

## ABB AFS660 Switch

High-availability Ethernet device based on new IEC-standard redundancy protocols PRP/HSR

# With ABB AFS660 switches, which support the new IEC-standard redundancy protocols (PRP, HSR), networks can now be built for the first time with genuinely uninterrupted data communication.

- Switchover times of 0 ms guarantee high reliability of substation communication networks and systems (PRP/HSR)
- Extensive security functions guarantee all-round protection against networkborne attacks and operator errors
- Precise synchronization enables applications to comply with stringent real-time requirements

The new AFS660 switches from ABB, with robust hardware and a powerful operating system, are able to withstand extremely harsh environmental conditions. For the first time, the integration of new redundancy protocols allows uninterrupted data communication. These new techniques, PRP (Parallel Redundancy Protocol) and HSR (High-availability Seamless Redundancy), are based on the international IEC62439 standard and therefore guarantee future security and interoperability. Precision time synchronization in accordance with IEEE 1588v2, synchronizes sensors, drives and measuring equipment. Gigabit Ethernet provides for a fast connection to the backbone, while connections to terminal equipment use 100 BASE-TX – either alone or in combination with 100 BASE-FX.

## Applications

The AFS660 switches from ABB are optimized for the type of data communication used in the electricity supply industry, because using Ethernet to link the field-level transformer stations of a power supply grid calls for special network equipment which can guarantee uninterrupted communication in the systems under even the harshest conditions. This is the only way of ensuring that end customers receive an uninterrupted power supply.

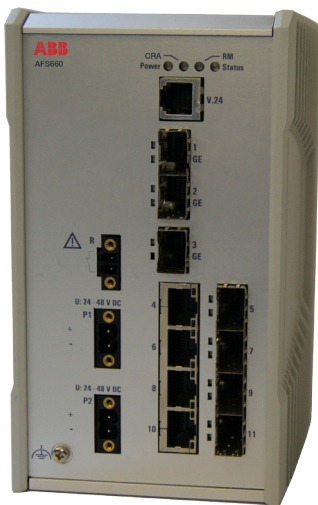
The AFS660 switches can also be used in many other areas. They offer optimum solutions wherever uninterrupted data communication is of the essence, for example in mechanical engineering, production or security applications.

## Benefits

The AFS660 switches are the first to allow uninterrupted data communication, thus ensuring continuous access to machines and systems, greatly increasing their productivity and hence also their profitability. The switches feature comprehensive security functions to provide all-round protection against network attacks. Since they also support precise synchronization, they can be used for applications with stringent real-time requirements.

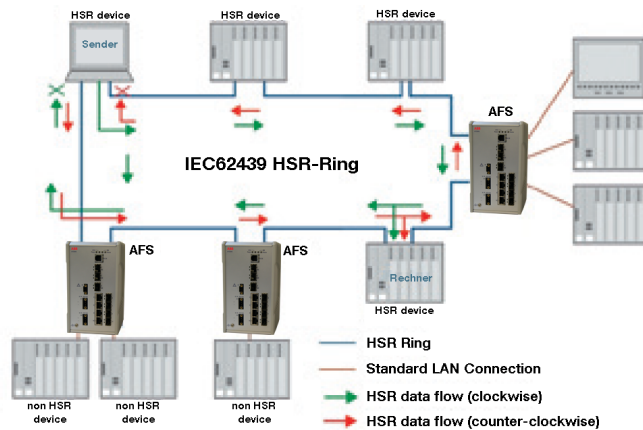
# ABB AFS660 switches

AFS660 switches from ABB offer eleven ports, three of which can be equipped with SFP transceivers that support Fast (100 BASE-FX) or – optionally – Gigabit-Ethernet (100/1000 BASE-FX). The remaining ports can be used either for 100 BASE-TX or as a combination of four SFP transceivers and four TX ports. These switches are also remarkable for their extensive management and redundancy methods, as well as enhanced security mechanisms. In addition a version is available that supports precise synchronization compliant with IEEE 1588v2, plus PRP (Parallel Redundancy Protocol) and HSR (High-availability Seamless Redundancy).

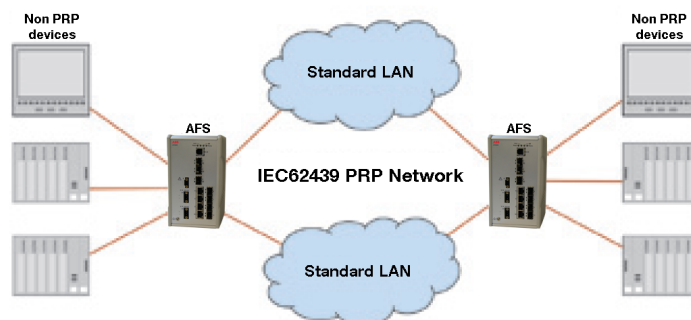


## The Advantages at a Glance

- Extensive range of redundancy methods: PRP, HSR, PRP/HSR Red Box, MRP, Fast MRP, RSTP
- Precise synchronization compliant with IEEE 1588v2
- Enhanced security mechanisms: authentication, radius, role based access, port security, SSHv2, HTTPS and SFTP
- Fast device replacement, comprehensive logging and storage of all configuration data, plus operating software updates via SD card
- Broad immunity to electrostatic discharges and magnetic fields
- Temperature range from -40°C to +70°C
- Power supply 24/36/48 V DC or 60/120/250 V DC and 110/230 V AC
- Strong and compact metal housing
- High level of vibration resistance



