Ethernet Switches Tutorial

What is an Ethernet Switch?
An Ethernet switch is a device used to connect multiple PCs, Servers, Laptops or other Ethernet IP enabled devices such as IP cameras to a Local Area Network (LAN). Most switches feature 10/100 Mega bit per second RJ45 ports although many newer switch designs now offer 10/100/1000 triple speed ports that provide up to 1 Gigabit per second access. The switch uses a MAC address table to keep track of where PCs, servers or other connected devices are located. Each device has a unique MAC (Media Access Control) address “burned” into the hardware. For example; if a PC on port one needs to “talk” to a file server, the switch will look at its MAC address table and determine which port the file server is located on and send the PCs data to that port. This relieves network congestion. The older Hub technology used a shared communication method where all requests were sent to all ports of the hub causing latency.

How is an Ethernet Switch used?
Ethernet switches typically utilize RJ45 ports for UTP or STP connectivity to PCs, Servers, Routers etc. Many switches also feature high speed uplink ports where modules can be purchased to connect fiber optic or UTP cabling supporting speeds of 1 Gigabit per second or more. Cables are used to plug into the ports on the switch and then into the Ethernet device (PC, router etc.) on the other end.

Where are Ethernet Switches used?
Ethernet switches are utilized everywhere from Small Office/Home Office (SOHO) environments to major ISPs (Internet Service Providers) to military installations. Ethernet switches are used for both industrial and commercial applications.

What is Ethernet?
In the early 1980s, Digital Equipment Corporation, Intel, and Xerox developed the Ethernet Local Area Networking format. This technology was soon accepted by the IEEE Committee, creating the 802.3 standard. This standard dictates the use of CSMA/CD (Carrier Sense Multiple Access with Collision Detection) as its accessing scheme. Local Area Networks (LANs) use a variety of NICs (Network Interface Cards), hubs, transceivers, converters, repeaters & switches, as well as different types of transmission media (copper and fiber) for carrying signals.

Connectors Commonly Used in Ethernet Environments

<table>
<thead>
<tr>
<th>Connector Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10BASE-T</td>
<td>10 Mbps (100 Mbps)</td>
</tr>
<tr>
<td>100BASE-T</td>
<td>100 Mbps (1000 Mbps)</td>
</tr>
<tr>
<td>1000BASE-X</td>
<td>1000 Mbps (1 Gbps)</td>
</tr>
<tr>
<td>RJ45 JACK</td>
<td>100FX, 1000BASE-X, Dual Fiber LC, Dual Fiber SC plug</td>
</tr>
</tbody>
</table>

Managed and Unmanaged Ethernet Switches
Unmanaged Ethernet switches, typically referred to as “plug and play”, are easy to install but do not provide port level statics, management and control that are often required in larger networks where many switches are installed. Managed switches typically feature an SNMP agent that allows port level control and statistics such as collisions, packets in, packet out etc. Some Managed switches also feature filters where only certain device, PCs etc are allow to communicate on a certain port of the switch. By using managed switches a network administrator can see if a port may be malfunctioning and sending bad packet onto the network and shut that port off so the whole network does not go down.

Industrial Ethernet Switches
There is a class of Ethernet Switches referred to as Industrial Ethernet switches which are designed to work in harsh environments where extreme temperatures, vibration, dust and moisture are present. These Industrial rated switches generally have no moving parts such as fans and utilize components that are designed for extreme temperatures etc. In very moist environments or areas where condensation is present a conformal coating is sometimes used to cover the entire PCB to protect the components. Typical installations for Industrial Ethernet switches include manufacturing facilities, mining, oil production, power plants, waste water treatment plants and any other application where environmental extremes exist.

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Secure Switching

SwitchMaster® R1000, Network Backup RJ45 A/B Switch

SwitchMaster® R1000 A/B Network Switches are physical layer hardware devices that enable workstations or backbone connections to switch between network resources. Ideal for disaster recovery and network access control applications, SwitchMaster® R1000 switches can support RJ45 10/100 Ethernet connections. Standard configurations include 8 or 16 copper RJ45 ports in a 1U rack mount enclosure. User control of the SwitchMaster® is simple and can be established from anywhere in the world. Each unit is equipped with a front panel toggle switch that enables the user to gang switch all ports locally or independently control each port via the serial console port. Optional configurations include an Ethernet port enabling the user to control the unit anywhere in the world via an IP connection. All units incorporate proprietary latching relay technology. This failsafe technology maintains the connection patch even when power fails or has been removed. Custom configurations including fiber optic connections are also available. Contact L-com sales with your specific requirements.

<table>
<thead>
<tr>
<th>Item #</th>
<th>Description</th>
<th>List Price</th>
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<tr>
<td>5101020</td>
<td>SwitchMaster® R1000, NBS 8 Port, RJ45 A/B Switch</td>
<td>695.00</td>
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<tr>
<td>5101021</td>
<td>SwitchMaster® R1000, NBS, 16 Port, RJ45 A/B Switch</td>
<td>879.00</td>
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<tr>
<td>5101022</td>
<td>SwitchMaster® R1000, NBS, 8 Port, RJ45 A/B Switch with SNMP</td>
<td>879.00</td>
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<tr>
<td>5101023</td>
<td>SwitchMaster® R1000, NBS, 16 Port, RJ45 A/B Switch with SNMP</td>
<td>1095.00</td>
</tr>
</tbody>
</table>

SwitchMaster® R5000 Series Rack Chassis

SwitchMaster® R5000 A/B Network Switches are a physical layer hardware based solution supporting a variety of switching and network access control applications all in a compact chassis. Each chassis is capable of supporting up to 16 A/B switching modules and can be cascaded to build a system of up to 255 switched ports. Choose from a variety of off-the-shelf switching modules including Cat6, Fiber Optic, Video F-Connector and DB25 connections which can be mixed or matched in the same chassis. Failsafe operation is achieved by incorporating latching relay or micro mirror technology into the switching modules so data can continue to pass through the system even when power fails or has been removed. User control of the R5000 is simple, quick and flexible and can be established from anywhere in the world by choosing one of our controller modules for each chassis.

