

## **PM212 IP Extender (PoE) User's Manual**



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# 1 Overview

## 1.1 What You Should Get

Thank you for purchasing the module ◦ Please check the module before using it.

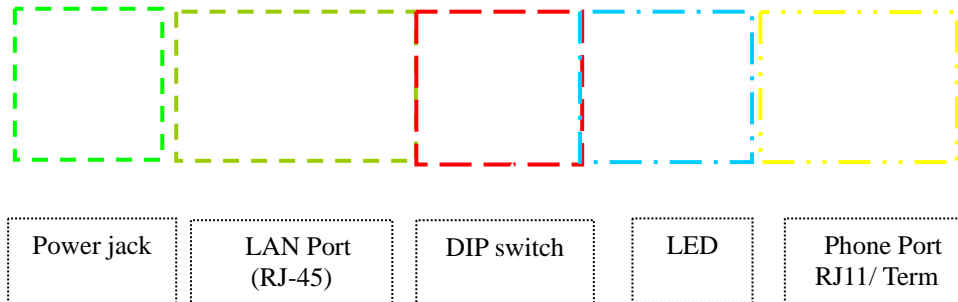
- ◆ PM212
  - ✓ Module-----x1
  - ✓ Power Adapter (DC 5V 2A)-----x1
  - ✓ Device Mounting-----x2
  - ✓  $\Phi 2.9'$  screw-----x4
  - ✓  $\Phi 4.8'$  screw -----x2
  - ✓ Terminal Block-----x1
  - ✓ User manual-----x1



## 1.2 External Architecture

### ◆ Case1 PM212

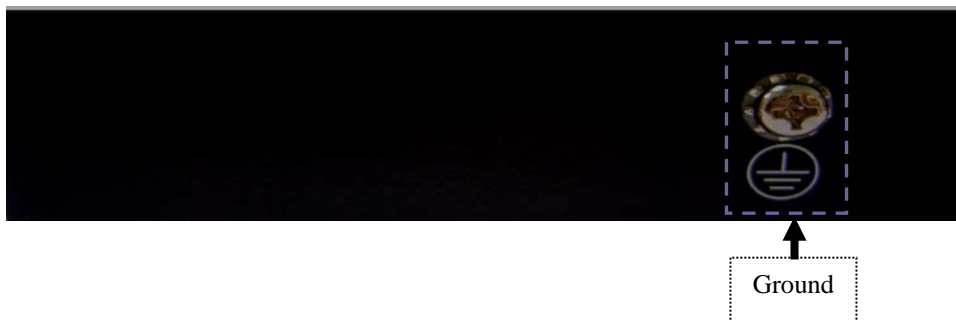
Front panel



Right side panel



Back panel



### 1.3 Size & Weight

PM212

Dimension: 126 (W) x 95 (D) x 30(H) (mm)

Weight: Approx 311± 2g

Material: metal



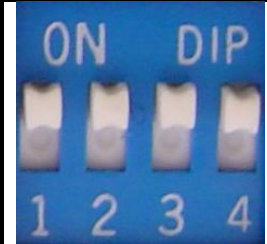
### 1.4 Connectors and Switches

#### (1) Power Input

- PM212  
 DC single 5V - 1A adapter

**CAUTION!:** Be sure to follow the specified power requirement to avoid damaging the equipment.

#### (2) Dip Switch Settings

	DIP Switch #	Function	ON Position	OFF Position
1	1	Master/Slave	CPE	CO
2	2	Transmission	Fast Mode	Interleave mode
3	3	Rate Limit	No Limit	Limited
4	4	SNR	6 dB	9 dB

#### DIP 1 : CO, CPE switch

CO: PoE module acts as Central Office (CO) side.

CPE: PoE module acts as Customer Premises Equipment (APE) side.

#### DIP2: Impulse noise protection

Interleave mode: Provides communication protection for up to 250ms impulse noise with latency of less than 6 ms.

Fast mode: Direct data transmission with latency of less than 1ms.

#### DIP 3: Rate limit control

Limited: Line rate limited to 50/20 Mbps.

