

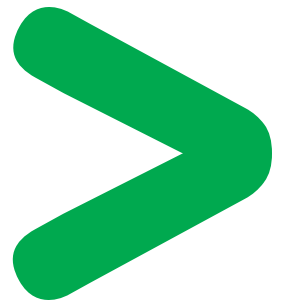
MV network management

Easergy range

Flair 200C

MV substation remote monitoring unit

Technical data sheet



Make the most of your energySM

Schneider
Electric



Throughout the world, poor quality of electric power supply is no longer accepted by consumers. In many countries, regulatory standards have been established to ensure a minimum quality of service for electricity.

Of the many indexes, those most commonly used are:

- **SAIDI**: standard average interruption duration index – e.g.: 96 minutes/year
- **SAIFI**: standard average interruption frequency index – e.g.: 1.2 interruptions/year

For power supply companies, the increase in quality of service must go hand-in-hand with an improvement in performance and competitiveness, as well as control of capital expenditures.

For an optimum response to these needs, power distribution companies are demanding new products and solutions to allow:

- **Improved reliability:**
 - » Reduction in the duration of loss of power in the event of incidents on the network (SAIDI)
 - » Reduction in the number of faults: e.g. through monitoring of distribution transformers
 - » Monitoring and improvement in the quality of power: performance tools for fault analysis
- **Reduction** in direct and indirect operation costs:
 - » Reduction in response times in the event of incidents
 - » Reduction in substation inspection campaigns for maintenance and measurement
 - » Reduction in service operations upon equipment failure through remote monitoring: preventive alarm, overloading of network or equipment (transformer)
 - » Service vehicle fuel consumption. It will allow you to participate in the reduction of CO₂ emissions
- **Improvement** in the efficiency of power distribution:
 - » Quality control of distributed voltage: measurement, alarms and traceability
 - » Optimization of the network operating plan based on exhaustive data concerning the network load
- **Capital expenditure optimization:**
 - » Have precise, reliable data to define changes and investment planning concerning the MV network load
 - » Safeguard network equipment through preventive actions

Easergy products and solutions meet these objectives by providing you with reliable, maintenance-free equipment that is easy to operate. Schneider Electric is constantly looking for new solutions to simplify the operation of MV networks.



Improve efficiency:

- of network through distributed monitoring/alarming/control
- of capital expense through reliable data to optimize network planning
- of operating expenses through reduced troubleshooting time and targeted asset management

The Flair 200C is an efficient tool for reducing repair and fault finding times. It improves quality of service and operation for power supply companies.

A product dedicated to remote monitoring of underground equipment and networks with a high level of function integration

Easergy Flair 200C is a remote monitoring unit designed to be installed on the underground equipment of a public-private distribution network.

Easergy Flair 200C is specially designed to meet customers' requirements for the management of underground distribution equipment. It provides compact, open solutions:

- Fault passage indicator compatible with any type of earthing system
- Transformer monitoring: sending of an alarm in the event of an incident in the transformer for efficient maintenance
- Power monitoring unit on the MV and LV network for improved monitoring of load curves and improved power distribution efficiency
- Distribution equipment digital concentrator for interfacing between the equipment's communicating devices and the control center
- Communication with the remote control center with call management upon alarm

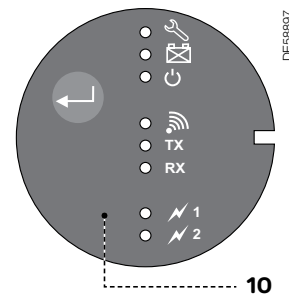
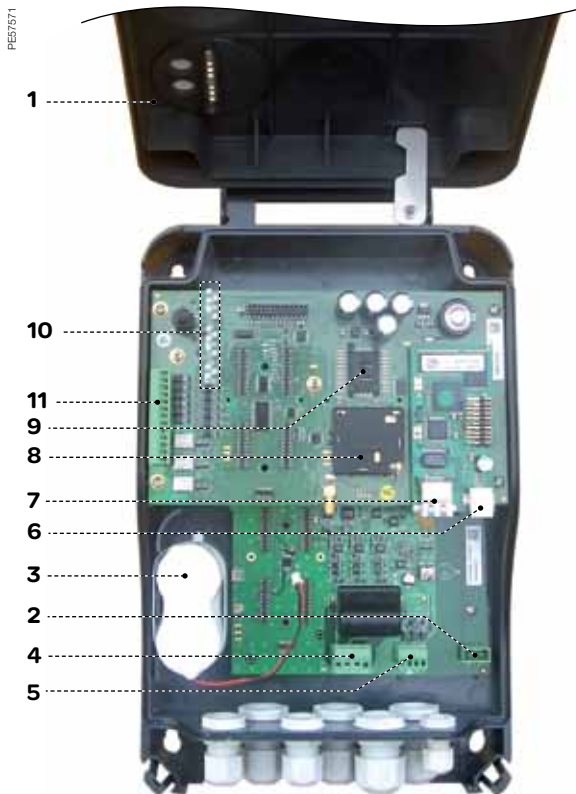
Compact cubicle for 1 or 2 measurement and fault current detection channels

