

# Industry Line

*Ethernet Solutions for Automation  
and Surveillance Applications*



# Westermo Worldwide...

**Produced by:**  
Westermo Teleindustri AB

*Specifications are subject to change without notice due to continuous product development and improvement.*

Westermo provides a full range of data communications solutions for demanding applications in the transport, water and energy markets among others. Westermo has been at the forefront of technological development since the start in 1975 and often pushed the limits of what is technically possible.

The staff at Westermo offers the highest possible service to help customers to select, configure and install the best solution for their specific needs. Our knowledge goes far beyond our own product range, regardless of whether the installation is in a substation, water treatment plant or alongside a railway.

In order to provide the best possible support, we have local presence in more than 35 countries through our authorized distributors and own offices.

Since 2008 Westermo has been part of the Beijer Electronics Group, a company with unique knowledge of the HMI and industrial automation business.



# Industrial Reliability for Automation and Surveillance

Over the last decades Industrial Ethernet has become the standard within automation solutions found in factories, process plants, transportation systems and infrastructure projects. More recently Ethernet has made its way into the alarm, CCTV surveillance and building automation systems sectors. Although standard IT equipment could be used for these types of solutions more and more companies are seeing the benefit of using industrial Ethernet equipment for these applications. Initially the price might be higher but in the longer term the cost of using industrial equipment will be lower. Industrial Ethernet equipment is optimised for extreme environmental conditions and is designed for longer life cycles and provides functions like high speed network reconfiguration in the event of cable damage.

The i-line family of industrial Ethernet products is aimed specifically for applications in these environments. The i-line range includes standard and compact unmanaged Ethernet switches, managed Ethernet Switches with advanced ring technology, media converters and Power over Ethernet (PoE) switches.

All devices within the i-line range feature industry grade components, easy-to-use features, and reliable and consistent operation. The rugged IP-31 rated aluminium alloy enclosure is ideal for heat dissipation and enables a wide operating temperature range without the need for moving parts.

**i-line**



## The i-line Solution

A wide range of compatible switches designed to meet the requirements of the factory automation, IP surveillance and building automation system markets.

### Managed Ethernet Switches

The MDI series includes four managed layer 2 Ethernet switches, featuring a wide range of port configurations and transmission speeds. The devices are designed for managing complex networks that may include redundant rings and long distances.

- MDI-110-F3**      7 × 10/100 TX, 3 × combo ports
- MDI-110-F3G**    7 × 10/100 TX, 3 × Gigabit combo ports
- MDI-112-F4G**    8 × 10/100 TX, 4 × Gigabit combo ports
- MDI-118-F2G**    16 × 10/100 TX, 2 × Gigabit combo ports



### 19" Managed Ethernet Switches

The MRI series is a selection of five 19" rack Ethernet high port density control room switches with or without PoE functionality. The devices are designed for critical and large-scale applications such as real time IP video surveillance with high resolution quality and wireless communication systems such as WiMAX and 802.11 Access Points.

- MRI-128-F4G**      24 × 10/100 TX, 4 × Gigabit combo ports
- MRI-128-F4G-DC**    24 × 10/100 TX, 4 × Gigabit combo ports
- MRI-128-F4G-PSE24** 24 × PoE+ 10/100 TX, 4 × Gigabit combo ports



## Ethernet Media Converters

The MCI series is a selection of Ethernet media converters. The MCI-211G converts 10/100/100TX to Gigabit fibre and its hot swappable Small Form-factor Plugable (SFP) fibre receiver allows the unit to operate over almost any type and distance of fibre supported by SFP. The MCI-422 model is not only a 2 channel RJ45 to fibre media converter, but also a compact 4-port 10/100 Mbit/s Fast Ethernet switch.

<b>MCI-211G</b>	1 × 10/100/1000TX, 1 × SFP
<b>MCI-422-MM-SC2</b>	2 × 10/100 TX, 2 × 10/100 Multimode FX
<b>MCI-422-SM-SC30</b>	2 × 10/100 TX, 2 × 10/100 Singlemode FX



## Unmanaged Ethernet Switches

The SDI series includes six standard Ethernet switches with differing port counts and media types. The 5 port switches can be powered from either 24 VAC or DC and all models have simple fault contacts and are DIN rail mountable.

