ACE850TP and ACE850FO Multi-protocol interfaces

PB105301

ACE850TP communication interface.

PB105300

ACE850FO communication interface.

Function

The ACE850 multi-protocol communication interfaces are for Sepam series 40, Easergy Sepam series 60 and Easergy Sepam series 80.
ACE850 interfaces have two Ethernet communication ports to connect a Sepam to a single Ethernet network depending on the topology (star or ring):
- For a star topology, only one communication port is used.
- For a ring topology, both Ethernet communication ports are used to provide redundancy. This redundancy conforms to the RSTP 802.1d 2004 standard.

Either port can be used for connection:
- To the S-LAN (Supervisory Local Area Network) port to connect Sepam to an Ethernet communication network dedicated to supervision, using one of the two following protocols:
  - IEC 61850
  - Modbus TCP/IP TR A15
- To the E-LAN (Engineering Local Area Network) port, reserved for Sepam remote parameter setting and operation using the SFT2841 software

There are two versions of the ACE850 interfaces, which are identical except for the type of port featured:
- ACE850TP (Twisted Pair), for connection to an Ethernet network (S-LAN or E-LAN) using a copper RJ45 10/100 Base TX Ethernet link
- ACE850FO (Fiber Optic), for connection to an Ethernet network (S-LAN or E-LAN) using a 100Base FX fiber-optic connection (star or ring)

Compatible Sepam

The ACE850TP and ACE850FO multi-protocol communication interfaces are compatible with:
- Sepam series 40 version ⩾ V7.00
- Easergy Sepam series 60 all versions
- Easergy Sepam series 80 base version and application version ⩾ V6.00

The ACE850 multi-protocol communication interfaces will only work if TCP/IP firmware option (ref. 59754) has been ordered with Sepam series 40, Easergy Sepam series 60 or Easergy Sepam series 80.

ACE850TP and ACE850FO Multi-protocol interfaces

Characteristics

ACE850TP and ACE850FO module

Technical characteristics

Weight		0.4 kg (0.88 lb)	
Assembly		On symmetrical DIN rail	
Operating temperature		-25°C to +70°C (-13°F to +158°F)	
Environmental characteristics		Same characteristics as Sepam base units	
Power supply			
Voltage		24 to 250 V DC	110 to 240 V AC
Range		-20%/+10%	-20%/+10%
Maximum consumption	ACE850TP	3.5 W in DC	1.5 VA in AC
	ACE850FO	6.5 W in DC	2.5 VA in AC
Inrush current		< 10 A 10 ms in DC	< 15 A 10 ms in AC
Acceptable ripple content		12%	
Acceptable momentary outages		100 ms	

Wired Ethernet communication ports (ACE850TP)

Number of ports	2 x RJ45 ports
Type of port	10/100 Base TX
Protocols	HTTP, FTP, SNMP, SNTP, ARP, SFT, IEC 61850, TCP/IP, RSTP 801.1d 2004
Baud rate	10 or 100 Mbps
Medium	Cat 5 STP or FTP or SFTP
Maximum distance	100 m (328 ft)

Fiber-optic Ethernet communication ports (ACE850FO)

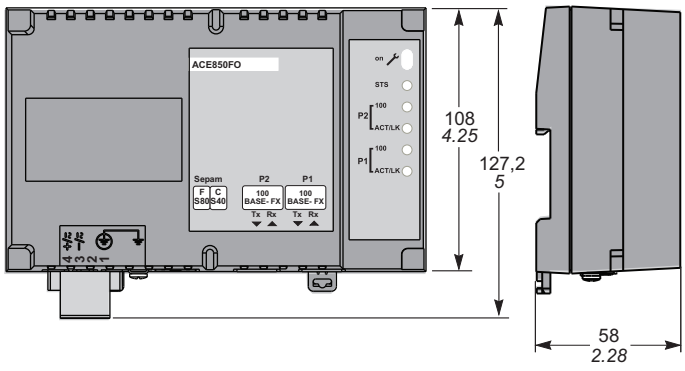
Number of ports	2
Type of port	100 Base FX
Protocols	HTTP, FTP, SNMP, SNTP, ARP, SFT, IEC 61850, TCP/IP, RSTP 801.1d 2004
Baud rate	100 Mbps
Fiber type	Multimode
Wavelength	1300 nm
Type of connector	SC