<table>
<thead>
<tr>
<th>Item #</th>
<th>Description</th>
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<tbody>
<tr>
<td>5000722</td>
<td>SwitchMaster® R5000 Series Rack Chassis</td>
<td>349.00</td>
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SwitchMaster® R5000 Series Controller and Switch Cards - DB25, SC or Category 6

<table>
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<tr>
<td>5100740</td>
<td>SwitchMaster® R5000, Single Slot Power Supply Card, w/Ext Power Supply</td>
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<td>5000764</td>
<td>SwitchMaster® R5000, Controller Card RS232</td>
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<td>5000765</td>
<td>SwitchMaster® R5000, Controller Card RS232 and SNMP</td>
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<td>SwitchMaster® R5000 Series DB25 A/B Switch Card</td>
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<td>5000792</td>
<td>SwitchMaster® R5000 Series Cat6, RJ45 A/B Switch Card</td>
<td>279.00</td>
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<tr>
<td>5000795</td>
<td>SwitchMaster® R5000, Video F-Connector A/B Switch Card</td>
<td>199.00</td>
</tr>
<tr>
<td>5000766</td>
<td>SwitchMaster® R5000, Blank Panel (1 Slot)</td>
<td>10.00</td>
</tr>
</tbody>
</table>

SecureSwitch® SC Fiber optic A/B/C Switch Revlon A Desktop or Rack Mount (EAL4+)

SecureSwitch® is an all optical switch that connects up to three different classified networks to a full-duplex common device. All optical switching is accomplished by using a proprietary mirrored switching mechanism that has been designed to provide a minimum of 75 db of isolation among all ports. Since there is no optical to electrical conversion, SecureSwitch® is completely transparent to optical signaling rates and protocols. A specialized latching control circuit insures data integrity through the device even when power fails or has been removed. Switching control between ports is fast and simple by selecting one of the three front panel switches. Front panel LED’s provide a quick visual indication of the selected connection. SecureSwitch® supports standard duplex ST or SC connectors and is available with a desktop enclosure or 1U rack mount chassis.

<table>
<thead>
<tr>
<th>Item #</th>
<th>Description</th>
<th>List Price</th>
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<tr>
<td>5101180</td>
<td>SecureSwitch® SC Fiber A/B/C Switch Rev A Desktop (EAL4+)</td>
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<td>5101183</td>
<td>SecureSwitch® SC Fiber A/B/C Switch Rev A Rack Mount (EAL4+)</td>
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</tbody>
</table>

L-com Category 6 A/B Network Switches

L-com’s Category 6 A/B Network Switches are physical layer hardware solutions which support a variety of switching, access and control applications, all in a compact desktop enclosure. These switch boxes feature a unique relay technology that supports the switching mechanism. Non-latching or latching relay configurations are available. The non-latching units provide automatic fail-over to the default Port A to C connection state when power fails or is removed. Latching relays provide the benefit of maintaining the flow of data between the selected connection even when power is removed. Additionally, all units incorporate a proprietary physical interface that enables these switch boxes to meet or exceed the stringent requirements of the Category 6 specification. This allows them to pass 10/100/1,000/10,000 Mbps Ethernet. Note: The Ethernet Control models may be controlled via telnet, web browser or SNMP. Custom configurations are available.

<table>
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<td>6100090</td>
<td>L-com CAT6 A/B Network Switch - Latching</td>
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<tr>
<td>6100091</td>
<td>L-com CAT6 A/B Network Switch - Non Latching</td>
<td>370.10</td>
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<tr>
<td>6100092</td>
<td>L-com CAT6 A/B Network Switch with Serial Control - Latching</td>
<td>408.65</td>
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<tr>
<td>6100093</td>
<td>L-com CAT6 A/B Network Switch with Serial Control - Non Latching</td>
<td>399.04</td>
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<td>6100094</td>
<td>L-com CAT6 A/B Network Switch with IP Ethernet Control - Latching</td>
<td>527.88</td>
</tr>
<tr>
<td>6100095</td>
<td>L-com CAT6 A/B Network Switch with IP Ethernet Control - Non Latching</td>
<td>516.27</td>
</tr>
</tbody>
</table>

Why Layer 1 Switching?

- Speed 10/100/1,000/10,000 Mbps - Our solutions support Category 6 and fiber optic connectivity. This means that we support today’s standards and tomorrow’s needs. (This is exclusive whereby no one in the market is able to do what we do).
- Future proof investment - today’s standards and tomorrow’s networks.
- Green solutions - use very little power.
- Secure solutions - all of these products are layer-1 hardware...they cannot be hacked like software.

