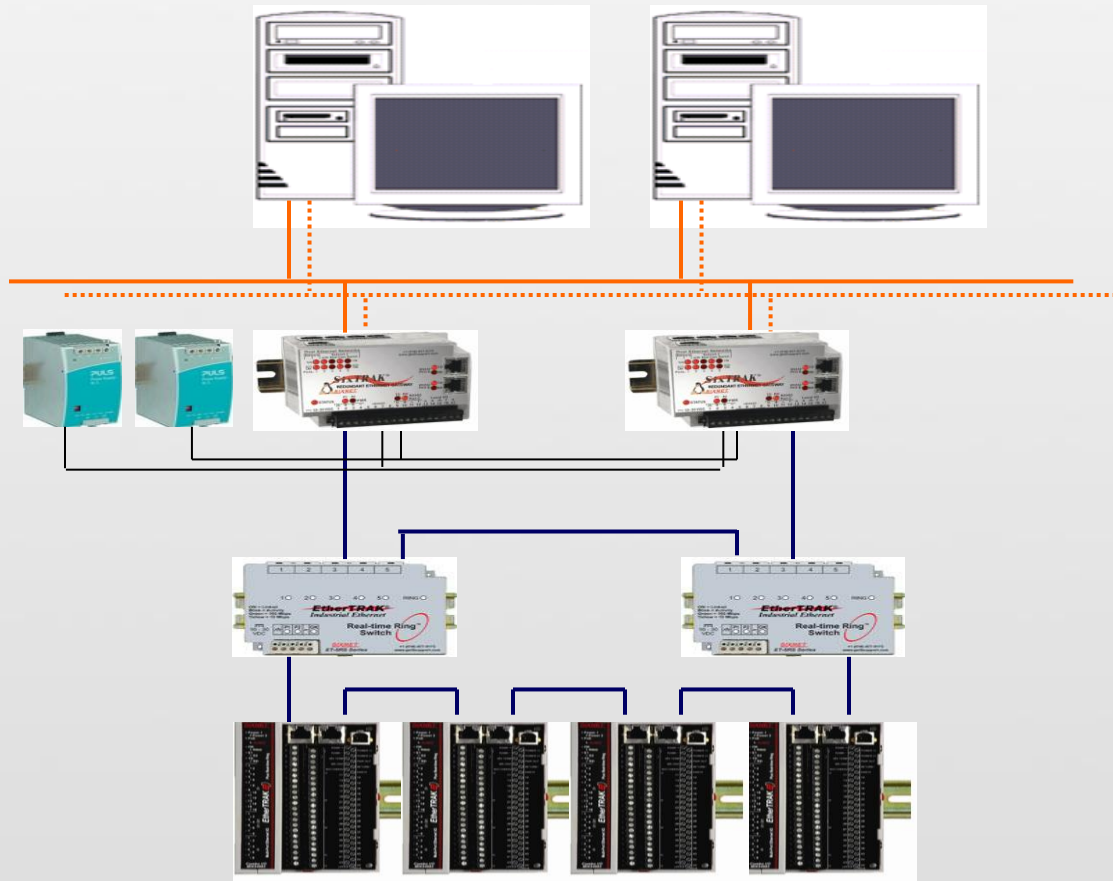




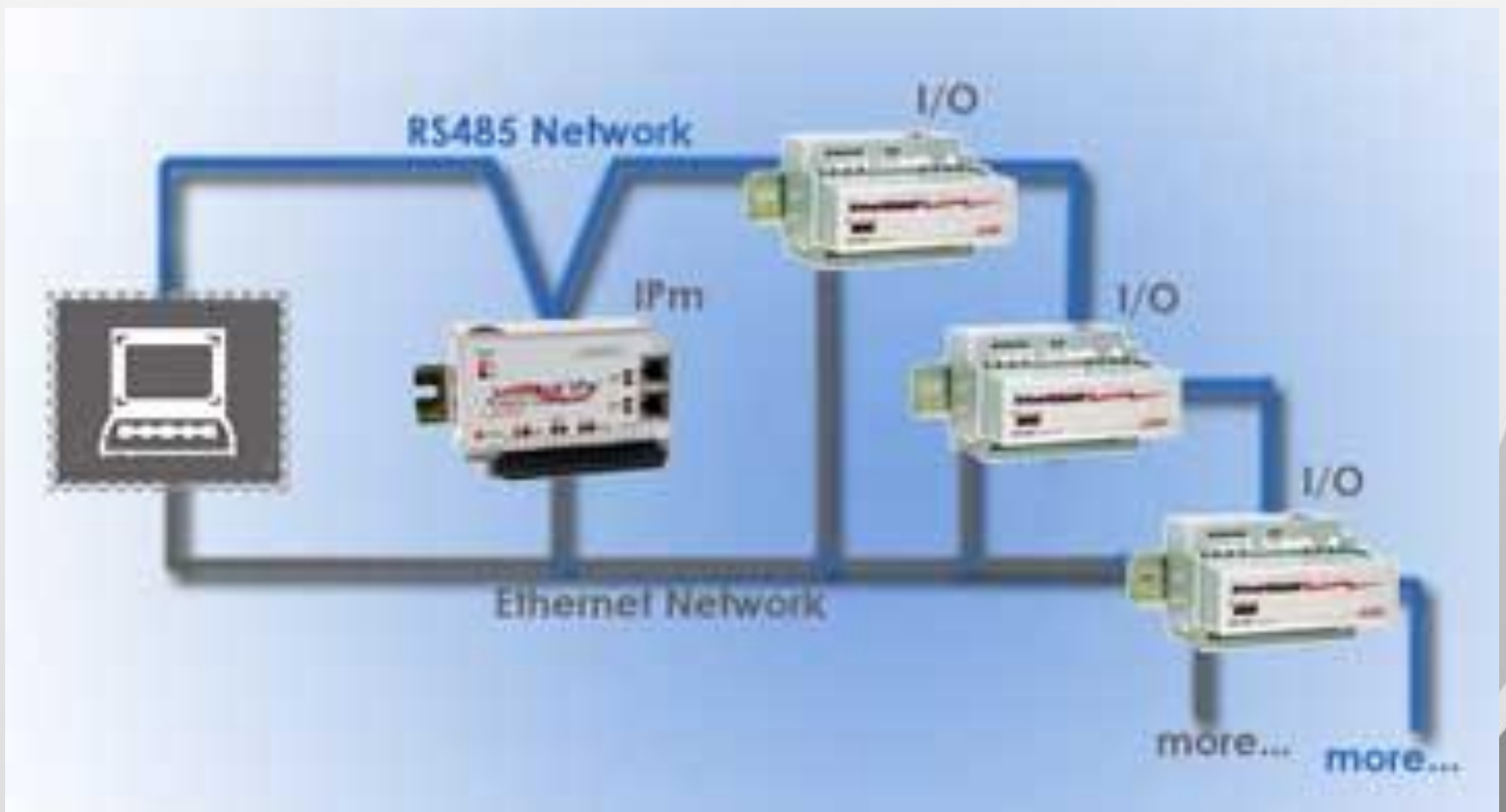
SIXNET IO Redundancy

- Begin with a typical redundant topology overview
 - ST IO
 - ET IO
- Focus on redundant SIXNET system
 - 1) I/O Network - E2 and Ring switches
 - Hands on training
 - 2) IPm redundancy – IPm, Tool Kit, ISAGRAF
 - Hands on training
 - 3) Combine the system