Fiber optic diameter (µm)	Tx minimum optical power (dBm)	Tx maximum optical power (dBm)	RX sensitivity (dBm)	RX saturation (dBm)	Maximum distance
50/125	-22.5	-14	-33.9	-14	2 km (1.24 mi)
62.5/125	-19	-14	-33.9	-14	2 km (1.24 mi)

Dimensions

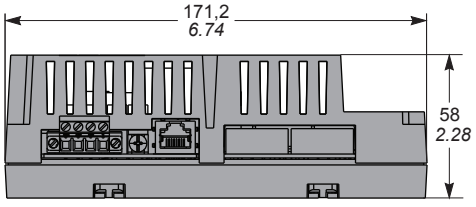
DE80441

mm
in



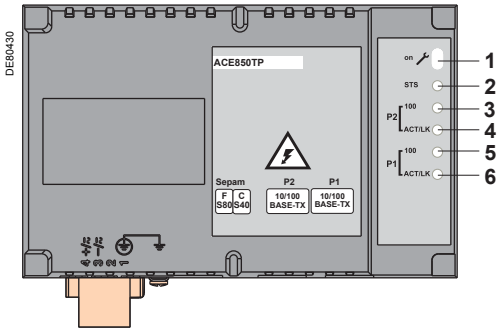
DE80403

mm
in

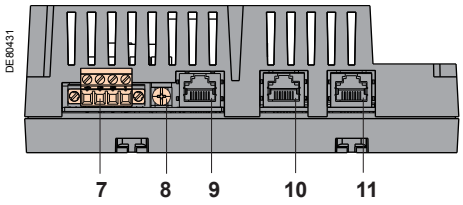


ACE850TP and ACE850FO Multi-protocol interfaces
Description

ACE850TP communication interface



ACE850TP: Front view.



ACE850TP: View of underside.

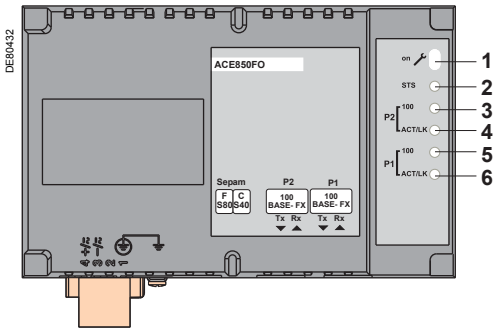
1 ACE850 communication interface status LED
- ■ LED off = ACE850 de-energized
- ■ Green LED permanently on = ACE850 energized and operational
- ■ Red LED flashing = ACE850 not configured and/or not connected to the base unit
- ■ Red LED permanently on = ACE850 not operational (initialization in progress or failed)

2 STS LED: communication status: green permanently on = OK
3 Ethernet Port 2 100 green LED: off = 10 Mbps, permanently on = 100 Mbps
4 Ethernet Port 2 activity LED: flashing on transmission/reception
5 Ethernet Port 1 100 green LED: off = 10 Mbps, permanently on = 100 Mbps
6 Ethernet Port 1 activity LED: flashing on transmission/reception

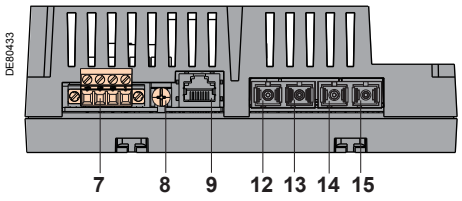
7 Power-supply terminal block
8 Grounding/earthing terminal using supplied braid
9 RJ45 socket to connect the interface to the Sepam base unit with the CCA614 cord:
- ■ Sepam series 40: communication port (C) (identified by a white label on the Sepam unit)
- ■ Easergy Sepam series 60 and series 80: communication port (F) (identified by a blue label on the Sepam unit)

10 RJ45 10/100 Base TX Ethernet communication port P2 (E-LAN or S-LAN)
11 RJ45 10/100 Base TX Ethernet communication port P1 (E-LAN or S-LAN)

ACE850FO communication interface



ACE850FO: Front view.



ACE850FO: View of underside.