Duplicate data packets are transmitted simultaneously in both directions



Identical data packets are transmitted simultaneously to both networks

# Technical information

Product Description	AFS660 (FE Type)	AFS665 (GE Type)
Description	Managed, Industrial Switch DIN Rail, fanless design	
Port Type and Quantity	3x FE SFP slots & 8x FE 10/100TX 7x FE SFP slots & 4x FE 10/100TX	3x FE/GE SFP slots & 8x FE 10/100TX 3x FE/GE SFP slots & 4x FE SFP & 4x FE 10/100TX
<b>Additional Interfaces</b>		
V.24 Interface	1x RJ11 socket	
SD Card Slot	1x to connect Configuration Recovery Adapter CRA-SD (SD card)	
<b>Gigabit Ethernet Network Size</b>		
Multimode Fiber (MM)	50/125 µm, 0 – 550 m, 7.5 dB link budget; 62.5/125 µm 0 – 275 m, 7.5 dB link budget (with M-SFP-SX/LC)	
Single Mode Fiber (SM) 9/125 µm	0 – 20 km, 11 dB link budget (with M-SFP-LX/LC); 14 – 42 km, 5 – 20 dB link budget (with M-SFP-LX+/LC)	
Single Mode Fiber (LH) 9/125 µm	24 – 72 km, 6 – 22 dB link budget (with M-SFP-LH/LC); 70 – 128 km, 15 – 30 dB link budget (with M-SFP-LH+/LC)	
<b>Fast Ethernet Network Size</b>		
Twisted Pair	0 – 100 m	
Multimode Fiber (MM) 50/125 µm	0 – 5000 m, 8 dB link budget; 62.5/125 µm, 0 – 4000 m, 11 dB link budget (with M-Fast SFP-MM/LC)	
Single Mode Fiber (SM) 9/125 µm	0 – 25 km, 13 dB link budget (with M-Fast SFP-SM/LC); 25 – 65 km, 10 – 29 dB link budget (with M-Fast SFP-SM+/LC)	
Single Mode Fiber (LH) 9/125 µm	40 – 104 km, 10 – 29 dB link budget (with M-Fast SFP-LH/LC)	
<b>Network Size - Cascadability</b>		
Line-/Star Topology	any	
Ring Structure	>200 Switches	
Fault Recovery Time	0 ms with PRP or HSR	
<b>Power Requirements</b>		
Operating Voltage	24/36/48 V DC redundant, or 60/120/250 V DC and 110/230 V AC	
<b>Software</b>		
Management	V.24, Telnet, SSHv2, HTTP, HTTPS, TFTP, SFTP, SNMP v1/v2/v3, Traps	
Diagnostics LED	persistent logging, syslog, signal contact, device status indication, port mirroring N:1, RMON (1,2,3,9), TCPDump, LLDP, copper cable test, SFP management(temperature, optical input and output power), switch dump, configuration check dialog, system information, self tests on cold start, system monitor 1	
Configuration	Command line interface (CLI), web based management, full featured MIB support, BOOTP/DHCP client with auto configuration, AFS Finder, Configuration Recovery Adapter CRA-SD, Automatic configuration undo (roll-back), text based configuration file, CLI scripting	
Security	MAC based port security, Authentication (IEEE802.1x), Guest/unauthenticated VLAN, Radius client, Restricted management access, Local user accounts, different privilege levels, management authentication via RADIUS, account locking, configurable password policy, account locking, audit trail, configurable login attempts. HTTPS certificate management, CLI/SNMP logging	
Redundancy Functions	MRP, RSTP 802.1w	
Enhanced Redundancy Option	Fast MRP, PRP, HSR (pending)	
Filter	QoS (8 classes), CoS queue management, interface trust mode, TOS/DSCP prioritization, port priority (IEEE802.1D/p), VLAN (IEEE802.1Q), IGMP snooping/querier per VLAN (v1/v2/v3), unknown multicast filtering, independent VLAN learning, static unicast/multicast address entries, fastaging	

Time Synchronization	PTPv2 TC two-step, SNTP server and client, Buffered RTC
Flow Control	Flow control (IEEE802.3X), egress interface shaping, ingress storm protection
Miscellaneous	Port power down, cable crossing, dual image support, VLAN unaware mode, access to management restricted by VLAN

#### Ambient Conditions

Operating Temperature	Standard 0°C to 60°C or option -40°C to +70°C, IEC 60068-2-2 Dry Heat Test +85°C, 16 Hours, optional conformal coating
Relative Humidity (non-condensing)	10% to 95%

#### Mechanical Construction

Dimensions (WxHxD)	90 (98) x 164 x 120 mm (EEC)
Weight	1.2 kg, (1.5 kg EEC)
Protection Class	IP30

#### Approvals

Substation	IEEE61850-3, IEEE1613
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For more information please contact:

**ABB Switzerland Ltd**

**Power Systems**

Brown Boveri Strasse 6

5400 Baden, Switzerland

Phone: +41 58 589 37 35

or +41 544 845 845 (Call Center)

Fax: +41 58 585 16 82

E-mail: [communication.networks@ch.abb.com](mailto:communication.networks@ch.abb.com)

**[www.abb.com/communicationnetworks](http://www.abb.com/communicationnetworks)**