Typical Redundant System Topology



“ET” Serial I/O Ethernet & RS-485 redundancy



- Single Ethernet Port

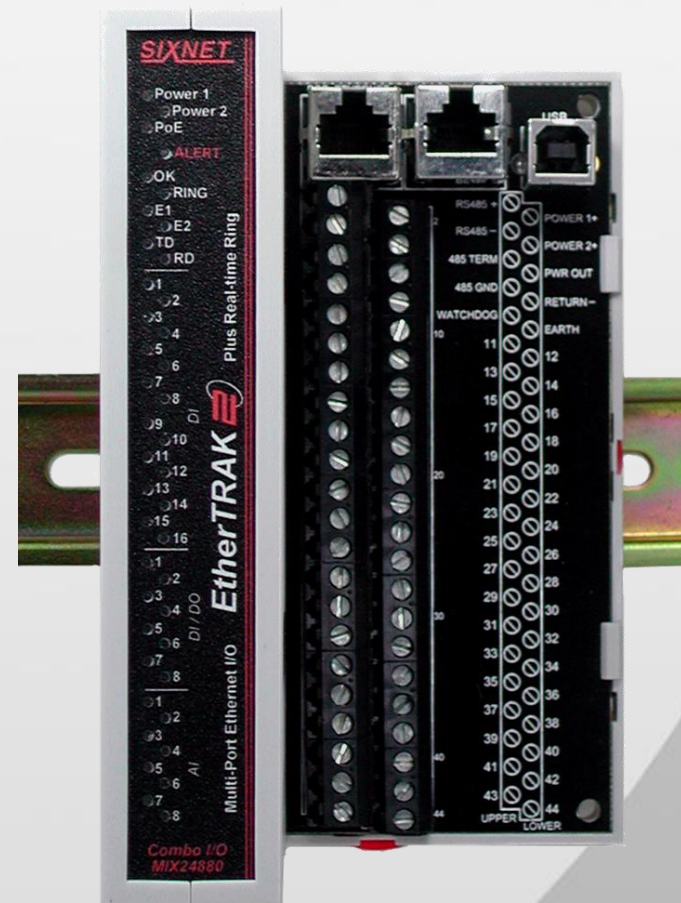
Maximum of 2 TCP/IP sessions supported

- Single RS-485 port

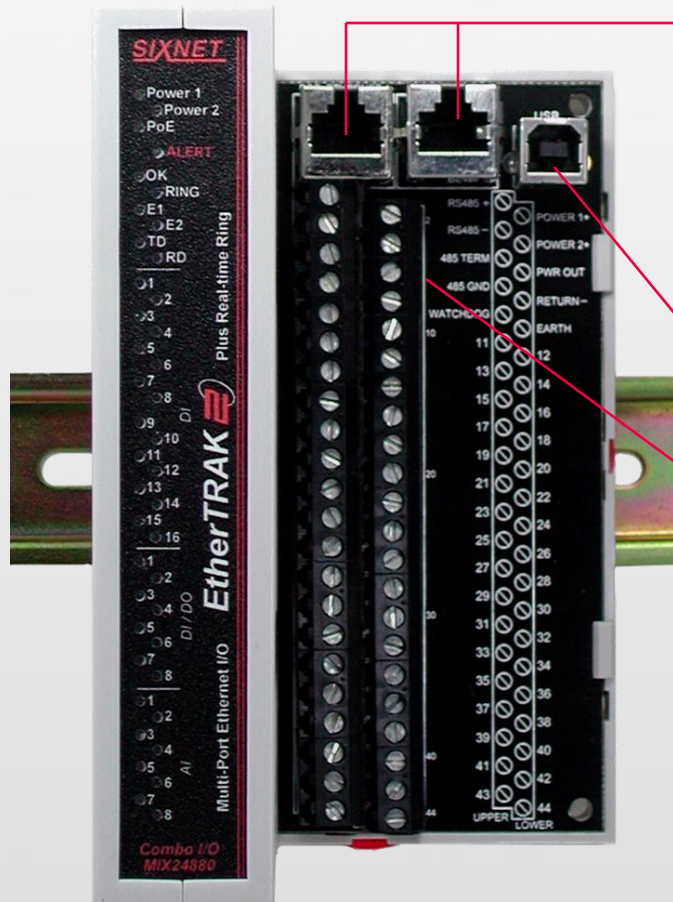
Daisy chain up to 32 modules

Note: SIXNET and Modbus protocol support on both ports

- Highly configurable
- Two Ethernet ports
- RS-485 port
- USB port (configuration & maintenance)
- High speed redundancy
- I/O update rates up to 1mS
- Web server configuration options for easy setup and maintenance

