

SIEMENS



Rugged Communication

RUGGEDCOM 19"

Layer 2 Ethernet Switches

Rack Mountable

Brochure

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siemens.com/ruggedcom

RUGGEDCOM Ethernet switches are specifically designed to operate reliably in industrially harsh environments.

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Features and benefits

RUGGEDCOM Ethernet switches are specifically designed to operate reliably in industrially harsh environments. All RUGGEDCOM switches meet and exceed recognized industry standards (e.g. IEC 61850-3, IEEE 1613, NEMA TS 2) for ruggedness and communications performance. They are ideally suited for mission critical real-time control applications requiring high levels of reliability and availability.

Common features

- Rugged Rated for reliability in harsh environments
- Modular design with many different fiber port options available
- Long haul fiber support
- High immunity to EMI and heavy electrical surges
- -40°C to +85°C operating temperature (no fans)
- Fully integrated power supply (no external adaptors)
- Universal high-voltage range supporting all nominal voltages
- Dual low-voltage DC inputs supporting nominal voltages: 12 VDC, 24 VDC or 48 VDC

RUGGEDCOM technology

RUGGEDCOM products have been specifically designed and tested to withstand the demands of harsh environments.

Rugged Rated

Highly Accelerated Life Testing (HALT) is used in the early stages of product development to detect any design and performance issues. Siemens performs Highly Accelerated Stress Screening (HASS) on all RUGGEDCOM products, in order to ensure that customers get their orders free of manufacturing errors and random defects.

RUGGEDCOM products provide reliable and error-free operation in harsh electrical installations with high EMI.

Operation in industrial temperature range

- -40 °C to +85 °C normal operation
- Passive cooling – no fans

High availability

- Integrated single or redundant power supplies
- Universal high-voltage range: 88–300 VDC or 85–264 VAC
- Low voltage: 12 VDC, 24 VDC or 48 VDC

Durable installations

- Full metal enclosure
- Heavy duty mounting
- Industrial terminal blocks for power and I/O connection

Zero Packet Loss

The proliferation of IP networking technology from the office to industrial environments, for use in real-time, mission critical, control applications requires a level of immunity to electromagnetic interference (EMI) well beyond what is currently delivered by commercial grade networking products. In fact, even the EMI immunity requirements prescribed by IEC 61000-6-2 (generic standards – immunity for industrial environments) are inadequate for many environments.

One such environment is the electric utility substation, where EMI levels can be significantly higher than those of the generic industrial environment defined in IEC 61000-6-2. In order to address this risk, both the IEC and IEEE have developed and issued standards addressing EMI immunity requirements for communications networking equipment in electric utility substations.

In response to these requirements, RUGGEDCOM technology withstands all of the EMI type tests required by IEC 61850-3 without experiencing any communications loss or delays. Products featuring this technology also qualify as IEEE 1613 class 2 error-free devices. This innovation is known as Zero Packet Loss technology and it is designed to provide the same level of EMI immunity, and reliability as protective relaying devices.



IEC 61850

IEC 61850 standard for communications in substations is composed of ten parts, which outlines a complete framework for substation automation, including EMI (electromagnetic interference), immunity and environmental requirements (IEC 61850-3) for communications networks in substations.

The EMI immunity requirements of IEC 61850-3 are derived from IEC 61000-6-5 (Immunity for Power Station and Substation Environments), which defines a set of potentially destructive EMI type tests designed to simulate both continuous and transient EMI phenomena in the substation.

This standard has a minimum requirement that the networking equipment operates without any physical damage, reset or latch-up during the application of a variety of destructive EMI immunity type tests.

IEEE 1613

IEEE 1613 specifies ratings, environmental performance and testing requirements for communications networking devices installed in electric power substations.

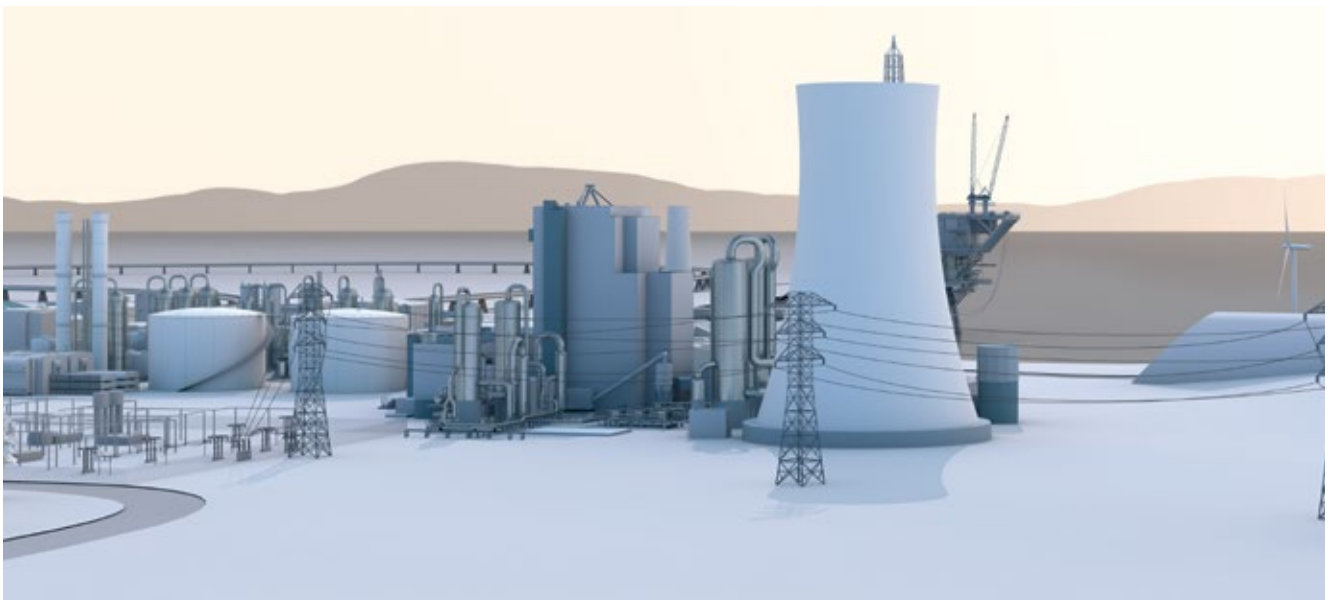
Within the standard, two classes of devices are defined, based on the outcome of a specific set of potentially destructive EMI type tests (EMI stress) designed to simulate EMI phenomena in the substation. These type tests are derived from the same type tests applied to mission critical protective relays (i.e. C37.90.).