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# Planet Ethernet Switches

**Planet 5 and 8 Port 10/100 Ethernet Switches**

Planet Economy Ethernet switches offer a cost effective way to set up a small network at home or in the office. The 5 and 8 Port switches are compact and easy to install. These switches feature 10/100Mb auto-negotiation, 1K MAC address table, and store and forward switching architecture ensuring optimum performance. Includes a 12VDC power supply.

- **SWTC-SW502** Planet 5 Port 10/100Mbps Fast Ethernet Switch 16.00
- **SWTC-SW802** Planet 8 Port 10/100Mbps Fast Ethernet Switch 20.00

**Planet 8 Port 10/100Mbps 1 Port 100FX Fast Ethernet Switch**

The Planet SWTC-PT801X Series Ethernet switches are a versatile and economical way to connect 8 10/100 RJ45 Copper ports to a fiber backbone or network via the built in fiber port. These switches are also rack mountable using optional 10-inch and 19-inch rack mount kits PT-RKE-10A and PT-RKE-10B (sold separately). These versatile switches feature automatic speed and duplex mode sensing, filtering/forwarding rates of 148,800pps for 100Mbps, 1,488,000pps for 10Mbps, IEEE 802.3x full duplex flow control, half-duplex back-pressure and MDI/MDIX auto-detection.

- **SWTC-PT8015C** Planet 8 Port 10/100Mbps - 1 Port 100FX MM SC Ethernet Switch 115.00
- **SWTC-PT8015ST** Planet 8 Port 10/100Mbps - 1 Port 100FX MM ST Ethernet Switch 115.00
- **PT-RKE-10A** Planet 10” Rack Mount Ears 5.00
- **PT-RKE-10B** Planet 19” Rack Mount Ears 7.50

**Planet 16 Port 10/100Mbps Fast Ethernet Switch**

The SWTC-PT1601 features 16 10/100Base TX ports that support auto-negotiation, half and full duplex operation as well as built in MDI/MDIX auto-detection for easy, plug and play connections. The high performance store and forward filtering and switching function ensures corrupt packets are not propagated through the network.

- **SWTC-PT1601** Planet 16 Port 10/100Fast Ethernet Switch 59.00

**Planet 24 Port 10/100Mbps Fast Ethernet Switch**

The SWTC-PT2401 is the perfect high density switching solution for today’s high performance Ethernet networks. The switch features 24 10/100Base-TX ports that support half and full duplex operation as well as auto-negotiation. High performance throughput (filtering/forwarding rate: 14,880 packets per second at 10Mbps, 148,800pps at 100Mbps) and dynamic shared memory buffer, enables the SWTC-PT2401 to boost bandwidth, eliminate unnecessary traffic and relieve network congestion.

- **SWTC-PT2401** Planet 24 Port 10/100Fast Ethernet Switch 79.00

**Planet 24 Port 10/100Mbps - 2 Port 10/100/1000 Gigabit Ethernet Switch**

The Planet SWTC-PT2620 26 port Fast Ethernet and Gigabit Ethernet switch provides 24 Fast Ethernet Switch ports and two Gigabit Ethernet 10/100/1000 switch. Each Fast Ethernet port supports 10/100Mbps and the two Gigabit Ethernet ports support 10/100/1000Mbps as well as Half/Full Duplex mode. With its 8.8Gbps non-blocking switch fabric, 8K MAC Address table, and 802.3x full-duplex flow control support, the SWTC-PT2620 offers wire-speed packet transfer performance without the risk of packet loss. MDI/MDX auto detection is provided for direct wire connection to any Ethernet device including switches, hubs, or workstations without requiring a crossover cable. By viewing the front panel LED indicators, users can easily monitor network connection status.

- **SWTC-PT2620** Planet 24 Port 10/100Fast Ethernet Switch Plus 2 Gig Port Ethernet Switch 139.00

**Planet 1000Base-SX/LX Mini-GBIC Modules**

The MOD-MGBP-SX and MOD-MGBP-LX provide flexible, high speed Gigabit access to the SWTC-PT2400 triple speed Gigabit Ethernet switch. These small form factor GBICs support either multimode or single mode fiber cabling with a maximum distance of 10km (MOD-MGBP-LX). These two Mini-GBIC interfaces are ideal for adding an uplink to a server or network backbone.

- **MOD-MGBP-SX** Planet 1000Base-SX Mini-GBIC Module, 550m 69.00
- **MOD-MGBP-LX** Planet 1000Base-LX Mini-GBIC Module, 10km 139.00

**Planet 10/100/1000Mbps Gigabit Ethernet Switch**

The Planet five and eight port Gigabit Ethernet switches deliver cost effective, versatile high speed IP data connectivity to the desktop or data closet. These switches feature a compact footprint as well as a non-blocking switching architecture that guarantees wire-speed packet transfer. The RJ45 copper interfaces support 10/100/1000Mbps auto-negotiation for optimal speed detection through RJ45 Category 6, 5 or 5e cables. MDI/MDX auto detection is provided for direct wire connection to any Ethernet device without requiring crossover cables. The switches also feature 802.3x, full duplex flow control.

