Loop-IP6820
Self-Healing Ring NTU

5 Years Warranty

Description

The Loop-IP6820 is a gigabit Ethernet self-healing ring network termination unit (NTU). An important protocol supported is *G.8032 Ethernet Ring Protection* on its WAN ports. For ring topologies the IP6820 supports auto-discovery to discover all units on the ring (a maximum of 128) as well as remote configuration for easy installation.

All end equipment can be in packet format via Ethernet ports or serial data via RS232/422/485 interfaces, which are converted into packets within the IP6820. The device has two WAN optical interfaces, two LAN optical interfaces, four electrical LAN interfaces, and one alarm relay interface. Manufacturing options include four additional electrical LAN interfaces, four or eight RS232/422/485 interfaces, and two sets of Dry Contact in/out interfaces.

With an embedded GbE L2 switch chip, the IP6820 also supports RSTP and MSTP for all Ethernet ports. It can be powered by AC, single DC, or dual DC power depending on field requirements. PoE (Power over Ethernet) is available as a manufacturing option. Physical DIN rail mounting is also supported.

Applications for the IP6820 include automation, SCADA, surveillance, traffic control, transportation, and IP networking. Network topologies include ring protection, point-to-point, and point-to-multipoint. Easy installation and configuration make maintenance and expansion simple.

Features

Mechanical, Electrical, Environmental

- Full frontal access (ETSI) unit complies with IP30 standard
- DIN Rail mounting
- Alarm relay and ACO (alarm cutoff) button
- Power: Single/dual DC modules with dual feed
- Input voltage monitoring, instant voltage monitoring, and temperature monitoring
- RoHS Compliant
- IEEE 1613, IEC61850-3 (for DC -48 Vdc only)

Interface Ports

- WAN port with OA&M functionality
  - Dual SFP optical housing interfaces
- Tributary ports
  - Up to Eight ports 10/100/1000 BaseT Ethernet
  - Two SFP housing ports
  - PoE (Power over Ethernet) option available in DC48 only for LAN ports 3-10 (RJ45)
  - Up to 8 RS232/RS422/RS485 interface ports supporting full or half duplex mode
  - Auto-negotiating or forced speed for speed and full/half duplex for tributary Ethernet ports

Other Features

- Jumbo frame: Up to 9000 bytes
- Synchronization

Ethernet Functionality

- G.8032 Ethernet Ring for WAN ports
- IEEE 802.1d STP, 802.1w RSTP, 802.1s MSTP
- IEEE 802.3x Flow Control, 802.1q port based VLAN and port isolation, 802.1p QoS
- IEEE 802.3ad Link Aggregation Control Protocol (LACP), also known as port trunking
- IEEE 802.1X Radius Client
- Auto-discovery, auto-diagnostic, and remote configuration for easy installation (up to 128 units)
- Master/Slave units setting via DIP switch
- Loop Ethernet Automatic Protection Switching (LEAPS)* for WAN ports
- IEEE 802.1ad VLAN Stacking (Q-in-Q)
- IGMP snooping v1 and v2*

OAM Protocols

- IEEE 802.3ah OAM Ethernet in First Mile (EFM)
  - Supports dying gasp functionality
- IEEE 802.1ag OAM
  - Connectivity Fault Management (CFM)
- Y.1731 OAM (available on WAN ports only)

Management

- SSH v2, Telnet
- SNMP v1/v2/v3

  - SNTP client
  - PTP IEEE 1588v2*
  - Synchronous Ethernet
- Dry contact interface
  - Two alarm inputs and two relay outputs
  - Supports point-to-point and point-to-multipoint applications
- Web-based management via Loop-iNET
- Remote configuration upload/download via TFTP
- Download firmware upgrades via TFTP

* Future option

Ordering Information

RoHS compliant units are identified by the letter **G** appearing at the end of ordering code.
SFP optical modules are **NOT** included. See separate SFP Optical Module brochure.