Class 1 — these devices are allowed to experience data errors, loss, or delays when exposed to EMI stress.

Class 2 — these devices must provide error-free (i.e. no data errors, delays or loss) operation when exposed to EMI stress.

Neither class of device must experience any permanent damage under EMI stress.

The RUGGEDCOM family qualifies as IEEE 1613 Class 2 error-free devices, putting these products in a class of their own.



RUGGEDCOM RSG2100



The RUGGEDCOM RSG2100 is a utility-grade, fully managed, 19-port modular Ethernet switch with Gigabit uplinks specifically designed to operate reliably in electrically harsh and climatically demanding environments.

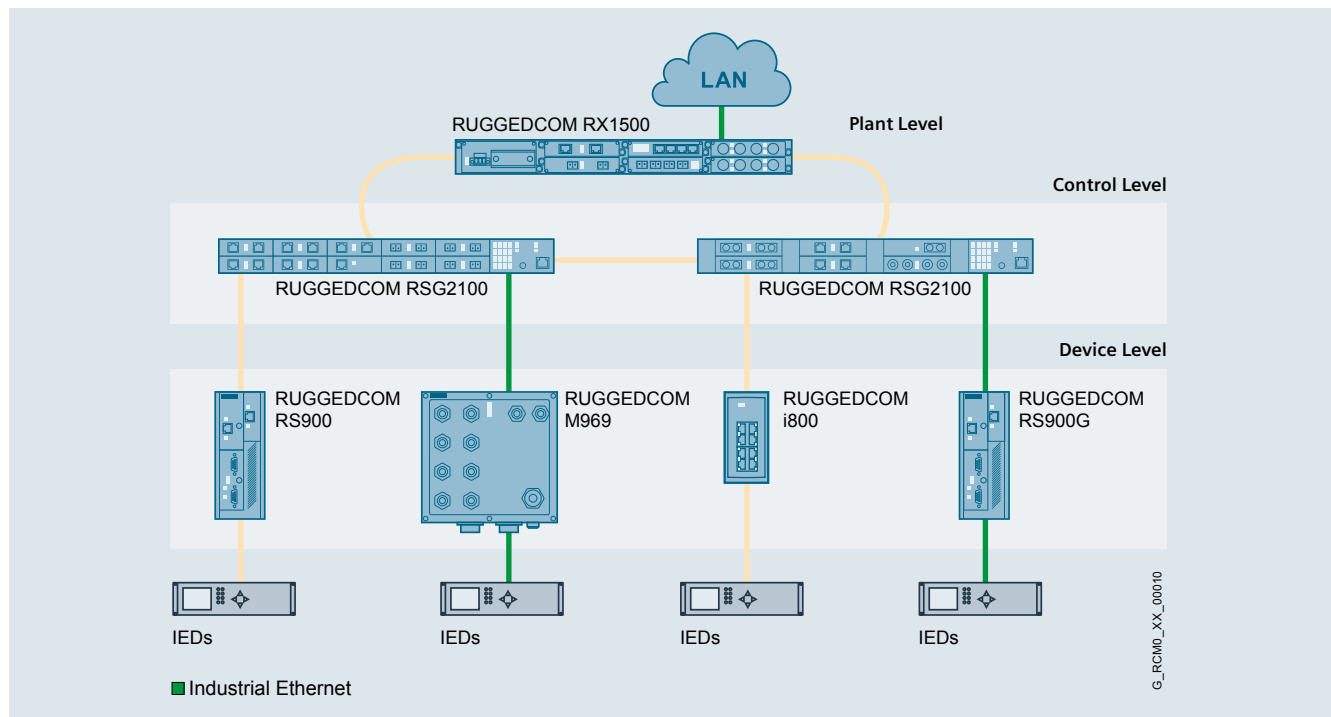
Ethernet ports

- Up to 19 ports:
 - 3 x 10/100/1000BASE-X ports
 - 16 x 10/100BASE-X ports
 - 2 port modules for added flexibility
- Industry standard fiber optic connectors: ST, MTRJ, LC, SC, RJ45, micro-D
- Copper, multi-mode and single-mode optical transceivers

Universal power supply options

- Fully integrated, optional dual redundant power supplies
- Universal high-voltage range: 88-300 VDC or 85-264 VAC
- Low-voltage range: 24 VDC (10 – 36 VDC) or 48 VDC (36 – 72 VDC)
- Screw or pluggable terminal blocks for reliable, maintenance-free connections
- CSA/UL 60950 safety approved to +85° C

Use case



Thanks to its interface versatility the RUGGEDCOM RSG2100 is an ideal device to connect a lot of different devices using a combination of fiber optic and copper with different connector types and speeds.

RUGGEDCOM RSG2100P



The RUGGEDCOM RSG2100P is a utility-grade, fully managed, 19-port Power-over-Ethernet (PoE) enabled modular Ethernet switch with Gigabit uplinks specifically designed to operate reliably in electrically harsh and climatically demanding environments.