- **SWTC-PTG803** Planet 5 Port 10/100/1000Mbps Gigabit Ethernet Switch 89.00
- **SWTC-PTG802** Planet 8 Port 10/100/1000Mbps Gigabit Ethernet Switch 99.00

**Planet 48 Port 10/100 Fast Ethernet Switch**

The Planet 48 port 10/100Base-TX Fast Ethernet Switch provides an economical and high performance Ethernet switching solution. With increasing bandwidth requirements for local area networks, Planet’s SWTC-PT4800 Fast Ethernet Switch is the ideal option to alleviate bottlenecks in client / server and peer-to-peer environments in a cost-effective way. This Switch provides a combination of 48 Fast Ethernet switching ports providing users with high-speed network connections. With its Auto-Negotiation capability, all the RJ45/STP ports can be configured to speeds of 10/20Mbps or 100/200Mbps automatically. In addition, this switch is equipped with the MDI/MDX auto-detection for easily plug and play connections, regardless of cabling types. Both straight through and crossover cables are supported. The high-performance throughput at filtering/forwarding rate is up to 14,880 packets per second in 10Mbps, and 148,800pps in 100Mbps. Along with its dynamic shared memory buffer, the SWTC-PT4800 can boost bandwidth, eliminate unnecessary traffic and relieve congestion on your critical server path.

- **SWTC-PT4800** Planet 48 Port 10/100 Fast Ethernet Switch 225.00
Hirschmann's new OpenRail line of managed industrial Ethernet switches takes advantage of evolving technologies by providing greater functionality and lower cost. These managed switches are an update to the RS2/Rail switches. The Rail family (RS2 & RS3) includes more port options with 4, 8, 16 or 24 Fast Ethernet ports and the option of two Gigabit Ethernet ports (RS30). These switches are available with a choice of “enhanced” or “professional” firmware. Users can decide which functionality their application requires and select the appropriate firmware option without having to pay for features they do not need. Features like IGMP Snooping and HIPER Ring are available in all OpenRail switches. These robust switches also feature a USB port for backing up and restoring the configuration using an Auto-Configuration Adapter or USB drive.

Hirschmann MICE managed modular 8 Port Ethernet/Fast Ethernet Rail Switch

Hirschmann Modular Industrial Communication Equipment (MICE) Ethernet/Fast Ethernet switches offer a unique combination of network management tools, redundancy features for high availability and modular media plug-ins for versatility. The compact switches are DIN Rail mountable, with redundant 24-volt power supplies and are compatible with 10BASE-T, 10BASE-FX, and 100BASE-TX and 100BASE-FX. The switches will accommodate twisted pair, single mode or multimode fiber optic connections. MICE switches are made up of an integrated backplane and a modular dock that accepts the various media modules. The switches support SNMP management, web-based management, port mirroring, port security, remote monitoring (RMON), bootstrap protocol (BootP), Dynamic Host Configuration Protocol (DHCP) and Hirschmann’s HIPER Ring. Hirschmann’s HIPER Ring provides high availability through self-healing ring redundancy. The switches’ rugged construction meets all standards for industrial Ethernet, making them suitable for applications where EMI interference, shock, vibration and temperature might otherwise cause concern.

Cable Types: Multimode or single mode fiber optics.

Ethernet Communications on the Plant Floor

The movement to utilize Ethernet connectivity standards on the plant floor is heavily underway. Suppliers of remote I/O devices are quickly changing from traditional RS485 ports to 10 or 100Mbps Ethernet ports. PLCs (Programmable Logic Controllers) are now equipped with Ethernet ports as standard equipment.

Industrial Railmounted Ethernet equipment is fairly new to the networking community. These products are designed and built to a higher standard of quality than their traditional RS485 port counterparts. These switches are compatible with 10/100TX, 100BASE-FX and 100BASE-TX with the option of two Gigabit Ethernet ports (RS30). These switches are available with a choice of “enhanced” or “professional” firmware. Users can decide which functionality their application requires and select the appropriate firmware option without having to pay for features they do not need. Features like IGMP Snooping and HIPER Ring are available in all OpenRail switches. These robust switches also feature a USB port for backing up and restoring the configuration using an Auto-Configuration Adapter or USB drive.
**Item #** | **Description** | **List Price**
--- | --- | ---
HIVIS OE 100 | 100 Nodes Industrial HiVision - Operator Edition | 1285.56
HIVIS OE 50 | 50 Nodes Industrial HiVision - Operator Edition | 899.17
HIVIS OE 10 | 10 Nodes Industrial HiVision - Operator Edition | 399.93
HIVIS OE 5 | 5 Nodes Industrial HiVision - Operator Edition | 299.93
HIVIS OE 2 | 2 Nodes Industrial HiVision - Operator Edition | 199.93
HIVIS OE 1 | 1 Node Industrial HiVision - Operator Edition | 99.93
RPS80-EEC | 24 VDC DIN Rail Power Supply, 3.4A | 188.93
RH1-CX+ | Hirschmann 10Mbps 4 Port BNC, Fiber ST, RJ45 24 VDC DIN Rail Hub | 617.93
RH1-TP | 4 Port DIN Rail Hub (4 10BASE-T Ports) | 305.93
SWTC-SPIDER3TX | Hirschmann Unmanaged SPIDER 3 Port 10/100 Ethernet Rail Switch | 123.93
SWTC-SPIDER4TX1FX | Hirschmann Unmanaged SPIDER 4 Port 10/100 1 Port 100FX Ethernet Rail Switch | 247.00
SWTC-SPIDER5TX | Hirschmann Unmanaged SPIDER 5 Port 10/100 Ethernet Rail Switch | 130.00
SWTC-SPIDER5TX | Hirschmann Unmanaged SPIDER 5 Port 10/100 Ethernet Rail Switch | 130.00
SWTC-SPIDER5TX | Hirschmann Unmanaged SPIDER 5 Port 10/100 Ethernet Rail Switch | 130.00
RS2-5TX | Hirschmann Industrial Switch 10/100Mbps 5-Port RJ45 | 339.73
RS2-TX | DIN Rail 10/100Base-TX Switch | 420.33
RPS30 | 24 VDC DIN Rail Power Supply, 5A | 396.67
RPS30-EEC | 24 VDC DIN Rail Power Supply, 3.4A | 188.93
RPS30-EEC | 24 VDC DIN Rail Power Supply, 3.4A | 188.93
RPS30-EEC | 24 VDC DIN Rail Power Supply, 5A | 396.67
RPS120-EEC | 24 VDC DIN Rail Power Supply, 13.3A | 117.00
RPS120-EEC | 24 VDC DIN Rail Power Supply, 13.3A | 117.00
HIVIS OE 50 | Industrial HiVision - Operator Edition, 50 Nodes | 899.17
HIVIS OE 100 | Industrial HiVision - Operator Edition, 100 Nodes | 1285.56
HIVIS OE 250 | Industrial HiVision - Operator Edition, 250 Nodes | 2057.43
HIVIS OE 500 | Industrial HiVision - Operator Edition, 500 Nodes | 2957.50
HIVIS OE 50 | Industrial HiVision - Operator Edition, 50 Nodes | 899.17
HIVIS OE 100 | Industrial HiVision - Operator Edition, 100 Nodes | 1285.56
HIVIS OE 250 | Industrial HiVision - Operator Edition, 250 Nodes | 2057.43
HIVIS OE 500 | Industrial HiVision - Operator Edition, 500 Nodes | 2957.50

