# Loop-IP6810
# Self-Healing Ring NTU

## Features

5 Years Warranty

- Full frontal access (ETSI) unit complies with IP30 standard
- Desktop, wall, or DIN Rail mounting
- Compact intelligent FX packet optical ring with Layer 2 switching capabilities
- WAN port with OA&M functionality
  - Dual SFP optical housing interfaces
  - Dual RJ45
- Tributary ports
  - 3 ports 10/100 BaseT Ethernet (with PoE option available in DC 48 only)
  - 2 ports RS232/485 interfaces, user selectable via 2-port DIP switch
  - 2 dry contact for input and 2 dry contact for output; support point-to-point and point-to-multi-point
- Power modules
  - On-board fixed single AC supply
  - On-board fixed single/dual DC modules with dual feed
- Auto-discovery topology, auto-diagnostic and remote-configure for easy plug-and-install (up to 64 units)
- Supports SNTP
- Ethernet Functionality
  - Loop Ethernet Automatic Protection Switching (LEAPS)
    - Fault recovery time: less than 50 ms
    - Point-to point: fault recovery time less than 8 ms
    - Up to 15 units: fault recovery time less than 25 ms
  - IEEE 802.1w RSTP, 802.1s MSTP*
  - IEEE 802.3x Flow Control, 802.1q Port Base VLAN / Port Isolation
- Up to 1024 MAC addresses
- Built-in BERT
- High speed, asynchronous RS232/RS485 for point-to-point, point-to-multi-point, or omnibus-like applications
- Master/Slave units setting by using DIP switch
- Auto-negotiating or forced speed for speed and full/half duplex for Ethernet ports
- Full/half duplex for tributary Ethernet ports
- Alarm relay and ACO (Alarm Cut Off) button
- Remote firmware download via TFTP & Z modem
- Remote configuration upload & download via TFTP
- Management port and interface
  - In-band management
  - RS232 console via DB9 connector
  - SNMP v1, v3
  - SSH v2
  - Telnet
  - LoopView GUI EMS
- IEEE 1613, IEC61850-3 (for DC -48 Vdc only)
- RoHS compliant

* Future Option

## Description

The Loop-IP6810 is a self-healing ring network termination unit (NTU) with a built-in L2 switch. It can be desktop, wall or DIN rail mounted. LEAPS, RSTP, or MSTP* Ethernet Ring protection or point-to-point protection is made possible in 100 Base-FX networks with the IP6810.

All end equipment can be either in packet format via Ethernet ports or serial data via RS232/485 interfaces which will be converted into packet format within the IP6810. The IP6810 has two WAN optical and electrical interfaces, two RS232/485 DTE interfaces, three Ethernet LAN interfaces, two sets of dry contact IN/OUT interfaces, and one alarm relay connector. The IP6810 comes in an industrial hardening mode to support temperatures from -20°C to 70°C (-4°F to 158°F).

The IP6810 supports auto-discovery to locate all units on the ring, and also supports remote configuration for ease of installation.

Single AC, single DC or dual DC is supported based on field requirements. Power over Ethernet (PoE) option is also available.

The IP6810 facilitates automation systems, SCADA systems, surveillance systems, traffic control systems, transportation systems and IP networking with robust protection in ring, point-to-point, or omnibus-like topology. Easy installation and configuration make maintenance and further expansion more efficient and cost-effective.

# Ordering Information

To specify options, choose from the list below.
**Note:** RoHS compliant units are identified by the letter **G** immediately at the end of the ordering code.

***Main Unit***

| Model | Description | Notes |
|---|---|---|
| Loop-IP6810-CS-SFPC -ipp1-ipp2-add1-**G** | Self-healing NTU Device with dual SFP (mini-GBIC) optical housing daughter card for WAN port, 3 Ethernet LAN ports, 2 RS232/485 ports and one DB9 port with 2-channel Dry Contact. Temperature range 0°C to 50°C | **SFP optical modules are NOT included**<br><br>Where ipp1, ipp2,add1, and SFP modules are defined in the tables below.<br><br>Add1 only available on DC48 option.<br><br>No IEEE 1613 and IEC 61850-3 certicifications for RJ45 daughter card for WAN port. |
| Loop-IP6810-CS-ETH -ipp1-ipp2-add1-**G** | Self-healing NTU Device with dual RJ45 daughter card for WAN port, 3 Ethernet LAN ports, 2 RS232/485 ports and one DB9 port with 2-channel Dry Contact. Temperature range 0°C to 50°C. | |
| Loop-IP6810-IS-SFPC -ipp1-ipp2-add1-**G** | Self-healing NTU Device with dual SFP (mini-GBIC) optical housing daughter card for WAN port, 3 Ethernet LAN ports, 2 RS232/485 ports and one DB9 port with 2-channel Dry Contact. Temperature hardening range -20°C to 70°C | |
| Loop-IP6810-IS-ETH -ipp1-ipp2-add1-**G** | Self-healing NTU Device with dual RJ45 daughter card for WAN port, 3 Ethernet LAN ports, 2 RS232/485 ports and one DB9 port with 2-channel Dry Contact. Temperature hardening range -20°C to 70°C | |
| Loop-IP6810-ISETH-SFPC-ipp1-ipp2-add1-**G** | Self-healing NTU Device with dual SFP (mini-GBIC) optical housing daughter card for WAN port, and 3 Ethernet LAN ports only. Temperature hardening range -20°C to 70°C. | |
| Loop-IP6810-ISETH-ETH-ipp1-ipp2-add1-**G** | Self-healing NTU Device with dual RJ45 daughter card for WAN port, and 3 Ethernet LAN ports only. Temperature hardening range -20°C to 70°C. | |