Easergy Flair 200C takes the form of a polycarbonate-ABS enclosure. The wall-mounting cubicle is provided with a padlocking system. On option, Easergy Flair 200C is provided with a second measurement and fault current detection channel.

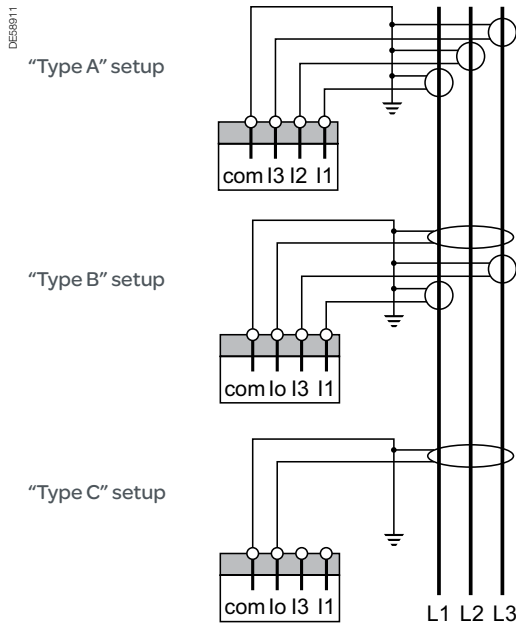
Main components:

- 1 — Upward-opening door with blocking system
- 2 — Power supply terminal block
- 3 — Battery
- 4 — 1 or 2 current acquisition, fault current detection and measurement processing circuits
- 5 — Digital output (DO) for fault current detection external indications
- 6 — USB configuration port
- 7 — Ethernet communication and configuration port
- 8 — GSM/GPRS modem*
- 9 — SIM card*
- 10 — Local indications:
 - 🔧 Equipment fault
 - 📧 Battery fault
 - 🔌 AC power on
 - 📶 GSM connection status
 - TX Transmit data
 - RX Receive data
 - ⚡ 1 Channel 1 fault current detection
 - ⚡ 2 Channel 2 fault current detection
- 11 — Digital inputs/outputs terminal block

* GSM/GPRS modem version



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Easergy Flair 200C detects phase-to-phase and phase-to-earth fault currents on networks with resistor-earthed, directly earthed or isolated neutral, and compensated (Petersen coil earthed neutral) system without voltage measurement.

In the case of compensated (Petersen coil earthed neutral) networks, the value of the earth fault is low relative to the value of the capacitive currents. As a consequence, conventional ammetric detection cannot be used. Easergy Flair 200C uses a new "Insensitive to Capacitive Currents" detection technology.

To enhance the reliability of the information transmitted, detection of a fault current is confirmed by loss of the "network." The "network loss" information is generated either from the voltage failure information processed based on the power supply, or from the load current on the line.

Two fault current detection algorithms are available in the Easergy Flair 200C catalog:

Ammetric detector (AMP)

- For networks with resistor-earthed, directly earthed and isolated neutral
- Permanent phase-to-phase and phase-to-earth faults: triggering threshold confirmed by an acknowledged time and network loss
- (Fast) phase-to-phase and transient phase-to-earth faults (not confirmed by network loss)
- Each type of fault has an associated counter that can provide relevant information concerning the number of faults for maintenance
- Fault confirmation by "network" loss
- "Inrush" filtering function at power up to prevent untimely detection when switching on loads

Insensitive to Capacitive Currents (ICC) detector

The principle of the ICC detector is based on similarity analysis of phase and earth fault currents to distinguish between an upstream earth fault current and a downstream fault without voltage measurement.

The ICC algorithm is used on resonance earth. The principle of the ICC algorithm can also be used with networks with directly earthed and impedance-earthed neutral, if the value of the capacitive currents is significant relative to the value of the earth fault current.