Main Unit

Model	Description	Notes
Loop-IP6820-CS-ipp1-ipp2-iadd1-**G**	Self-healing NTU Device with 2 SFP (mini-GBIC) optical housing WAN ports and 6 LAN ports (2 SFP and 4 RJ45). Commercial Series – Temperature range 0°C to 50°C.	• Replace the **ipp1, ipp2,** and **iadd1** fields with the values in the tables below
Loop-IP6820-IS-ipp1-ipp2-iadd1-**G**	Self-healing NTU Device with 2 SFP (mini-GBIC) optical housing WAN ports and 6 LAN ports (2 SFP and 4 RJ45). Industrial Series – Temperature range -20°C to 70°C.	

■ Replace **ipp1** and **ipp2** with your selection for the 1st and 2nd power supply.

ipp1 =	Description	Notes
IDC48	Single DC power supply (-48 Vdc: -36 to -72 Vdc) Temperature range -20°C to 70°C.	• Order a second power module for dual DC power and backup redundancy purposes. (Optional) • The second power supply must be the same voltage as the first. **ipp2** = **ipp1**. • IDC24 does not work with POE
IDC24	Single DC power supply (-24 Vdc: -18 to -36 Vdc) Temperature range -20°C to 70°C.	

■ Replace **iadd1** with your selection for an optional integrated daughter card. Otherwise leave field blank.

iadd1 =	Description	Notes
I4GEPOEA	4 GbE ports, 2 dry contact ports, and PoE (Power over Ethernet) over 8 LAN ports. Uses PoE option A pin assignments.	• For an explanation of PoE options A and B, please see the PoE Pin Assignments section below
I4GEPOEB	4 GbE ports, 2 dry contact ports, and PoE (Power over Ethernet) over 8 LAN ports. Uses PoE option B pin assignments.	

IPOEA	2 dry contact ports and PoE (Power over Ethernet) over 4 LAN ports. Uses PoE option A pin assignments.	• All daughter cards are industrial series with temperature ranges from -20°C to 70°C (-4°F to 158°F).
IPOEB	2 dry contact ports and PoE (Power over Ethernet) over 4 LAN ports. Uses PoE option B pin assignments.	
I4GE	4 GbE ports and 2 dry contact ports	
I4DTEDC	4 DTE (RS232, RS422, or RS485) ports with RJ45 interfaces and 2 Dry Contact ports.	
I8DTEDC	8 DTE (RS232, RS422, or RS485) ports with RJ45 interfaces and 2 Dry Contact Ports.	

PoE Pin Assignments Explanation
Pin Assignment A – "Phantom Power Supply" Power is modulated over the data lines (pairs 1&2, 3&6)
Pin Assignment B – "Redundant Power Lines" Power is sent directly over empty wires (pairs 4&5, 7&8)
For Ethernet that is 1000 Base-T, all pairs are used and power is modulated over all data lines (as in pin assignment A).

Powered devices using PoE that conform to the PoE standard IEEE 802.3af are required to support both A and B. So both options A and B will work. However if you are using PoE powered devices that do not conform to the standard, then please make sure that you choose the correct pin assignments to go with your powered devices. The maximum output power consumption is 15.4 watts per Ethernet LAN port.

Order Example 1:
Main unit: Loop-IP6820-CS-IDC48-G
Description: Self-healing NTU Device with 2 SFP (mini-GBIC) optical housing WAN ports, 6 LAN ports (2 SFP and 4 RJ45 Gb Ethernet), and one -48V DC industrial power module, Commercial Series – Temperature range 0°C to 50°C (32°F to 122°F).

Order Example 2:
Main unit: Loop-IP6820-CS-IDC48-IDC48-I4GEPOEA-G
Description: Self-healing NTU Device with 2 SFP (mini-GBIC) optical housing WAN ports, 10 LAN ports (2 SFP, 8 RJ45 Gb Ethernet), 2 dry contact ports, PoE (Power over Ethernet) with pin assignment A over 8 LAN ports and two -48V DC industrial power modules, Commercial Series – Temperature range 0°C to 50°C (32°F to 122°F).

