

Instruction Bulletin

ACE969 Multi-Protocol Communication Interface Install Sheet

Retain for future use.

Function



ACE969TP Communication Interface



ACE969FO Communication Interface

The ACE969 multi-protocol communication interfaces function with Sepam™ Series 20, 40, or 80. They have two communication ports to connect a Sepam to two independent communication networks:

The S-LAN (Supervisory Local Area Network) port to connect Sepam to a supervision network using one of the three following protocols:

- IEC 60870-5-103
- DNP3
- RTU Modbus

The communication protocol is selected when setting Sepam parameters. 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 ACE969 interfaces. Each has different S-LAN ports:

- ACE969TP (Twisted Pair) is for connecting to an S-LAN network using a two wire RS485 connection
- ACE969FO (Fiber Optic) is for connecting to an S-LAN network using a fiberoptic connection (star or ring)

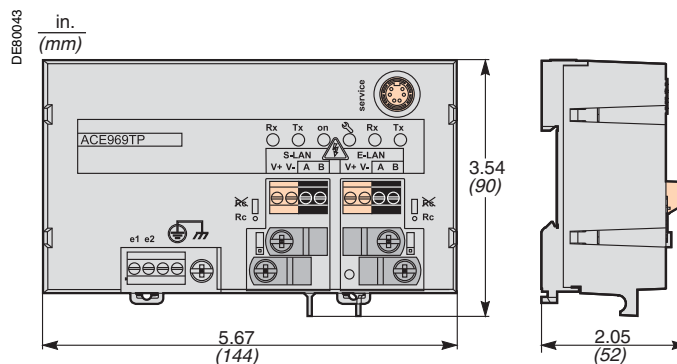
The E-LAN port is always a two-wire RS485 connection.

Characteristics

Install1

| ACE969 + ... | Version OK | OK |
|-----------------|-------------------------------|--------------------|
| Sepam Series 20 | ≥ V0526 | < V0526 |
| Sepam Series 40 | ≥ V3.00 | < V3.00 |
| Sepam Series 80 | Base ≥ V3.00 Appli ≥ V3.00 | < V3.00 < V3.00 |

Dimensions



| ACE969 Module | | | | |
|---|--|----------------------|----------------------------------|----------------------|
| Technical Characteristics | | | | |
| Weight | 0.628 lb (0.285 kg) | | | |
| Assembly | On symmetrical DIN rail | | | |
| Operating Temperature | -13°F to +158°F (-25°C to +70°C) | | | |
| Environmental Characteristics | Same characteristics as Sepam base units | | | |
| Power Supply | | | | |
| Voltage | 24 to 250 VDC | 110 to 240 VAC | | |
| Range | -20%/+10% | -20%/+10% | | |
| Maximum Burden | 2 W | 3 VA | | |
| Inrush Current | < 10 A 100 μs | | | |
| Acceptable Ripple Current | 12% | | | |
| Acceptable momentary outages | 20 ms | | | |
| Two-Wire RS485 Communication Ports | | | | |
| Electrical Interface | | | | |
| Standard | EIA 2-wire RS485 differential | | | |
| Distributed power supply | External, 12 V DC or 24 V DC ±10% | | | |
| Power burden | 16 mA in receiving mode | | | |
| | 40 mA in sending mode | | | |
| Maximum number of Sepam units | 25 | | | |
| Maximum Length of 2-Wire RS485 Network | | | | |
| Number of Sepam Units | With Distributed Power Supply | | | |
| | 12 VDC | 24 VDC | | |
| 5 | 1000 ft (320 m) | 3300 ft (1000 m) | | |
| 10 | 590 ft (180 m) | 2500 ft (750 m) | | |
| 20 | 430 ft (130 m) | 1500 ft (450 m) | | |
| 25 | 410 ft (125 m) | 1200 ft (375 m) | | |
| Fiber Optic Communication Port | | | | |
| Fiber Optic Interface | | | | |
| Fiber Type | Graded-index multimode silica | | | |
| Wavelength | 820 nm (invisible infra-red) | | | |
| Type of Connector | ST (BFOC bayonet fiber optic connector) | | | |
| Maximum Length of Fiber Optic Network | | | | |
| Fiber Diameter (μm) | Numerical Aperture (NA) | Attenuation (dBm/km) | Min. Optical Pwr Available (dBm) | Maximum Fiber Length |
| 50/125 | 0.2 | 2.7 | 5.6 | 2300 ft (700 m) |
| 62.5/125 | 0.275 | 3.2 | 9.4 | 5900 ft (1800 m) |
| 100/140 | 0.3 | 4 | 14.9 | 9200 ft (2800 m) |
| 200 (HCS) | 0.37 | 6 | 19.2 | 8500 ft (2600 m) |