Ethernet ports

- Up to 19 ports:
 - 3 x 10/100/1000BASE-X ports
 - 16 x 10/100BASE-X ports
 - 2 port modules for added flexibility
- Industry standard fiber optic connectors: ST, MTRJ, LC, SC, RJ45, micro-D
- Copper, multi-mode and single-mode optical transceivers

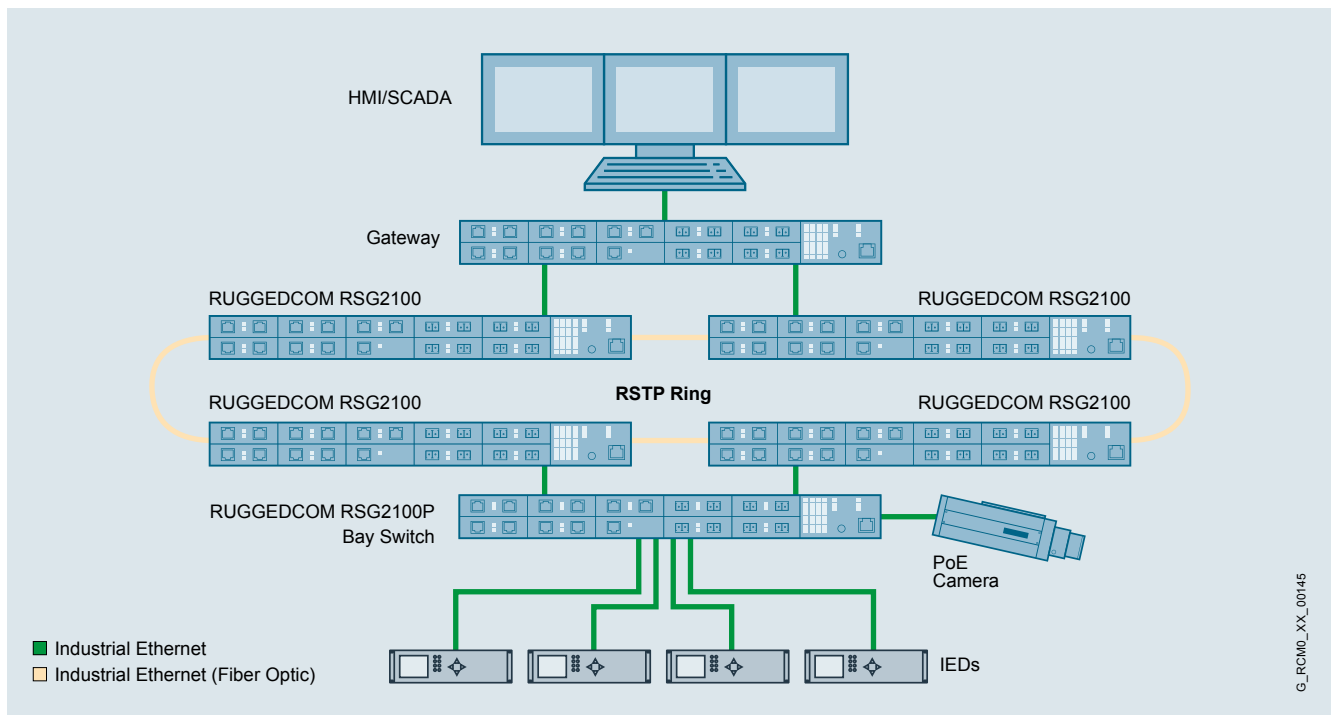
Power-over-Ethernet (PoE)

- Up to 4 PoE ports
- 4 x optional 10/100BASE-TX 802.3af compliant ports

Universal power supply options

- Fully integrated power supplies
- Universal high-voltage range: 88-300 VDC or 85-264 VAC
- Low-voltage range: 24 VDC (10 – 36 VDC) or 48 VDC (36 – 72 VDC)
- Screw or pluggable terminal blocks for reliable, maintenance-free connections
- CSA/UL 60950 safety approved to +85° C

Use case



The RUGGEDCOM RSG2100 is deployed in a redundant ring based on RSTP for optimal reliability.

RUGGEDCOM RSG2200



The RUGGEDCOM RSG2200 is a utility-grade, fully managed, 9-port modular Gigabit Ethernet switch specifically designed to operate reliably in electrically harsh and climatically demanding environments.

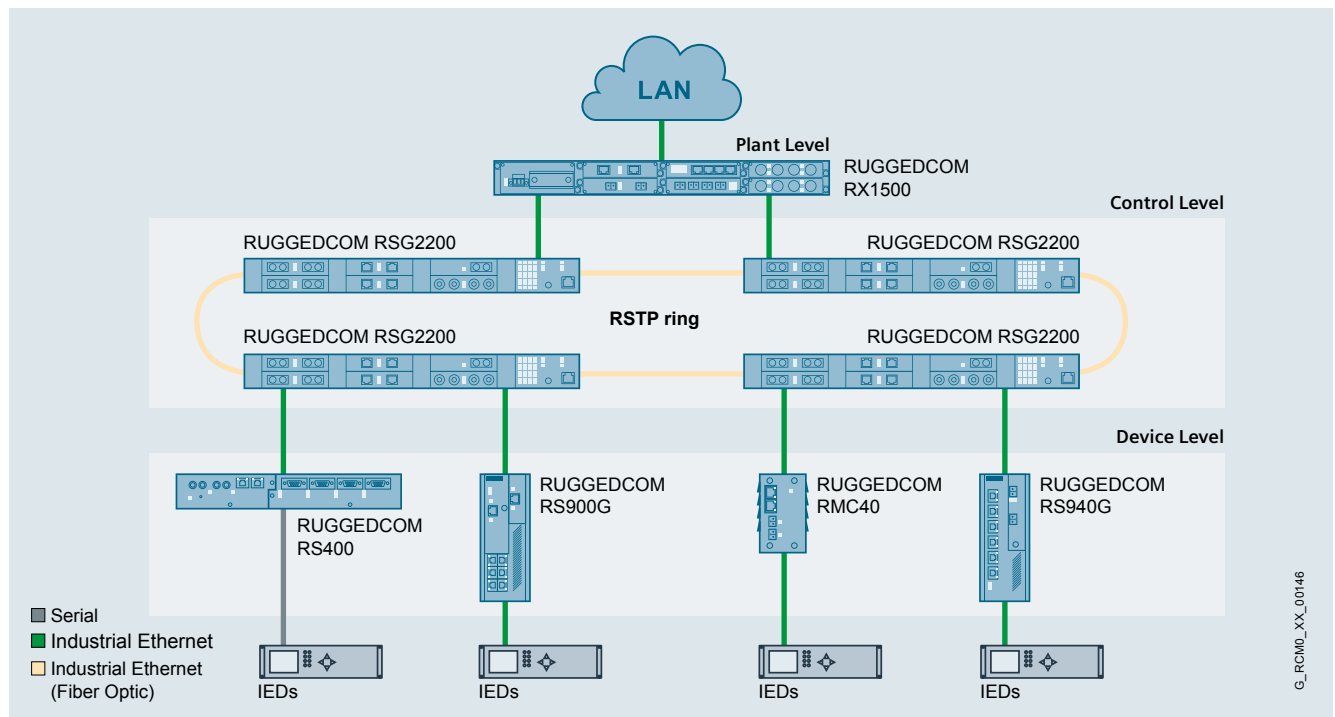
Ethernet ports

- Up to 9 x 10/100/1000BASE-X ports
- 2 port modules for added flexibility
- Industry standard fiber optic connectors: RJ45, ST, MTRJ, LC, SC
- Copper, multi-mode and single-mode optical transceivers