- Permanent phase-to-phase and phase-to-earth faults: tripping threshold confirmed by an acknowledged time and network loss
- Fault validation by "network" loss from the load current
- Operation on network with sustained fault or not

Easergy Flair 200C is also available without the fault detection option.

Easergy Flair 200C then acts only as an underground equipment measuring, supervision, monitoring and control unit.

| Characteristics | Detector type | | | |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------------------------------------------|------------------|
| | Ammetric detector (AMP) | | Insensitive to Capacitive Currents detector (ICC) | |
| Mains voltage | 4 kV to 36 kV | | 4 kV to 36 kV | |
| Frequency | 50/60 Hz | | 50/60 Hz | |
| Type of network | Resistor-earthed, directly earthed or isolated | | Compensated, resistor-earthed or directly earthed | |
| Type of sensor setup | A, B and C configurable | | A and B configurable | |
| Phase fault | Configurable from 10 A to 800 A in increments of 1 A | | | |
| Earth fault | A setup: configurable from 5 A to 160 A in increments of 1 A B and C setups: configurable from 2 A to 160 A in increments of 1 A | | | |
| “Network” monitoring mode | By voltage/By current | | By current | |
| Fault acknowledge time | Phase fault: configurable from 40 ms to 800 ms in increments of 20 ms Earth fault: configurable from 40 ms to 800 ms in increments of 20 ms | | | |
| Inrush | Configurable Yes/No (duration 3 s) | | | |
| Operation with sustained fault | — | | Configurable Yes/No | |
| Minimum current | — | | Configurable from 5 A to 20 A in increments of 1 A | |
| Acknowledge time | — | | Configurable from 1 s to 100 s in increments of 1 s | |
| Network time without fault | — | | Configurable from 1 s to 10 s in increments of 1 s | |
| Fault reset | <ul style="list-style-type: none"> • Automatic upon voltage return: configurable Yes/No • After time delay: configurable from 1 h to 12 h in increments of 1 h • At a distance via the remote control center • Manual by push button on the enclosure | | | |
| Indications | <ul style="list-style-type: none"> • Remote control center: phase at fault, summary of a phase fault, earth fault • Locally: by LED on the enclosure, by external indicator terminal (standard indicator unit or internal indicator unit) | | | |
| Detector precision | With sensor: | | | |
| | Standard | High-performance | Standard | High-performance |
| Without “power monitoring unit” option | ±10% | ±7% | ±10% | ±7% |
| With “power monitoring unit” option | ±5% | ±2% | ±5% | ±2% |

Standard measurements with fault passage indicator

- Temperature measurement
 - » Cubicle interior: $\pm 2^{\circ}$ C from -4° F to 158° F (-20° C to 70° C)
 - » Cubicle exterior: interior temperature 15.8° F (-9° C)
- Current measurement: I1, I2, I3, I0 and leverage

Measurements available with the “power monitoring unit” option

- Current measurement: I1, I2, I3, I0 and leverage
- LV and MV voltage measurement and monitoring
- Frequency
- Active, reactive and apparent power
- Active and reactive energy with capability for counter indexing
- Power factor

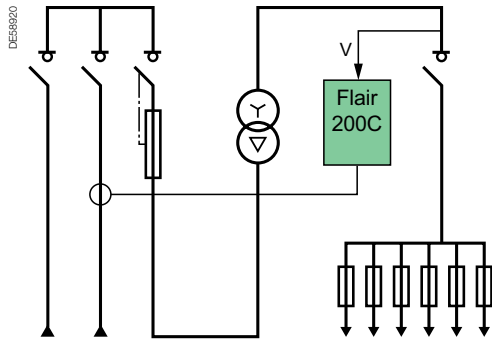
Measurement recording

Easergy Flair 200C offers various modes for recording measurements and transmitting them to the remote control center. The criteria can be combined together:

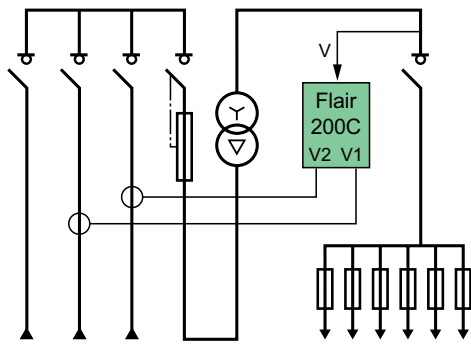
- Recording: local recording in the Flair 200C internal log
- Event recording: measurement transmitted at the request of the remote control center
- Dial-up: measurements are transmitted at the initiative of the Flair 200C when the requisite conditions are met.
- Measurements can be recorded in several ways:
 - » Regularly: sampled or averaged value with configurable period
 - » Upon exceeding a high or low threshold
 - » Upon variation or “dead band” (variation %)
 - » Upon regular recording of Min. and Max. values over 1, 7 or 14 days