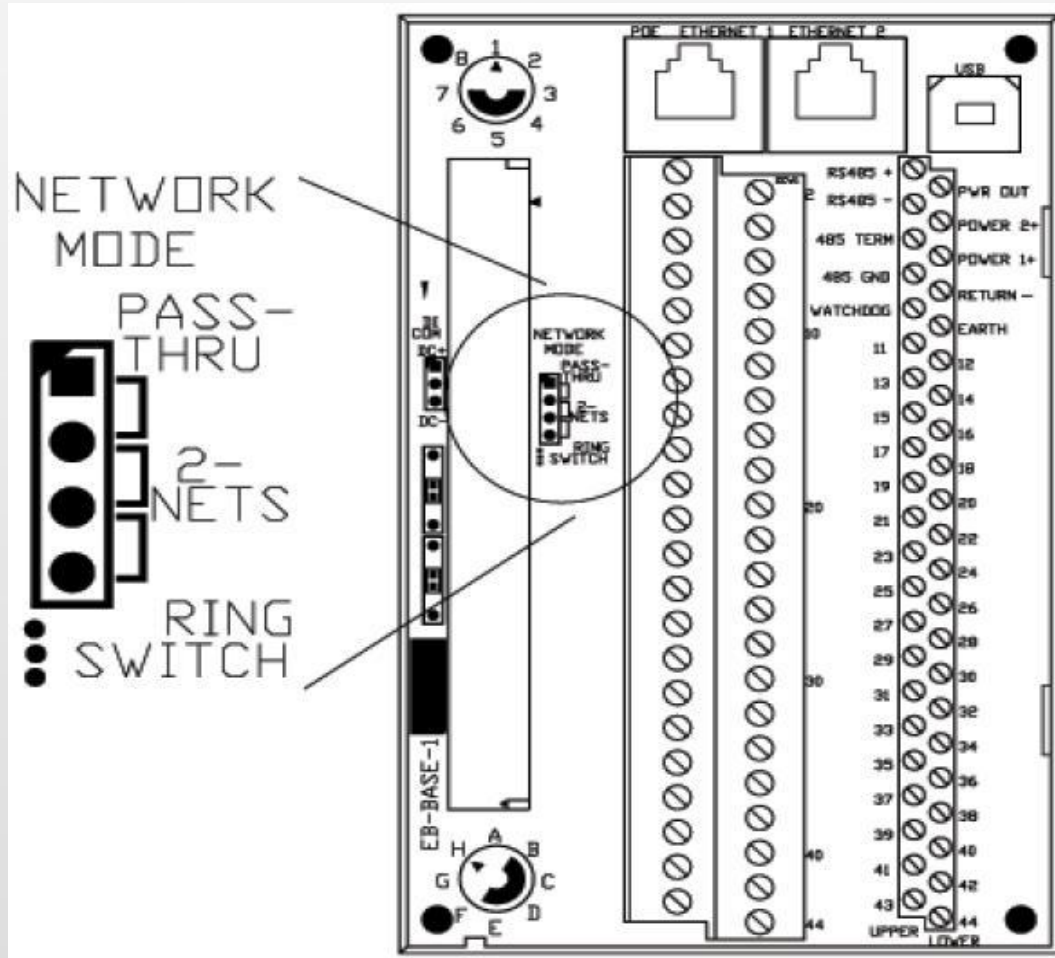


E2 I/O Network Modes



- Dual Ethernet Ports for:
 - Real-time Ring™ Switch Redundancy
 - “Passthru”
 - Dual Independent Networks
- USB port
- RS485 Port

- Jumper settings located on base
- Remove module to access jumpers
- Configure using project or web browser



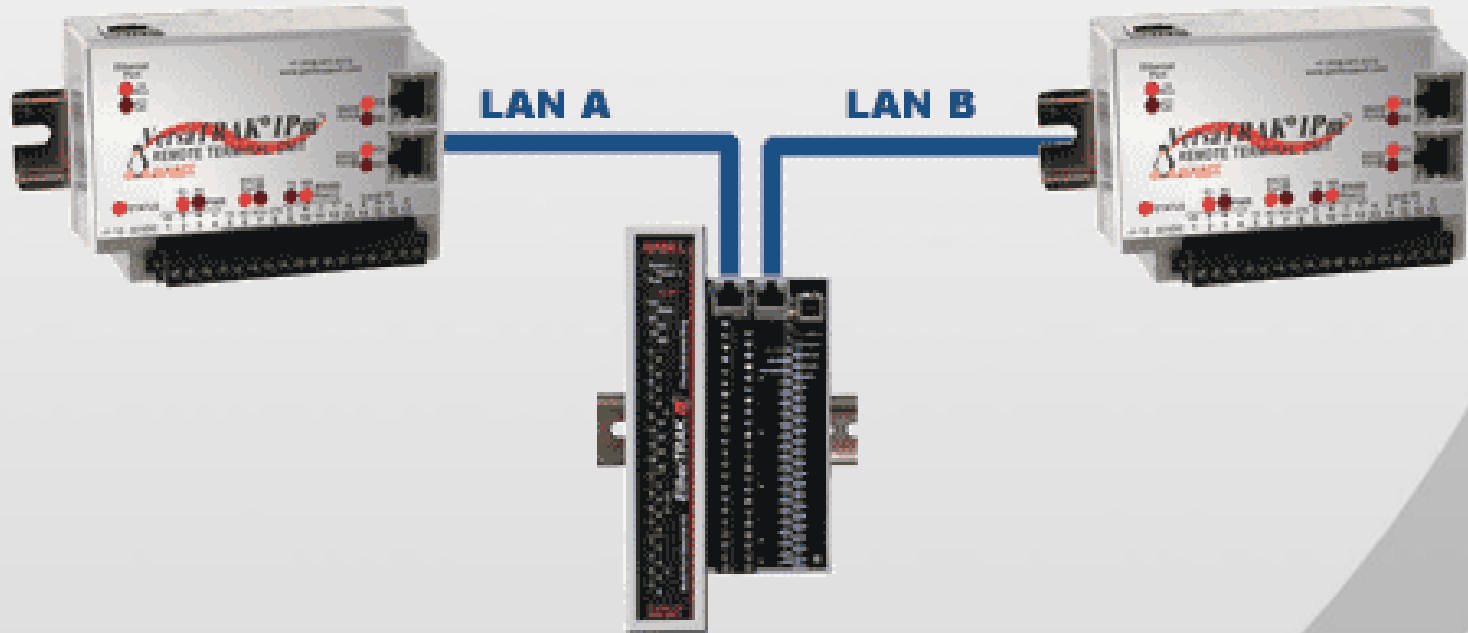
“Switch Elimination”

A real-time switch in the module passes Ethernet traffic between the two Ethernet ports. Saves Space because the I/O modules can be daisy-chained without the need for external switches.