Maximum length is calculated with:

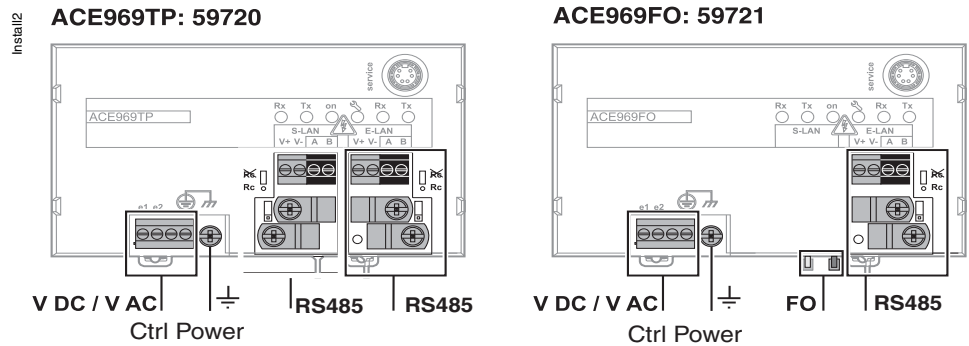
- Minimum optical power available
- Maximum fiber attenuation
- Losses in two ST connectors: 0.6 dBm
- Optical power margin: 3 dBm (according to IEC 60870 standard)

Example for a 62.5/125 μm fiber

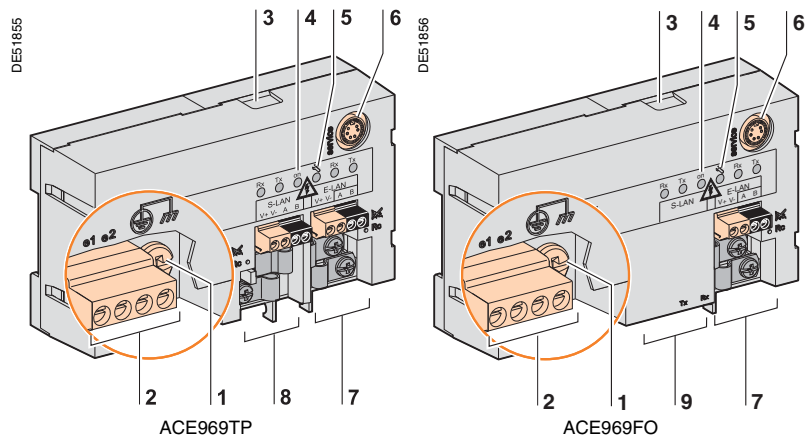
$$L_{\max} = (9.4 - 3 - 0.6)/3.2 = 1.8 \text{ km (1.12 mi)}$$