No limit: Provides up to 100Mbps/60Mbps line rate in short line.

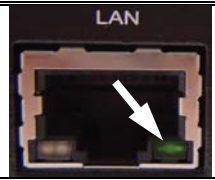
#### DIP 4: General protection

9dB: Better channel noise protection with SNR of up to 9 dB.

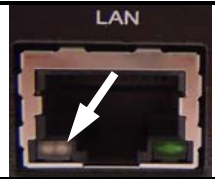
6dB: Original channel noise protection with SNR of 6 dB SNR.

#### (3) LED Indicators


LAN Port (RJ-45) bottom right LED status

	LED Status	Function
	Off	Off-Line
	Blinking	Transmitting data
	Lights On	Idle

LAN Port (RJ-45) bottom left LED status

	LED Status	Bandwidth Speed
	Off	Full-Duplex 100Mbps
	Lights On	Half-Duplex 10Mbps

Front Panel LED status

	LED Position	OFF	Blinking	Lights On
	Top (PW)	Power Off	Don't care	Power On
	Middle (CPE/CO)	CO Mode	Don't care	CPE mode
	Bottom (LINK)	Don't care	Training (handshaking)	Slave & Master successfully connected

## 1.5 Product Configuration

<b>Model Number</b>	<b>Power Supply</b>	<b>Interface</b>	<b>Special Feature</b>	<b>Ideal Locations of Application</b>
<b>PM212</b>	Max. 4.2W 5V DC	1/2-Wire Terminal Block	Noise-Free feature for Elevator and tunnel application	Elevators and tunnel

## 2 Introduction

The Professional IP Extender (PoE) modules which include models that utilize new built-in IP camera device or are capable of upgrading analog camera into IP camera, are ideal devices for centralized surveillance and control. Furthermore, its installation cost is cut to minimum due to reduced installation man-hour and cable/wiring requirements. Through splitter, the PoE modules can be connected to the security network through existing coaxial cables or telephone wirings. PoE modules are also capable of extending its surveillance capability to about 2 kilometer from control center through a single Ethernet port (RJ-45) and an RJ-11 or wire terminal block port.

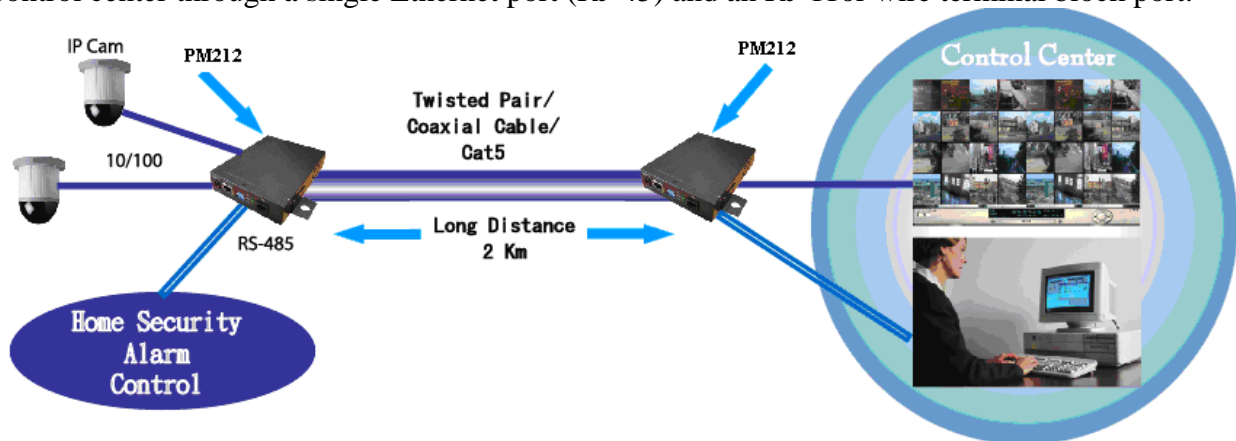


Figure 1 · Application Environment

PoE modules are plug-n-play as they do not require software. For long range connections, the modules offer up to 100/60 Mbps transition bandwidth for the distance of within 300 meters and 25/5 Mbps for 1.6 kilometers using existing telephone line at ultra-high performance. Being a plug-n-play device, it provides minimum installation time as well as minimum expense by allowing video streaming and data sharing with existing telephone twisted-pair or coaxial cable without interference.