1 ACE850 communication interface status LED
- ■ LED off = ACE850 de-energized
- ■ Green LED permanently on = ACE850 energized and operational
- ■ Red LED flashing = ACE850 not configured and/or not connected to the base unit
- ■ Red LED permanently on = ACE850 not operational (initialization in progress or failed)

2 STS LED: communication status: green permanently on = OK
3 Ethernet Port 2 100 green LED: permanently on = 100 Mbps
4 Ethernet Port 2 activity LED: flashing on transmission/reception
5 Ethernet Port 1 100 green LED: permanently on = 100 Mbps
6 Ethernet Port 1 activity LED: flashing on transmission/reception

7 Power-supply terminal block
8 Grounding/earthing terminal using supplied braid
9 RJ45 socket to connect the interface to the Sepam base unit with a CCA614 cord:
- ■ Sepam series 40: communication port (C) (identified by a white label on the Sepam unit)
- ■ Easergy Sepam series 60 and series 80: communication port (F) (identified by a blue label on the Sepam unit)

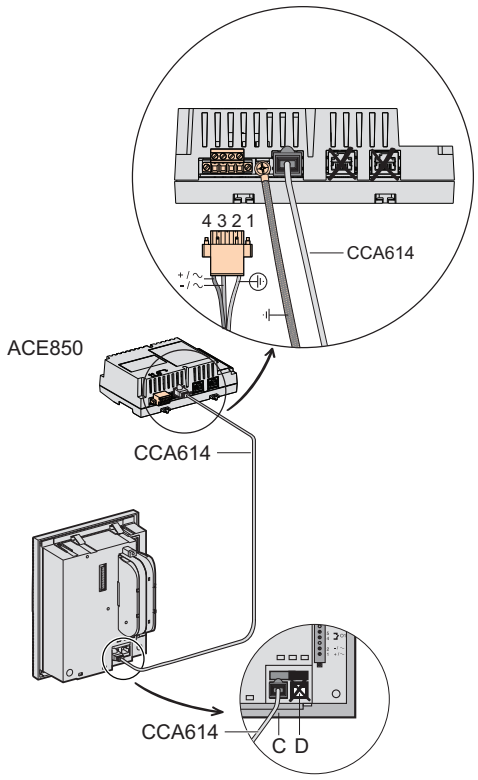
12 Tx fiber of 100 Base FX SC connector for Ethernet communication port P2 (E-LAN or S-LAN)
13 Rx fiber of 100 Base FX SC connector for Ethernet communication port P2 (E-LAN or S-LAN)
14 Tx fiber of 100 Base FX SC connector for Ethernet communication port P1 (E-LAN or S-LAN)
15 Rx fiber of 100 Base FX SC connector for Ethernet communication port P1 (E-LAN or S-LAN)

⚠ CAUTION

HAZARD OF BLINDING
Never look directly into the end of the fiber optic.
Failure to follow these instructions can result in injury.

ACE850TP and ACE850FO Multi-protocol interfaces
Connection

DE80444



Connecting the ACE850 to Sepam series 40.

Connection to Sepam

■ The ACE850 communication interface should only be connected to Sepam series 40, Easergy Sepam series 60 or 80 base units using a CCA614 prefabricated cord (length = 3 m or 9.8 ft, blue RJ45 fittings).
■ Sepam series 40: Connect the CCA614 cord to connector (C) on the Sepam base unit (white label).
■ Easergy Sepam series 60 or series 80: Connect the CCA614 cord to connector (F) on the Sepam base unit (blue label).

Connection of power supply

The ACE850 interfaces must be supplied with 24 to 250 V DC or 110 to 240 V AC.