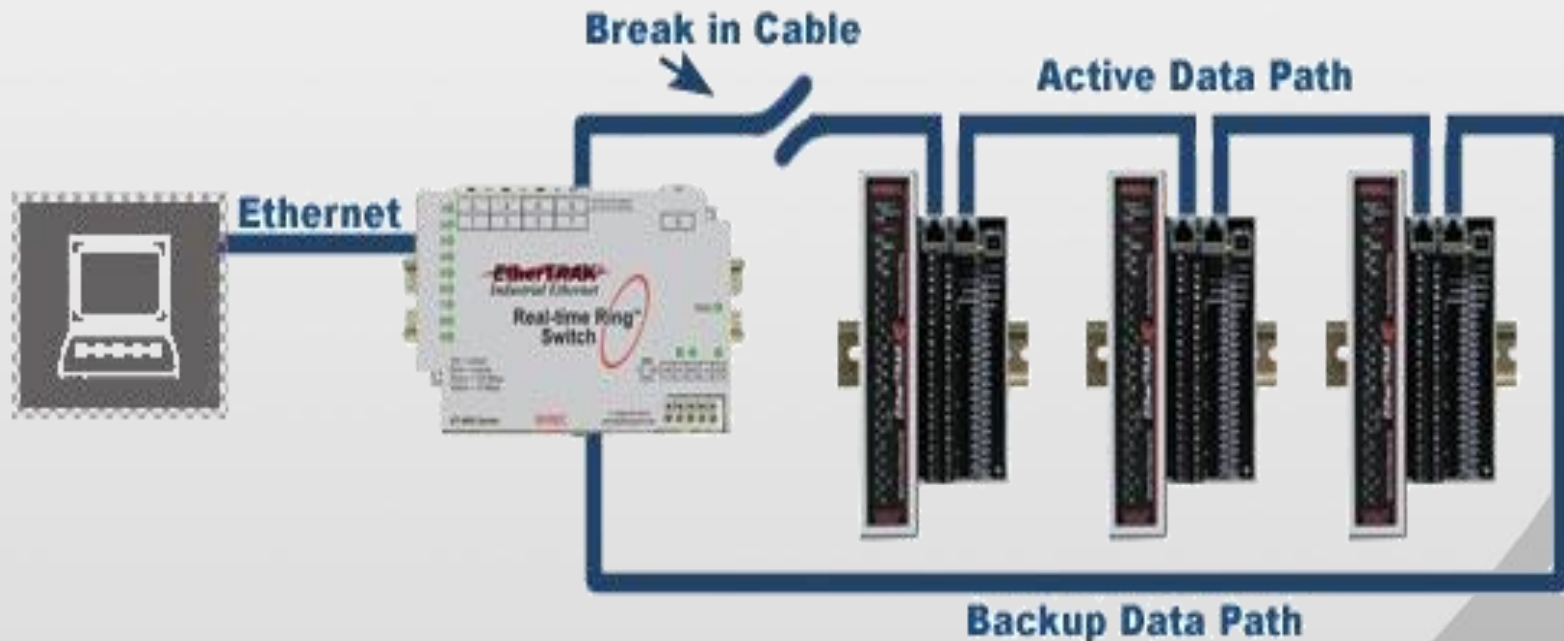
Two Networks Mode

- Each Ethernet port has unique MAC and IP addresses allowing you to connect the module to two independent physical networks.