■ Where **ipp1** is used to select the 1st industrial power supply (temperature hardening range -20°C to 70°C):

| ipp1 = | Description | Note |
|---|---|---|
| **IAC** | Single AC power supply (100 to 240 Vac, 50/60 Hz) | Please choose appropriate power cord for AC version. Power redundancy not supported. |
| **IDC24** | Single DC power supply (-24 Vdc: -18 to -36 Vdc) | For redundancy purposes, ordering a second power module will provide dual DC power. |
| **IDC48** | Single DC power supply (-48 Vdc: -36 to -72 Vdc) | |

■ Where **ipp2** is used to select the 2nd DC power supply for **pp1** (temperature hardening range -20°C to 70°C) :

| ipp2 = | Description | Note |
|---|---|---|
| **IDC24** | Single DC power supply (-24 Vdc: -18 to -36 Vdc) | Your selection for pp2 must be the same as pp1 |
| **IDC48** | Single DC power supply (-48 Vdc: -36 to -72 Vdc) | |

■ Where **add1** is used to select enclosure types:

| Add1 = | Description | Note |
|---|---|---|
| **PoE** | Power over Ethernet | Only available with DC48 power |

***Accessories***

| **Power Cord** | | |
|---|---|---|
| Loop-ACC-PC-USA | AC power cord for Taiwan/America | |
| Loop-ACC-PC-EU | AC power cord for Europe |  |
| Loop-ACC-PC-UK | AC power cord for UK |  |

| | | |
|---|---|---|
| Loop-ACC-PC-AUS | AC power cord for Australia | |
| Loop-ACC-PC-CH | AC power cord for China | |
| **Tray** | | |
| 81.TRAY19.0000G | 19” Tray (One tray for two base units) | |
| **User’s Manual** | | |
| Loop-IP6810-S-UM | User’s Manual (optional paper copy). A electronic version of the manual on CD is included with every order. | |
| **SFP Optical Modules** | | |
| Please place your order using the 5-digit alphanumeric codes listed in the separate SFP Optical Module Brochure. | | |

**Examples 1:**
Main unit: Loop-IP6810-IS-SFPC-IDC24-IDC24-G
Description: Industrial standard unit with 2 SFP optical housing daughter card, 3 Ethernet LAN ports, 2 RS232/485 ports and one DB9 port with 2-channel Dry Contact, and two -24 Vdc industrial power modules.

**Examples 2:**
Main unit: Loop-IP6810-CS-SFPC-IAC-G
Description: Commercial standard unit with 2 SFP optical housing daughter card, 3 Ethernet LAN ports, 2 RS232/485 ports and one DB9 port with 2-channel Dry Contact, and one 100 to 240 Vac industrial power module.

**Examples 3:**
Main unit: Loop-IP6810-IS-SFPC-IDC48-IDC48-PoE-G
Description: Industrial standard unit with 2 SFP optical housing daughter card, 3 Ethernet LAN ports, 2 RS232/485 ports and one DB9 port with 2-channel Dry Contact, and two -48 Vdc industrial power modules, and PoE option.

**Examples 4:**
Main unit: Loop-IP6810-ISETH-SFPC-IDC24 -G
Description: Industrial standard unit with 2 SFP optical housing daughter card, 3 Ethernet LAN ports, and one -24 Vdc industrial power module.

**Examples 5:**
Main unit: Loop-IP6810-IS-ETH-IDC24 -G
Description: Industrial standard unit with 2 RJ45 daughter cards for WAN port, 3 Ethernet LAN ports, and one -24 Vdc industrial power module.

