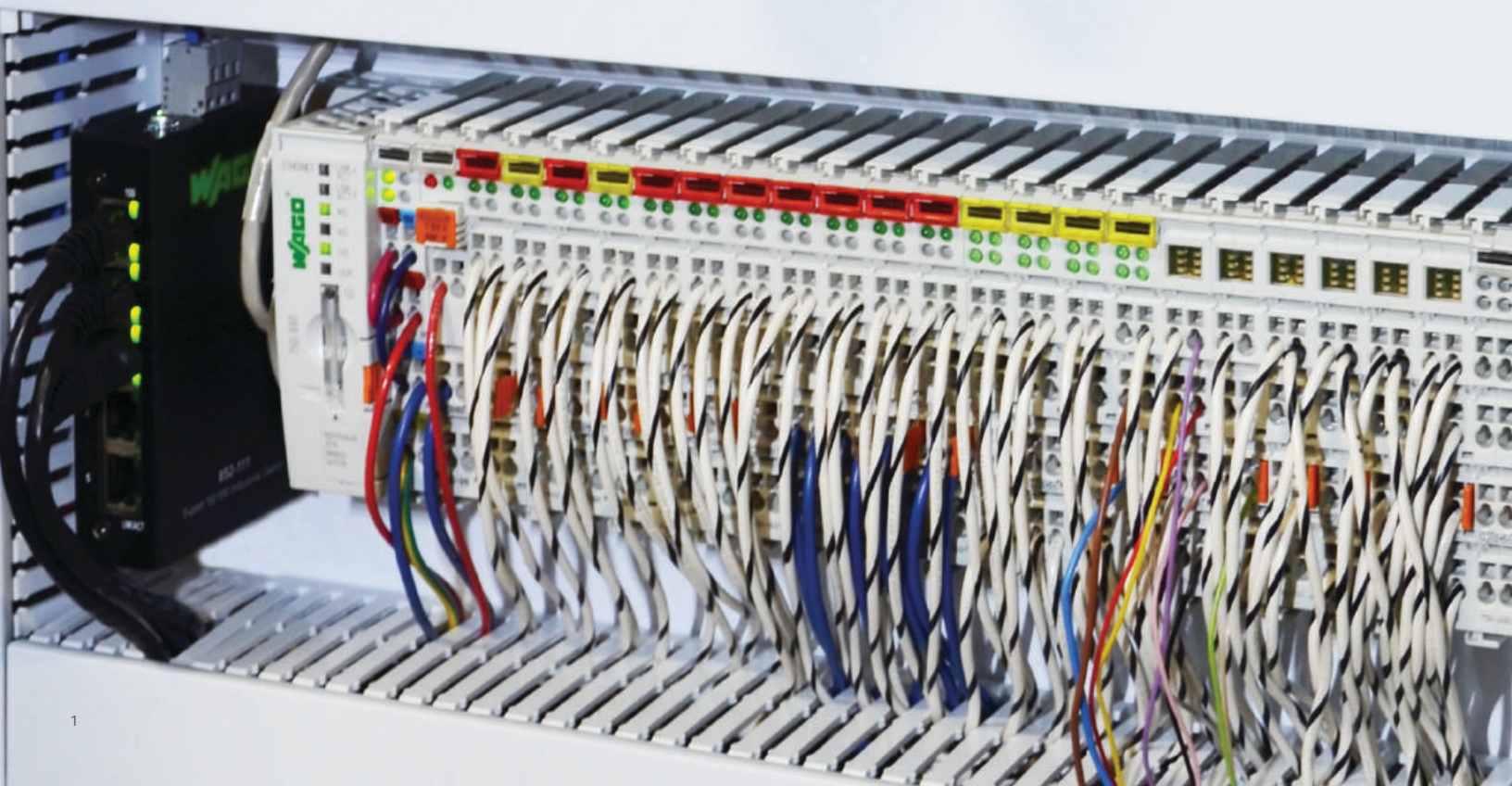# INDUSTRIAL ETHERNET SWITCHES
WAGO Solutions at the Heart of the Industrial ETHERNET
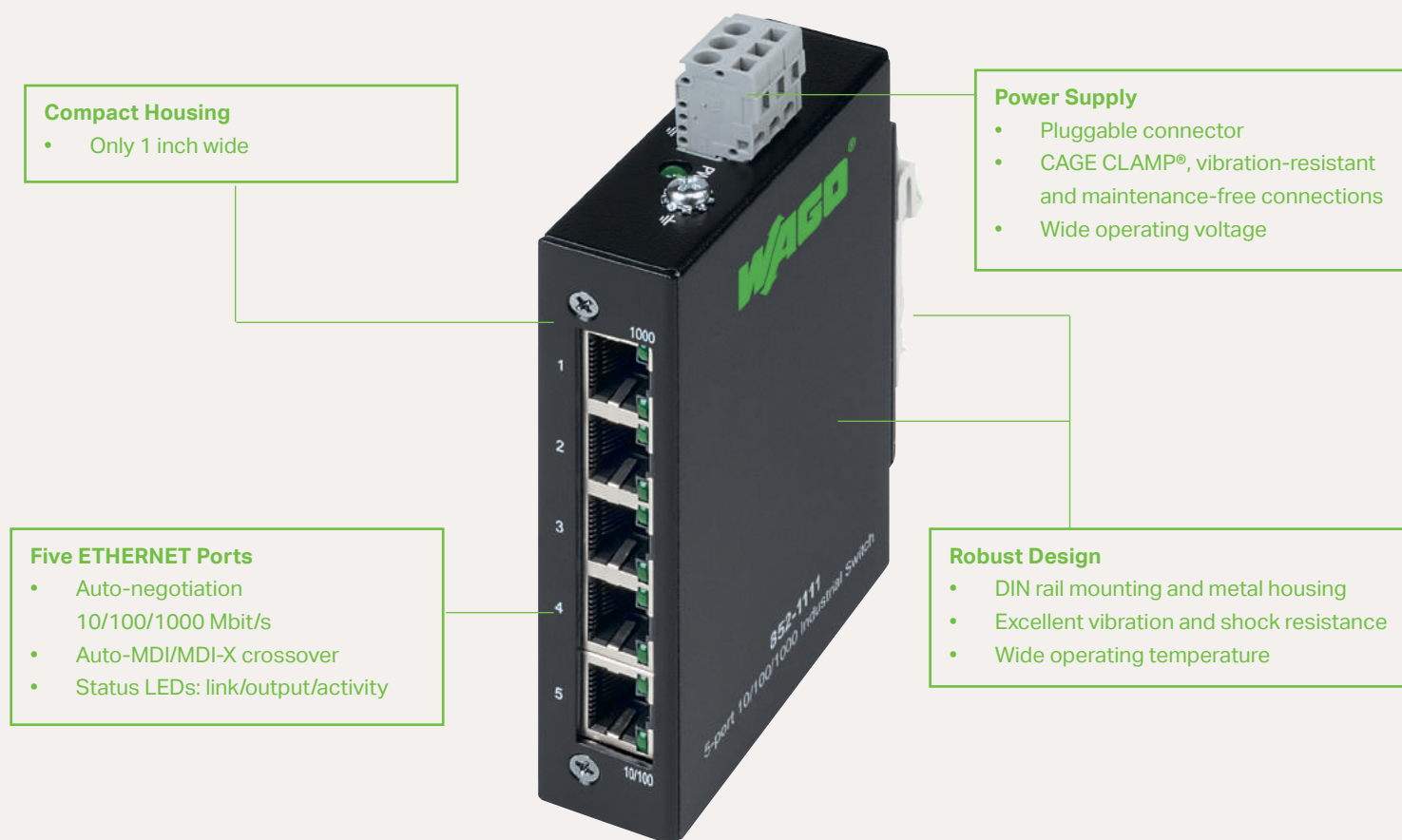
1