Measurement characteristics

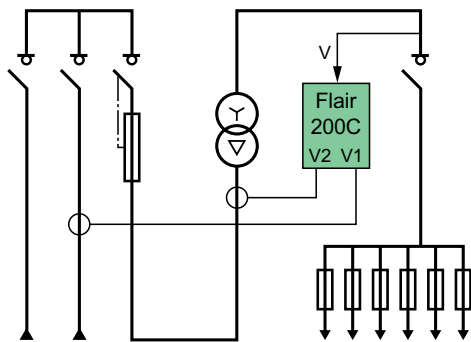
| | | |
|---------------------|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Voltage measurement | Type of measurement | Single-phase from the power source |
| | Input voltage | 120/240 Vac – 20% + 10%; 50/60 Hz |
| | Transformer time index (phase shift) | Configurable from 0 to 11 h |
| | Network voltage rating (scaled) | Configurable from 200 V to 36,000 V |
| | Value returned | V1 MV or LV: true rms value up to H15 |
| Current measurement | Type A setup | <ul style="list-style-type: none"> • I1, I2 and I3: true rms value up to H15 • I0: value calculated from I1 + I2 + I3 (H1) • Average 3I: from I1, I2 and I3 |
| | Type B and C setups | <ul style="list-style-type: none"> • I1 and I3: true rms value up to H15 • I0: true rms value up to H3 • I2: value calculated from I0 - I1 - I3 (H1) • Average 3I: from I1, I2 and I3 |
| Number of samples | | 36 per period (50/60 Hz) |



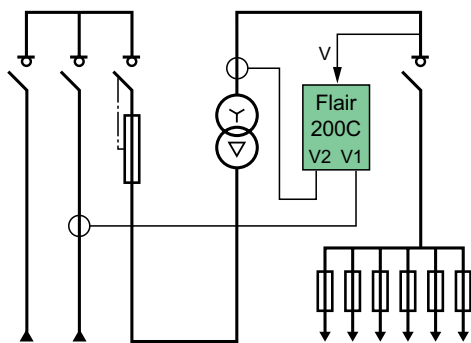
Setup 1



Setup 2



Setup 3



Setup 4

| Measurement precision | | |
|-----------------------|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Current | Standard sensor | 5% from 100 to 500 A |
| | High-performance sensor | 2% from 100 to 500 A |
| | Without sensors | 0.5% from 100 to 500 A |
| Voltage | | 1% from 90 to 265 Vac |
| Power factor | | <ul style="list-style-type: none"> ±1% at 600 A with $0.707 < PF < 1$ on channel 1 ±5% at 600 A with $0.707 < PF < 1$ on channel 2 |
| Frequency | 50 Hz | ±0.02 Hz from 48 to 52 Hz |
| | 60 Hz | ±0.02 Hz from 58 to 62 Hz |
| Power (without CTs) | | <ul style="list-style-type: none"> ±1% at 600 A with $0.707 < PF < 1$ on channel 1 ±5% at 600 A with $0.707 < PF < 1$ on channel 2 |

Measurements and detection of possible fault currents according to various setups

| Setups | 1 | 2 | | 3 | | 4 | |
|----------------|----|----|----|----|----|----|----|
| | | V1 | V2 | V1 | V2 | V1 | V2 |
| Fault detector | • | • | • | • | — | • | — |
| Current | MV | MV | MV | MV | MV | MV | LV |
| Voltage | MV | MV | MV | MV | MV | — | LV |
| Power | • | • | • | • | • | — | • |
| Energy | • | • | • | • | • | — | • |
| Power factor | • | • | • | • | • | — | • |



Examples of transformer monitoring points:

- Transformer temperature
- Door opening
- Switch position
- LV outgoer fuse tripping
- Public lighting

Voltage monitoring and quality control

With the “power monitoring unit” option, Easergy Flair 200C can indicate power supply faults and provide a log for improved quality control of the power supplied.