Universal power supply options

- Fully integrated, optional dual redundant power supplies
- Universal high-voltage range: 88-300 VDC or 85-264 VAC
- Low-voltage range: 24 VDC (10 – 36 VDC) or 48 VDC (36 – 72 VDC)
- Screw or pluggable terminal blocks for reliable, maintenance-free connections
- CSA/UL 60950 safety approved to +85° C

Use case



With the RUGGEDCOM RSG2200 Gigabit communication is possible for reliable and high speed connection throughout the network.

RUGGEDCOM RST2228 New



The RUGGEDCOM RST2228 is a high port density field modular 19" Layer 2 rack switch with 10 Gbit/s uplinks and the support for IEEE 1588.

Ethernet ports

- 4 x 1000BASE-X/10GBASE-X uplinks
- Up to 24 x 10/100/1000BASE-X ports
- 4-port modules for added flexibility
- Industry standard connectors: RJ45, LC & SFP
- Copper, multi-mode and single-mode optical transceivers

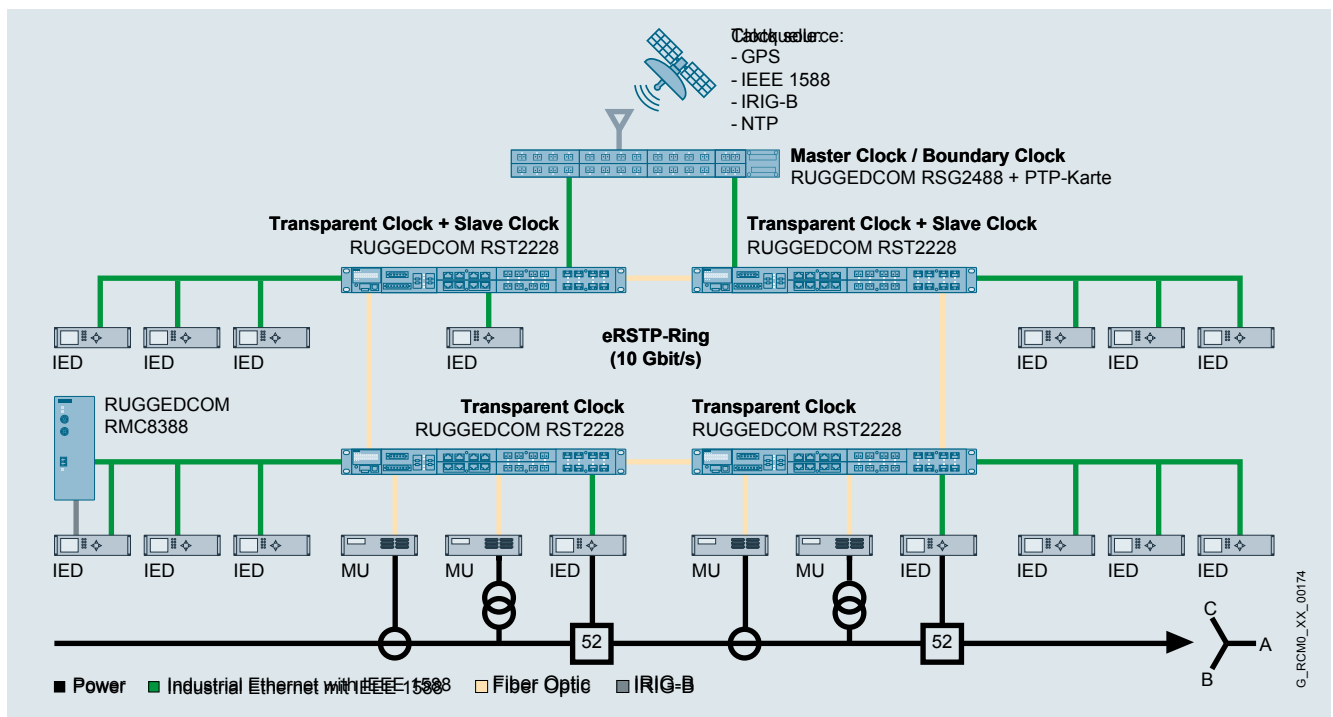
Precision timing

- IEEE 1588 v2 with hardware time stamping
- Transparent clock

Universal power supply options

- Fully integrated, optional dual redundant power supplies
- Universal high-voltage range: 88 – 300 VDC or 85 – 264 VAC
- Screw or pluggable terminal blocks for reliable, maintenance-free connections
- CSA/UL 60950 safety approved to +85° C
- Low Voltage power supply options 12 VDC (10.5...15 VDC), 24 VDC (13...36 VDC) and 48 VDC (36...72 VDC)

Use case



Up to 24 modern IEDs or other IEEE 1588 slaves can be connected directly to the RUGGEDCOM RST2228 via Fast Ethernet or Gigabit/s ports.

RUGGEDCOM RST2228P New



The RUGGEDCOM RST2228P is a high port density field modular Power-over-Ethernet (PoE) enabled 19" Layer 2 rack switch with 10 Gbit/s uplinks and the support for IEEE 1588.