Contents

Compact Housing
- Only 1 inch wide

Power Supply
- Pluggable connector
- CAGE CLAMP®, vibration-resistant and maintenance-free connections
- Wide operating voltage

Five ETHERNET Ports
- Auto-negotiation 10/100/1000 Mbit/s
- Auto-MDI/MDI-X crossover
- Status LEDs: link/output/activity

Robust Design
- DIN rail mounting and metal housing
- Excellent vibration and shock resistance
- Wide operating temperature

ETHERNET ECO SWITCHES
Economical and Compact

| UNMANAGED	FAST ETHERNET		GIGABIT		STAINLESS STEEL ADAPTER (DNV)
Ports	5 x 10/100	8 x 10/100	5 x 10/100/1000	8 x 10/100/1000	
Power Supply	18 … 30 VDC	18 … 30 VDC	9 … 48 VDC	9 … 57 VDC	
Dimensions (W x H x D)	23.4 x 109.2 x 73.8 mm 0.92 x 4.3 x 2.9 in	109.2 x 73.8 x 23.4 mm 4.3 x 2.9 x 0.92 in	23.4 x 109.2 x 73.8 mm 0.92 x 4.3 x 2.9 in	46 x 116 x 99.6 mm 1.8 x 4.6 x 3.9 in	Use with 852-111 and 852-1111
Temperature	-40 °C … +70 °C -40 °F … +158 °F	-40 °C … +70 °C -40 °F … +158 °F	-40 °C … +70 °C -40 °F … +158 °F	0 °C … +60 °C +32 °F … +140 °F	
Approvals	cULus, DNV [1]	cULus	cULus [2], DNV [1]	cULus [2]	
PROFINET	-	-	CC-A	CC-A	
Prioritization	-	-	IEEE 802.1 p	IEEE 802.1 p	
Part Number	**852-111**	**852-112**	**852-1111**	**852-1112**	**852-9101**

[1] With DIN 852-9101 rail adapter

[2] Pending

Power Supply
- Redundant power supply terminals
- Wide voltage range
- Pluggable connector

Robust Design
- DIN rail mounting and metal housing
- Excellent vibration and shock resistance
- Temperature range: -40 °F ... +158 °F
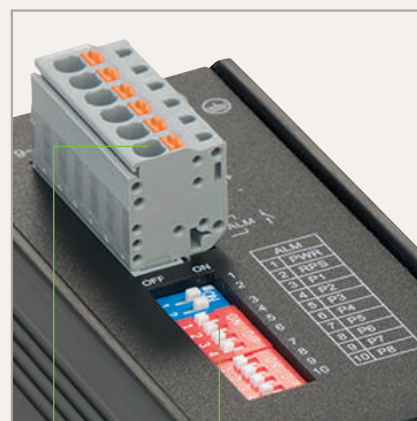
Configuration via DIP switches

Alarm Contact
- Monitor power supplies
- ETHERNET port monitoring
- Signaling via PLC or remote I/O
- Indicator LEDs on front panel of cabinet

ETHERNET STANDARD SWITCHES

Robust and Versatile

UNMANAGED	FAST ETHERNET			GIGABIT	
Copper Ports	5 x 10/100	8 x 10/100	8 x 10/100	8 x 10/100/1000	16 x 10/100/1000
Fiber-Optic Ports	-	-	2 x SFP 100	-	-
Power Supply	9 ... 48 VDC	9 ... 48 VDC	9 ... 48 VDC	9 ... 57 VDC	9 ... 57 VDC
Redundant Power Supply	Yes	Yes	Yes	Yes	Yes
Alarm Contact	Yes	Yes	Yes	Yes	Yes
Dimensions (W x H x D)	50 x 120 x 105 mm 2 x 4.7 x 4.1 in	50 x 162 x 105 mm 2 x 6.4 x 4.1 in	50 x 162 x 105 mm 2 x 6.4 x 4.1 in	50 x 120 x 105 mm 2 x 4.7 x 4.1 in	50 x 162 x 105 mm 2 x 6.4 x 4.1 in
Temperature	-40 °C ... +70 °C -40 °F ... +158 °F	-40 °C... +70 °C -40 °F ... +158 °F	-40 °C ... +70 °C -40 °F ... +158 °F	-40 °C ... +70 °C -40 °F ... +158 °F	-40 °C ... +70 °C -40 °F ... +158 °F
Approvals	cULus	cULus	cULus	cULus [1]	cULus [1]
PROFINET	-	-	-	CC-A	CC-A
Prioritization	-	-	-	IEEE 802.1 p	IEEE 802.1 p
Part Number	852-101	852-102	852-103/040-000	852-1102	852-1106

[1] Pending

Power Supply
- Pluggable connector
- Vibration-proof, maintenance-free power supply connection
- Wide operating voltage

Status LEDs
- Power supply is connected
- PoE sensor is powered
- Communication partner is connected
- Data is being transmitted

5 RJ45 Ports 1 GBit/s
- 4 ports PoE+ (30 W)
- 1 Uplink port

Fiber-Optic Version
- 2 SFP* ports

Operating Temperature: -40 °F ... +158 °F

* Small Form-factor Pluggable

POWER OVER ETHERNET (PoE+)

UNMANAGED		
PoE+ Ports	4 x PoE+ (30 W)	4 x PoE+ (30 W)
Copper Ports	5 x 10/100/1000	5 x 10/100/1000
SFP Ports	–	2 x SFP 1000
Power Supply	24 ... 57 VDC	24 ... 57 VDC
Dimensions (W x H x D)	50 x 120 x 160 mm	50 x 120 x 160 mm
Temperature	-40 °C ... +70 °C -40 °F ... +158 °F	-40 °C ... +70 °C -40 °F ... +158 °F
Approvals	cULus[1]	cULus[1]
Prioritization	IEEE 802.1 p	IEEE 802.1 p
Part Number	**852-1411**	**852-1417**

[1] Pending

"Power over ETHERNET" (PoE+) technology powers PoE-capable devices via network cable using a switch. This allows devices like PoE-capable IP cameras or IoT sensors to be economically integrated into the network, eliminating the separate installation of power and data cables. Other advantages include diagnostics performed within the system.

The IEEE 802.3at-2009 PoE standard, which is also known as PoE+ or PoE plus standard, provides up to 25.5 W of power to the PoE-capable devices. To make this possible, the PoE-capable switch can provide up to 30 W per PoE-enabled port.
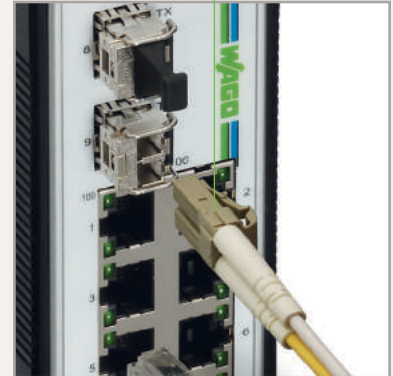
Large choice of SFPs