<b>SDI-541-MM-SC2</b>	4 × 10/100 TX, 1 × Multimode FX
<b>SDI-541-SM-SC30</b>	4 × 10/100 TX, 1 × Singlemode FX
<b>SDI-550</b>	5 × 10/100 TX
<b>SDI-862-MM-SC2</b>	6 × 10/100 TX, 2 × Multimode FX
<b>SDI-862-SM-SC30</b>	6 × 10/100 TX, 2 × Singlemode FX
<b>SDI-880</b>	8 × 10/100 TX



## Unmanaged Power over Ethernet Switches

The PSI series includes three PoE (Power over Ethernet) switches designed to ensure high-bandwidth uplink connection for small to large-scale surveillance networks. Models with either four or eight IEEE 802.3af Fast Ethernet PoE ports are available, both offering 2 Gigabit uplink ports. An integrated 12V to 48V power booster makes the units ideal to support the deployment of standard PoE IP cameras.

<b>PSI-660G-24V</b>	4 × PoE 10/100 TX, 2 × 10/100/1000 TX
<b>PSI-1010G-24V</b>	8 × PoE 10/100 TX, 2 × 10/100/1000 TX
<b>PSI-1010G-48V</b>	8 × PoE 10/100 TX, 2 × 10/100/1000 TX
<b>PSI-1010G-F2G-48V</b>	8 × PoE 10/100 TX, 2 × Gigabit SFP



## Managed Power over Ethernet Switch

The PMI offers 8 PoE ports and 2 Gigabit combo port uplinks, ideal for e.g. surveillance networks. With intelligent management, security and resilience functions it is suitable also for the most advanced solutions.

<b>PMI-110-F2G</b>	8 × PoE+ 10/100 TX, 2 × Gigabit combo ports
--------------------	---





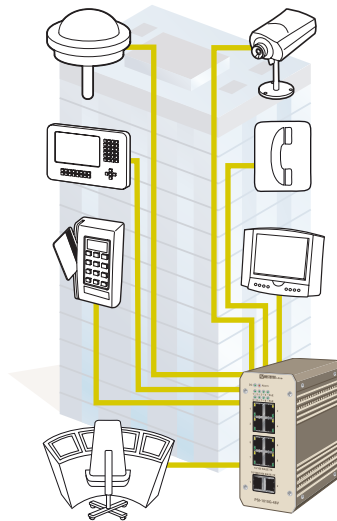
## Building Automation Solution Networks

In today's society there is an increasing requirement for our buildings to become more efficient, more reliable and more secure. To achieve this advanced building automation systems are being developed which require effective and reliable data communications solutions. Intelligent systems controlling air conditioning, thermal regulation, power consumption and surveillance can result in significant cost saving as well as benefiting the environment.

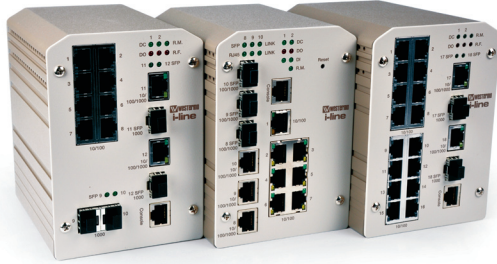
Ethernet has become the preferred technology in these networks for several reasons. It provides fast data rates, long distance between nodes, interoperability and a high overall performance. The protocol can also use standard network equipment like routers and switches which provides greater flexibility when designing networks.

The Westermo i-line range provides a wide range of Ethernet products that are designed to provide secure, effective and reliable network structures in this environment.

Building automation systems come in many forms, but regardless of the benefits of Ethernet itself, no data can be transmitted if the network fails. Choosing industrially graded network devices can mitigate this risk as the overall system reliability is increased. The Westermo i-line devices are developed with high MTBF figures (Mean Time Between Failure), have rugged IP-31 rated enclosures that makes them better suited to environments where mechanical stress, moisture, condensation or dirt could adversely affect the function of standard Ethernet devices. In critical applications there are also features like dual power inputs, redundant ring protocols and much more that guarantee that the system will still operate in cases of power or network failure.



Intelligent systems have become increasingly common in large buildings such as hospitals, offices and train stations. Security and energy efficiency are increased while labour costs are minimized. The Westermo i-line range offers everything from simple plug-and-play devices up to fully managed redundant ring solutions.