Component Descriptions

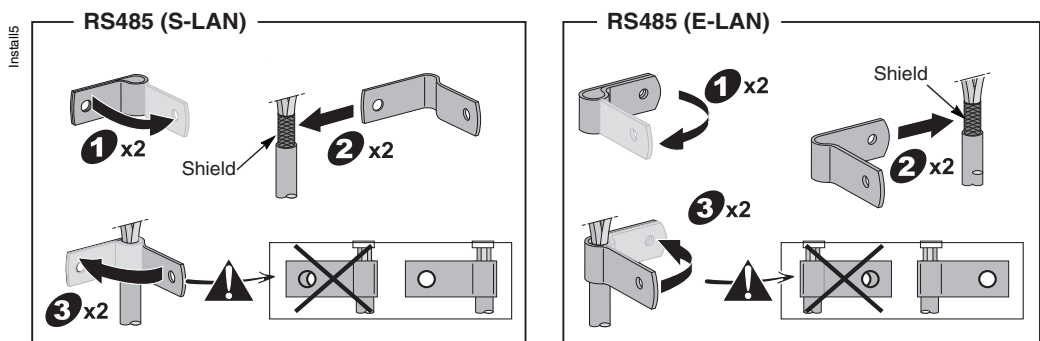
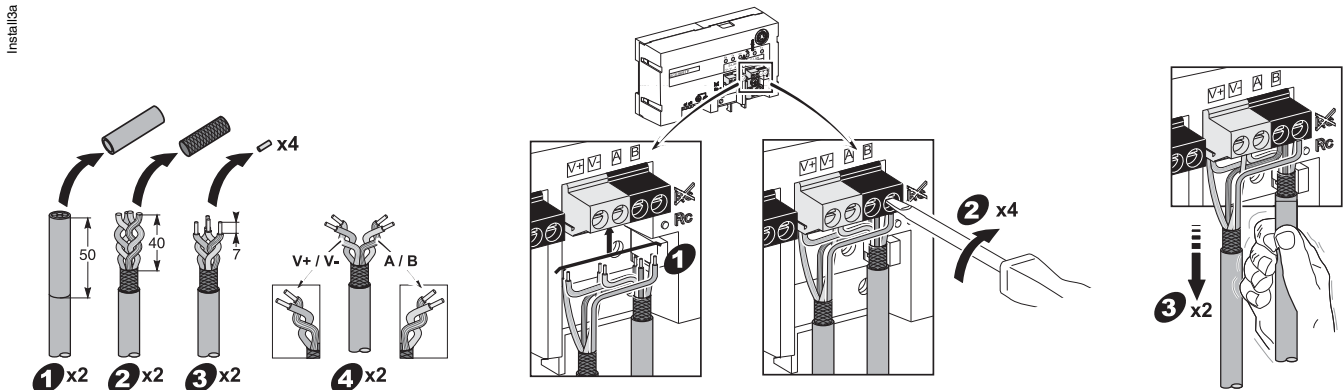
ACE969 Communication Interfaces



1. Grounding terminal using supplied braid
2. Power-supply terminal block
3. RJ45 socket to connect the interface to the base unit with a CCA612 cable
4. Green LED: ACE969 energized
5. Red LED: ACE969 interface status
- LED off = ACE969 set up and communication operational
- LED flashing = ACE969 not set up or setup incorrect
- LED remains on = ACE969 failed
6. Service connector: reserved for software upgrades
7. E-LAN 2-wire RS485 communication port (ACE969TP and ACE969FO)
8. S-LAN 2-wire RS485 communication port (ACE969TP)
9. S-LAN fiber-optic communication port (ACE969FO)

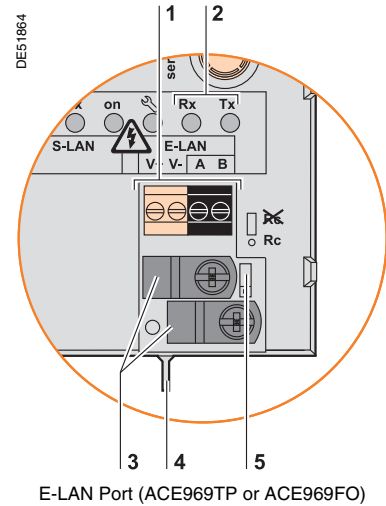
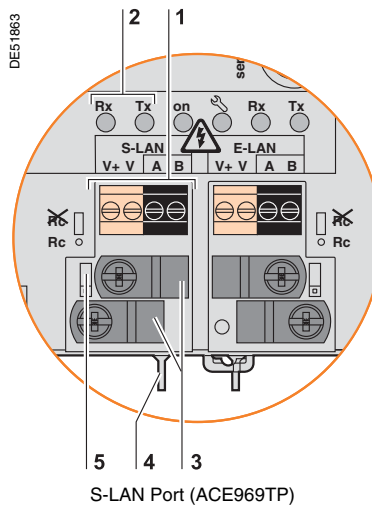