Mechanical lock
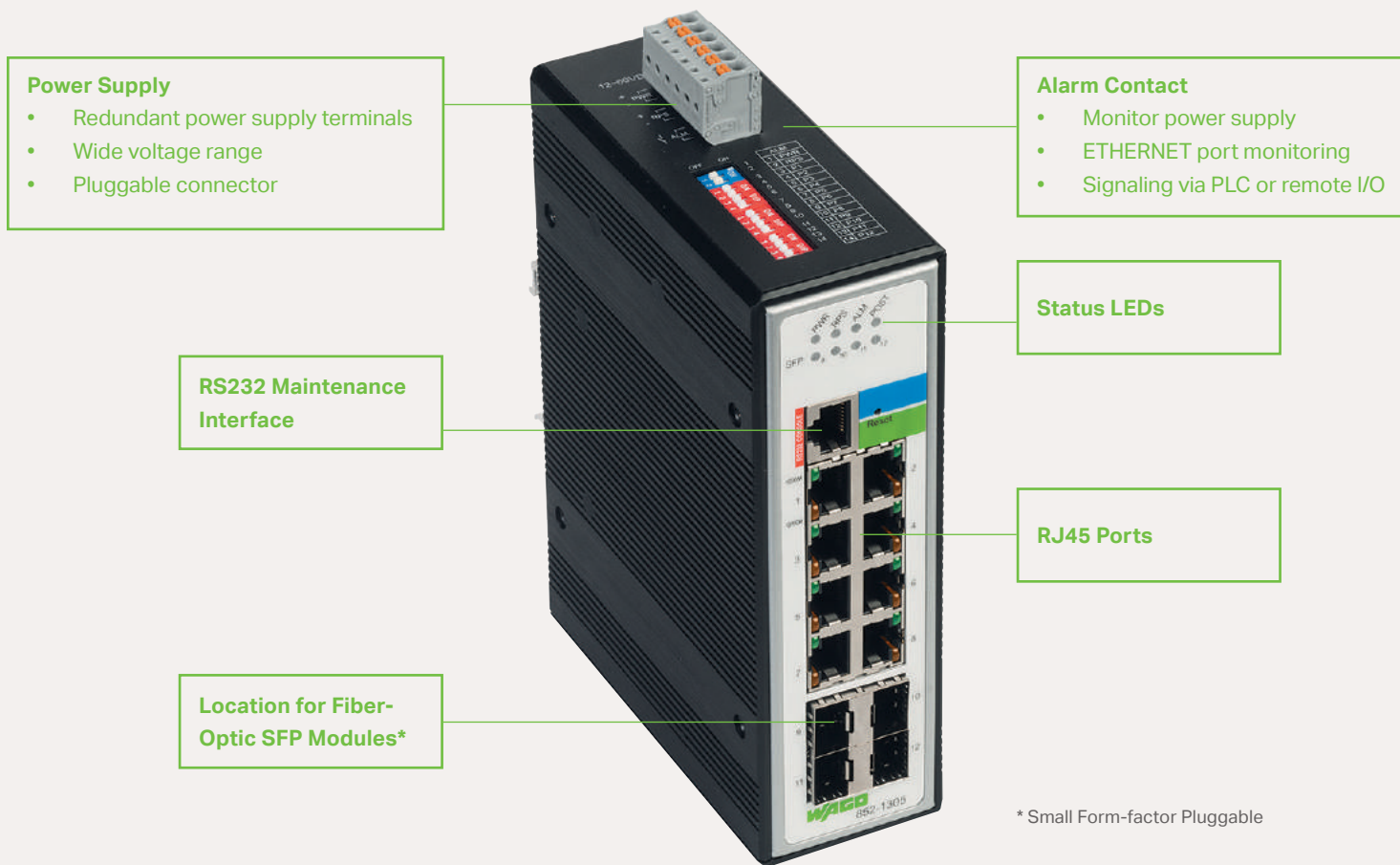
Single and multimode types

SFP MODULES

Interface for Fiber-Optic

CATEGORY	FAST ETHERNET			GIGABIT		
Use With	852-103 852-303[1]	852-103 852-303[1]	852-303[1]	852-303[1] 852-1305 852-1505 852-1417	852-303[1] 852-1305 852-1505 852-1417	852-303[1] 852-1305 852-1505 852-1417
Mode	Multimode	Single mode	Multimode	Multimode	Single mode	Single mode
Max. Distance	2 km / 1.2 mi	30 km / 18.5 mi	2 km / 1.2 mi	0.55 km / 0.4 mi	10 km / 6.2 mi	80 km / 49.7 mi
DDM*	No	No	No	Yes	Yes	Yes
Connector	LC duplex	LC duplex	LC duplex	LC duplex	LC duplex	LC duplex
Operating Temp.	0 °C … +60 °C +32 °F … +140 °F	0 °C … +60 °C +32 °F … +140 °F	-40 °C … +70 °C -40 °F … +158 °F	-40 °C … +85 °C -40 °F … +185 °F	-40 °C … +85 °C -40 °F … +185 °F	-40 °C … +85 °C -40 °F … +185 °F
Network Speed	100 Mbit	100 Mbit	100 Mbit	1000 Mbit	1000 Mbit	1000 Mbit
Part Number	**852-201/107-022**	**852-201/107-030**	**852-201/040-002**	**852-1200**	**852-1210**	**852-1280**

[1] Must be configured via DIP switch
* Digital Diagnostic Monitoring

Power Supply
- Redundant power supply terminals
- Wide voltage range
- Pluggable connector

Alarm Contact
- Monitor power supply
- ETHERNET port monitoring
- Signaling via PLC or remote I/O

RS232 Maintenance Interface

Status LEDs

RJ45 Ports

Location for Fiber-Optic SFP Modules*

* Small Form-factor Pluggable

MANAGED ETHERNET SWITCHES

Performance, Security, Flexibility

Our industrial managed switches offer users advanced networking features to configure, manage and monitor your LAN.
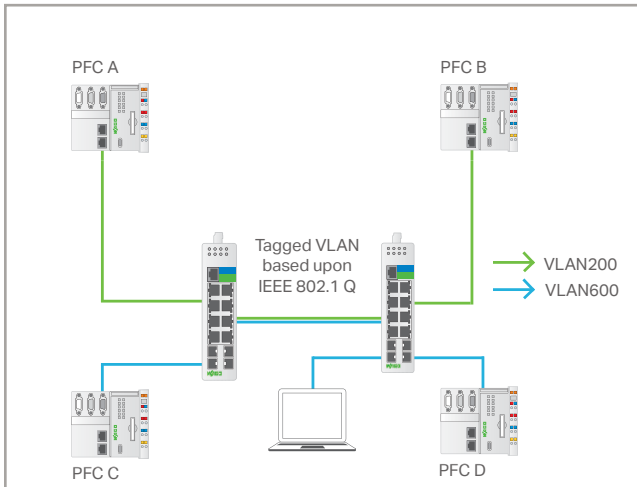
The industrial managed ETHERNET switches can be used to help increase network security, performance and diagnostics.

The fully configurable firewall and 802.1x authentication and SysLog can be enabled to enhance system security. Multiple solutions for network redundancy such as RSTP, Jet Ring or Express Ring technologies provide increased network availability. The creation of virtual networks (VLAN) permits the separation of networks in order to optimize performance and security. Network health can be monitored via the alarm relay and Modbus registers. All of this is offered in a compact, robust industrial managed switch.