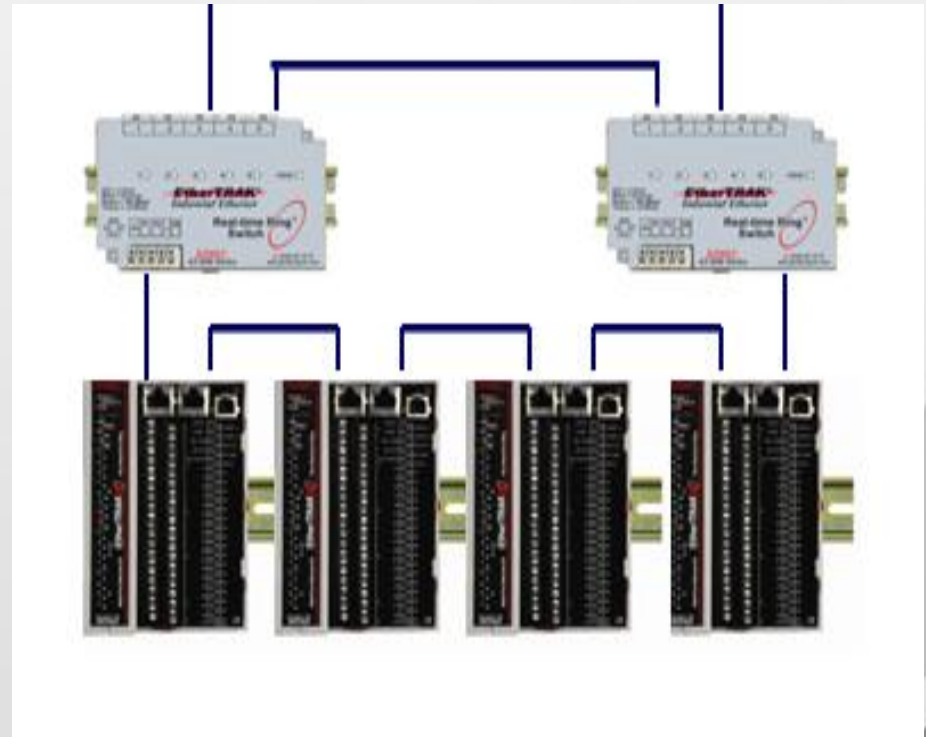


Ring Switch Mode

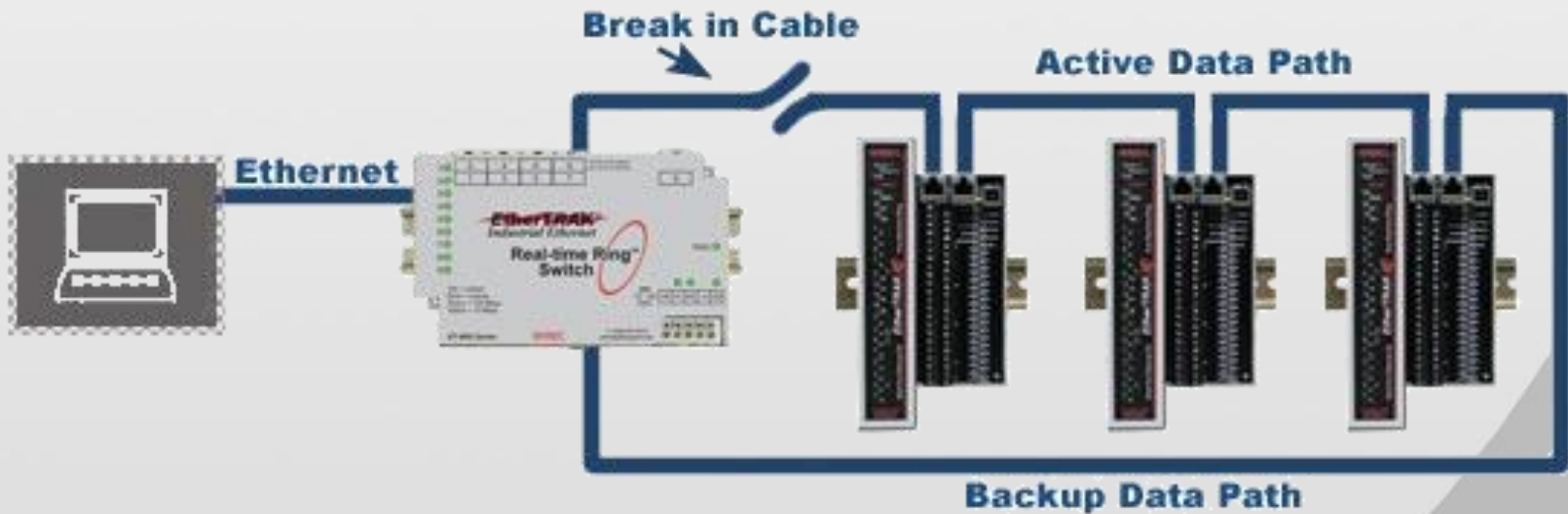
Connect the last device back to the first to form a Real-time Ring™ and create redundant Ethernet reliability



- Redundant Ring system topology
- Ideal solution for redundant I/O
- Designed with two Ring switches – No single point network failure!
-