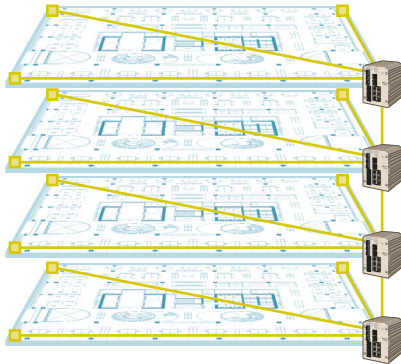


## Redundant Ring Solutions

For advanced solutions the fully managed Ethernet switches in the i-line family offer a flexible port setup and a wide set of management and security features. Management features include CLI and Made Easy GUI, SNMP v1/v2/v3, port configuration. Network control includes Jumbo frame, 802.1Q VLAN, QoS, IGMP Snooping v1/v2/v3. The managed i-line switches allow a range of redundant ring solutions including RSTP, trunk ring, multi ring and dual homing ring.

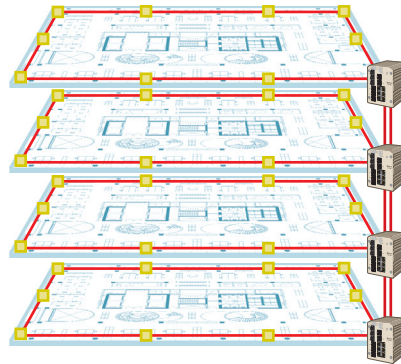
## Traditional Star Topology

- ⌘ Easy to install and wire
- ⌘ No redundancy



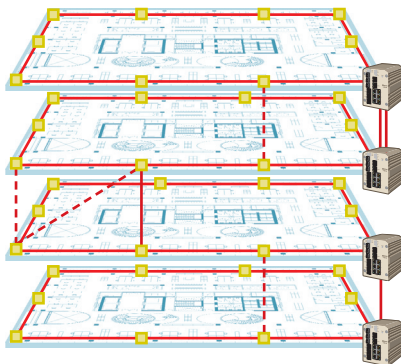
## Ring + Trunking

- ⌘ A ring for each floor
- ⌘ Each ring is connected by one link
- ⌘ Use Trunk/LACP to provide redundancy and increase bandwidth



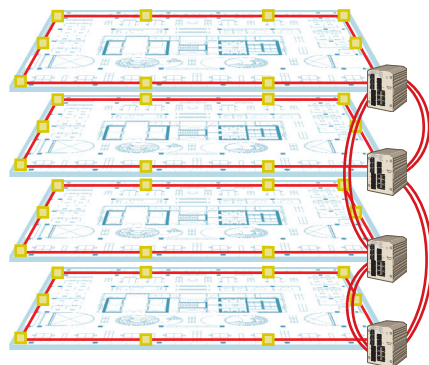
## Dual Homing Rings

- ⌘ Easy configuration
- ⌘ No critical point
- ⌘ Recovery time < 100 ms
- ⌘ Seamless Restoration
- ⌘ Multiple redundancy, max 7
- ⌘ Flexible connection
- ⌘ Smart path for best performance
- ⌘ Together with Trunk/LACP for more redundancy and bandwidth



## Multiring

- ⌘ Recovery time < 5 ms
- ⌘ Seamless Restoration
- ⌘ Use TrunkRing for more redundancy and bandwidth





## Ethernet Networks for CCTV Systems

Surveillance cameras are seen increasingly in our everyday environment, in public areas, private businesses and offices. It is a simple and cost effective way to improve public security and protect corporate assets. Whether it is traffic, shopping malls, water treatment plants or airports that are monitored, the network that transmits the video signal between the camera and the recording unit is always a critical point of failure.

IP technology has become a popular solution for transmitting the video systems due to its flexibility and ability to allow streams to be seen at great distance utilising large IT networks or even the internet. Ethernet provides a very effective backbone for these IP networks. The Westermo i-line offers many options to build a network for trouble free video transmission.

By having a wide range of solutions products can be selected matching the available budget or the network integrity level. If monitoring a low importance object, a simple point-to-point solution will get the job done, whereas a system that monitors a nuclear power plant may need a considerably more reliable solution. The i-line series of Ethernet products offers solutions for any surveillance application.

### **IGMP (Internet Group Management Protocol)**

Multicast data packets is the perfect way to transmit data to multiple `consumers' on a network. If for instance fifty users wish to view a video feed it would congest a network completely if every data frame had to be sent fifty times. A single multicast packet is all that is transmitted by the data `producer'.