MANAGED			PoE+
PoE+ Ports			8 x PoE+ (30 W)
Copper Ports	8 x 10/100	8 x 10/100/1000	8 x 10/100/1000
Fiber-Optic Ports	2 x SFP 100/1000	4 x SFP 100/1000	
Power Supply	12 ... 60 VDC	12 ... 60 VDC	48 ... 57 VDC
Redundant Power Supply	Yes	Yes	Yes
Alarm Contact	Yes	Yes	Yes
Dimensions (W x H x D)	50 x 162 x 120 mm 2 x 6.4 x 4.7 in	50 x 162 x 120 mm 2 x 6.4 x 4.7 in	50 x 162 x 120 mm 2 x 6.4 x 4.7 in
Temperature	-40 °C ... +70 °C -40 °F ... +158 °F	-40 °C ... +70 °C -40 °F ... +158 °F	-40 °C ... +70 °C -40 °F ... +158 °F
Approvals	cULus[1], DNV	cULus[1], DNV	cULus[1]
PROFINET	CC-A	CC-A	
Prioritization	IEEE 802.1Q	IEEE 802.1Q	IEEE 802.1Q
Part Number	**852-303**	**852-1305**	**852-1505**

7

[1] Pending

MANAGED SWITCHES
Data Transmission

Logical Network Disconnection

- VLAN (e.g., per IEEE 802.1Q)
  Segmentation in logical, virtual networks:
  - Broadcast limitation
  - Security improvement
  - Data flow prioritization
  - Subdivision of machines and office networks, for example
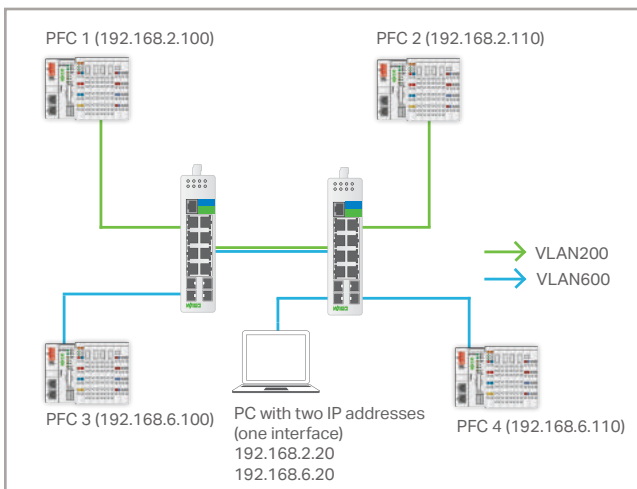
IP-Based VLAN

- Routing of data packets between VLANs via IP address
- Communication from one participant to two or more VLANs
- Economic connection of networks to higher-level routers
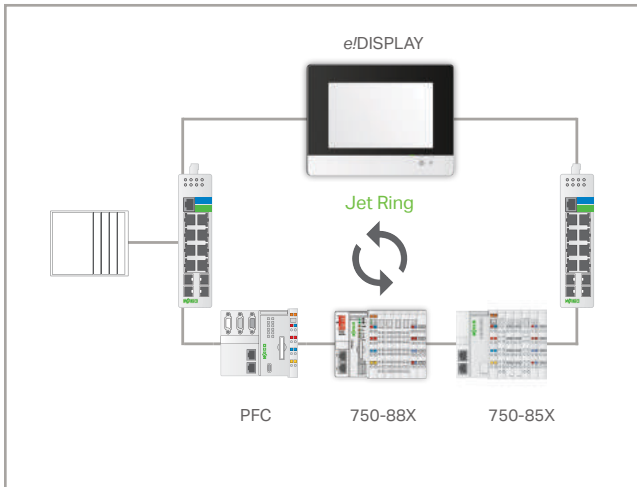- Prioritization of data packets via IP address
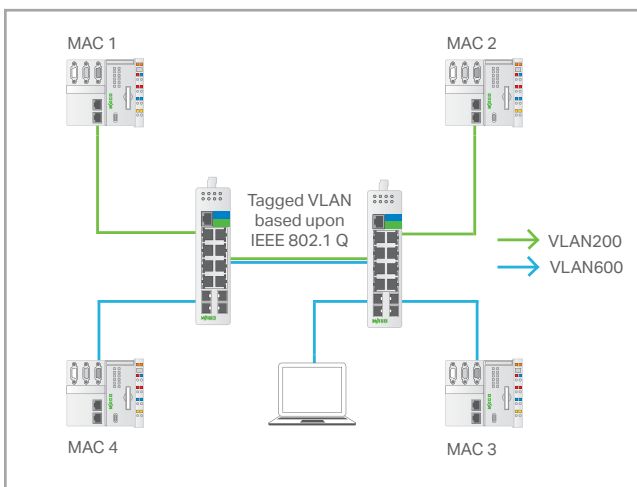
MAC-Based VLAN

- Assignment of data packets to a VLAN via MAC address
- Prioritization of data packets via MAC address
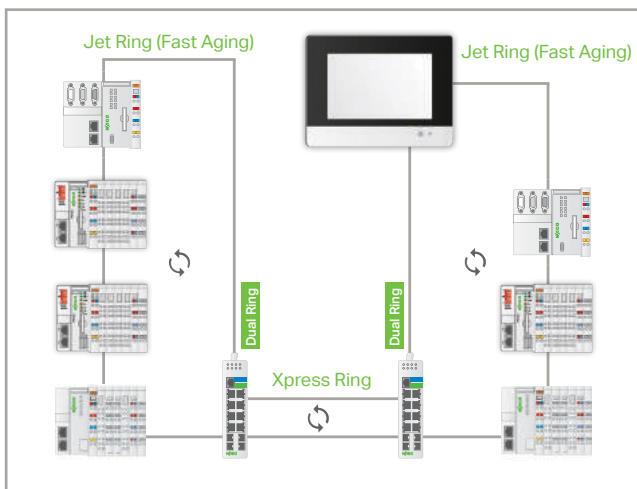
MANAGED SWITCHES
Redundancy

Jet Ring

Jet Ring

Redundancy in simple and flexible ring

- Proprietary ring topology
- Recovery time < 300 ms
- Very simple to configure
- Copper or fiber

Integration in the Jet Ring

- Managed configured switches in Jet Ring mode
- WAGO PLCs and bus couplers with integrated switch and Fast Aging configuration
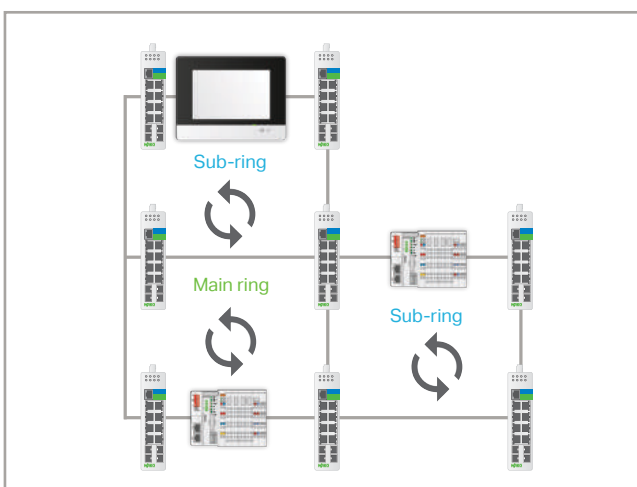

Xpress Ring and Dual Ring

Xpress Ring and Dual Ring

Redundancy in high-performance ring

- Proprietary ring topology
- Recovery time < 20 ms
- Simple to configure
- Copper or fiber

Dual Ring

- Combination of both redundancy types
- 1 jet ring and 1 Xpress ring per switch or 2 Xpress rings per switch


ERPS V2

ERPS: ETHERNET Ring Protection Switching

The rapid and open solution

- Standardized and open technology
- Recovery time < 50 ms
- Intertwined topologies up to 6 rings per switch
- Elimination of Single Points of Failure