- Power off detection thresholds configurable from 5% to 95% of Vn
- Power on detection thresholds configurable from 70% to 120% of Vn
- Time for acknowledging power off and on configurable from 20 ms to 800 ms

Digital inputs/outputs for substation monitoring and control

6 configurable digital inputs:

- Standard input: goes to 1 when the digital input is active
- FPI input: goes to 1 when the digital input is active and causes the external indicator to flash

Each digital input has its associated counter.

3 configurable digital outputs:

- Standard output: the output is maintained when the associated variable goes to 1
- Pulse output: activation of the command generates a pulse of duration configurable between 50 ms and 5 s in increments of 5 ms on the output
- Dual output: 2 outputs are used. This choice offers a simple solution for controlling certain switches by means of double-bit commands

Archives, indications and alerts for optimum operation and maintenance

All internal data (variables) and data coming from equipment connected to the Modbus local area network can be recorded with time stamping. This information can be transmitted to the remote control center and/or archived in logs for consultation and downloading (in the form of .xls files), by connecting a microcomputer locally or remotely.

Variable recording criteria:

- **Events:** information transmitted to the SCADA system. These variables are recorded in the “events” log. They are transmitted to the remote control center according to the protocol exchange conditions.
- **Alarms:** spontaneous transmission. These variables are recorded in the “alarm” log. They trigger spontaneous dial-up to the remote control center and can send an SMS or an email according to the configuration.
- **System:** can be consulted locally, is designed for operation and maintenance: memory storage of transmission events, transmission errors, change of system configuration, etc.

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| Equipment status | |
|----------------------|----------|
| Label | Value |
| Moving voltage | 0% |
| Charger fault | 0% |
| Battery fault | 0% |
| General shutdown | 0% |
| Battery disconnected | True |
| Battery low | 0% |
| Test communication | 0% |
| Measurements | |
| Frequency | 50.01 Hz |
| Voltage measured | 230.1 V |
| Measured current 1 | 0.0 A |
| Current P1 | 0.0 A |
| Current P2 | 0.0 A |
| Current P3 | 0.0 A |
| Mean current | 0.0 A |
| Mean phase current | 0.0 A |
| Power factor | 0.999997 |
| Active power | 0.000000 |
| Reactive power | 0.000000 |

PE575068N

| Date/Time | Description |
|----------------------|-------------------------------------|
| 2012/08/19 09:38:00 | FI0 28 - Battery disconnected - Yes |
| 2012/08/19 09:38:700 | FI0 36 - Digital input 3 - Opened |
| 2012/08/19 09:38:700 | FI0 34 - Digital input 2 - Opened |
| 2012/08/19 09:38:700 | FI0 21 - Digital input 1 - Opened |
| 2012/08/19 09:39:000 | FI0 28 - Battery disconnected - Yes |
| 2012/08/19 09:39:100 | FI0 28 - Digital input 2 - Opened |
| 2012/08/19 09:39:100 | FI0 24 - Digital input 2 - Opened |
| 2012/08/19 09:39:100 | FI0 21 - Digital input 1 - Opened |
| 2012/08/19 09:39:700 | FI0 28 - Battery disconnected - Yes |
| 2012/08/19 09:39:700 | FI0 36 - Digital input 3 - Opened |
| 2012/08/19 09:39:700 | FI0 34 - Digital input 2 - Opened |

Time setting and event time stamping

Flair 200C time setting is performed:

- Either locally with a laptop PC;
- Or via the remote control system;
- Or via the Ethernet network

With management of:

- Time zones
- Summer/winter time difference

Precision of event time stamping:

- Resolution: 1 ms
- Discrimination between 2 events: 10 ms

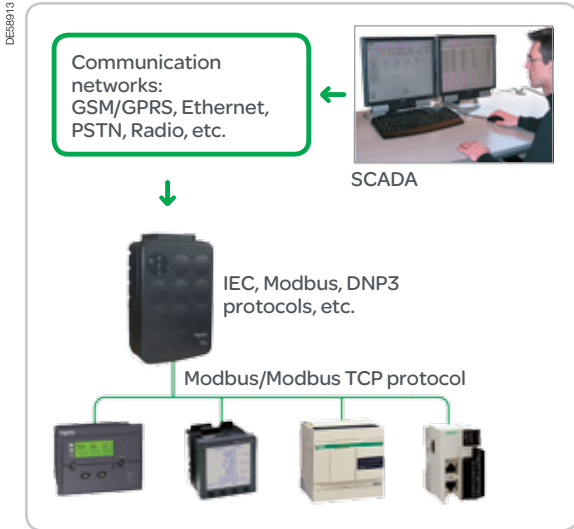
Event storage capacity

| | |
|--------------|--------|
| Events | 10,000 |
| Alarms | 2,000 |
| System | 6,000 |
| Measurements | 30,000 |

For all the logs, when the maximum storage capacity is reached, the most recent event erases the oldest event.