With its ultra-high performance, the PoE modules are capable of transmitting high definition images; such as High Definition Television (HDTV). This makes the device most suitable for hotel/motel rooms TV network application. PoE modules also support Ethernet Bridge and switching functions and are compatible with optical fiber device.

In suppressing radio interference in tunnel or elevator, as well as in long distance surveillance in farmlands or of bridges across bays, the PoE modules are capable of meeting these challenges as long as telephone line or cable networks already exist in these locations. Furthermore, the modules are also equipped with RS485 interfaces for Emergency/Security Control application.

Lastly, PoE modules feature the Remote Power Feeding (RPF) capability that enables the device to transmit and provide power over telephone lines. This is an ideal option for applying surveillance network in remote areas where power source is not available.

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## 3 Unique Features

1. **No new wiring network required:** Uses existing phone lines /coaxial cables
2. **Fast Upgrade:** Upgrade analog camera to IP camera.
3. **Long distance transmission:** Up to 100/60 Mbps transmission bandwidth within 300m without interference.
4. **Support multi-camera at the same time:** Support Twenty-five cameras at the same time within 200m in sufficient bandwidth.
5. **Easy to Install:** Plug-n-play device, no software installation required
6. **Auto-detect & adapts itself with environment:** Can readjust itself to adapt with complicated wiring environment, such as elevator or tunnel.
7. **Cost saving:** Saves material and labor cost due no new wiring required. Hence no wiring installation man-hour required.

## 4 Application Case Examples

### 4.1 Case: Multi-Media Network in Elevator (PM212)

◆ **Objective:**

PM212 module is most suitable for elevator use due to its Noise-Free feature. With this PoE module, user can broadcast Internet information, Net Radio, Net TV, etc., through a set-top Box and an LCD monitor in the elevator. It utilizes the reserved spare wirings of the existing elevator emergency phone network.