"L-com’s e-mails pointing out answers to questions and getting people to start using your website as a knowledge based resource is an excellent marketing idea, but also an excellent resource. Educating our colleagues is a vital part of keeping our technological superiority over the competition whether it is business or national defense." - Joe Gannatal, Supervisory Electronics Engineer, U.S. Navy
Unicom's Unmanaged 10/100Mbps Ethernet Switches - 5 or 8 RJ45 Ports

The Mini-Switch 5 and 8 are super compact 10/100Base-TX switches. These parts represent the newest generation in Ethernet switching technology by supporting both 10 and 100Mbps speeds, half or full-duplex transmission modes and auto MDI/MDIX crossover checking. Units include a 9 VDC power supply.

Unicom's Unmanaged 10/100Mbps Ethernet Switches - 16 or 24 Ports

Unicom’s Dyna-Switch Series 16 and 24 port unmanaged Ethernet switches are an affordable and efficient way to upgrade a network. With sixteen or twenty-four 10/100Mbps ports with MDI/MDIX, these switches will fit neatly on a desktop or can be rack mounted with the included mounting brackets. With full duplex operation, the switches can increase the bandwidth of the 10Mbps Ethernet port and the 100Mbps fast Ethernet port to 20Mbps and 200Mbps, respectively. This switch supports IEEE 802.3 full-duplex flow control and half-duplex backpressure congestion control.

Unicom DynaGST 24 Port Gigabit Switch with SFP slots

The DynaGST 2402G Gigabit Ethernet switches are an ideal solution for solving traffic congestion at the core of the network. They offer auto-negotiating 10/100/1000Base-T Gigabit Ethernet ports that can significantly improve your network backbone performance. The DynaGST switches provide two mini GBIC Gigabit slots for Gigabit speed network connections. The DynaGST Gigabit Ethernet switches feature an Auto MDI/MDIX function for each port and support store-and-forward switching.

Unicom 24 Port 10/100/1000Base-T Managed Switch with 4 SFP Slots

Unicom’s SmartGST-2404GM managed switch is the newest generation of fast Ethernet switching technology. Twenty-four 10/100/1000Base-T auto sensing, auto MDI/MDIX ports provide a completely flexible high-performance non-blocking full wire speed solution. Enhanced by its many features including SFP GBIC ports, VLAN tagging, port trunking, spanning tree, and broadcast storm filters, this switch is an ideal solution for campus and enterprise networks.

Unicom 8 Port 10/100 Managed Switch with 1000Base-T Port and SFP Slot

Unicom's SmartGST-900M managed switch is the newest generation of fast Ethernet switching technology. Eight 10/100Base-TX auto sensing, auto MDI/MDIX ports provide a completely flexible high-performance non-blocking full wire speed solution. Enhanced by its many features including SFP GBIC port, one 1000Base-T port, VLAN tagging, port trunking, spanning tree, and broadcast storm filters, this switch is an ideal solution for campus and enterprise networks. The SmartGST-900M management features also include port-based, dynamic and static VLANs, GVRP, IGMP Snooping, port mirroring and port security. The SFP GBIC and 1000Base-T port offer high-speed long haul connections that eliminate bottlenecks to create the ideal backbone.

How auto-negotiation works

IEEE 802.3 NWay Auto-negotiation is a data communications protocol used with Ethernet switches, routers and media converters. The NWay protocol was developed so Ethernet devices, which support multiple transmission speeds such as a 10/100, can operate more efficiently. This protocol automatically selects the highest possible common transmission speed between two Ethernet switches, routers or media converters and automatically sets that speed on the port.