Characteristics of a local area network

| | |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Protocol | Modbus/Modbus TCP Master |
| Number of slaves | 31 in an RS485 link/20 in an Ethernet link |
| Maximum number of variables | <ul style="list-style-type: none"> • Digital Inputs/Outputs: 400 • Double-bit digital Inputs/Outputs: 200 • Analog Inputs/Outputs: 300 |



Open to all SCADA systems

Easergy Flair 200C can manage both a “serial type” protocol and IP protocols. It is now possible to mix serial and IP transmission media on a given application.

A communications catalog that is constantly enriched

DNP3 serial and TCP protocols

- Level supported for commands and replies: 3
- Transmission in Master/Slave mode if Unsolicited Response operation is not used
- Transmission in Master/Master mode⁽¹⁾ if this type of operation is used

Modbus serial and TCP protocols

- Transmission in Master/Slave mode
- Transmission in Master/Master mode⁽¹⁾ with the Report by exception function

Other proprietary protocols

We have extensive experience with interoperability of our protocols via our numerous projects worldwide (contact us).

⁽¹⁾ **Master-Master:** this option is used to limit exchanges with non-permanent transmission media (Radio, GSM, GPRS, PSTN). A device speaks only when it has something to say. On the other hand, the SCADA no longer controls the data flow and collisions between messages can occur when several devices take control to speak at the same time. Easergy Flair 200C includes collision avoidance algorithms to deal with this problem.

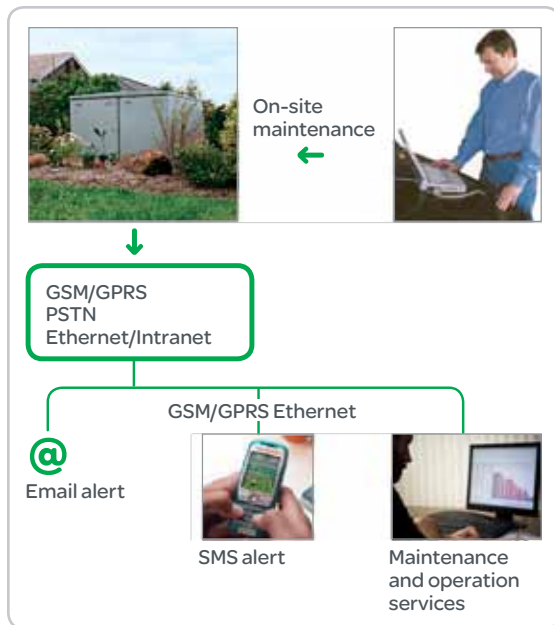
| Modems and interfaces | Technical characteristics | Main functions |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| RS232 serial interface | <ul style="list-style-type: none"> • Non-insulated | Direct link and management of external transmission devices: <ul style="list-style-type: none"> • Direct: radio modem • Hayes: telephone, GSM Signals management: <ul style="list-style-type: none"> • Rx, Tx, DCD, DTR, DSR, RTS, CTS, RI |
| RS232/485 serial interface | <ul style="list-style-type: none"> • Insulated 2.5 kV • Max. data rate: 38,400 bits/s | Direct link and management of external transmission devices: <ul style="list-style-type: none"> • Direct: radio modem • Hayes: telephone, GSM Signals management: <ul style="list-style-type: none"> • Rx, Tx, DCD, DTR, DSR, RTS, CTS, RI |
| GSM/GPRS modem | <ul style="list-style-type: none"> • Quadriband modem • 900–1800 MHz or 850–1900 MHz • Colinear antenna with 6 db gain, triband with 5 m cable – Indoor/outdoor installation | Data transmission: <ul style="list-style-type: none"> • Message repetition (3) • Main dial-up No. • Backup dial-up No. • SMS transmission |
| Voice modem (PSTN) | <ul style="list-style-type: none"> • Standard V.32 bis • 300 to 14,400 bits/s • Insulation: 8 kV | <ul style="list-style-type: none"> • Message repetition (3) • Main dial-up No. • Backup dial-up No. |
| FSK radio modem | <ul style="list-style-type: none"> • FSK modulation V23 • 200 or 600–1200 baud • Reception level: -30 to +10 dBm on 600 Ohm • Transmission level: -10 dBm or 0 dBm • Receive access impedance: 600 Ohm or high impedance | Signals management: <ul style="list-style-type: none"> • Rx, Tx, squelch, DCD, RTS • Parity, frame errors Test mode: <ul style="list-style-type: none"> • Carrier generation |
| FFSK radio modem | <ul style="list-style-type: none"> • FFSK modulation • 1200–2400 baud • Reception level: -30 to +10 dBm on 600 Ohm • Transmission level: -10 dBm or 0 dBm • Receive access impedance: 600 Ohm or high impedance | Signals management: <ul style="list-style-type: none"> • Rx, Tx, squelch, Send Cd • Parity, frame errors Test mode: <ul style="list-style-type: none"> • Carrier generation |
| Ethernet port | <ul style="list-style-type: none"> • 10 base T/100 base T – TX (RJ45) • 10/100 Mbits | <ul style="list-style-type: none"> • IP protocol and configurator management |