◆ **Location:**

PiXORD Microelectronics Corp building elevators

◆ **Network Architecture:**

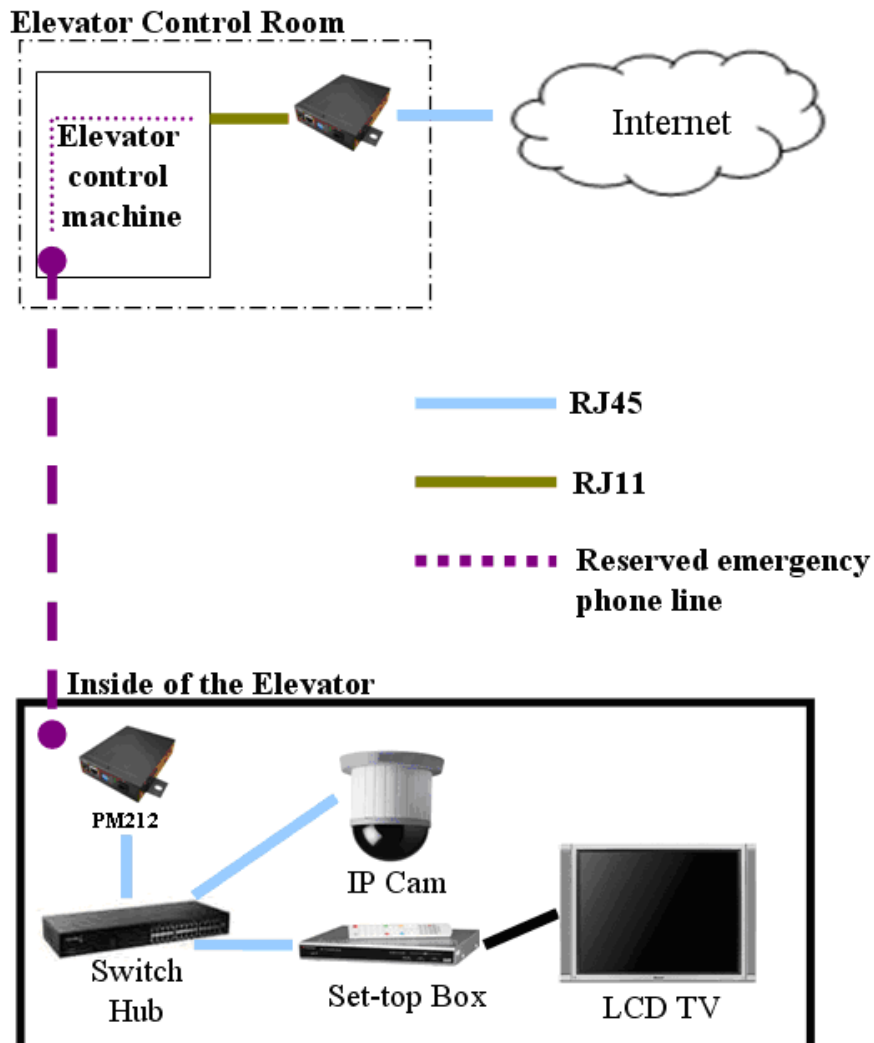


Figure3. PiXORD Elevator PM212 Network Architecture

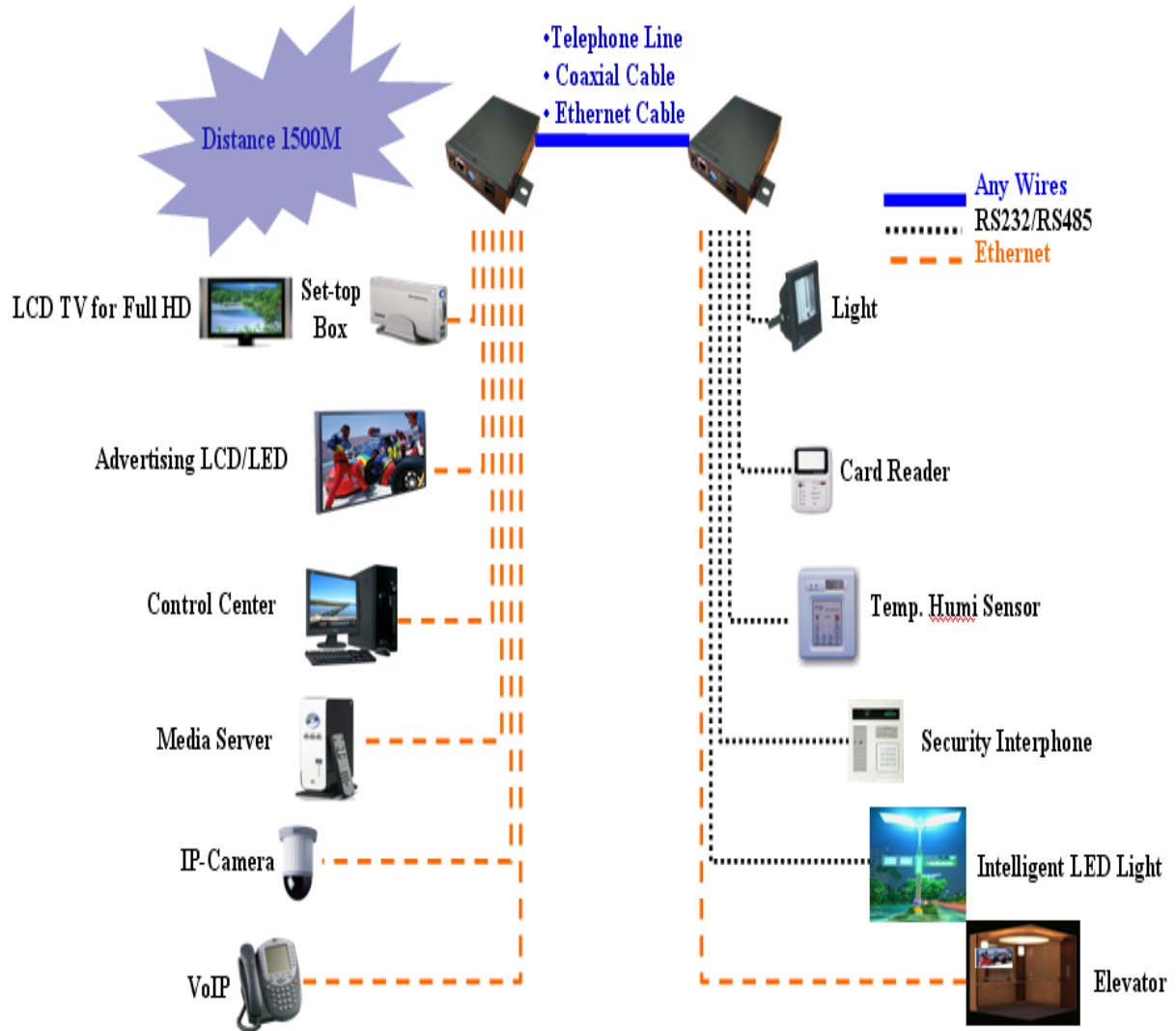
The PiXORD elevator PM212 network architecture has a PoE module (PM212), IP camera, switch hub, set-top box, and LCD monitor. PM212 module uses the spare lines of the elevator emergency phone system which is connected to the control room (11F). From the elevator control box in the control room, user picks the spare emergency phone line and connects it to his computer. All IP devices signal are transformed into Ethernet packet format or from Ethernet packet format to IP signals through PM212 module.