Ethernet ports

- 4 x 1000BASE-X/10GBASE-X uplinks
- Up to 24 x 10/100/1000BASE-X ports
- 4-port modules for added flexibility
- Industry standard connectors: RJ45, LC & SFP
- Copper, multi-mode and single-mode optical transceivers

Power-over-Ethernet (PoE)

- Up to 24 PoE Ports
- All PoE ports support IEEE 802.3at / 802.3bt (draft)
- Maximum power per port is 60 Watt
- 500 Watt shared power budget per device

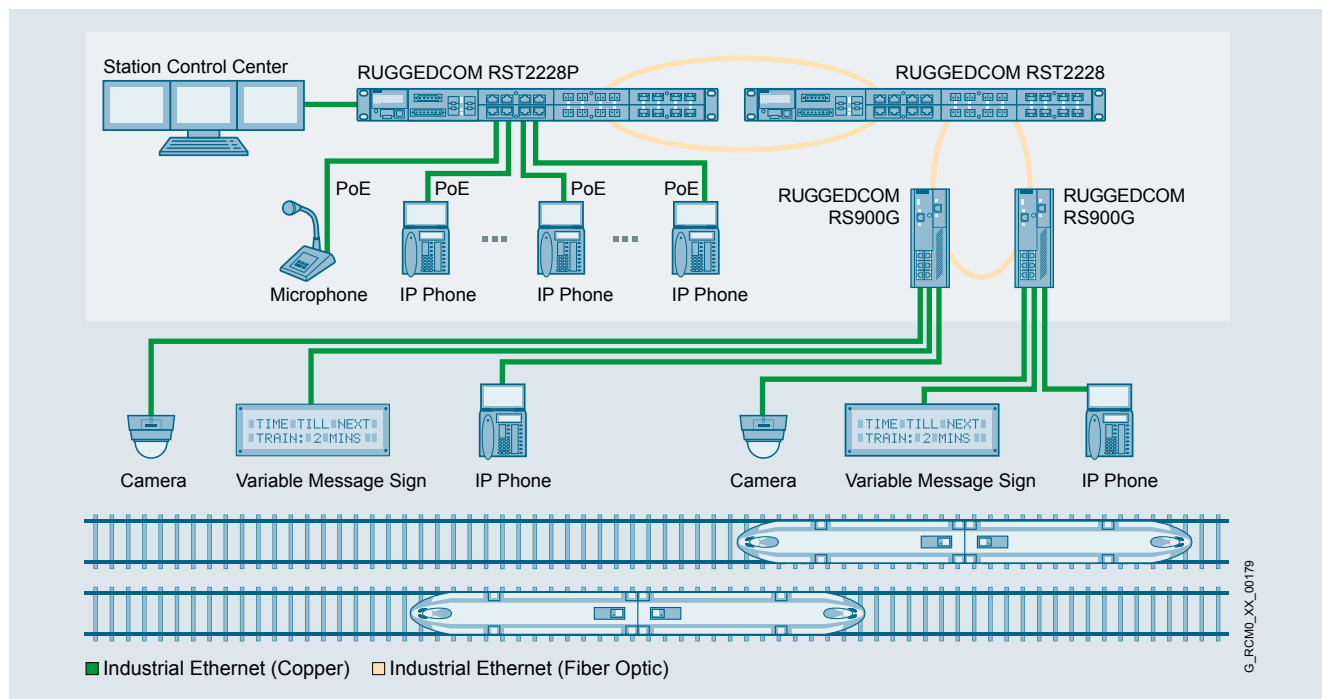
Precision timing

- IEEE 1588 v2 with hardware time stamping
- Transparent clock

Universal power supply options

- Fully integrated, optional dual redundant power supplies
- Universal high-voltage range: 88 – 300 VDC or 85 – 264 VAC
- Screw or pluggable terminal blocks for reliable, maintenance-free connections
- CSA/UL 60950 safety approved to +85° C
- Low Voltage power supply options 12 VDC (10.5...15 VDC), 24 VDC (13...36 VDC) and 48 VDC (36...72 VDC)