RS485 Connection



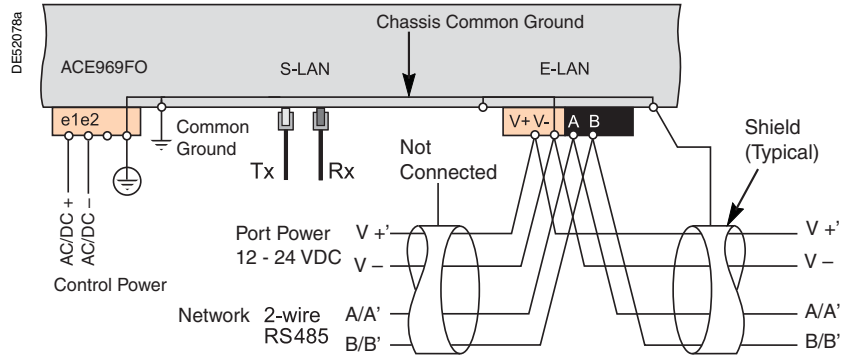
Two-Wire RS485 Communication Ports

1. Grounding terminal using supplied braid Two-Wire RS485 Network Terminal Block:
 - Two black terminals connect the two-wire RS485 twisted pair
 - Two green terminals connect a twisted pair for distributed power supply
 2. LEDs:
 - Flashing Tx LED: Sepam sending
 - Flashing Rx LED: Sepam receiving
 3. Clamps and recovery of shielding for two network cables, incoming and outgoing (inner diameter of clamps = 0.24 in or 6 mm)
- NOTE:** Clamps are also common ground.
4. Fixing stud for network cable ties
 5. Jumper for 2-wire RS485 network line-end impedance matching with the load resistor ($R_c = 150 \Omega$), is set to:



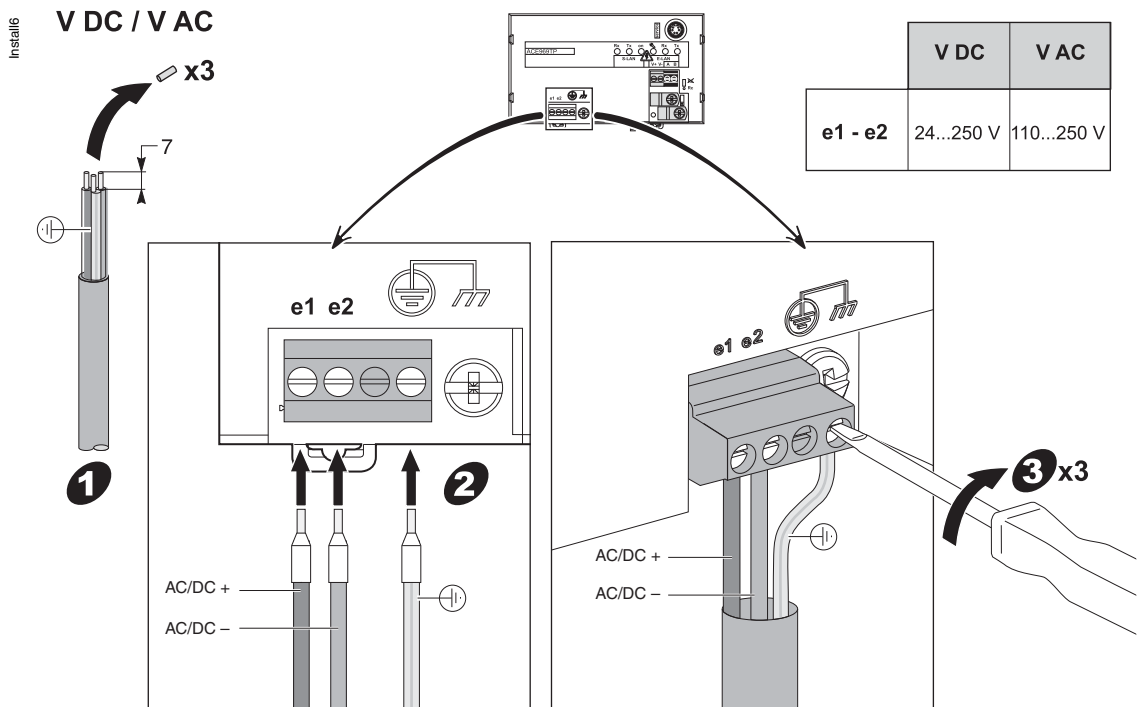
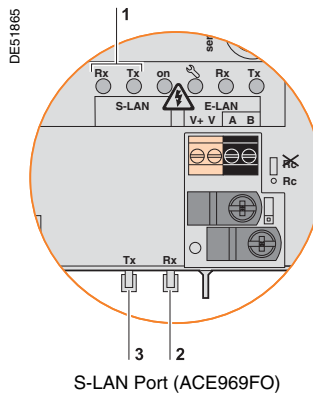
- \overline{Rc} , if the module is not at one end of the network (default position). The "X" over the "Rc" indicates that the resistor is not in use
- **Rc**, if the module is at one end of the network. This means the resistor is jumpered in