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**CAUTION!!**

- 1. The PM212 module has a self-detection function and has to self-adjust itself to conform with the environment conditions. Therefore it needs some time (about 3~5 minutes) to connect with another PM 212 module*
- 2. For safety precaution, user must consult and coordinate with the concerned elevator company technical personnel during installation of the PM212 module in order not to disrupt the existing elevator safety device wiring circuit.*

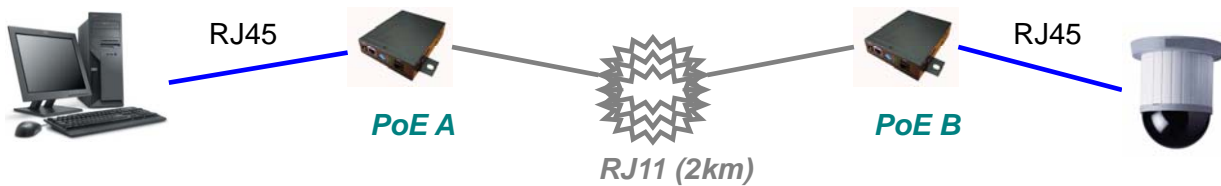
## 5 Integrating Other Products with PoE



## 6 Q&A

### Q1. How to select CO side and CPE side mode PoE?

**A1.** Referring to the figure below, the PoE B module (nearest to IP camera) is the CO side and PoE A module (nearest to control center) is the CPE side for valid operation bandwidth.



### Q2. How to identify fast and interleaved mode?

**A2.** Fast mode guarantees a minimum end to end latency of less than 1 ms. Interleaved mode provides protection from any impulse noise with duration of less than 250  $\mu$ s. Interleaved mode has a maximum end to end latency of 10 ms. Interleaved mode is the default mode.

### Q3. How to select target data rate and target SNR margin:

**A3.** User can select fixed SNR margin (9 dB) or fixed target data rate. When fixed SNR margin is selected, the systems will maintain the SNR margin at 9 dB across all usable loop length. When fixed target data rate is selected, the system will lock the data rate at 50Mbps/30Mbps whenever the calculated SNR margin is higher than 9 dB. This provides the best system stability and is the default mode.

### Q4. Why PoE modules cannot link each other after training?

- A4:**
- 1) A pair of PoE modules should consist of a CO side mode module and a CPE side mode module. They cannot be of the same mode modules.
  - 2) RJ-11 jack and connector may have loose contact.
  - 3) The distance between 2 PoE modules should not exceed 2Km.