# *Loop-IP6810 RTU Ethernet Ring Product Specification*

## *WAN Network Side Interface*

| | |
|---|---|
| Number of Ports | Up to 2 |
| Functions | 100 Base-Fx<br>10/100BaseT (only available for -24 Vdc): Auto-negotiation, Auto MDI/MDIX, and Full or half duplex |
| Connector | SFP housing<br>RJ45 (for -24 Vdc) |

### *SFP Optical Module Characteristics (Please refer to SFP optical module brochure for detail)*

## *Tributary Customer Side Interfaces*

### *RS232 Interface*

| | | |
|---|---|---|
| Number of Ports | Up to 2 | Note: Interface changed by DIP switch from RS485 |
| Electrical | RS232, DCE | |
| Baud Rate | 200, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps, asynchronous | |
| Function | Up to 16 remote IP address each port<br>Flow control: RTS/CTS, XON/XOFF<br>RTS forwarding | |
| Connector | DB9, female<br>Add stop bit: 1, 1.5, 2 bit<br>Add data bit: 5, 6, 7, and 8 bit | |

### *RS485 Interface*

| | | |
|---|---|---|
| Number of Ports | Up to 2 | Note: Interface changed by DIP switch from RS232 |
| Electrical | RS485, DCE | |
| Baud Rate | 200, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps, asynchronous | |
| Function | | |
| Connector | DB9, female<br>Add stop bit: 1, 1.5, 2 bit<br>Add data bit: 5, 6, 7, and 8 bit | |

### *Ethernet Interface*

| | |
|---|---|
| Number of ports | 3 |
| Ethernet functions | 10/100BaseT, IEEE 802.3, 802.3u<br>LEAPS (Loop Ethernet Automatic Protection Switching)<br>802.1q Port Base VLAN, Port Isolation<br>802.3x Flow Control<br>Auto-negotiation (10/100M)<br>Auto MDI/MDIX<br>Full or half duplex<br>Up to 1024 MAC addresses<br>Rate limiting for LAN port |
| QoS Functions | Four priority queue |
| Connector | RJ45 |

### *Dry Contact I/O Interface*

| | |
|---|---|
| Connector | DB9, Female |
| **2-channel Inputs** | |
| Internal Resistance | 1 k ohm |
| Activation Current | 3.3 mA |
| Deactivation Current | 1.5 mA |
| Allowable Current | 4 mA |
| **2-channel Outputs** | |
| Initial Insulation Resistance | Minimum 100M ohm (at 500 Vdc) |
| Allowable Short-circuit Rating Current | 5 A (at maximum) |

### *Protocols*

IEEE 802.1w RSTP, 802.1s MSTP*
SNMP

| | |
|---|---|
| LEAPS | Each unit with 3.69 ms delay and 0.05 ms/km transmission delay (at maximum)<br>Fault recovery time: normally less than 50 ms |

### *Alarm Control*

| | |
|---|---|
| Alarm relay | NO, COM, NC |
| Connector | Terminal block |
| Alarm cut off | ACO button |

### *Management*

| | |
|---|---|
| LEDs | Multi-color LEDs |
| Console port | Protocol: Menu driven VT-100<br>Electrical: RS232, DCE<br>Connector: DB9S, female |
| Telnet | Supported |
| SSH | v2 |
| SNMP | v1, v3 |
| LoopView GUI EMS | Supported |

### *Performance Monitor*

| | |
|---|---|
| Alarm Queue | Contains up to 500 alarm records which record the latest alarm type,alarm severity ,and date & time |
| OA&M | Link Status Update, Link Status Monitoring |
| BERT | PRBS $2^{\wedge 15}$-1 |

### *Power*

| | |
|---|---|
| Power | AC: Full range supports 100 to 240 Vac, 50/ 60 Hz<br>DC24: -18 to -36 Vdc<br>DC48: -36 to -72 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) |
| Power Consumption | 10 Watts maximum normally<br>Less than 6 Watts (for devices with 3 Ethernet ports only) |
| Protection | Over current protection fuse |

***Physical and Environmental***

| | |
|---|---|
| Dimensions | 215 x 41.5 x 156 mm (WxHxD), 1U height |
| Temperature range | -20 to 70 °C |
| Humidity | 0 to 95% RH (non-condensing) |
| Mounting | Desk-top, wall mount , DIN rail |
| Enclosure Type | IP30 enclosure |