An extensive choice of integrated modems

External modems and transmission devices

Flair 200C manages all types of external modem and transmission devices via the RS232 or Ethernet link.

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Local and remote operation and maintenance by embedded Web server

Easergy Flair 200C incorporates a Web data server in HTML page form for data configuration and monitoring. All that is needed to log on to the Flair 200C is a PC provided with a Web browser. Remote access is possible via GSM, GPRS, Ethernet and PSTN transmission networks, and can be implemented in parallel from the remote control center.

Thanks to this remote access and its capability to send emails and sms, the Flair 200C offers you a cost-efficient solution to monitor your underground equipment without a SCADA system. In local connection mode, pages are refreshed automatically upon a change of state or cyclically. The embedded Web server allows local monitoring of the equipment.

Secure multilingual server

The home page allows you to select the server menu language. The available languages in standard configuration are:

- English, French, Spanish, Portuguese, etc.
- Data literals are customizable
- Data access is secured by password. Three access levels can be defined: Administrator, Operator, Monitoring

User-friendly operation and control

In parallel to network operation and control from the SCADA system, equipment operation can be controlled via 3 pages:

- **Display** of states and measurements
- **Commands**: reset fault detectors and other digital outputs, reset or preset fault or energy counters... Command sending is secured (selection and confirmation)
- **Consultation** of archived data by saving CSV file form for analysis to PC. The views are refreshed regularly or automatically upon a change of state

Easier maintenance

- Updating of software versions or change of protocol by downloading from a PC. Two software versions are saved. It is possible to switch between the two versions.
- Analysis of system Event Log file:
 - » Storage of transmission events (to determine the origin of a recurring communication fault)
 - » Indication of transmission errors (CRC error, collisions, PSTN line out of order, switchover to redundancy, etc.)
 - » Indication of system events (start-up, resetting, change of configuration, etc.)
- Communication analyzer
This analyzer allows observation of frames exchanged with the remote control center and any Modbus/Modbus TCP slaves in the equipment.

PE57505EN



RESYST/DEM

| Label | Status |
|-----------------------|------------|
| Missing voltage | OK |
| Charger fault | OK |
| Battery fault | OK |
| Control disconnection | OK |
| Battery disconnected | OK |
| Battery low | OK |
| Test communication | OK |
| Powering | 6.33 A |
| Voltage measured | 232.4 V |
| Current P1 | 0.0 A |
| Current P2 | 0.0 A |
| Current P3 | 0.0 A |
| IS current | 0.0 A |
| Mean phase current | 0.0 A |
| Power factor | 0.991 |
| Active power | 0.001 kW |
| Reactive power | 0.000 kVAR |

Rapid, reliable setup

- Downloading of data configurations Configuration is performed by downloading a configuration file. The equipment is delivered with factory settings
- Preparation of typical configuration settings. An off-line configurator allows customer configuration settings to be prepared from typical data. The data is saved to PC in text format
- Equipment data saving to PC
- Partial configuration of equipment

The Easergy Flair 200C configurator accepts a partial text file for the modification of a variable, for example. This improves the reliability of installed base revision for a change of settings (e.g. communication settings).