IGMP Snooping is a method that actually "snoops" or inspects IGMP traffic. The protocol will only enable multicast streams to switch ports that have requested to `join' the feed. In this way switches can control multicast data on networks.

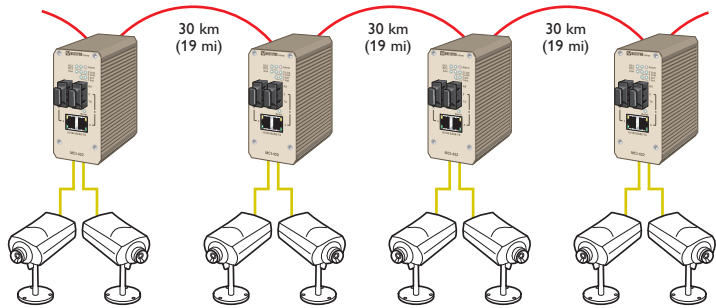
**The managed i-line switches support IGMP Snooping.**



### Wide Area Surveillance

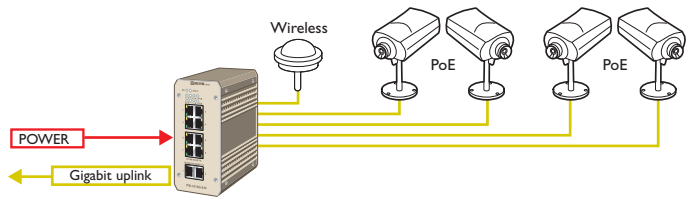
A simple monitoring system that can extend over long distances can be achieved with MCI-422.

A fibre cable connects the devices in a daisy chain network along a railway, a road or other large area.



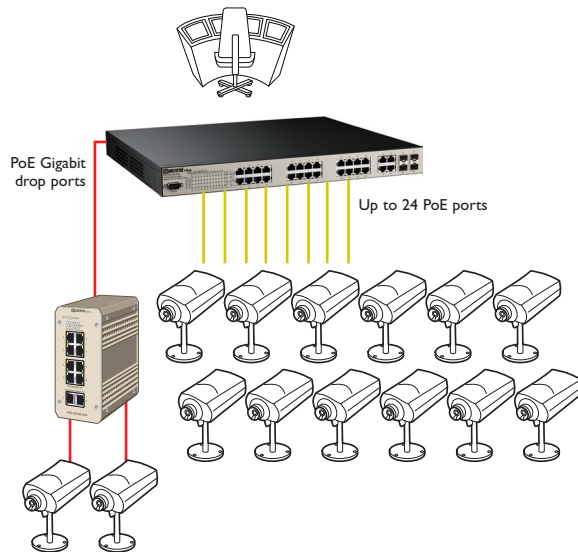
### PoE Solutions

PoE (Power over Ethernet) solutions eliminate the need for additional power cabling. The power and data share the same cable making for easy and low cost installation. The PSI range has 2 gigabit ports and QoS that allow high quality video to be transmitted.



### High Port Density

Where large numbers of cameras are operated in a small area, like a train station or supermarket, multiple cameras need to be fed from a single switch. To provide the levels of power required in these applications require high quality power supply design in the switch.