Benefits of using NWay Auto negotiation (also referred to as auto-sensing or auto-negotiation) include:

- Network connections that automatically choose the highest performance levels without the need for costly and time consuming manual port configurations.
- Guaranteed network uptime and resiliency. If the NWay protocol detects that a device that is being attached is not of the same technology (i.e. Token Ring to Ethernet connection) the port will not allow a connection or data transfer saving the network from potentially catastrophic downtime.
- NWay Auto negotiation is backward compatible with 10Mbps only Ethernet devices.

Prior to connecting a network device, the link, activity and speed LEDs are not lighted (inactive).

Upon connecting a network device to port 1 of the switch, NWay Auto-Negotiation automatically detects that the connected device is operating at 100Mbps and sets switch port 1 to that speed. The green 100 LED indicates this status.

When a network device is connected that is running at 100Mbps, the 100 LED indicator will not light up indicating NWay Auto Negotiation has set the local switch port to 10Mbps.

Item # | Description | List Price
---|---|---
GEP22000S-L GBIC SFP Transceiver, 1000SX, LC, Multimode, 500m | 99.00
GEP22000S-L GBIC SFP Transceiver, 1000SX, LC, Multimode, 500m | 99.00
GEP33224T-1 24 Port 10/100/1000Base-T with Two Slots for SFP (Mini) GBICs | 429.00
GEP33224T-1 24 Port 10/100/1000Base-T with Two Slots for SFP (Mini) GBICs | 429.00
GEP63109T 8 Port 10/100 Managed Switch with 1000Base-T Port and SFP Slot | 329.00
GEP63109T 8 Port 10/100 Managed Switch with 1000Base-T Port and SFP Slot | 329.00
GEP66424T 24 Port 10/100/1000Base-T Managed Switch with 4 SFP Slots | 479.00
GEP66424T 24 Port 10/100/1000Base-T Managed Switch with 4 SFP Slots | 479.00
FEP31024T Unicom 24 Port 10/100Mbps Unmanaged Ethernet Switch | 101.86
FEP31024T Unicom 24 Port 10/100Mbps Unmanaged Ethernet Switch | 101.86
SWTC-32005T Unicom 5 Port 10/100Mbps Unmanaged Ethernet Switch | 25.00
SWTC-32005T Unicom 5 Port 10/100Mbps Unmanaged Ethernet Switch | 25.00
SWTC-32008T Unicom 8 Port 10/100Mbps Unmanaged Ethernet Switch | 30.00
SWTC-32008T Unicom 8 Port 10/100Mbps Unmanaged Ethernet Switch | 30.00
SWTC-32005T Unicom 5 Port 10/100Mbps Unmanaged Ethernet Switch | 25.00
SWTC-32005T Unicom 5 Port 10/100Mbps Unmanaged Ethernet Switch | 25.00
SWTC-32008T Unicom 8 Port 10/100Mbps Unmanaged Ethernet Switch | 30.00
SWTC-32008T Unicom 8 Port 10/100Mbps Unmanaged Ethernet Switch | 30.00
GEP22100L-L GBIC SFP Transceiver, 1000LX, LC, Single mode, 10km | 199.00
GEP22100L-L GBIC SFP Transceiver, 1000LX, LC, Single mode, 10km | 199.00
GEP22000S-L GBIC SFP Transceiver, 1000SX, LC, Multimode, 500m | 99.00
GEP22000S-L GBIC SFP Transceiver, 1000SX, LC, Multimode, 500m | 99.00
GEP22100L-L GBIC SFP Transceiver, 1000LX, LC, Single mode, 10km | 199.00
GEP22100L-L GBIC SFP Transceiver, 1000LX, LC, Single mode, 10km | 199.00
GEP33224T-1 24 Port 10/100/1000Base-T with Two Slots for SFP (Mini) GBICs | 429.00
GEP33224T-1 24 Port 10/100/1000Base-T with Two Slots for SFP (Mini) GBICs | 429.00
GEP66424T 24 Port 10/100/1000Base-T Managed Switch with 4 SFP Slots | 479.00
GEP66424T 24 Port 10/100/1000Base-T Managed Switch with 4 SFP Slots | 479.00
GEP22000S-L GBIC SFP Transceiver, 1000SX, LC, Multimode, 500m | 99.00
GEP22000S-L GBIC SFP Transceiver, 1000SX, LC, Multimode, 500m | 99.00
GEP22100L-L GBIC SFP Transceiver, 1000LX, LC, Single mode, 10km | 199.00
GEP22100L-L GBIC SFP Transceiver, 1000LX, LC, Single mode, 10km | 199.00
Ethernet Switches > Linksys Ethernet Switches / Korenix Industrial Networking

**Links Ksys EtherFast® 10/100Mbps 5, 8 or 16 Port Workgroup Switches**

Links Ksys EtherFast 10/100Mbps workgroup switches allow quick and easy migration to fast Ethernet’s 100Mbps speed. Every switch includes a complete suite of advanced data error detection and correction features for surefire communication every time. Auto partitioning, data-collision control, signal regeneration and incoming frame retiming ensure that none of the data is lost, even during heavy network traffic. Available in 5, 8, or 16 port configurations.