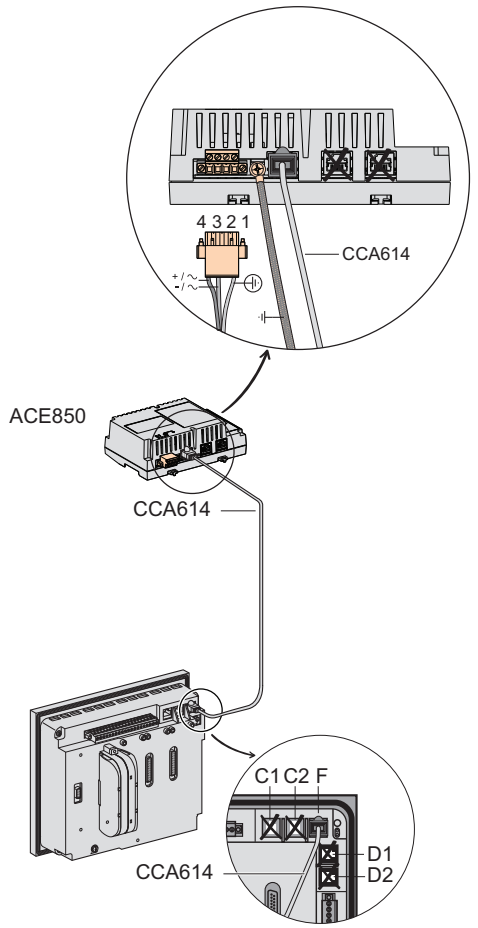
⚠ DANGER

HAZARD OF ELECTRIC SHOCK, ELECTRIC ARC OR BURNS

■ Only qualified personnel should install this equipment. Such work should be performed only after reading this entire set of instructions and checking the technical characteristics of the device.
■ NEVER work alone.
■ Turn off all power supplying this equipment before working on or inside it. Consider all sources of power, including the possibility of backfeeding.
■ Always use a properly rated voltage sensing device to confirm that all power is off.
■ Start by connecting the device to the protective ground and to the functional ground.
■ Screw tight all terminals, even those not in use.

Failure to follow these instructions will result in death or serious injury.

DE80445



Connecting the ACE850 to Easergy Sepam series 60 or series 80.

Terminal	Assignment	Type	Wiring
3 4	-/~ +/~	Screw terminals	■ Wiring without fittings: □ 1 wire with maximum cross-section 0.5 to 2.5 mm² (≥ AWG 20-12) or 2 wires with maximum cross-section 0.5 to 1 mm² (≥ AWG 20-18) □ Stripped length: 8 to 10 mm (0.31 to 0.39 in) ■ Wiring with fittings: □ Recommended wiring with Schneider Electric fitting: - DZ5CE015D for 1 wire 1.5 mm² (AWG 16) - DZ5CE025D for 1 wire 2.5 mm² (AWG 12) - AZ5DE010D for 2 wires 1 mm² (AWG 18) □ Tube length: 8.2 mm (0.32 in) □ Stripped length: 8 mm (0.31 in)
DE51962 1 ⏚	Protective earth	Screw terminal	1 green/yellow wire, max. length 3 m (9.8 ft) and max. cross-section 2.5 mm² (AWG 12)
DE51845 ⏚	Functional earth	4 mm (0.16 in) ring lug	Earthing braid (supplied) for connection to cubicle grounding

ACE850TP and ACE850FO Multi-protocol interfaces
Connection

ACE850TP or ACE850FO communication architectures

Performance

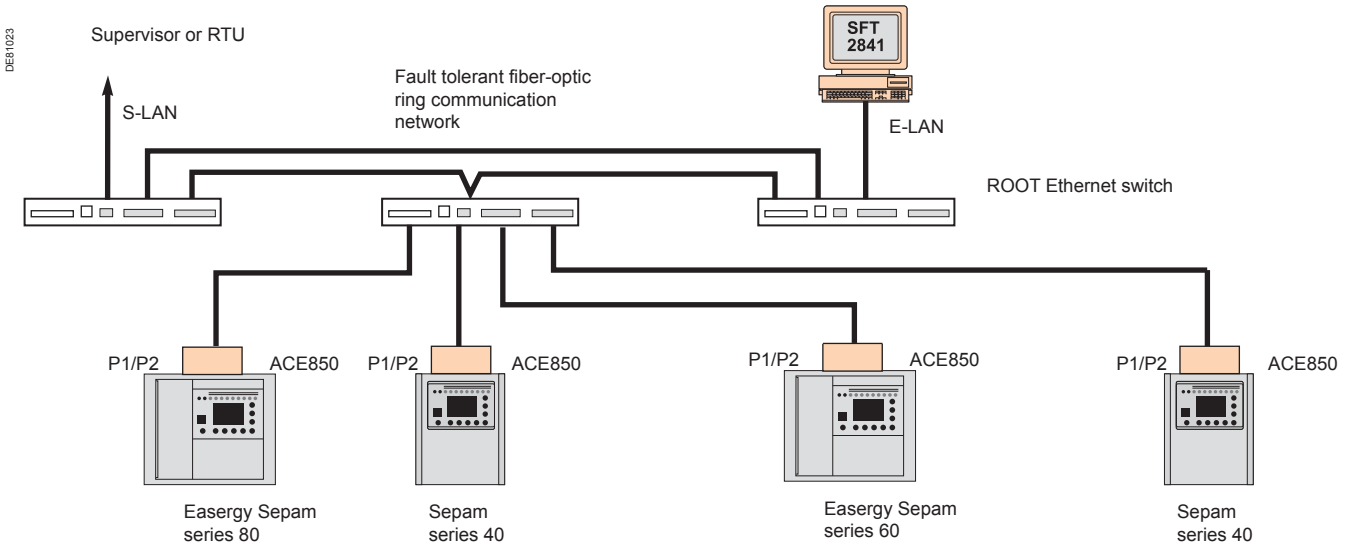
Redundancy performance tests have been conducted using RuggedCom switches (RS900xx, RSG2xxx family), compatible with RSTP 802.1d 2004.
To ensure optimum performance of the protection system during communication between Sepam units via GOOSE messages, we strongly recommend setting up a fault-tolerant fiber-optic ring structure as shown in the connection examples.