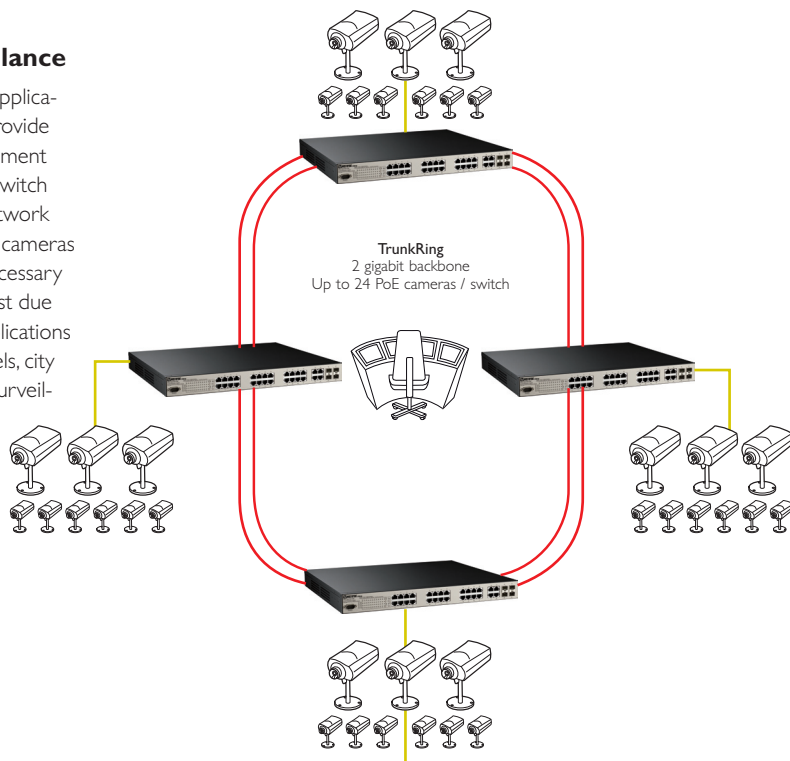
## Control Room Solutions

Ethernet was originally mainly used in the office environment where switches often resided in temperature controlled IT rooms. As Ethernet has spread into more and more application areas the switches have needed to evolve to work in less ideal locations where reliability is however critical. Industrial level switches have an advantage even in a control room environment as they are designed not to require cooling fans to operate. Any moving part in a communications device will lead to lower reliability and lifetime.

Often in control rooms very high port densities are required and hence the 19 inch form factor is ideal for mounting large numbers of units. The MRI range of switches provides high port densities designed to industrial specifications.

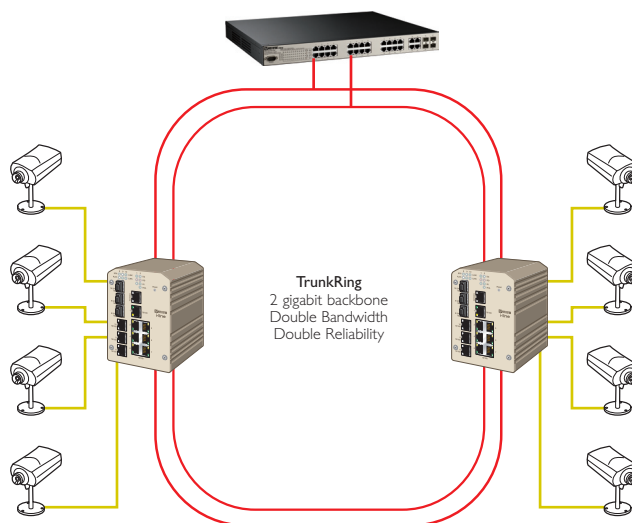
## Large Scale Surveillance

In large scale surveillance applications, the MRI series can provide reliable and simple management for up to 24 cameras per switch with or without PoE. A network can consist of hundreds of cameras so network resilience is necessary to ensure footage is not lost due to cable failure. Typical applications are airports, harbours, hotels, city centres and campus area surveillance.



## High Bandwidth Solutions

Large surveillance applications that require high quality video consume a lot of bandwidth. A typical application is traffic surveillance systems which often extend over long distances with many cameras connected to the same backbone. The MDI and MRI series can be used to create trunk rings which allow a 2 Gbit redundant fibre backbone.





## H E A D   O F F I C E

### Sweden

Westermo  
SE-640 40 Stora Sundby  
Tel: +46 (0)16 42 80 00  
Fax: +46 (0)16 42 80 01  
info@westermo.se  
www.westermo.com

## Sales Units

Westermo Data Communications

---

### China

sales.cn@westermo.com  
www.cn.westermo.com

### France

infos@westermo.fr  
www.westermo.fr

### Germany

info@westermo.de  
www.westermo.de

### North America

info@westermo.com  
www.westermo.com

### Singapore

sales@westermo.com.sg  
www.westermo.com

### Sweden

info.sverige@westermo.se  
www.westermo.se

### United Kingdom

sales@westermo.co.uk  
www.westermo.co.uk

### Other Offices



*For complete contact information, please visit our website at [www.westermo.com/contact](http://www.westermo.com/contact)  
or scan the QR code with your mobile phone.*

**REV 2.0-2014-06 • 100-3830**

Westermo Teleindustri AB, Sweden – A Beijer Electronics Group Company