Order Example 3:
Main unit: Loop-IP6820-IS-IDC24-IDC24-I8DTEDC-G
Description: Self-healing NTU Device with 2 SFP (mini-GBIC) optical housing WAN ports, 6 LAN ports (2 SFP and 4 RJ45 Gb Ethernet), 8 DTE (RS232/RS422/RS485) ports with RJ45 interfaces, 2 dry contact ports, and two -24V DC industrial power modules, Industrial Series – Temperature range -20°C to 70°C (-4°F to 158°F).

Accessories

User's Manual	
Loop-IP6820-S-UM	User's Manual (optional paper copy). A CD version of the manual is included with every order.

Firmware Upgrade	
Loop-IP6820-FWUPGR	Firmware Upgrade. Customers who desire to have a firmware upgrade after their warranty has expired can purchase this option. This will upgrade the firmware to the most current version and provide an additional 12 months of software repair and patches on existing functionality as necessary.

IEEE 1588 v2 PTP Software Upgrade	
Loop-IP6820-1588UPGR*	Software Upgrade to IEEE 1588v2. Customers who desire to use the IEEE 1588 v2 Precision Time Protocol (PTP) function can purchase this option. This option will provide

	an activation code and instructions on how to unlock the function on the device.

Power Adapter		
Loop-ACC-APA-240-**G**	240 Watt, AC (3.6A auto sensing) to DC (+48 Vdc, 5A) adapter for USA and Taiwan	
Loop-ACC-APE-240-**G**	240 Watt, AC (3.6A auto sensing) to DC (+48 Vdc, 5A) adapter for Europe	
Loop-ACC-APU-240-**G**	240 Watt, AC (3.6A auto sensing) to DC (+48 Vdc, 5A) adapter for UK	

SFP Optical Modules
SFP (small form-factor pluggable) optical modules are **NOT** included. To order please check the SFP optical module brochure or contact your nearest Loop sales representative.

Product Specification

WAN Specifications (network side interface)

Number of Ports	2
SFP Ethernet functions	IEEE 802.3, 802.3u, 802.3ab, 802.3ah, 802.1ag, Y.1731 802.1q Port Base VLAN, Port Isolation 802.3x Flow Control Speed: 1000 Mbps Up to 16K MAC addresses Bidirectional rate limiting
QoS Functions	8 priority queues
Connector	SFP housing

LAN Interface (on board, tributary/customer side interface)

Number of Ports	Maximum 6 ports (2 SFP and 4 RJ45)
SFP Ethernet Functions	IEEE 802.3, 802.3u, 802.3ab, 802.3ah, 802.1ag 802.1q Port Base VLAN, Port Isolation 802.3x Flow Control Speed: 1000 Mbps Up to 16K MAC addresses Bidirectional rate limiting
RJ45 Ethernet Functions	10/100/1000BaseT IEEE 802.3, 802.3u, 802.3ab, 802.3ah, 802.1ag 802.1q Port Base VLAN, Port Isolation 802.3x Flow Control Auto-negotiation (10/100/1000M) Auto MDI/MDIX Auto-crossover function Force mode: duplex (full or half), speed (10/100/1000M) Up to 16K MAC addresses Bidirectional rate limiting
QoS Functions	8 priority queues
Connector	RJ45 or SFP

Gigabit (GbE) Interface (manufacturing option)

Number of ports	Maximum 4 ports
Ethernet functions	10/100/1000BaseT IEEE 802.3, 802.3u, 802.3ab, 802.3ah, 802.1ag 802.1q Port Base VLAN, Port Isolation 802.3x Flow Control Auto-negotiation (10/100/1000M) Auto MDI/MDIX Auto-crossover function Force mode: duplex (full or half), speed (10/100/1000M) Up to 16K MAC addresses

	Bidirectional rate limiting
QoS Functions	8 priority queues
Connector	RJ45

Alarm Control

Alarm Relay Port	NO, COM, NC
Connector	3 pin Terminal block
Alarm cut off	ACO button

