

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.



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 ($T_a = 5...55$ °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 |
| 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 $\Delta T = 0-2.99$ K. | |
| Limit value monitoring | One-sided or two-sided, hysteresis 0 – 10 %, action of the output signal is selectable. | |
| Mains version | | |
| Power supply (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 k Ω |
| | 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 M Ω |
| | 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 >6.0; available on Play Store |
| App | ParamApp |
| Features | Commissioning and readout via NFC and Bluetooth interface for better usability |