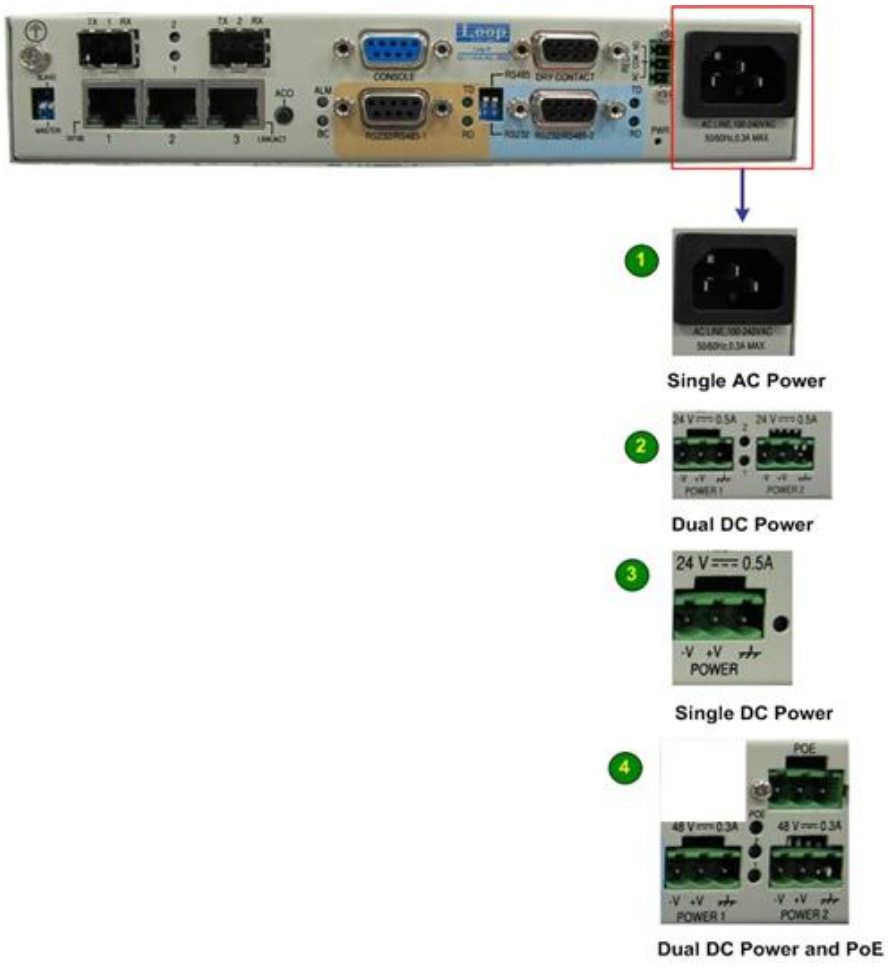
***Standard Compliance***

| | |
|---|---|
| IEEE | 802.3, 802.3u, 802.3x, 802.1d, 802.1w, 802.1p, 802.1q, 802.1s* |

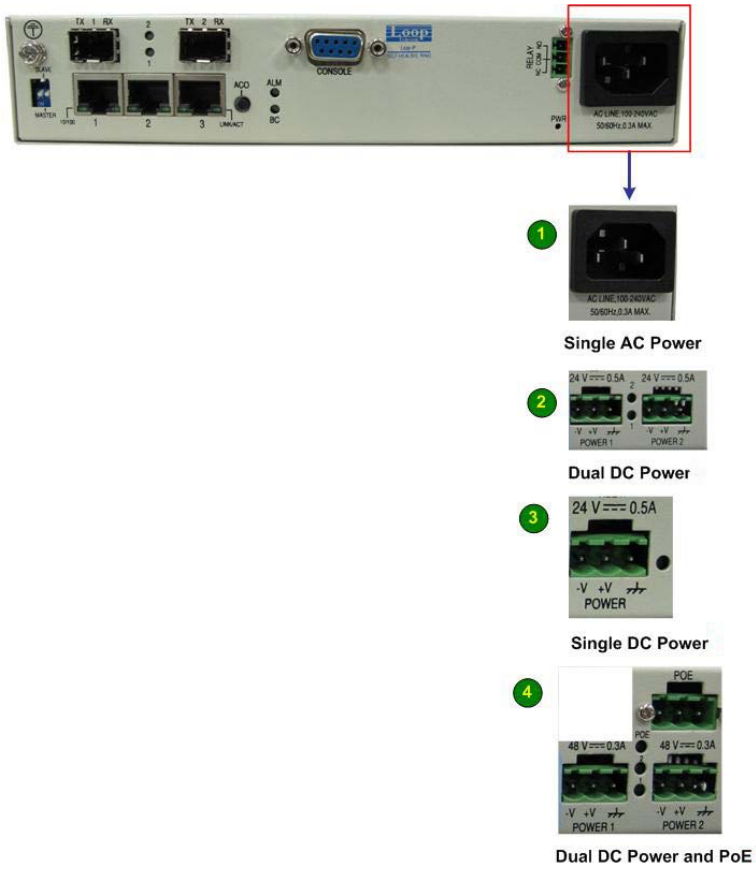
***Certification***

| | |
|---|---|
| EMI/EMC | FCC15 subpart B class A, EN55022 class A, EN55024, EN300 386, EN300 386 v1.4.1, EN55022 :2006+A1 :2007, EN55024 :1998+A1 :2001+A2 :2003, EN61000-3-2 :2006, EN61000-3-3 :2008 |
| Safety | IEC60950-1, EN60950-1, IEC61850-3:2002, IEEE1613:2003, IEC60255-21 Class1 (Operating), IEC60255 Class1 &2 (Transport) |