Use case

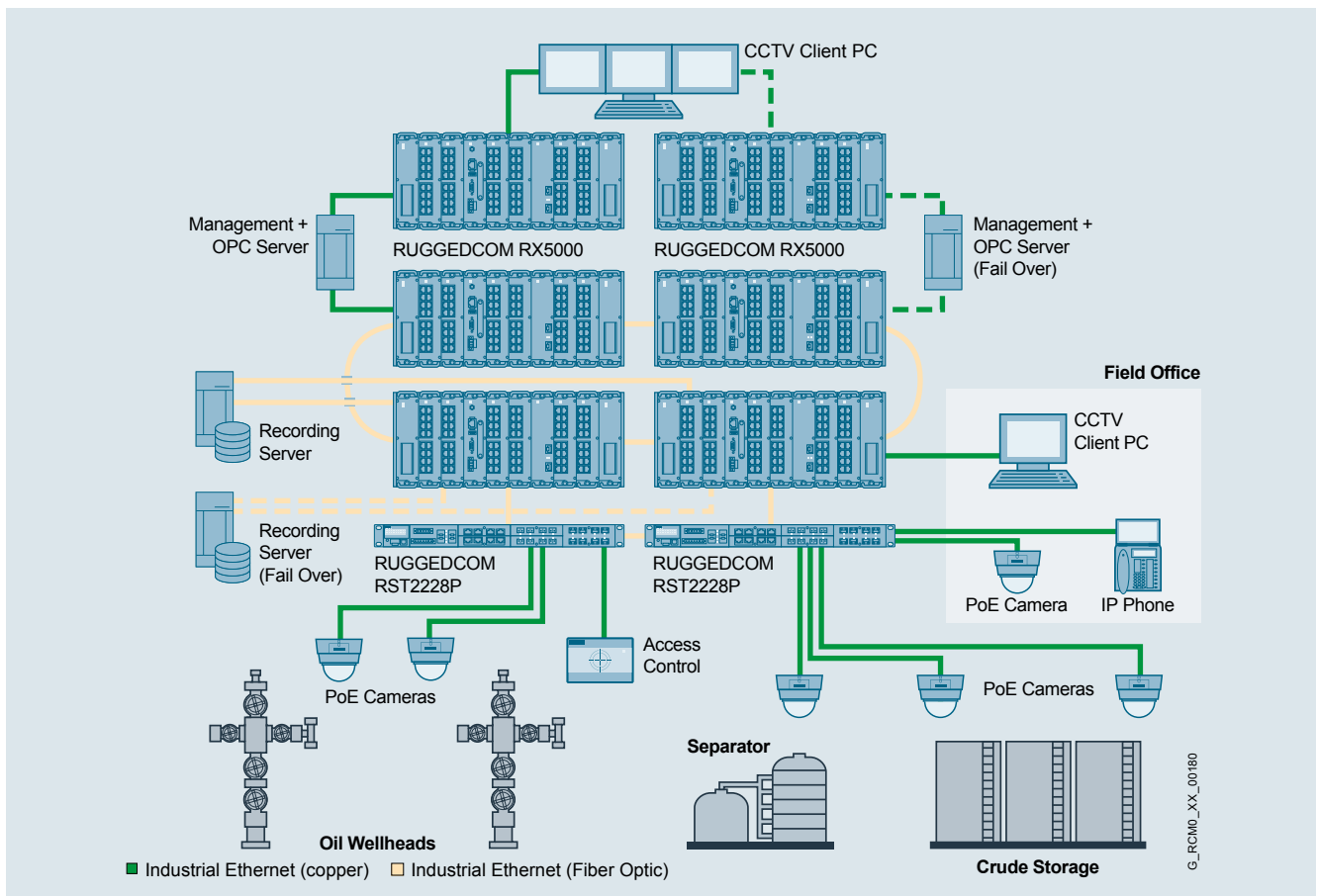


Connect a high number of Power-over-Ethernet capable VoIP-telephones and other devices to a single RUGGEDCOM RST2228P.

RUGGEDCOM RST2228 and RST2228P modules New



The RUGGEDCOM RST2228 and RST2228P are field modular Ethernet switches equipped with 6 slots for various media modules. Media modules are available with different interface options.



Fully redundant communication network based on the RUGGEDCOM RST2228P is suitable for oil & gas applications thanks to its comprehensive set of approvals and rugged design.

RUGGEDCOM RSG2300



The RUGGEDCOM RSG2300 is a utility-grade, fully managed, 32-port modular Ethernet switch specifically designed to operate reliably in electrically harsh and climatically demanding environments.

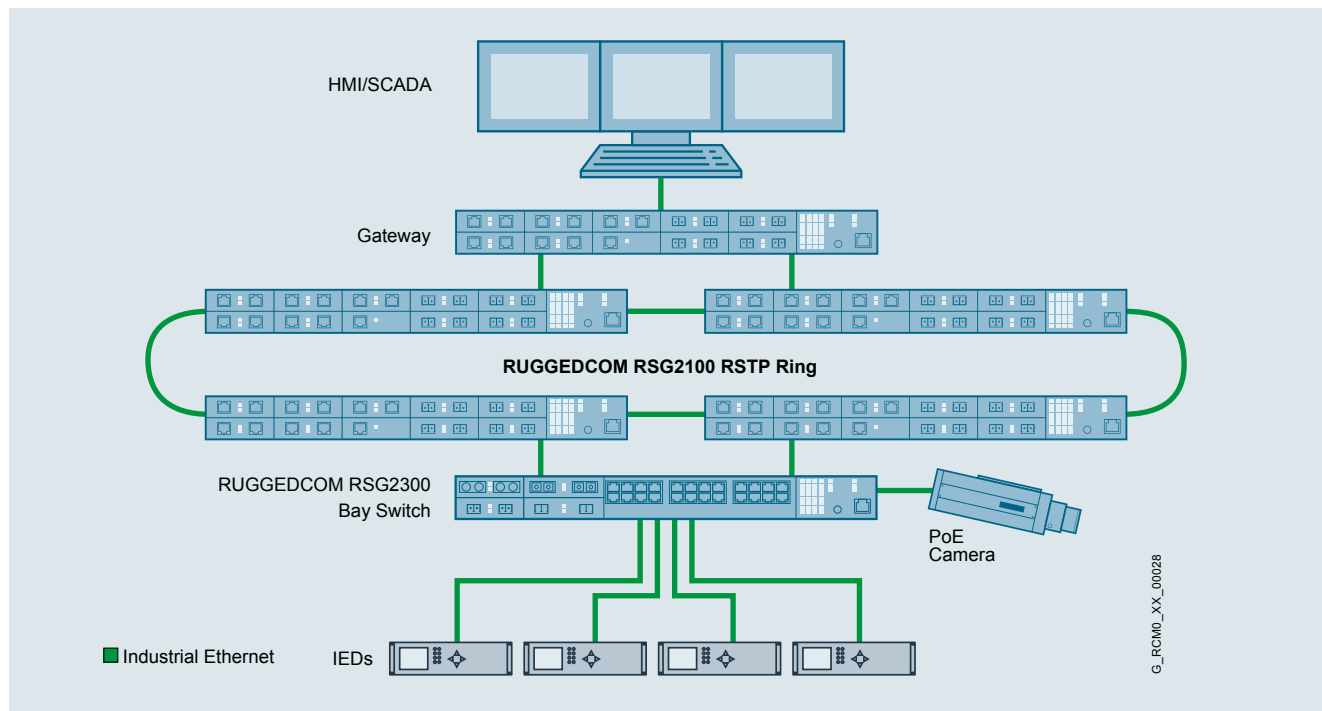
Ethernet ports

- Up to 32 ports:
 - 4 x optional 10/100/1000BASE-X ports
 - 4 x optional 10/100BASE-X ports
 - 24 x fixed 10/100BASE-TX ports
- 2 port modules for added flexibility
- Industry standard fiber optic connectors: RJ45, ST, MTRJ, LC, SC
- Copper, multi-mode and single-mode optical transceivers

Universal power supply options

- Fully integrated, optional dual redundant power supplies
- Universal high-voltage range: 88-300 VDC or 85-264 VAC
- Low-voltage range: 24 VDC (10 – 36 VDC) or 48 VDC (36 – 72 VDC)
- Screw or pluggable terminal blocks for reliable, maintenance-free connections
- CSA/UL 60950 safety approved to +85° C

Use case



With its high port density of copper interface the RUGGEDCOM RSG2300 is ideal for connecting a large number of devices at the Bay level.

RUGGEDCOM RSG2300P



The RUGGEDCOM RSG2300P is a utility-grade, fully managed, 32-port modular Power-over-Ethernet (PoE) enabled Ethernet switch specifically designed to operate reliably in electrically harsh and climatically demanding environments.