Dry Contact Ports

Inputs		**Outputs**	
Number of Channels	2	Number of Channels	2
Connector	Screw type	Connector	Screw type
Internal Resistance	1 kOhm	Initial Insulation Resistance	Minimum 100 MOhms (at 500 Vdc)
Activation Current	3 mA	Maximum Current	5 A
Deactivation Current	1.5 mA	Maximum Voltage	100 Vdc, 250 Vac
Allowable Current	4 mA		

Management

LEDs	Multi-color LEDs
Console port	Electrical: RS 232 Connector: DB9
Remote Login	SSH v2, Telnet
SNMP	v1, v2, v3
Web-based Management	Available over HTTPS
GUI EMS	LoopView GUI EMS, Loop iNET: Intelligent Management System

RS232/RS422/RS485 Interface

Number of Ports	4 or 8 (manufacturing option)
Connector	RJ45 Add stop bit: 1, 1.5, 2 bit Add data bit: 5, 6, 7, and 8 bit
Common Features	Control signal display Flow control: RTS/CTS, XON/XOFF
Baud Rate (DCE) for all interfaces	200, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, and 115200 bps asynchronous
RS232 Functions	Up to 16 remote IP address each port Optional lightning protection IP-based and TCP-based transmission supported
RS422 Functions	Full and half duplex 230400 bps baud rate also available
RS485 Functions	Full and half duplex 230400 bps baud rate also available

Performance Monitor

Alarm Queue	Contains up to 500 alarm records which record the latest alarm type, alarm severity, and datetime
OA&M	Link Status Update, Link Status Monitoring

Power

Power	DC48: -36 to -72 Vdc DC24: -18 to -36 Vdc Both DC24 and DC48 are on-board fixed single/dual DC modules with dual feed
PoE (Power over Ethernet)	DC input range: -44 to -57 Vdc (PSE for indoor only), normal is -48 Vdc For -48 Vdc only. Maximum output power consumption is 15.4W per Ethernet LAN port.
Power Consumption	25 Watts maximum in normal use
Protection	Over current protection fuse

AC to DC Adapter

Input Range	88 to 132 Vac/176 to 264 Vac auto sensing
Output Voltage	48 Vdc ± 1%
Output Current	5.0 A ± 1%
Output Power	240 Watt max.

Physical and Environmental

Dimensions	219 x 67.2 x 167 mm (HxWxD)
Temperature range	0 to 50°C (commercial series), -20°C to 70°C (industrial series)
Humidity	0 to 95% RH (non-condensing)
Mounting	DIN rail
Enclosure Type	IP30 enclosure

Standards Compliance

IEEE

802.1d	MAC Table Learning and STP	802.3u	Fast Ethernet 100 Base-T
802.1p	Priority Code Point	802.3x	Flow Control
802.1q	VLAN – port based VLAN and port isolation	802.3z	Gigabit Ethernet 1000 Base-T over fiber optics
802.1s	MSTP	802.3ab	Gigabit Ethernet 1000 Base-T over twisted pairs
802.1w	RSTP	802.3ad	Link Aggregation
802.1x*	Port Access Protocol*	802.3af	Power over Ethernet
802.1ad	VLAN Tag Stacking (Q-in-Q)	802.3ah	Ethernet in the First Mile
802.1ag	Ethernet CFM	1588v2*	Precision Time Protocol*

RFC (IETF)

1112	IGMP Snooping v1*
2236	IGMP Snooping v2*

ITU

G.8032 v1/v2	Ethernet Ring Protection Switching (ERPS)
Y.1731	OAM

Loop Telecom

LEAPS*	Each unit with 3.69 ms delay and 0.05 ms/km transmission delay (maximum) Fault recovery time: less than 50 ms

Certifications

EMI/EMC	FCC15 subpart B class A, EN55022 class A, EN55024, IEC61850-3, IEEE1613
Safety	EN60950-1