RESYST/DEM



Electrical characteristics

| | | | |
|----------------------------------|--------------------------------------|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power supply | Voltage | — | 120/240 Vac – 20% +10%; 50/60 Hz |
| | Battery | Type | Sealed spiral lead maintenance-free type: 4 V; 2.5 Ah |
| | | Battery life from -4° F to 158° F (-20° C to 70° C) | Minimum 4 h (minimum 3 h with Ethernet option) |
| | | Lifetime at 68° F (20° C) | 10 years |
| Inputs/Outputs | 6 inputs | — | Insulated, dry loop polarized at 5 V internally |
| | 3 outputs | IEC 60255-5 | Insulated (50 Hz/1 min.): 1.5 kV 30 VA (maximum 60 Vdc or 125 Vac) |
| Dielectric | AC supply input | IEC 60255-5 | Insulation (50 Hz/1 min.): 10 kV Surge (1.2/50 µs): 20 kV |
| | Current Transformer input | IEC 60255-5 | Insulation (50 Hz/1 min.): 2.5 kV Surge (1.2/50 µs): 5 kV |
| Electromagnetic | Rapid transients | IEC 61000-4-4 | <ul style="list-style-type: none"> ±4 kV on mains, sensor and RS485 (criterion A) ±2 kV on logical inputs/outputs and external indicator terminal (standard indicator unit) (criterion A) ±1 kV on GSM/GPRS antenna (criterion B) |
| | Electrostatic discharge | IEC 61000-4-2 | Level 3; 8 kV in air; 6 kV at contact (criterion A) |
| | Radiated electromagnetic field | IEC 61000-4-3 | 80 MHz; 3 GHz; 10 V/m (criterion A) |
| | Radio frequency in common mode | IEC 61000-4-6 | 0.15 MHz to 80 MHz; 10 Vac (criterion A) |
| | 50 Hz magnetic field | IEC 61000-4-8 | 30 A/m continuous-duty and 300 A/m from 1 to 3 s (criterion A) |
| | Surge | IEC 61000-4-5 | <ul style="list-style-type: none"> 2 kV level 3 in common mode (criterion A) 1 kV level 2 in differential mode (criterion A) |
| | Immunity to voltage dips | IEC 61000-4-11 | Voltage dip: <ul style="list-style-type: none"> 30% reduction for 0.5 period (criterion B) 60% reduction for 5 periods (criterion C) 60% reduction for 50 periods (criterion C) Power cuts: <ul style="list-style-type: none"> greater than 95%, 250 periods (criterion C) |
| | Pulse magnetic field immunity | IEC 61000-4-9 | 1000 A/M Level 4 (criterion A) |
| Damped oscillatory wave immunity | IEC 61 000-4-12 level 3; criterion A | <ul style="list-style-type: none"> ±2.5 kV in common mode ±1 kV in differential mode | |

Environmental characteristics

| | | | |
|--|---------------------|-----------------------------|-------------------------------------------------------------------------------|
| | Temperature | IEC 60068-2-1/IEC 60068-2-2 | -4° F to 158° F (-20° C to 70° C) |
| | Relative humidity | IEC 60068-2-30 | 95%; 144 h (6 x 12-h cycles at 131° F [55° C] + 12 h at 77° F [25° C]) |
| | Salt spray test | IEC 60068-2-11 | 168 h |
| | Storage temperature | IEC 60068-2-14 | -40° F to 158° F (-40° C to 70° C); maximum variation of 41° F (5° C) per min |

Mechanical characteristics

| | | | |
|--|------------------------|---------------|------------------------------------------------|
| | Cubicle material | — | Polycarbonate |
| | Vibrations | IEC 60068-2-6 | 10 Hz to 2000 Hz; 2 g peak-to-peak |
| | Dimensions (H x W x D) | — | 13.12 X 8.26 X 4.09 in. (333.5 X 210 X 104 mm) |
| | Weight (typical) | — | 5.5 lbs (2.5 kg) |
| | Protection index | IEC 60529 | IP31 (IP2X with cubicle open); IK07 |

The Flair 200C is compatible with all current sensors of the Easergy range and available commercially. Easergy Flair 200C is calibrated in factory with the Easergy sensors to assure you the announced performance.

Two ranges of opening and self-locking sensors are available in the Easergy Flair 200C catalog in the form of ready-to-connect kits.

Accessories

Current sensors

- **MF1 standard** sensors



CTs with protected blades of the Easergy Flair detector range

- **High-performance** sensors



Resin-coated CTs of the Easergy monitoring and control unit range

External indicator terminals

- Standard indicator unit



Mounted outside

- Internal indicator unit



Mounted inside the substation, provided with a 30 cm fiber-optic light guide

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As standards, specifications and designs change from time to time, please ask for confirmation of the information given in this publication.