Integration in the ERPS Ring V2

- Managed switches configured in ERPS mode V2
- WAGO PLCs and bus couplers with integrated switch and Fast Aging configuration
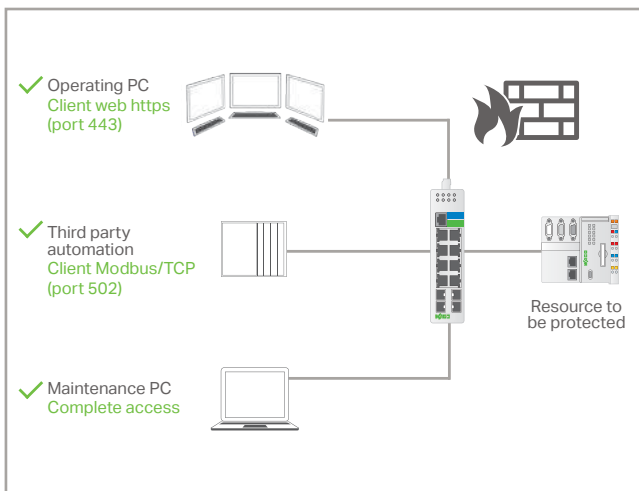
Security
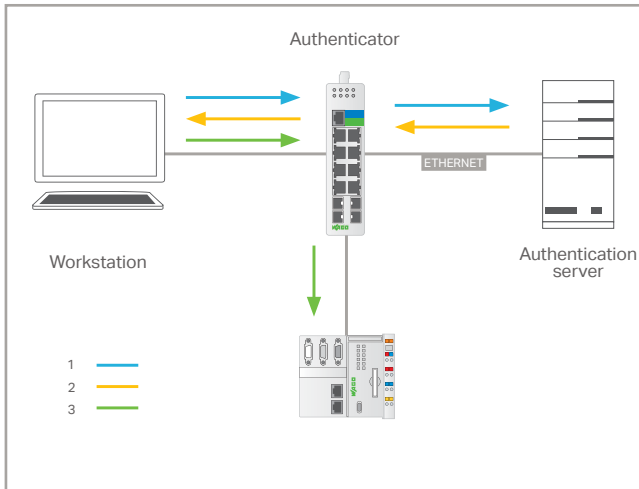
802.1X

Authentication 802.1X

The security standard for IT networks

- Authenticator profile
- Active/inactive protection by port
- Opportunities for profile management:
    - In local mode, database hosted in the switch
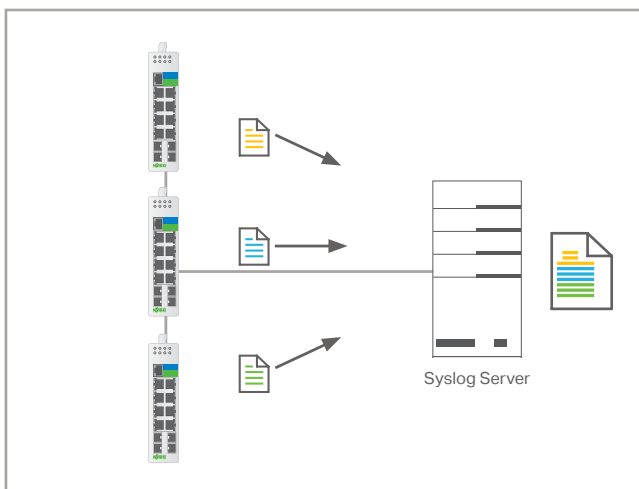   - Via network, database on a RADIUS authentication
       server

Firewall

Level 3 Firewall - Access Control List

Authorize only necessary services

Creation of selective rules for the following functions:
- IP source address
- TCP/UDP source port
- IP address of the destination
- TCP/UDP port of the destination
- Transport protocol: TCP and/or UDP
- Source interface

SysLog

Advanced Functions

Prevention and monitoring

- Local or remote SysLog logging
- DHCP snooping
   Prevention of DHCP spoofing attacks (identity theft
   from a legitimate DHCP server)
- Management host (3 configurable addresses)
   The configured addresses are the only ones allowed to
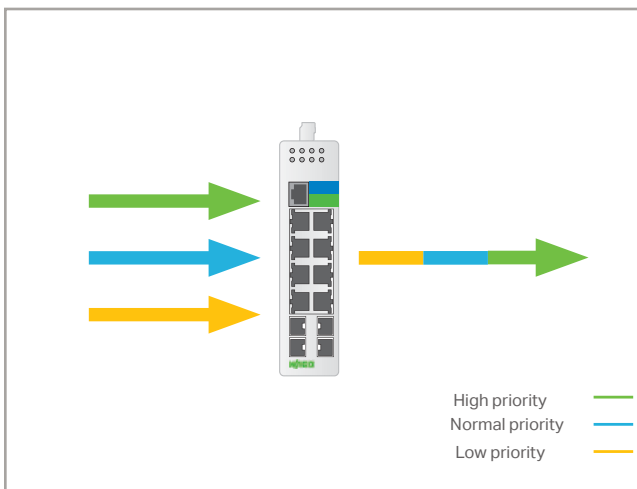   access the configuration interfaces

MANAGED SWITCHES
Performance
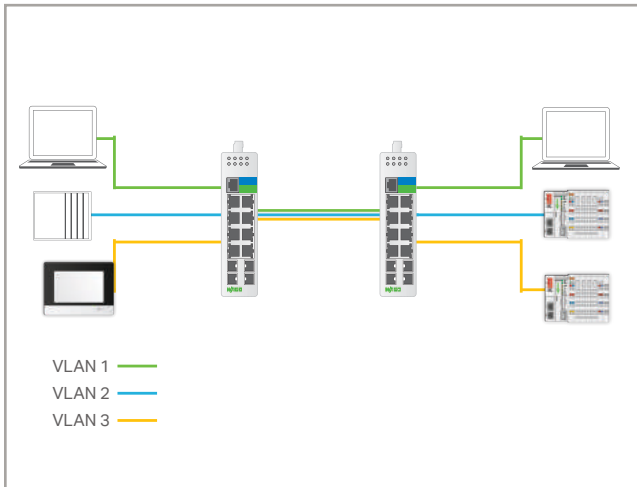
Network Optimization

With a wide range of options

- LACP link aggregation
  Merge multiple data connections into a single
  logical link:
  - Increase transmission rate
 - Link redundancy

VLAN 1 ———
VLAN 2 ———
VLAN 3 ———

VLAN

Traffic Prioritization and Limitation

Controlled bandwith

- Faster transfer of important data packets through
  the switch
- Prioritization of data packets per IEEE 802.1 Q
- Limitation of the bandwith or number of packets per
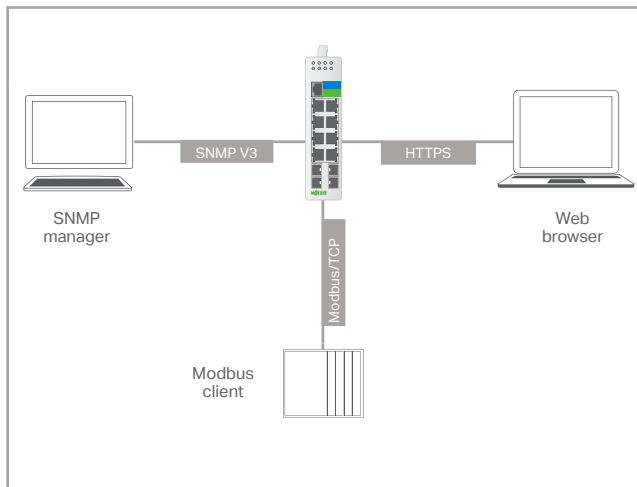 unit of time per port
- Increase in data transmission quality