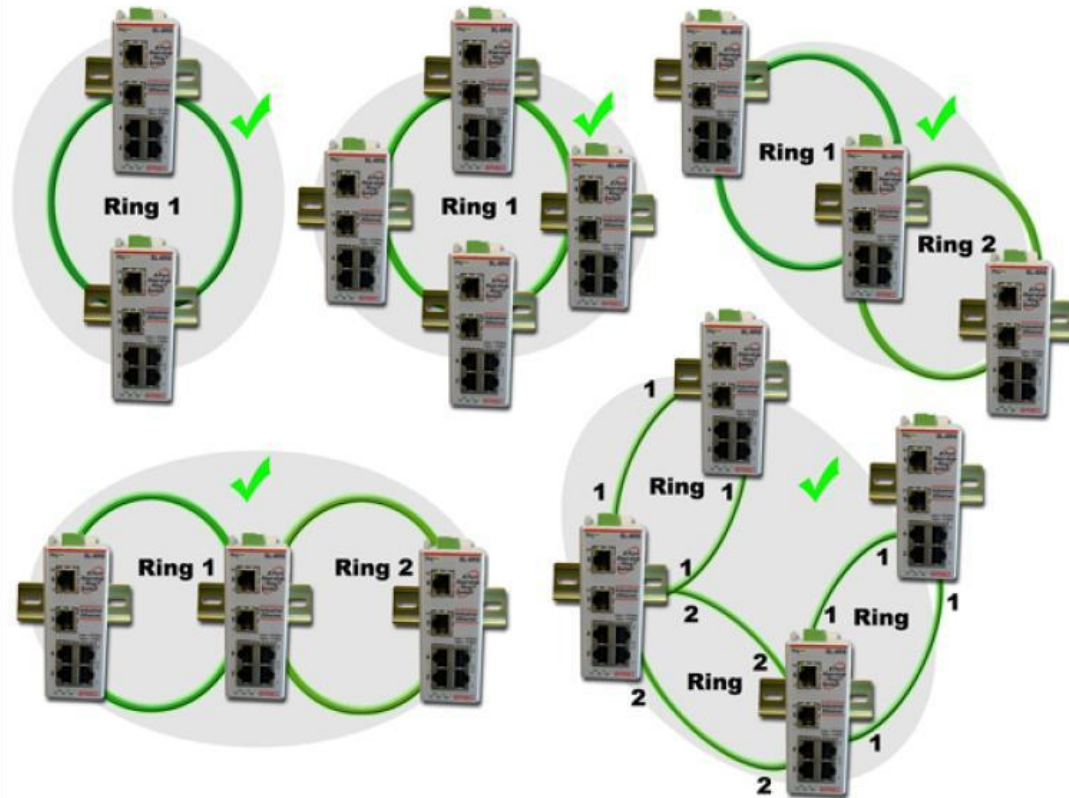


- Using only Ethernet cables
- Max distance between devices 300 feet
- Use fiber optic options for long distance distributed I/O



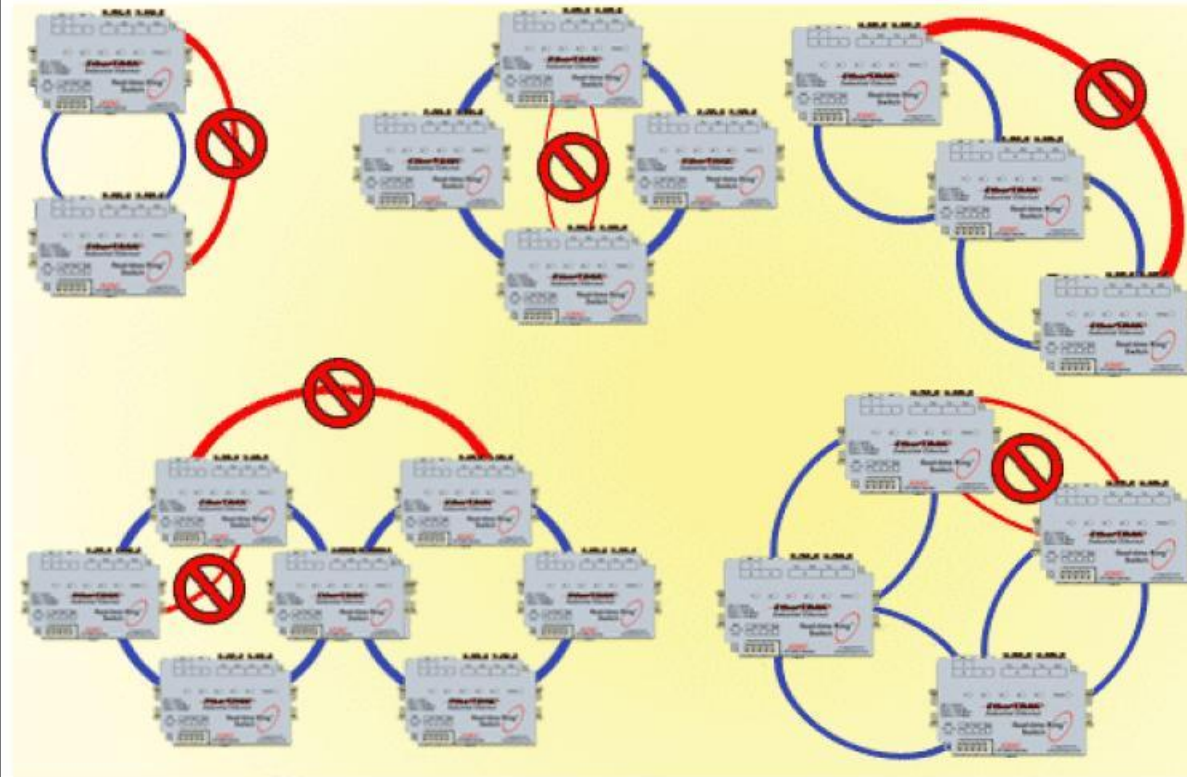
Valid Ring Topologies

Below are examples of how you should wire your Ring Switches together. In general, you should keep your topology simple.



Invalid Ring Topologies

The examples below are invalid ring topologies. Do NOT connect Ring Switches in the ways shown below, as they will lead to unpredictable network performance. Paths indicated by the color red create unintended rings (see unintended rings example below).