*Future option

Panel Views

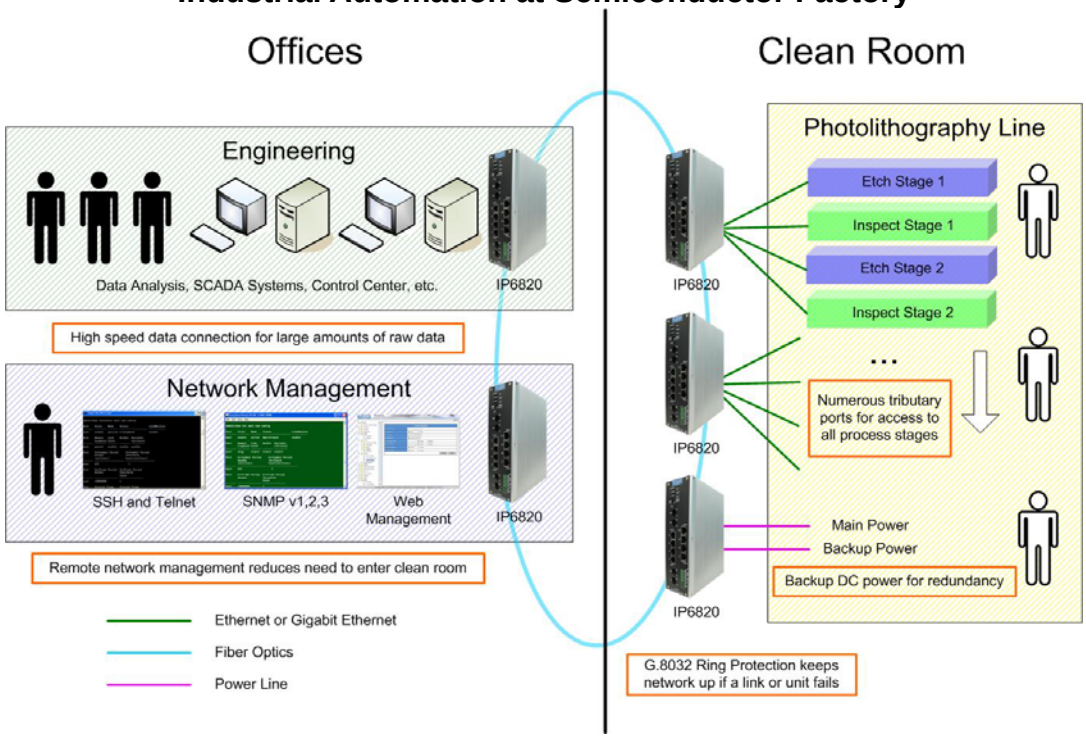
Front Panel View

Top Panel View

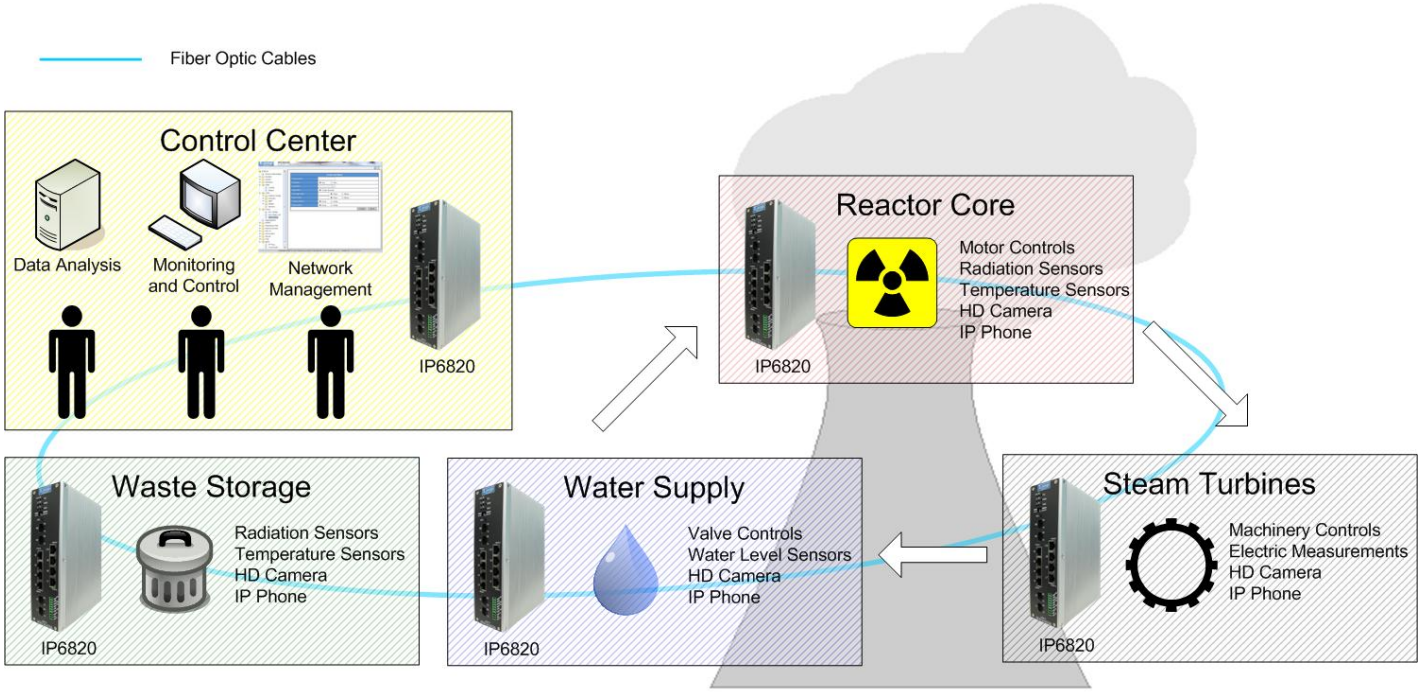