High priority ———
Normal priority ———
Low priority ———

QoS
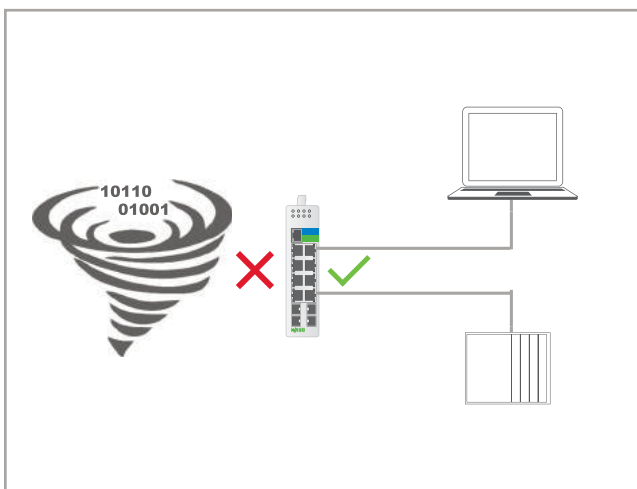
Traffic Control

Guaranteed reliability

- Stopping broadcast storms
- Helps to ensure network availability
- Limitating broadcast and multicast data flows

10110
01001

Storm Control

Administration and Diagnostics

Configuration interfaces

Configuration Interfaces
Wide range of options

- Configure via secure web server with a clear and intuitive interface
- Or configure via the command line interface, commonly used by IT professionals
- Leverage the SNMP agent for email or text notifications
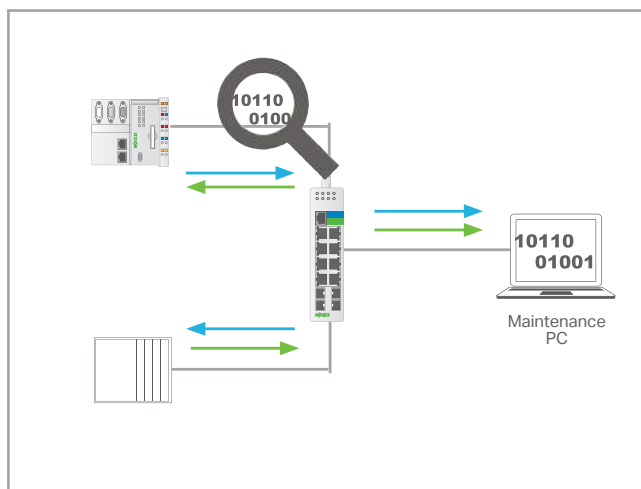- Retrieve diagnostic information via the managed switch's Modbus/TCP server

DDM

Digital Diagnostic Monitoring (DDM)
The optical links under control

- Automatic detection of connected SFP modules
- Real-time monitoring of SFP health
  - Temperature
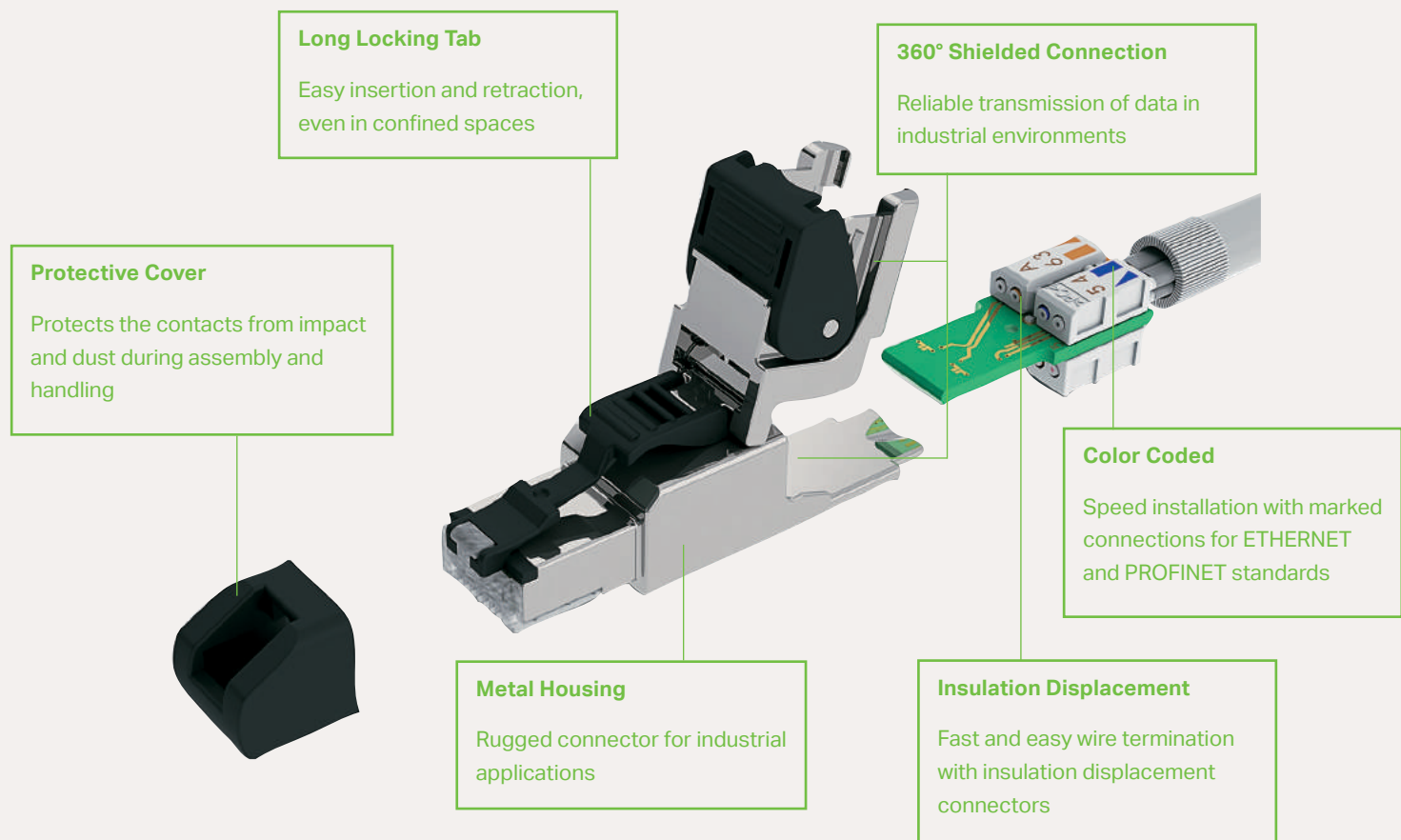 - Power supply
  - Transmission power
  - Reception power