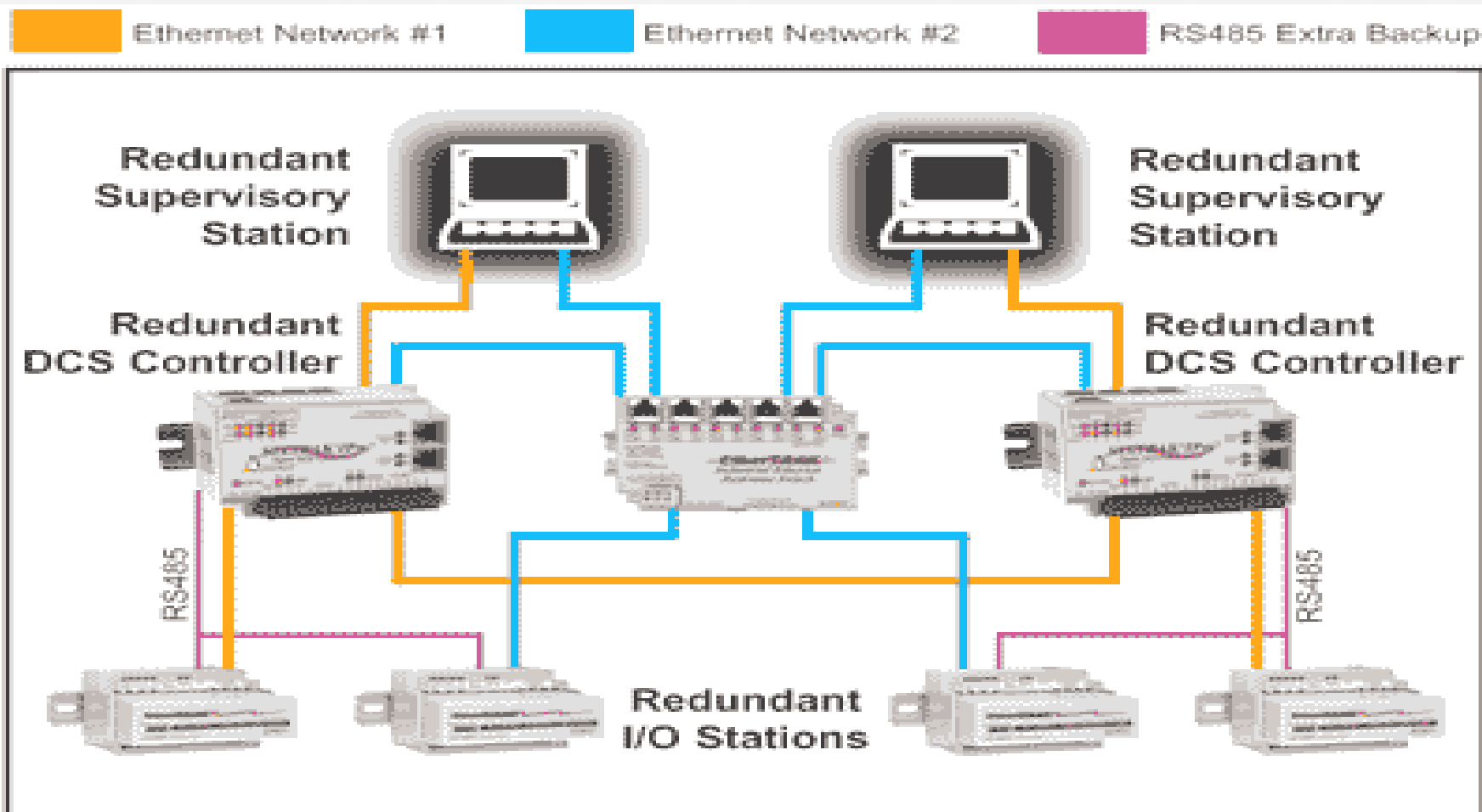
Managed and Ring switch integration

- The managed switch now has Real Time Ring support
- Connect a Ring Network to a managed network
- Maximizes Ring integration capabilities

- High speed redundancy = 30ms plus 5ms per hop
- Plug and play options for the Ring switches
- LED indicators = Identifies ring status (E2 & Ring switches)
- Modbus ring status monitoring (E2 & Ring switches)
- Priority Queuing (Ring switches)
- Port Mirroring (Ring switches)

You don't have to be a network administrator to setup a ring

- Any E2 network mode setup will support an additional level of redundancy – RS-485
- All ports will function simultaneously
- Use as a remote monitoring option
- Connect 3rd part devices to the RS-485 port on the E2 devices
(E2 supports built in communications)





Redundant Power supply Options

- E2 products – supports redundant power supply terminal
- IPM products – support redundant power supply terminal
- Ring Switches – support redundant power supply terminal

All product above Include:

- Power LED indicators for monitoring purposes