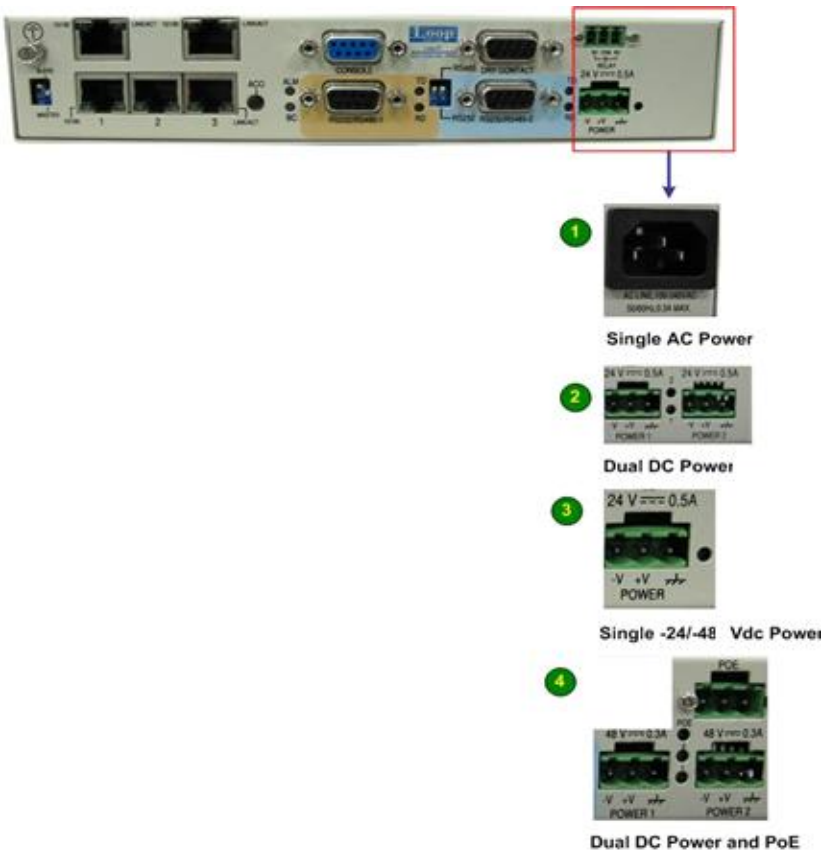
## *Front Panel Views*




**IP6810 Front Panel**

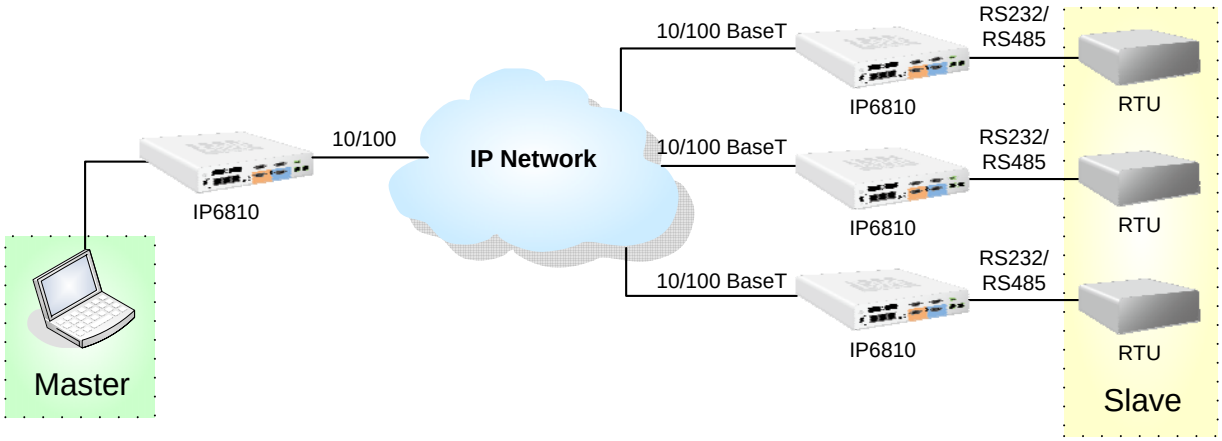



**IP6810 with Ethernet Ports Only**

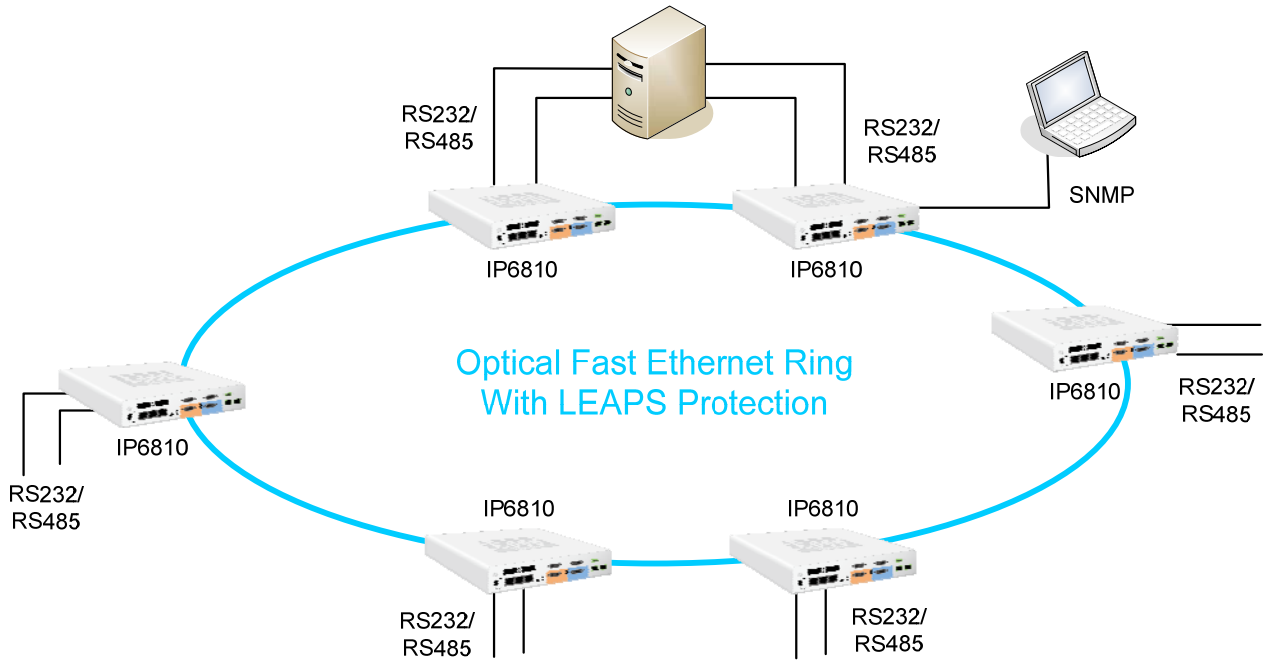



**IP6810 with Dual RJ45**

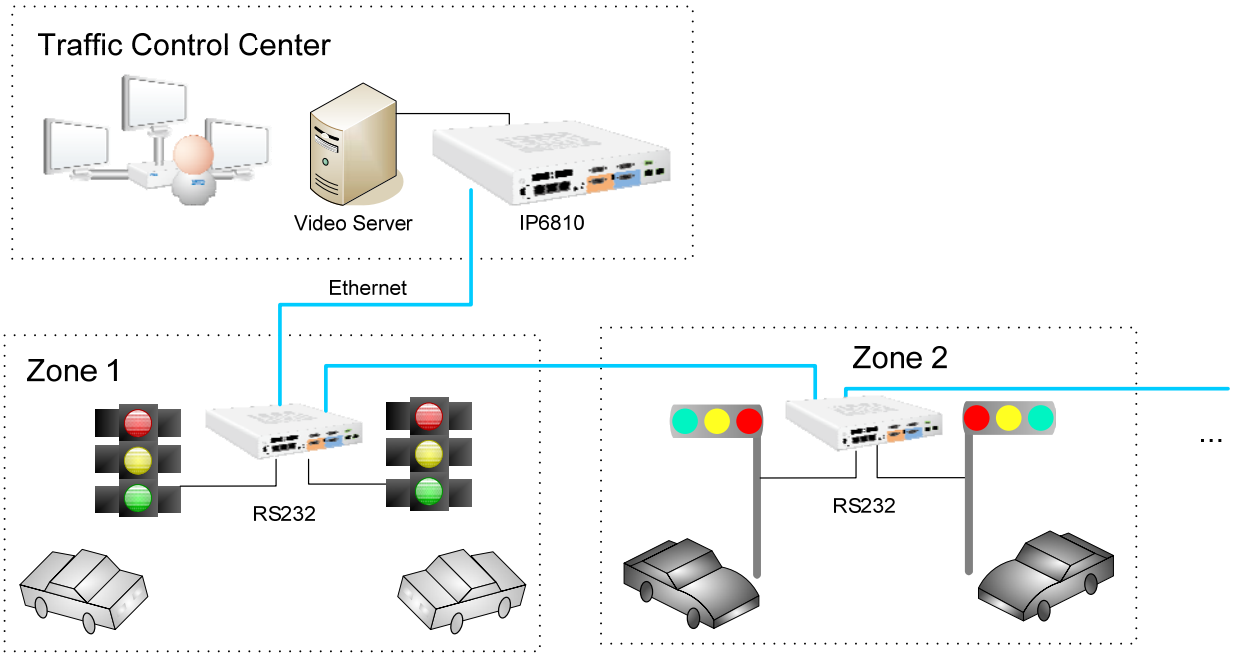