Port Mirroring

Monitoring and Diagnostics
Simplified maintenance

- Monitor network traffic via Port Mirroring
- Use LLDP for automatic detection of network topologies
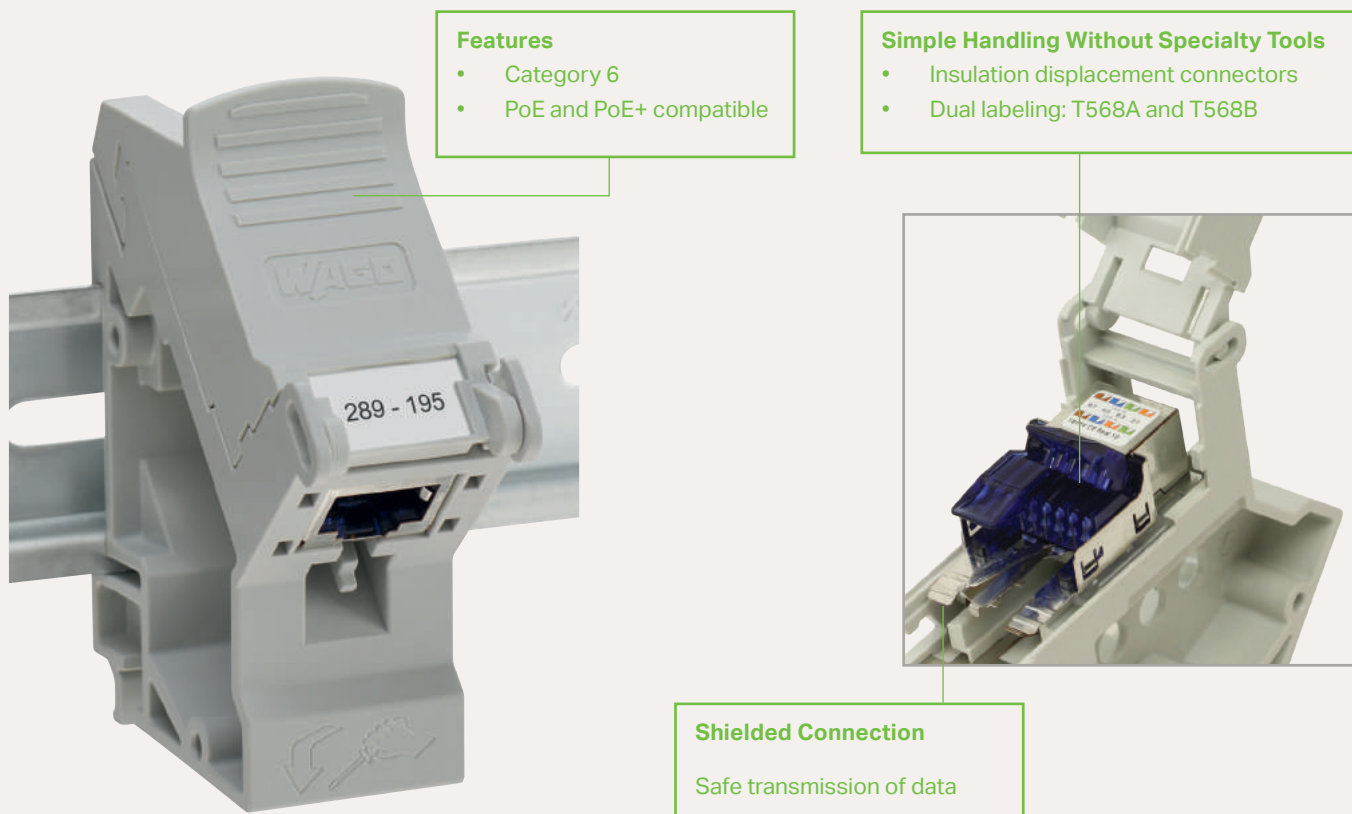- RS232 serial port for direct configuration

Long Locking Tab

Easy insertion and retraction, even in confined spaces

360° Shielded Connection

Reliable transmission of data in industrial environments

Protective Cover

Protects the contacts from impact and dust during assembly and handling

Color Coded

Speed installation with marked connections for ETHERNET and PROFINET standards

Metal Housing

Rugged connector for industrial applications

Insulation Displacement

Fast and easy wire termination with insulation displacement connectors

CAT 6A RJ45 CONNECTORS
Rapid Assembly

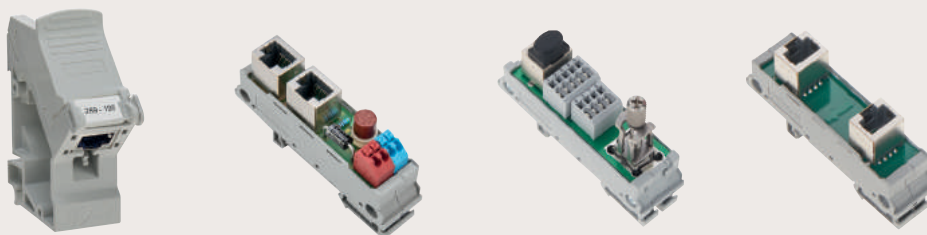| RJ45 CONNECTORS				
	Part Number	**Configuration**	**Network**	**Wire Size**
	750-977/000-011	Straight - No strain relief	ETHERNET T568A	22 AWG
	750-977/000-012	Straight - No strain relief	ETHERNET T568B	22 AWG
	750-977/000-013	Straight - No strain relief	PROFINET	22 AWG
	750-977/000-021	Straight - No strain relief	ETHERNET T568A	24 AWG
	750-977/000-022	Straight - No strain relief	ETHERNET T568B	24 AWG
	750-978/000-011	Straight - With strain relief	ETHERNET T568A	22 AWG
	750-978/000-012	Straight - With strain relief	ETHERNET T568B	22 AWG
	750-978/000-013	Straight - With strain relief	PROFINET	22 AWG
	750-978/000-021	Straight - With strain relief	ETHERNET T568A	24 AWG
	750-978/000-022	Straight - With strain relief	ETHERNET T568B	24 AWG
	750-979/000-011	90 Degree - With strain relief	ETHERNET T568A	22 AWG
	750-979/000-012	90 Degree - With strain relief	ETHERNET T568B	22 AWG
	750-979/000-013	90 Degree - With strain relief	PROFINET	22 AWG
	750-979/000-021	90 Degree - With strain relief	ETHERNET T568A	24 AWG
	750-979/000-022	90 Degree - With strain relief	ETHERNET T568B	24 AWG

Features
- Category 6
- PoE and PoE+ compatible

Simple Handling Without Specialty Tools
- Insulation displacement connectors
- Dual labeling: T568A and T568B

Shielded Connection

Safe transmission of data

DIN RAIL MOUNT RJ45 INTERFACES
ETHERNET Cabling on DIN Rail

RJ45 INTERFACES

Category	Cat 6	Cat 5	Cat 5	Cat 5
Description	Cable to RJ45	Passive PoE Injector	Cable to RJ45	RJ45 to RJ45
Max. Output	10 Gbit/s	100 Mbit/s	100 Mbit/s	100 Mbit/s
Dimensions (W x H x D)	26.8 x 64.4 x 81.4 mm 1 x 2.5 x 3.2 in	20.5 x 51 x 85 mm 0.79 x 2 x 3.4 in	24 x 40 x 85 mm 1 x 1.6 x 3.4 in	20.5 x 51 x 85 mm 0.79 x 2 x 3.4 in
Connection	IDC	CAGE CLAMP®	CAGE CLAMP®	-
Temperature	-10 °C ... +60 °C +14 °F ... +140 °F	-40 °C ... +85 °C -40 °F ... +185 °F	-40 °C ... +85 °C -40 °F ... +185 °F	-40 °C ... +85 °C -40 °F ... +185 °F
Shield Clamp	No	No	Yes	No
Conductors Section	24 ... 22 AWG	24 ... 16 AWG	28 ... 14 AWG	-
Part Number	289-195	289-196	289-175/790-108	289-172

Version with External Antenna

Use in a control cabinet

WLAN 802.11 a/b/g/d/e/i/h and *Bluetooth*® 4.0
Robust communication with high data throughput

High IP65 Protection Class
For direct on-machine use

Access Point Functionality
Build a network of up to 7 clients

WIRELESS ETHERNET GATEWAY
Copper Cable Replacement

WIRELESS ETHERNET GATEWAY		
Antenna	Internal directional antenna	External antenna
Security Encryption	WEP64, WEP128, TKIP, AES/CCMP	
Transmission Range	400 m / 1,300 ft.	
Frequency Band	ISM band, 2.4 GHz (*Bluetooth*®, WLAN); ISM band, 5 GHz (WLAN)	
Security Authentication	WPA/WPA2 PSK, LEAP, PEAP	
Power Supply	24 VDC (9 ... 30 V)	
Temperature	-30 °C ... +65 °C -22 °F ... +149 °F	
Protection Type	IP65	
Approvals	CE, FCC, IC, UL[1]	
Part Number	758-918	758-918/000-0001