Ethernet ports

- Up to 32 ports:
 - 4 x optional 10/100/1000BASE-X ports
 - 4 x optional 10/100BASE-X ports
 - 24 x fixed 10/100BASE-TX ports
- 2 port modules for added flexibility
- Industry standard fiber optic connectors: RJ45, ST, MTRJ, LC, SC
- Copper, multi-mode and single-mode optical transceivers

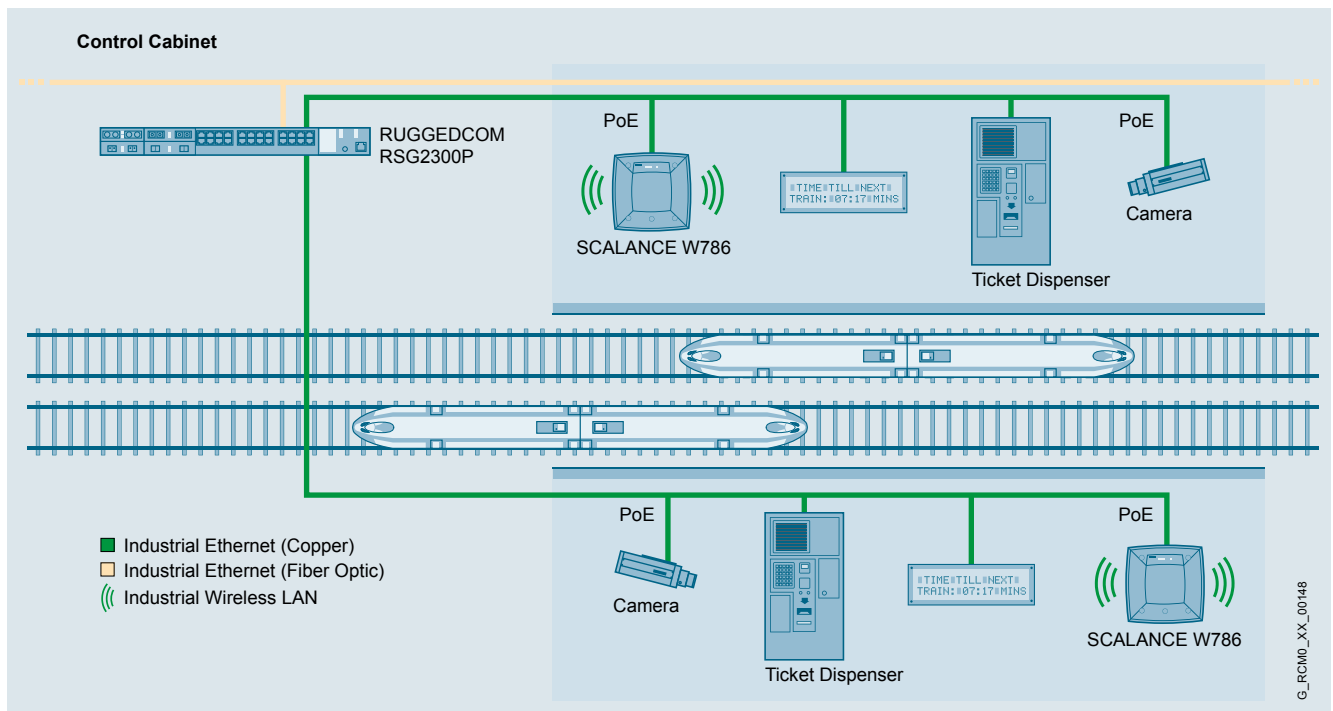
Power-over-Ethernet (PoE)

- Up to 4 PoE ports
 - 2 x fixed 10/100BASE-TX 802.3af compliant ports
 - 2 x optional 10/100BASE-TX 802.3af compliant ports

Universal power supply options

- Fully integrated power supplies
- Universal high-voltage range: 88-300 VDC or 85-264 VAC
- Low-voltage range: 24 VDC (10 – 36 VDC) or 48 VDC (36 – 72 VDC)
- Screw or pluggable terminal blocks for reliable, maintenance-free connections
- CSA/UL 60950 safety approved to +85° C

Use case



With its high number of ports the RUGGEDCOM RSG2300P is ideal for connecting Wireless LAN, cameras and other peripheral devices directly.

RUGGEDCOM RSG2488



The RUGGEDCOM RSG2488 is a utility-grade, field upgradable, fully managed, 28-port Gigabit Ethernet switch with hot-swappable dual redundant power supplies. It is specifically designed to operate reliably in electrically harsh and climatically demanding environments.

Ethernet ports

- 28 x 10/100/1000BASE-X ports
- 4 port field replaceable modules
- Industry standard fiber optic connectors: RJ45, FastConnect, M12, ST, LC, SC
- Copper, multi-mode and single-mode optical transceivers