- **SWTC-EF4124**: Linksys EtherFast 16 Port 10/100Mbps Ethernet Switch with Optional Module Slot (List Price: $89.00)
- **SWTC-EF4124**: Linksys EtherFast 24 Port 10/100Mbps Ethernet Switch with Optional Module Slot (List Price: $139.00)

**Links Ksys EtherFast® 10/100Mbps Ethernet Switches with Optional Fiber Module Slot**

Links Ksys EtherFast 4100 Series 10/100Mbps Ethernet switches will boost your network performance with full duplex data transfer and dedicated bandwidth. This series features non-blocking, wire-speed switching that forwards packets quickly. Address learning and aging and data flow control help prevent packet collisions and data transfer errors. The EtherFast 3100 series is rack mountable.

- **SWTC-EF4116**: Linksys EtherFast 16-Port 10/100Mbps Ethernet Switch (List Price: $89.00)
- **SWTC-EF4124**: Linksys EtherFast 24-Port 10/100Mbps Ethernet Switch (List Price: $139.00)

**Links Ksys EtherFast® 10/100Mbps Ethernet Switches**

Links Ksys EtherFast 3100 Series 10/100 Ethernet Switches will boost your network performance with full duplex data transfer and dedicated bandwidth. This series features non-blocking, wire-speed switching that forwards packets quickly. Address learning and aging and data flow control help prevent packet collisions and data transfer errors.

- **SWTC-SR2016**: Linksys 16 Port 10/100/1000 Rackmount Gigabit Ethernet Switch (List Price: $223.00)
- **SWTC-SD2008**: Linksys EtherFast 16-Port 10/100Mbps Ethernet Switch (List Price: $89.00)
- **SWTC-SD2005**: Linksys EtherFast 8-Port 10/100Mbps Ethernet Switch (List Price: $54.00)

**Korenix JetBox Industrial Computers**

The Korenix JetBox Series is the total solution for embedded computing. These RISC CPU based computers feature versatile peripheral interfaces, communication capabilities and storage expandability. The built-in OS (Linux, WinCE, or Windows XP embedded) supports services and daemons and provides application development tools for users to develop their own applications. These are only a few of the advantages of implementing a Korenix JetBox solution.

- **JETBOX 9300**: JetBox Industrial Computer (List Price: $1640.00)
- **JETBOX 9310**: JetBox Industrial Computer with 4 Port PoE (List Price: $1750.00)

**Korenix JetNet Industrial PoE Splitter 10/100/1000TX**

The JetNet Series from Korenix offers a variety of state-of-art managed and unmanaged Ethernet switches meeting all your industrial networking needs. These cost effective, rugged switches were designed for harsh applications such as manufacturing floors, processing plants, and other areas where commercial grade switches would fail.

- **JETNET 1701**: Industrial PoE Splitter 10/100/1000TX (List Price: $148.00)

**Korenix JetNet Industrial Switch 7 10/100TX,3 Gig RJ-45/SFP Combo**

Korenix’s JetNet is used to provide Ethernet LAN connectivity in harsh environments such as water treatment plants, manufacturing facilities and highway/tunnel systems. Auto MDI/MDI-X allows for cable flexibility. DIN Rail or wall mount options offers location flexibility. Dual power input DC12~48V.

- **JETNET 3010G**: Industrial Switch 7 10/100TX,3 Gig RJ-45/SFP Combo (List Price: $660.00)

**Korenix JetNet Industrial Switch 5 10/100TX PoE**

The JetNet Series from Korenix offers a variety of state-of-art managed and unmanaged Ethernet switches meeting all your industrial networking needs. These cost effective, rugged switches were designed for harsh applications such as manufacturing floors, processing plants, and other areas where commercial grade switches would fail.

- **JETNET 3705**: Industrial Switch 5 10/100TX PoE (List Price: $270.00)

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**Item # | Description | List Price**
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**JETNET 3705**
*JetNet 5 Port 10/100/1000 Desktop Gigabit Ethernet Switch* (List Price: $75.00)

**JETNET 3010G**
*JetNet 8 Port 10/100/1000 Desktop Gigabit Ethernet Switch* (List Price: $169.00)

**JETNET 1701**
*JetNet 16 Port 10/100/1000 Rackmount Gigabit Ethernet Switch* (List Price: $223.00)

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**Links Ksys EtherFast® 10/100Mbps 5, 8 or 16 Port Workgroup Switches**

**Links Ksys EtherFast® 10/100Mbps Ethernet Switches with Optional Fiber Module Slot**

**Links Ksys EtherFast® 10/100Mbps Ethernet Switches**

**Korenix JetBox Industrial Computers**

**Korenix JetNet Industrial PoE Splitter 10/100/1000TX**

**Korenix JetNet Industrial Switch 7 10/100TX,3 Gig RJ-45/SFP Combo**

**Korenix JetNet Industrial Switch 5 10/100TX PoE**

Free technical support
Call toll free at 1-800-343-1455
if you have questions about your application.
Power-over-Ethernet (PoE) 12 and 48 VDC Injectors

HyperLink offers a wide range of PoE injector styles including reverse polarity, 12 VDC and 48 VDC models. These PoE injectors can be used to connect PoE compliant devices such as access points, IP phones or wireless routers and supply data as well as power over a single CAT5 cable. Power-over-Ethernet eliminates the need for an AC outlet at each end device location. Only a single Ethernet cable is run to each device such as an access point instead of separate power and data cables. The injector is typically installed near the Ethernet switch.