[1] Pending

15

Bluetooth® and WLAN
for Industrial Applications

The Wireless ETHERNET Gateway (WEG) can be configured to communicate via Bluetooth 4.0 or Wireless LAN; and, multiple communication set-ups further increase the WAGO WEG's versatility for your application. The WEG is packaged in IP65 housing and easy to mount directly on equipment, making it ideal for use in harsh industrial environments. It can be configured using a button on the front of the unit or via your web browser.
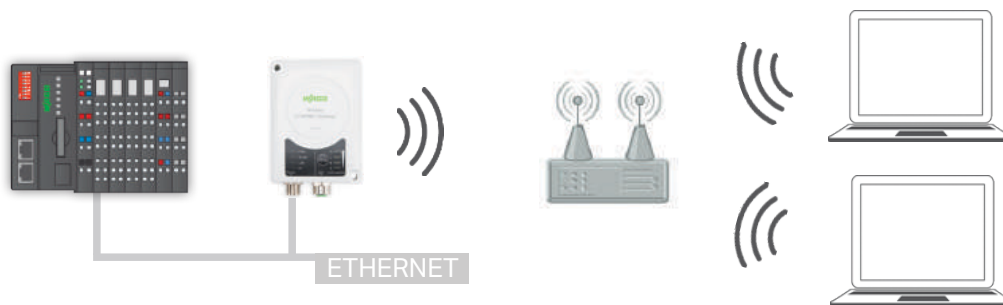
Configuration Examples

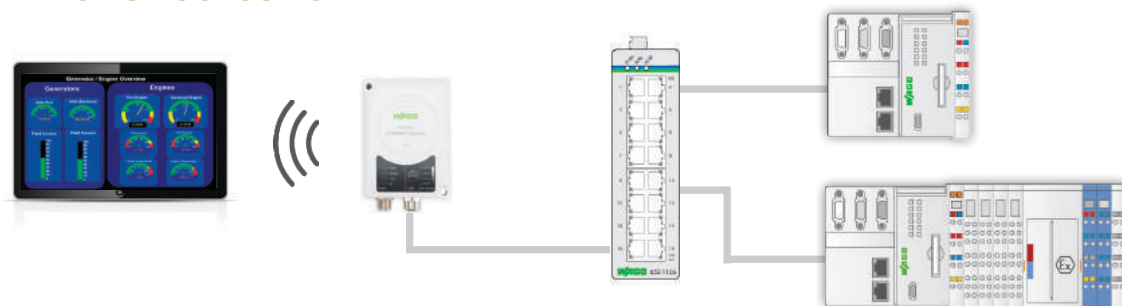**Easy Configuration: ETHERNET Bridge via WLAN or *Bluetooth*®**

ETHERNET / IP VIA BLUETOOTH

Bluetooth

ETHERNET

ETHERNET
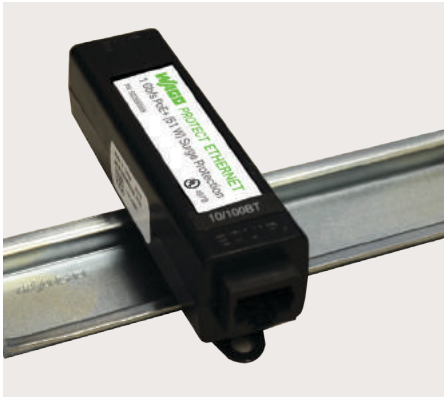
CONNECT TO AN EXISTING ETHERNET WLAN

ETHERNET

WEG AS ACCESS POINT

WAGO PROTECT

1 Gb/s PoE ETHERNET Surge Protection

Our new data line of ETHERNET surge protectors increase network availability by protecting equipment from electrical surges due to lightning strikes and other electrical anomalies. ETHERNET communication is becoming the life blood of today's factory floor as well as remote industrial applications. Maintaining equipment communication is essential, because downtime can be very costly. These two inline surge protectors are easily installed on a DIN rail and they support RJ45 connections up to 1 Gb ETHERNET transmission speeds. Both devices are engineered to protect 48 VDC PoE data lines to help protect systems with remote sensors.

ETHERNET SURGE DEVICES

Description	1 Gb/s PoE+	1 Gb/s PoE++
Max. PoE Power	51 Watts	100 Watts
Nominal Voltage	48 VDC	48 VDC
Max. PoE Current Per Pin	600 mA	1.5 A
Technology	Gas discharge tube	Hybrid gas discharge tube and silicon avalanche diode
Protection Modes	Line-to-ground, shield-to-ground	Line-to-line, line-to-ground, shield-to-ground
Pins Protected	[1, 2] [3, 6] [4, 5] [7, 8] {Shield}	[1, 2] [3, 6] [4, 5] [7, 8] {Shield}
Surge Suppression Line to Line	N/A	< 75 Vpk @ 100 A 8/20 µs
Max. Surge Current Per Pin Line to Ground	1 kA (8/20 µs)	2 kA (8/20 µs)
Max. Surge Current Shield to Ground	20 kA (8/20 µs)	20 kA (8/20 µs)
Response Time	< 75 ns	< 5 ns
Connections	Inline RJ45 Cat 5 e shielded	Inline RJ45 Cat 5 e shielded
Operating and Storage Temp.	-40 °C ... +75 °C -40 °F ... +167 °F	-40 °C ... +75 °C -40 °F ... +167 °F
Relative Humidity	99% (non-condensing)	99% (non-condensing)
UL Certification	497B	497B
ETHERNET Protocol	IEEE 802.3	IEEE 802.3
Part Number	**60366569**	**60366571**

BULKHEAD SOCKETS

Convenient Way to Pass RJ45 or USB Networks Through a Control Enclosure

BULKHEAD SOCKETS		
Connection	RJ45	USB with 2 foot extender cable
Degree of Protection	IP65 with closed cover, IP20 in use	IP65 with closed cover, IP20 in use
Mounting	22 mm hole	22 mm hole
Number of Poles	8	9
Class/Category	Cat 5	3.0 Type A Plug
Operating and Storage Temp.	-25 °C ... +70 °C -13 °F ... +158 °F	-25 °C ... +70 °C -13 °F ... +158 °F
Part Number	**51205068**	**51205157**

ASSOCIATED PRODUCTS

WAGO has a complete offering for automation applications

For more than 20 years, the WAGO automation range has been expanding every year to offer a wider range of solutions.

The *EPSITRON®* power supply system is an ideal complement to active elements of the network infrastructure. From the most simple power supplies to the most advanced secured power supplies, WAGO suggests a tailored response to each application case.

WAGO's line of automation products integrates perfectly into industrial ETHERNET applications. A broad offering of PLCs and distributed couplers support industrial protocols such as Ethernet/IP, Modbus/TCP and PROFINET. Pair these devices with our more than 500 digital, analog and specialty I/O modules to meet and exceed your application requirements.

POWER SUPPLIES
wago.us/epsitron

UNINTERRUPTIBLE POWER SUPPLIES
wago.us/ups

ELECTRONIC CIRCUIT BREAKERS
wago.us/ecb

REMOTE INPUTS/OUTPUTS
wago.us/iosystem

PROGRAMMABLE CONTROLLERS
wago.us/pfc200

INDUSTRIAL DISPLAYS
wago.us/edisplay