CALEC® ST III - Standard & Smart

Technical data sheet

Product description

CALEC® ST III is an energy meter used in the areas of:

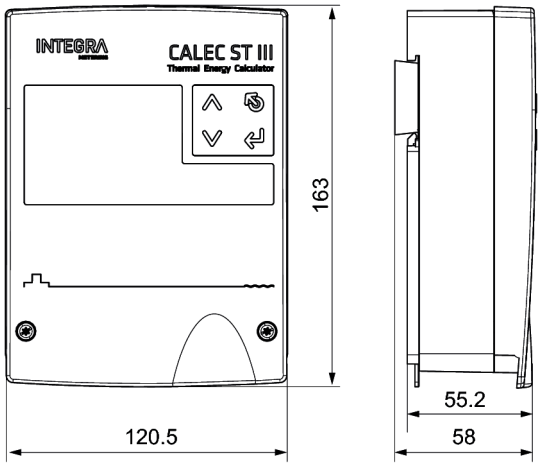
- commercial buildings / building technology
- near and district heating / district cooling
- residential construction / sanitary

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 AG, 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.

Note: Photo for illustrative purposes only

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)

Housing and operating conditions	
Cable inlets	1x Ø 4-8 mm power port 4x Ø 2.5-5 mm signal port 1x 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 (Ta = 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

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.

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.

Additional functions	
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.
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 ΔT = 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 (Standard version)	1 W / 24 VAC/DC – 240 VAC, 50/60 Hz (according to EN 1434).
Power supply (Smart version)	5W / 110 – 240 VAC, 50/60 Hz (according to EN 1434)
Calculation cycle	1 s
Backup battery real-time clock	3 V Li-Mn CR1220

Low voltage power supply for flow meters		
	Voltage	Flow meter
Supply voltage (Standard & Smart version)	2x 3.6 VDC, max. 2 mA galvanic isolation max. 48 VDC	e.g. AMFLO® SONIC UFA 113
Supply voltage (only on Smart version)	1x 24 VDC, max.150 mA galvanic isolation max.48 V DC	e.g. AMFLO® MAG Smart or active sensors
3.6 V sensor power output	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	±1 % @ load steps of 5 mA
	Insulation voltage galvanic isolation	Normative 48 V technical: 312 VAC
	Clearance to other circuits	0.5 mm

Low voltage power supply for flow meters		
24 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	±6 % @ load steps of 100 mA
	Insulation voltage galvanic isolation	Normative 48 V Technical: 312 VAC
	Clearance to other circuits	0.5 mm

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), or for passive sensors with the following values.	
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

Modbus RTU (option)	
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
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 (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
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 (T1 mode) – 16 mW
Addresses	LoRa address
Max. power consumption	50 mA
Impedance of antenna	50 Ω
Reinforcement	0 db
Antenna connection	Connector SMA
Smart Phone Commissioning	
Operating system	Android and iOS; available on Google Play Store or on App Store
App	IM Connect+
Features	Commissioning and readout via NFC and Bluetooth interface for better usability