Oblique View

Application Illustrations

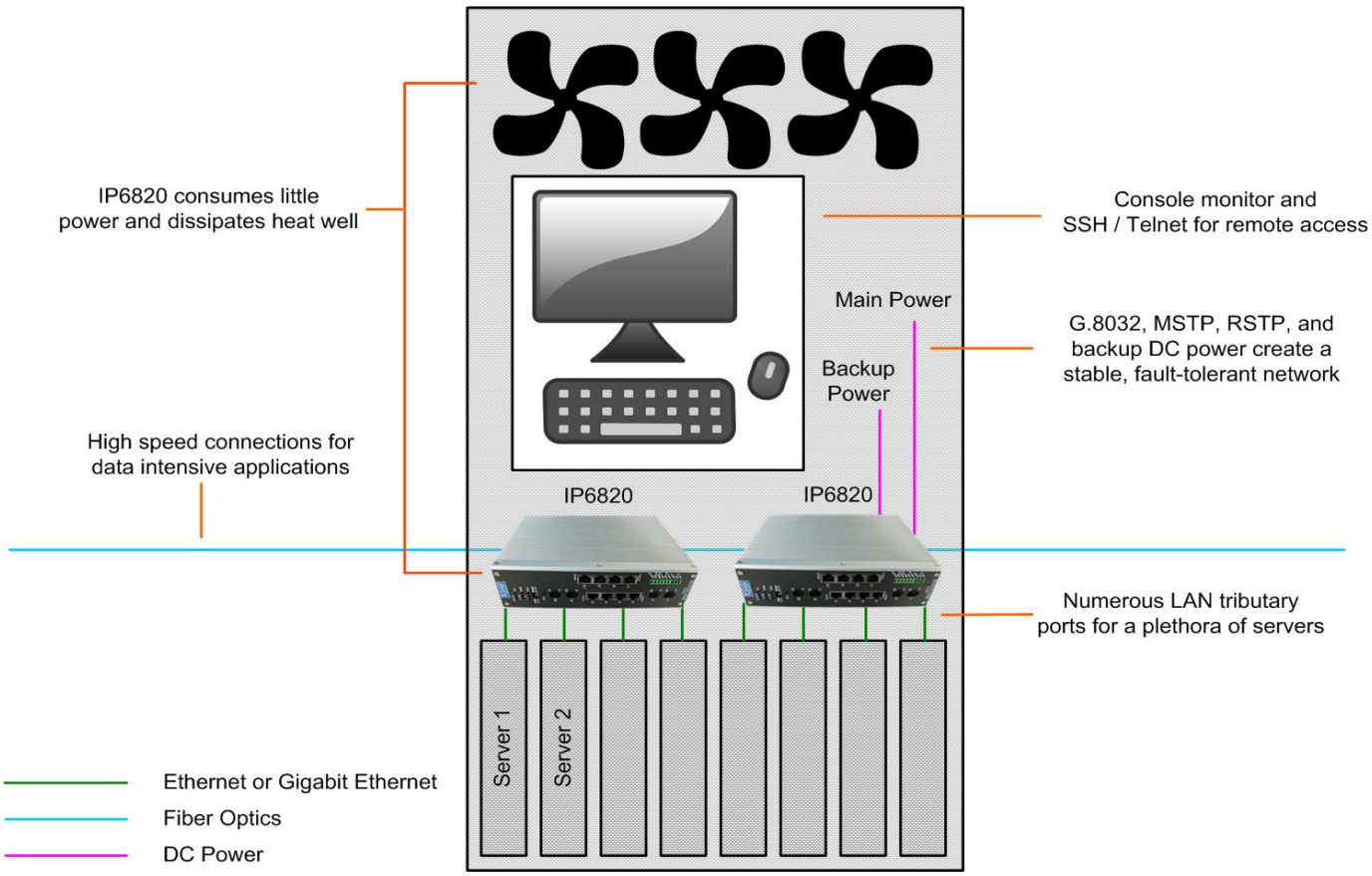
Industrial Automation at Semiconductor Factory