Fiber-Optic Communication Port



1. LEDs:

- Flashing Tx LED: Sepam sending
 - Flashing Rx LED: Sepam receiving
2. Rx, female ST type connector (Sepam receiving)
 3. Tx, female ST type connector (Sepam sending)

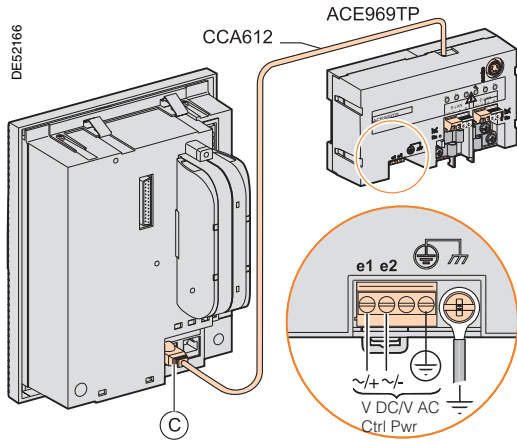


Connecting the ACE969

Power Supply and Sepam

The ACE969 interface connects to **(C)** on the Sepam base unit using a CCA612 cable (length = 9.8 ft or 3 m, with green RJ45 fittings)

24 to 250 V DC or 110 to 230 V AC operates the ACE969 interface.



⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Only qualified electrical workers should install this equipment. Such work should be performed only after reading this entire set of instructions.
- NEVER work alone.
- Before performing visual inspections, tests, or maintenance on this equipment, disconnect all sources of electric power. Assume that all circuits are live until they have been completely de-energized, tested, and tagged. Pay particular attention to the design of the power system.
- 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.
- Screw tight all terminals, even those not in use.

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

| Terminals | Type | Wiring |
|-----------------------------|-------------------------|---|
| e1-e2 - supply | Screw terminals | <p>Wiring with no fittings:</p> <ul style="list-style-type: none"> • One wire with maximum cross-section 0.2 to 2.5 mm² (≥ AWG 24-12) or two wires with maximum cross-section 0.2 to 1 mm (≥ AWG 24 - 18) • Stripped length: 0.31 to 0.39 in (8 to 10 mm) <p>Wiring with fittings:</p> <ul style="list-style-type: none"> • recommended wiring with Telemecanique fitting: <ul style="list-style-type: none"> - 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) • Wire length: 0.32 in (8.2 mm) • Stripped length: 0.31 in (8 mm) |
| Protective gnd | Screw terminal | Control Power ground conductor 1 green/yellow wire, max. length 9.8 ft (3 m) and max. cross-section 2.5 mm ² (AWG 12) |
| Functional gnd (Common Gnd) | 0.16 in (4 mm) ring lug | Grounding braid, supplied for connection to cubicle grounding |

