

PRODUCT TECHNICAL REFERENCE

SPA-ZC 400

Ethernet Adapter

ABB SPA-ZC 400 is an Ethernet adapter for connecting one REF541/3/5 or REM543/5 protection relay to an IEC 61850-8-1 station bus. It carries process data over IEC 61850 and also supports SPA over TCP/IP on the same Ethernet link.

Manufacturer	ABB
Complete model	SPA-ZC 400
Product type	Ethernet Adapter
Country of origin	Sweden
HS code	8537101190
Shipping origin	Xiamen,Fujian,China

APTER POWER SALES TEAM

INDUSTRIAL AUTOMATION PRODUCT SUPPORT

Product-specific support for SPA-ZC 400

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01 Product role and integration

SPA-ZC 400 integrates a compatible ABB protection relay with an IEC 61850-8-1 station bus while retaining an Ethernet path for SPA engineering access.

1

Maps relay status, measurements and commands into station-bus data

2

Provides SPA engineering access over the installed TCP/IP network

3

EMP and EMG versions retain simultaneous optical LON or SPA traffic

4

Uses CET projects to organize data mapping and adapter configuration

02 System arrangement

The adapter mounts directly on one REF541/3/5 or REM543/5 relay and connects by optical Ethernet through the station-bus switch. It is used in substation retrofit projects that bring protection, control, measurement and diagnostic information from an installed relay into an IEC 61850 system.

Engineering note

Secure SPA-ZC 400 to the relay's two 9-pin D connectors, then route its fibre-optic LAN connection through the station-bus Ethernet switch before loading the CET mapping. For EMP or EMG variants, set the optional optical interface for the engineered LON or SPA topology before commissioning.

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Technical specifications

IED interface	Fixed D-type subminiature connectors
IEC 61850 LAN	100BaseFX fibre optic
LAN transceiver	MT-RJ multimode glass fibre
Optional LON/SPA glass connector	ST transmitter/receiver pair
Optional LON/SPA plastic connector	Snap-in transmitter/receiver pair
Common diagnostic LEDs	Power; Diagnostic red; Diagnostic green
LAN diagnostic LEDs	LINK; TX; RX
LON/SPA diagnostic LED	RX
Continuous service temperature	-10...+55 deg C
Transport and storage temperature	-40...+70 deg C
Contact ESD test level	6 kV
Air ESD test level	8 kV
Conducted RF immunity	10 V rms, 150 kHz...80 MHz
Radiated RF immunity	10 V/m rms, 80...1000 MHz
Fast transient immunity	4 kV, all terminals
Power-supply surge immunity	4 kV line-to-earth; 2 kV line-to-line
50 Hz magnetic-field immunity	300 A/m continuous

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04 Industrial applications

REF541/3/5 station-bus retrofit

Integrates feeder-relay events and control points with an IEC 61850 substation network.

REM543/5 motor-protection integration

Exchanges motor-protection indications with the station-level control system.

Remote SPA service channel

Supports maintenance access to the connected relay without a separate engineering cable.

Dual-port migration project

EMP and EMG installations keep an existing optical LON or SPA path during network modernization.

05 Installation and commissioning controls

1 Identify whether the installed unit is the base, EMP or EMG execution before removing any cable.

2 Isolate the relay and station-bus work area before disturbing either 9-pin D connector.

3 Earth the device frame in accordance with the cubicle protection and local electrical procedure.

4 Match the optical fibre material and connector style to the installed transceiver hardware.

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Engineering FAQ

Which ABB relays can SPA-ZC 400 connect to an IEC 61850-8-1 station bus?

The ABB manual identifies one REF541/3/5 or REM543/5 relay for the fixed adapter connection.

Can SPA-ZC 400 keep an existing LON or SPA optical connection during IEC 61850 migration?

The EMP and EMG versions provide the optional simultaneous optical port; its topology and protocol jumper settings must match the installed bus.

How is SPA-ZC 400 mechanically secured to the relay?

The adapter is fastened to the relay at the two 9-pin D-type connectors; both mechanical alignment and connector seating must be checked.

Which SPA-ZC 400 diagnostics should be checked after power-up?

Check common Power and Diagnostic indications, LAN LINK/TX/RX activity and the optional LON/SPA receive indication before functional testing.

What must be preserved when replacing SPA-ZC 400 in an existing project?

Preserve the exact execution, optical hardware, connected relay identity, approved CET project, IP plan and station-bus switch port.

How can an engineer validate SPA-ZC 400 data mapping?

Compare controlled relay changes with the corresponding IEC 61850 status, measurement and command objects, and review diagnostic data if any mapping is missing.

How should SPA-ZC 400 be configured before station-bus commissioning?

Build or recover the CET project, verify the relay data model and mappings, then download the approved configuration under change control.

What fibre checks are required during SPA-ZC 400 maintenance?

Confirm connector type, cleanliness, bend radius, transmit-to-receive routing and stable station-switch link indication.

Official ABB source record

ABB SPA-ZC 400 Ethernet Adapter Installation and Commissioning Manual

1MRS755347, Version C/30.12.2004