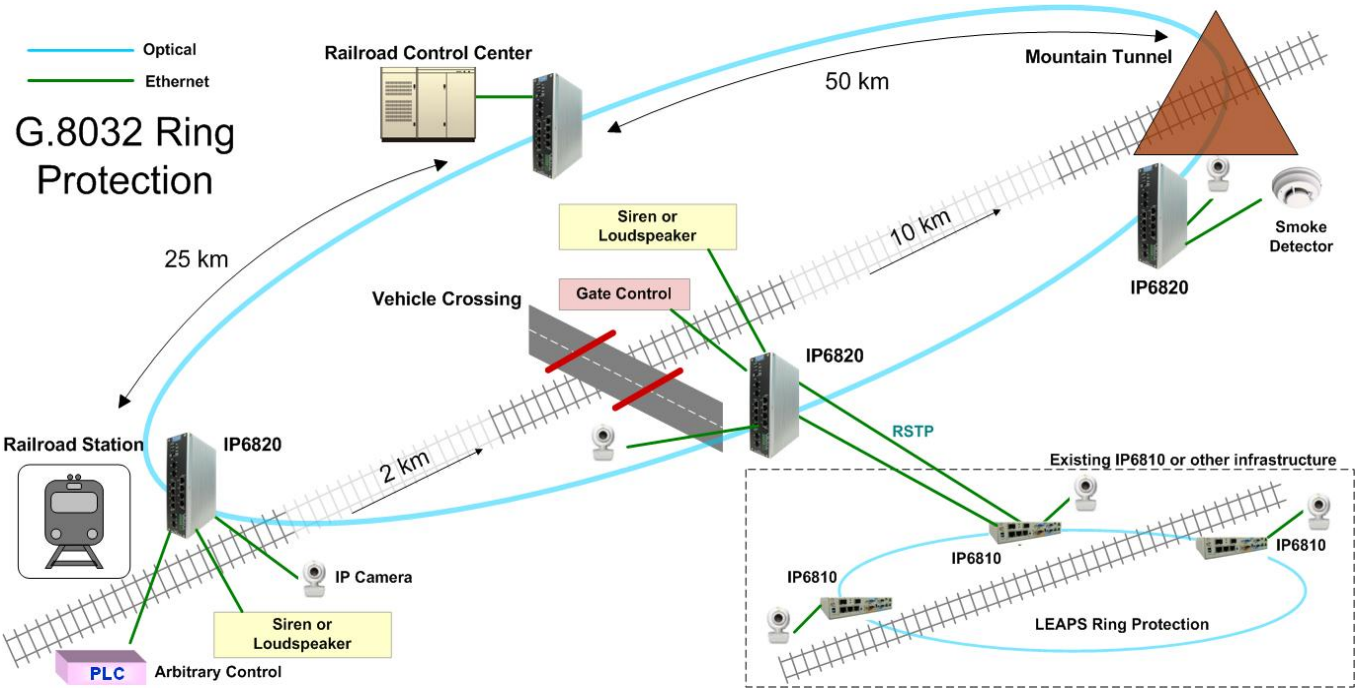
SCADA in Nuclear Power Plant



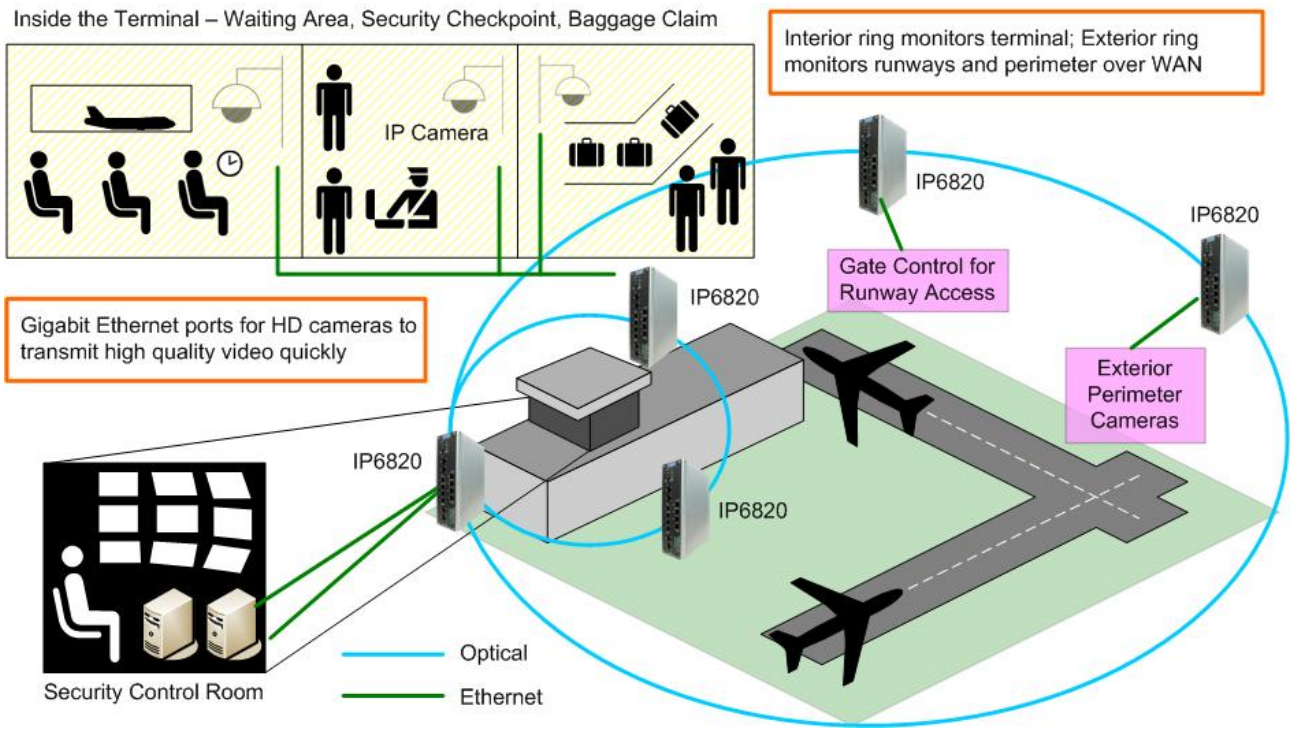
Server Rack in a Cluster



Railroad Automation and Monitoring



Security Monitoring at an Airport



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