
Calculation cycle	1 s						
Backup battery real-time clock	3 V Li-Mn CR1220, 3 months backup						
Low voltage power supply for flow meters							
	<table border="1"> <thead> <tr> <th>Voltage</th> <th>Flow meter</th> </tr> </thead> <tbody> <tr> <td>2x 3.6 VDC, max. 2 mA galvanic isolation max. 48 VDC</td> <td>e.g. AMFLO® SONIC UFA 113</td> </tr> <tr> <td>1x 24 VDC, max. 150 mA galvanic isolation max.48 V DC</td> <td>e.g. AMFLO® MAG Smart or active sensors</td> </tr> </tbody> </table>	Voltage	Flow meter	2x 3.6 VDC, max. 2 mA galvanic isolation max. 48 VDC	e.g. AMFLO® SONIC UFA 113	1x 24 VDC, max. 150 mA galvanic isolation max.48 V DC	e.g. AMFLO® MAG Smart or active sensors
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2x 3.6 VDC, max. 2 mA galvanic isolation max. 48 VDC	e.g. AMFLO® SONIC UFA 113						
1x 24 VDC, max. 150 mA galvanic isolation max.48 V DC	e.g. AMFLO® MAG Smart or active sensors						
Supply voltage							
	Power supply, galvanically isolated to the system, for external flow meters.						
	$V_{out\ nom}$ 3.6 V						
	$V_{OUT\ min}$ 3.45 V						
	$V_{OUT\ max}$ 3.75 V						
	$I_{Out\ max}$ 10 mA						
	V_{Ripple} 50 mV						
	Load regulation $\pm 1\%$ @ load steps of 5 mA						
	Insulation voltage galvanic isolation Normative 48 V technical: 312 VAC						
	Clearance to other circuits 0.5 mm						
3.6 V sensor power output							
	Power supply, galvanically isolated to the system, for external loads or flow meters.						
	$V_{out\ nom}$ 24 V						
	$V_{OUT\ min}$ 22 V						
	$V_{OUT\ max}$ 26 V						
	$I_{Out\ max}$ 180 mA						
	V_{Ripple} 200 mV						
	Load regulation $\pm 6\%$ @ load steps of 100 mA						
	Insulation voltage galvanic isolation Normative 48 V Technical: 312 VAC						
	Clearance to other circuits 0.5 mm						
24 V sensor power output							

Pulse inputs		
Input #1 (10/11) Input #2 (54/55)	Connecting a pulse generator according to NAMUR, with potential-free contact (reed relay) or SSR (solid state relay).	
Pulse input class ID	2-wire pulse input according to class ID compliant with EN1434-2 Suitable for NAMUR-, "Open Collector" or mechanical pulse sources	
	Supply voltage	8...8.4 V
	Source impedance	1 kΩ
	Switching threshold IL	2.1 mA
	Switching threshold IH	1.2 mA
	Pulse length	≥ 2 ms
	Pulse pause	≥ 2.5 ms
	Max. pulse frequency	≤ 200 Hz
Typical input capacitance	20 nF	
Pulse outputs		
Output #1 (50/51)	Passive digital output	
Pulse output	Contact rating	48 VDC, 100 mA
	Electrical isolation	48 V
	Contact resistance (on)	<30 Ω
	Contact resistance (off)	>10 MΩ
	Pulse frequency	Max. 10 Hz
	Pulse width	50 ms
M-Bus (on-board or option)		
M-Bus interface	According to EN 13757-2/-3	
Addresses	Primary address: 0 Standard secondary address: 99999999	
Baud rate	300, 2'400, 9'600 Baud	
wM-Bus (on-board or option)		
wM-Bus interface	According to EN 13757-4 / OMS 4.0	
Frequency band	868 MHz (T1 Mode 5 and mode 7) - 25 mW (14 dBm)	
Addresses	OMS address including serial number of the device	
Modbus RTU (option)		
Physical layer and address	RS 485 / address: 1	
Baud rate	300, 2'400, 9'600, 19'200, 38'400 Baud	
Address range (slave)	1..247	
Parity	Even	
Function code	03: Read holding register	
LON interface (option)		
Type	LON TP-FT 10 Free topology (2-wire twisted pair) Certified in accordance with LONMARK® 3.4	
Baud rate	78 k Baud	
Max. bus length	500 m / 2700 m with/without termination resistors 64 nodes per segment	
BACnet MS/TP (option)		
Physical layer and AMT ID	RS 485 / ID: 431	
BACnet device profile and instance	B - ASC / the last 5 digits of the serial number	
BACnet MAC address	The last 2 digits of the serial number	

BACnet MS/TP (option)	
Baud rate and mode	Automatic / master
N2Open (option)	
Physical layer and address	RS 485 / address: 1...255 / Default: 1
Baud rate	9'600 Baud
2 analog outputs 2AOU (option)	
Output signal	4...20 mA or 0...20 mA
Supply voltage	6...24 VDC
Electrical isolation	max. 48 VDC
Maximum resistance	≤ 837 Ω at 24 VDC, 0 Ω at 6 V
Maximum transformer error	0.15 % of measured value + 0.15 % of end value
Supported modes	Active and passive
2 pulse outputs DOU (option)	
Contact rating	48 VDC, 100 mA
Electrical isolation	48 V
Contact resistance (on)	<30 Ω
Contact resistance (off)	<10 MΩ
Pulse frequency	Max. 10 Hz
Pulse width	50 ms
KNX (option)	
Type	TP1 (2-wire twisted pair), certified according to KNX standard 2.1
Max. power consumption	10 mA
Baud rate	9'600 Baud
LoRa Wireless (option)	
Communication interface	LoRaWAN
Frequency band	868 MHz - 25 mW (14 dBm)
Addresses	LoRa address
Max. power consumption	50 mA
Impedance of antenna	50 Ω
Gain	0 dB
Antenna	Connector SMA Max. emitted power: 14 dBm
Smart Phone Commissioning	
Operating system	Android >6.0; available on Play Store
App	ParamApp
Features	Commissioning and readout via NFC and Bluetooth interface for better usability