Note: *Protection performance during communication between Sepam units via GOOSE message is only ensured by using:*
- *Fiber-optic connections*
- *IEC 61850-compatible managed Ethernet switches*

ROOT Ethernet switch

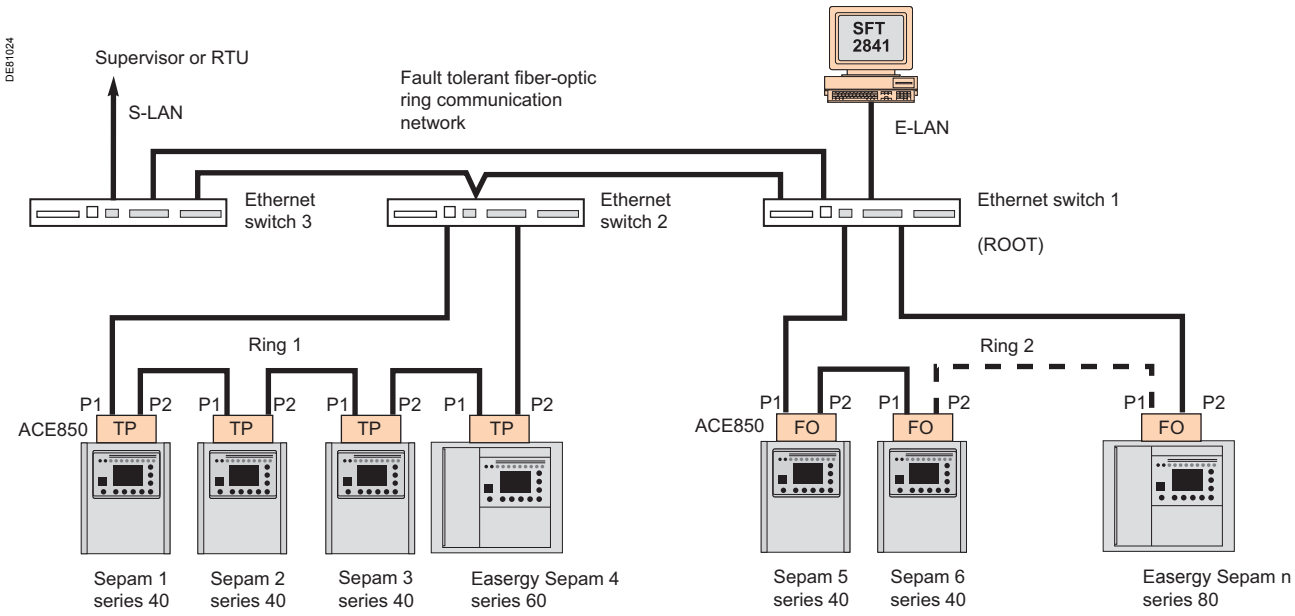
The ROOT Ethernet switch is the master switch of the RSTP reconfiguration function:
- A single ROOT Ethernet switch per Ethernet network, in the main loop of the network
- A Sepam unit must not be the ROOT Ethernet switch of the network

Example of Sepam units connected in a star configuration



ACE850TP and ACE850FO Multi-protocol interfaces
Connection

Example of Sepam units connected in a ring configuration



Recommendations for connecting Sepam units in ring configuration

When connecting Sepam units in the same ring configuration, the ACE850 interfaces must be of the same type (either ACE850TP or ACE850FO).
In the worst-case scenario, each Sepam unit must not be separated by more than 30 communicating devices connected to the network (other Sepam units or Ethernet switches) from the ROOT Ethernet switch.
A worst-case analysis must be performed for all the Sepam units in each network topology.
Example:

- In the best-case scenario, Sepam 2 of ring 1 is separated from the ROOT Ethernet switch by 2 devices: switch 2 and Sepam 1.
- In the worst-case scenario, i.e. if the connections between switches 1 and 2 and between Sepam units 1 and 2 of ring 1 are broken, Sepam 2 of ring 1 will be separated from the ROOT Ethernet switch by 4 devices: switch 3, switch 2, Sepam 4 and Sepam 3.