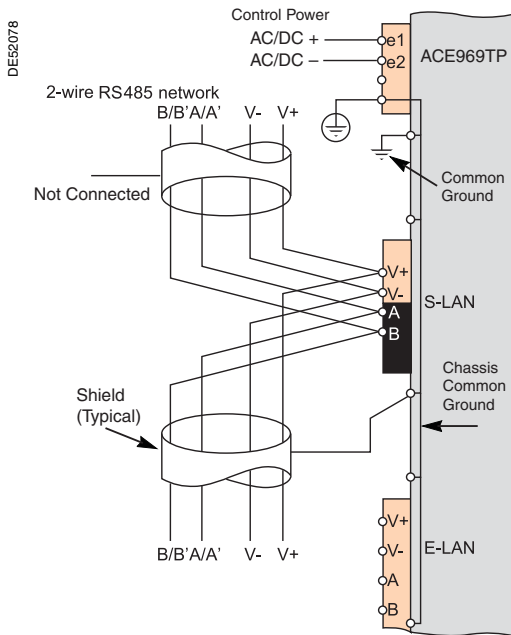
CAUTION

ESD SENSITIVE COMPONENTS

- Before touching the Memory Cartridge you must ground yourself and discharge any static charge
- Ground yourself every time before touching the memory cartridge

Failure to follow this instruction can result in equipment damage.

Connections



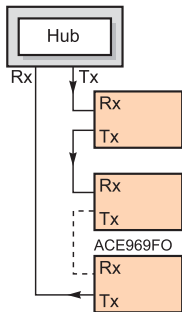
Two-Wire RS485 Communication Ports (S-LAN or E-LAN)

1. Connect the RS485 twisted pair (S-LAN or E-LAN) to black terminals **A** and **B**.
2. Connect the twisted pair for the distributed power supply to green terminals **V+** and **V-**.
3. The interfaces are fitted with clamps to hold the network cable in place and to recover shielding at the incoming and outgoing points of the network cable:
 - The network cable must be stripped
 - One cable shielding must be around and in contact with the clamp (see note below)
4. An internal connection links all cable clamps to the ACE969 Interface grounding terminals (protective and functional grounding), with the shielding of the RS485 cables is grounded as well.
5. On the ACE969TP interface, the cable clamps for the S-LAN and E-LAN RS485 networks are grounded.

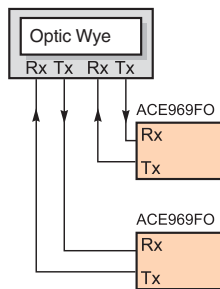
NOTE: The cable shielding shown at left should only be done at one point, preferably at one end of the daisy chain.

Fiber Optic Communication Port (S-LAN)

Ring Connection



Optic Wye Connection



CAUTION

HAZARD OF BLINDING

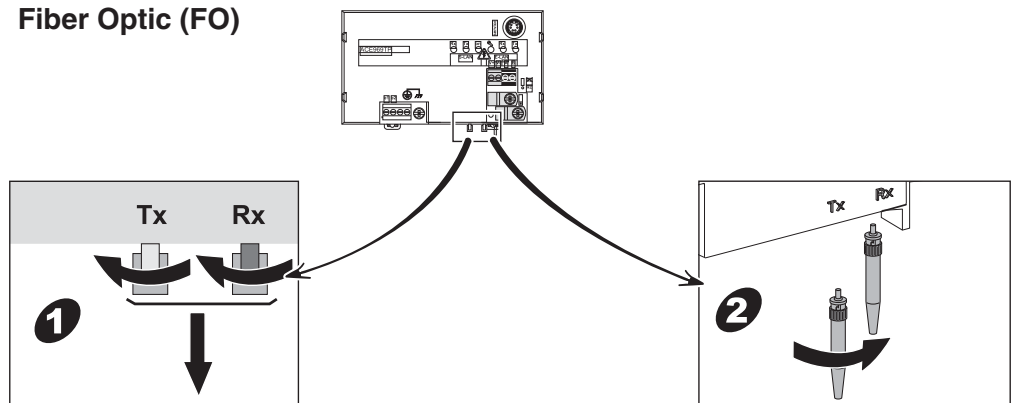
- Never look directly into the fiber optic

Failure to follow this instruction can cause serious injury.

The fiber optic connection can be made point-to-point to an optic star system, or in a ring system (active echo). The transmitting and receiving fiber optic fibers must have male ST type connectors. The fiber optics screw-lock to **Rx** and **Tx** connectors.

Fiber Optic (FO)

Install



Notes

Schneider Electric USA
295 Tech Park Drive, Suite 100
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1-888-SquareD (1-888-778-2733)
www.us.SquareD.com

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