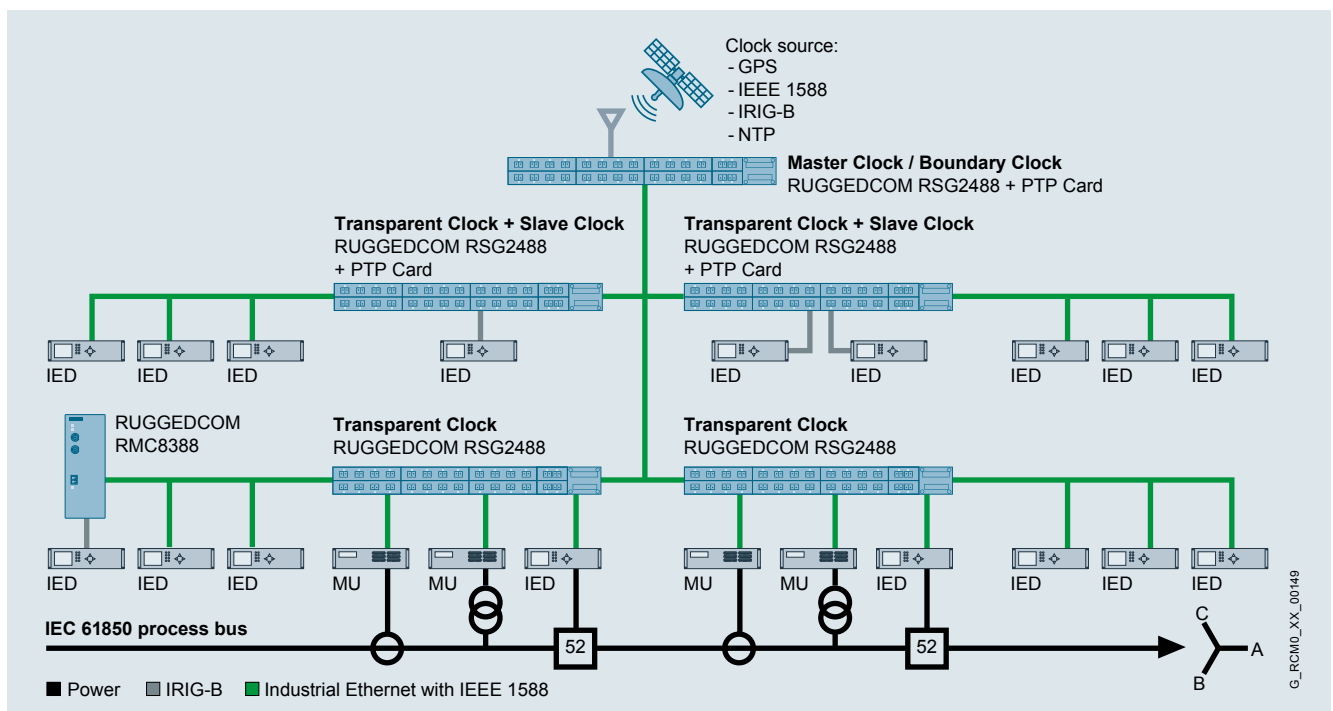
Precision timing

- IEEE 1588, SNTP, IRIG-B and GPS conversion
- Support IEEE 1588 1-step and 2-step
- GPS-Input to serve as grandmaster clock
- Supports master, slave, ordinary and transparent clock

Universal power supply options

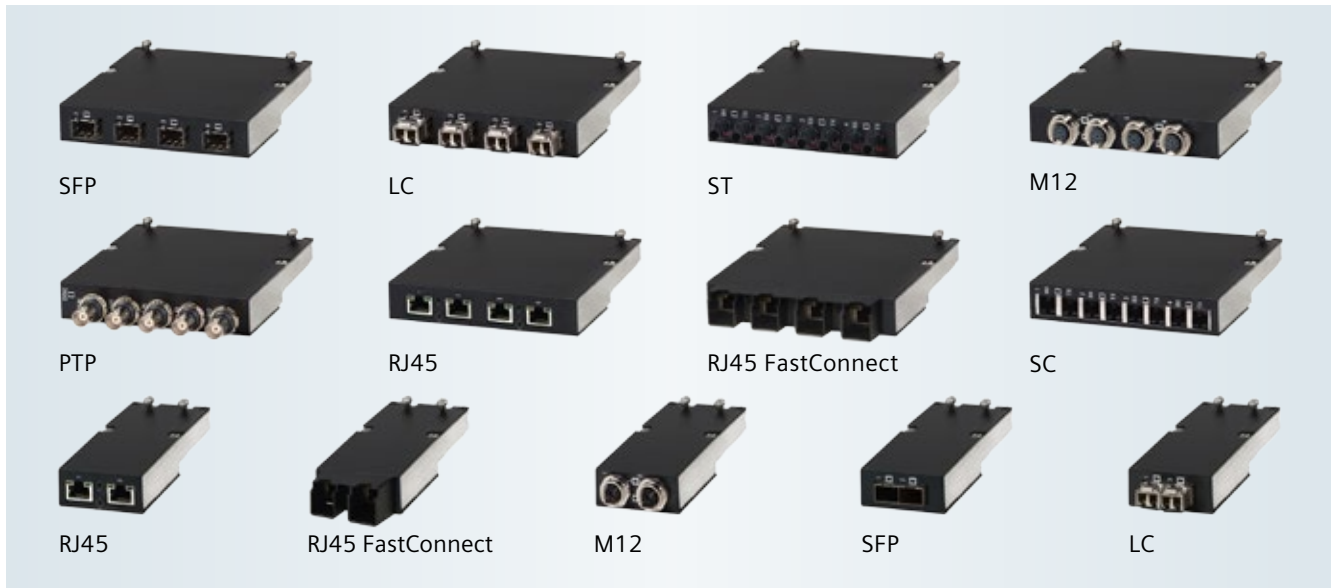
- Fully integrated, hot-swappable dual redundant power supplies
- Universal high-voltage range: 100-300 VDC or 85-264 VAC
- Low-voltage range: 24 VDC (13 – 36 VDC) or 48 VDC (37 – 72 VDC)
- Screw or pluggable terminal blocks for reliable, maintenance-free connections
- CSA/UL 60950 safety approved to +85° C

Use case

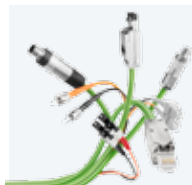


The field-modular RUGGEDCOM RSG2488 is the most versatile offering for IEEE1588 time synchronisation and can function as master, boundary, slave and transparent clock.

RUGGEDCOM RSG2488 modules



The RUGGEDCOM RSG2488 is a modular and field replaceable platform that allows you to select amongst Ethernet options, making it ideally suited for electric power utilities, the industrial plant floor, rail and traffic control systems.



FastConnect Cabling System

Stringent demands are placed on the installation of cables in an industrial environment. Siemens offers FastConnect, a system that fulfills all these requirements: on-site assembly – quick, easy and error-free. For more information, visit: siemens.com/fastconnect



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Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions only form one element of such a concept.

Customer is responsible to prevent unauthorized access to its plants, systems, machines and networks. Systems, machines and components should only be connected to the enterprise network or the internet if and to the extent necessary and with appropriate security measures (e.g. use of firewalls and network segmentation) in place.

Additionally, Siemens' guidance on appropriate security measures should be taken into account. For more information about industrial security, please visit:
[siemens.com/industrialsecurity](https://www.siemens.com/industrialsecurity)

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends to apply product updates as soon as available and to always use the latest product versions. Use of product versions that are no longer supported, and failure to apply latest updates may increase customer's exposure to cyber threats.

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