## *Application Illustrations*



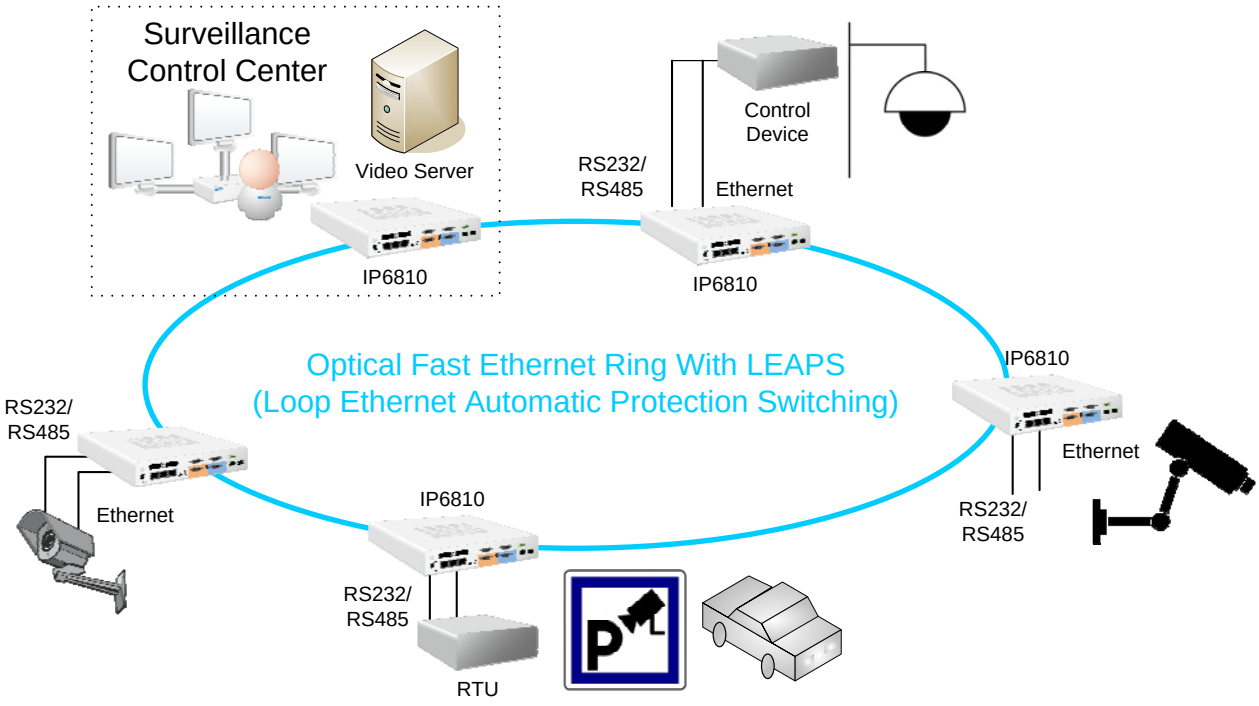

**Point-to-Multi-Point Application**



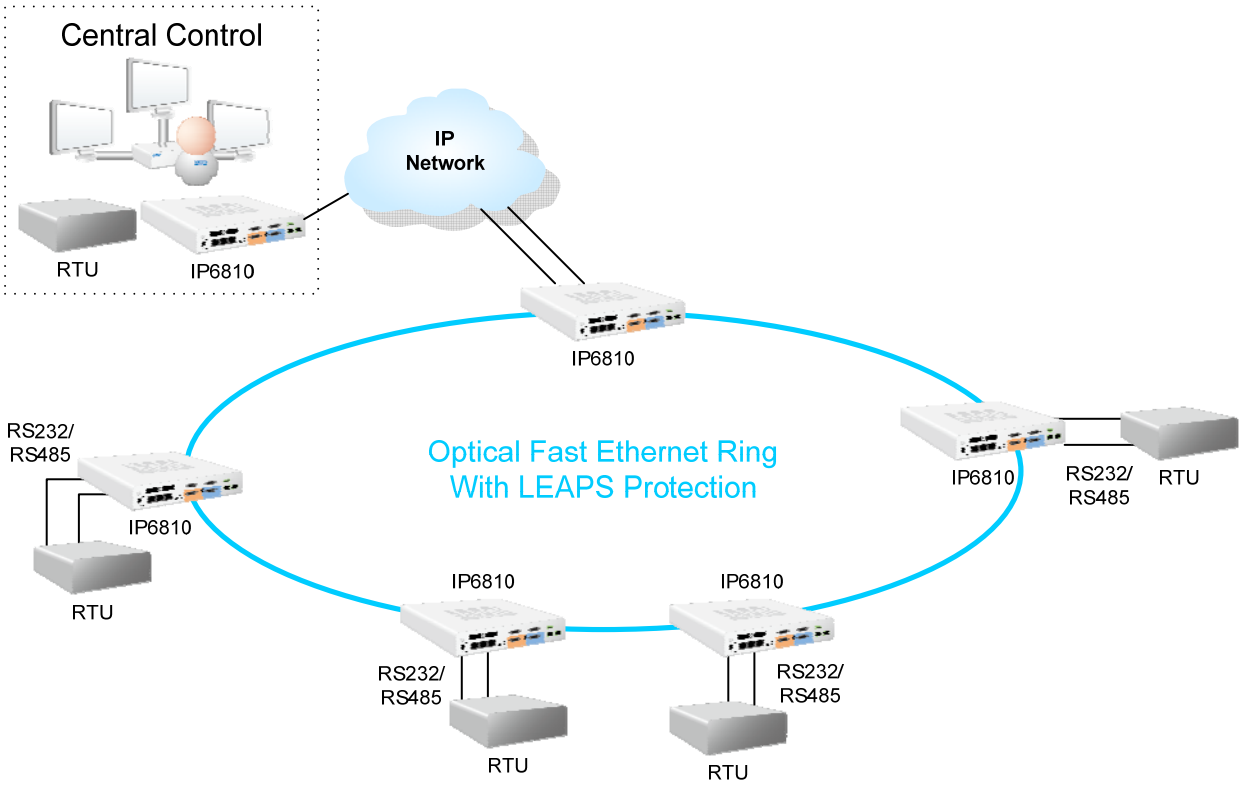

**Local SCADA**



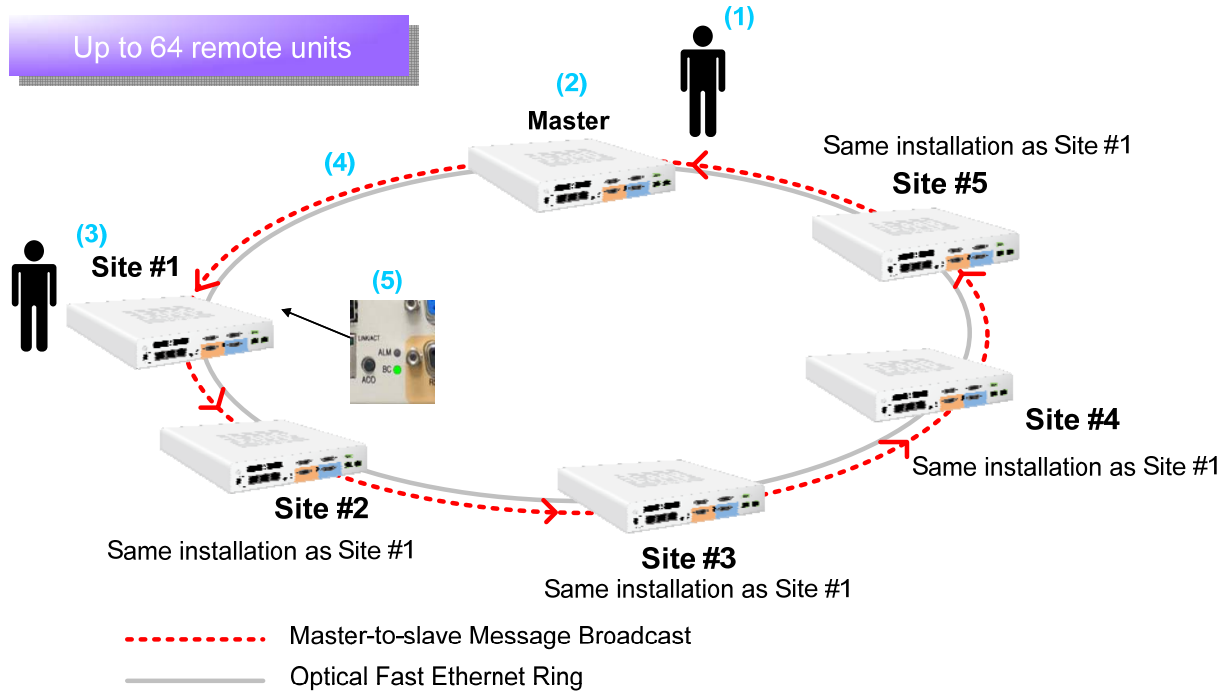

**Traffic Light Management**




**Video Surveillance**




**Remote SCADA**




## No Configuration Necessary in Advance for Installation

**Setup Procedure:**
(1) Set DIP switch to Master, connect both WAN ports and power up the unit
(2) On VT100, set the master unit's Auto-Discovery function to ENABLE
(3) On remote site, set the unit's DIP switch to Slave, connect both WAN ports and power up the unit
(4) The master unit will automatically detect the slave unit and show the information on VT100 screen
(5) BC LED will turn GREEN, which indicates the Link between Master and Site 1 is ON

**Auto-Configure (Plug-and-Play)**

LoopTelecom.com

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