**Innovations All-In-One Power Supply and Injector**

- **PS4820-POE**
  - 48 VDC, 20 W, Dual RJ45, Includes Power Cord
  - List Price: 39.99

- **PS4860-POE**
  - 48 VDC, 60 W, Dual RJ45, Requires PSCORD3
  - List Price: 74.99

**Innovations Injectors / Taps**

- **BT-CAT5-P1**
  - 5-48 VDC, 1 Port
  - List Price: 29.99

- **BT-CAT5-P1-4848**
  - 48 VDC, 1 Port, Includes 48VDC/48W Supply
  - List Price: 74.99

- **BT-CAT5-P1R**
  - 5-48 VDC, 1 Port, Reverse Polarity
  - List Price: 29.99

- **BT-CAT5-P1RA4848**
  - 48 VDC, 1 Port, Reverse Polarity, Includes 48VDC/48W Supply
  - List Price: 79.99

- **BT-CAT5-R1-12**
  - 12 VDC, 1 Port, Regulated
  - List Price: 59.99

**Innovations Accessories**

- **PSCORD3**
  - 3 Conductor Plug, USA/AC Power Cord, 1ft
  - List Price: 2.99

- **CA-CAT5-31**
  - CAT5 Ethernet Patch Cable, 1ft
  - List Price: 2.29

- **CA-CAT5-62**
  - CAT5 PoE Conversion Cable for Cisco APs, 2ft
  - List Price: 14.99

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**Transition Networks Redundant Fast Ethernet 100BASE-FX Adapter Cards**

Maintain network stability and reliability with a redundant NIC. Dual-port NICs provide redundancy and if port failure is detected, the auto-failover feature automatically transfers network communications to the secondary port without disrupting the network. Whether it's a desktop solution or network server, using a redundant NIC with auto-failover guarantees consistent reliable network performance.

- **NIC-NDFX-ST**
  - Transition Networks NIC Redundant 100FX ST Multimode
  - List Price: 459.00

- **NIC-NDFX-SC**
  - Transition Networks NIC Redundant 100FX SC Multimode
  - List Price: 459.00

- **NIC-NDFX-ST**
  - Transition Networks NIC Redundant 100FX ST Multimode
  - List Price: 459.00

**Planet 10/100Base-TX PCI Adapter with Wake On LAN**

The NIC-PT9503A 10/100 Ethernet adapter is designed for use with desktop PCs with 32-bit PCI expansion slots. This adapter supports both 10Base-T and 100Base-TX networks right out of the box. The adapters 10/100 RJ45 port automatically detects a network’s maximum speed and adjusts itself accordingly. Additionally, the adapter features Wake-On-LAN (WOL) event management.

- **NIC-PT9503A**
  - Planet 10/100Base-TX PCI Adapter RJ45
  - List Price: 12.95

**Planet 10/100Mbps Cardbus PCMCIA Ethernet Adapter**

The NIC-PT3504-FC can be used in any laptop computers 32 bit PCMCIA slot. This adapter features a single RJ45 port for connecting to Ethernet network devices. Additionally, this adapter complies with PCMCIA Release Type II and JEIDA v4.x standards. Support for auto negotiation as well as half and full duplex operation is included. The NIC-PT3504-FC is the perfect plug and play solution for your PCMCIA adapter needs.

- **NIC-PT3504-FC**
  - Planet 10/100Mbps Cardbus PCMCIA Ethernet Adapter
  - List Price: 19.95

**NETGEAR’s FA311 10/100Mbps Ethernet PCI Network Interface Card**

The NETGEAR Ethernet Network Card connects users to other networked computers, printers, zip drives, routers, network storage and the Internet. Plug it in and achieve high-speed 10/100Mbps transfer rates for data. NETGEAR’s single chip design improves the reliability and performance of the network card. Be prepared for the future with both 3.3v PCI and low-profile PCI capability - no upgrades required. All major operating systems are supported: Microsoft Windows, Microsoft NT, Novell NetWare, RedHat Linux and SCO OpenServer Unix.

- **NIC-FA311**
  - NETGEAR’s 10/100Mbps PCI NIC
  - List Price: 19.25

**NETGEAR’s FA511 10/100Mbps Cardbus 32-Bit NIC**

The NETGEAR 10/100Mbps Cardbus Mobile Ethernet Adapter provides laptops with 32-bit, Plug-and-Play, bus-mastering network connectivity. The FA511 auto-detects network speed without manual port reconfiguration. Since the Cardbus operates at a modest 3.3V, it conserves the laptop’s power consumption and extends battery life. The FA511 also supports full-duplex capabilities for a maximum throughput of 200Mbps.

- **NIC-FN511**
  - NETGEAR’s 10/100Mbps Cardbus 32-Bit Card
  - List Price: 39.00

**Linksys EtherFast® 10/100Mbps LAN PCI Card**

The Linksys EtherFast 10/100Mbps LAN Card is a high performance network adapter for desktop computers with 32-bit PCI expansion slots. The card’s 10/100Mbps combo RJ45 port automatically detects a network’s maximum speed and adjusts itself accordingly. This PC card also features Wake-On-LAN (WOL) event management. If the installed PCI motherboard has built-in WOL support, you’ll be able to remotely turn on that computer.

- **NIC-LNE100TX**
  - Linksys EtherFast 10/100Mbps LAN PCI Card
  - List Price: 21.00

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**For more useful information go to... www.L-com.com/Resources**

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