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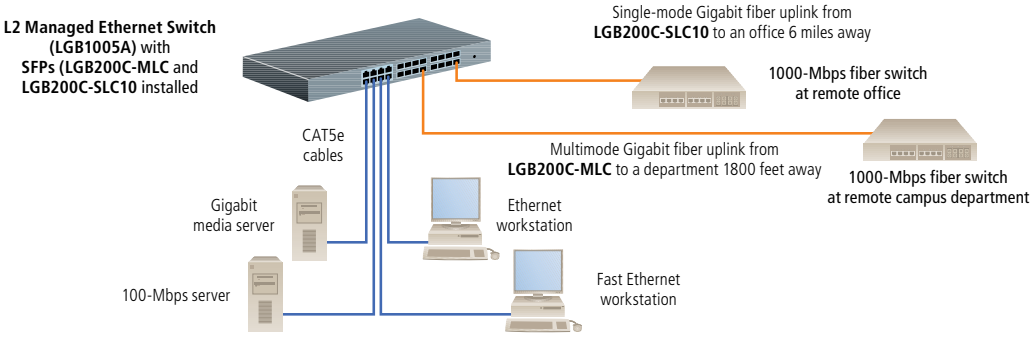
L2 Managed Ethernet Switch

Bring bandwidth flexibility to your mixed-speed environments—and add uplinks to fiber!

FEATURES

- Has eight 10/100/1000 twisted-pair ports and 16 SFP (Small Form-Factor Pluggable) slots.
- Add SFP modules to create uplinks to fiber optic segments.
- Supports all 802.3/u/x/z Ethernet, Fast Ethernet, and Gigabit Ethernet specifications.
- LACP aggregation enables you to bundle ports to create high-bandwidth links and higher availability.
- Ideal for real-time VoIP applications.
- Prioritize specific traffic using programmable QoS features.
- Manage and configure via an RS-232 serial connection or Web-based tools via an Ethernet connection.
- Extensive VLAN capabilities for increased security and traffic segmentation.
- Embedded 400 KB on-chip buffer and 8K MAC addresses.
- Supports SNMP and RMON management.
- Spanning Tree (802.1w) algorithms prevent network switching loops.
- RoHS compliant.

Switch between mixed-speed segments and high-speed Gigabit fiber segments.



OVERVIEW

Connect desktop computers to a workgroup and link your copper 10-/100-/1000-Mbps segments to a fiber optic Gigabit Ethernet backbone with the L2 Managed Ethernet Switch.

Highly suitable for both metropolitan area network (MAN) and office LAN applications, the switch features 8 1000BASE-TX copper and 16 SFP ports. Because it's compatible with IEEE 802.3u/x/z standards, you can integrate applications of varying speeds into your switching application.

Or, use the switch in a server farm environment to connect central servers and desktop workgroups to remote networks over a fiber optic backbone. You can even connect two peer networks.

The switch is a Layer 2 manageable device, offering management via an async console directly connected to its RS-232 port or through an Ethernet port using CLI or SNMP.

For easy integration into your network, the switch automatically negotiates the best speed and duplex values at both ends of the connection. And because its twisted-pair ports support MDI/MDI-X auto-crossover, you can use either straight-through or crossover cable for your network connections.

Connect fiber segments via SFP plug-in modules.

To establish high-speed 1000-Mbps uplinks, order an SFP module. We offer an 850-nm multimode model, a 1310-nm single-mode model, and a 1550-nm single-mode model.

The hot-swappable modules are easy to install. Just slide them into the switch's slot and connect the media cable. Because they're Layer 1 devices, the transceivers operate transparently.

Provide bandwidth where you need it.

The switch's bandwidth-management function enables you to set each port's ingress and egress bandwidth limit. And to allocate more bandwidth to a specific application, the switch has 802.3ad Link Aggregate Control Protocol (LACP) capabilities. This controls how physical link traffic is routed.

You can, for instance, combine Gigabit ports to create a multilink trunk for load sharing. This is particularly useful in switch-to-switch cascading applications requiring high full-duplex speeds. You can also bundle links into one logical link to create fault tolerance protection for your connections.

In addition to link capacity, you can also create higher availability. All traffic is aggregated based on MAC addresses, so traffic loads are balanced effectively.

For bandwidth aggregation, the switch supports two kinds of port trunking methods: LACP port trunking and static port trunking. Using LACP, a port makes an agreement with its peer port before it becomes a member of a trunk group. But with static port trunking, a port can immediately become a member of a trunk group without any handshaking with its peer port.

The switch supports a maximum of eight trunk groups for LACP and an additional eight trunk groups for static trunk. In total, up to 12 Gigabit ports can be set up per trunk for bandwidth up to 24 Gbps on the switch.

QoS for assigning priority to important traffic.

Along with Layer 2 802.1p Priority Queue control, the switch offers a much higher level of Quality of Service (QoS) support, so you can program a higher layer classification and prioritization for traffic in real-time applications.

The QoS port priority feature assigns each port a "high" or "low" priority in the transmitting of packets. For example, if the switch

transmits IP packets from Port 2 and Port 3 to Port 1 and you set the Class of Port 2 as "high" and Port 3 as "low," Port 3 packets will be dropped when congestion occurs.

Certain Layer 3 and Layer 4 classifications are also possible when assigning QoS. At Layer 3, you can define precedence based on the three bits within the ToS field of the IP frame header. At Layer 4, the switch allows prioritization of incoming packets on UDP/TCP ports. Following predefined QoS policies, you can give priority to Web browsing, e-mail, and FTP traffic, as well as VoIP telephony, iSCSI, streaming audio/video, or access to important SQL, Oracle, or other databases.

In addition, the switch lets you define weight classification of packet priority on the packet's VLAN tag (using one of the 4094 unique 12-bit VLAN IDs).

When using a VLAN tagged field to determine priority, three bits in the packet are arranged in eight possible traffic patterns, with "high priority" or "low priority" assigned to each.

Regardless of prioritization chosen, you can count on reliable voice and data as information travels from Layer 2 to Layer 4.

Isolate traffic through VLANs.

Because the switch supports up to 256 active VLANs, you can create virtual network segments that not only group users and ports logically across your enterprise, but by replacing a shared-hub architecture, they remove the physical barriers imposed by each wiring closet. Because traffic is isolated from different groups of users, you can ensure better security.

Specifically, the switch supports advanced 802.1Q, which limits broadcast traffic to within the same VLAN broadcast domain. And for enhanced security and performance, you can isolate traffic between different users using the switch's Q-in-Q VLAN feature.

You can set up VLANs using one of four VLAN modes:

- **Port-Based VLAN Mode**. Any packet coming in or out from any one port of a port-based VLAN will be accepted. Up to eight port-based VLAN groups are supported.
- **Tag-based VLAN Mode**. The VLAN identifies its member by VID. If there are additional rules in ingress or egress filtering lists, the packet is screened with the new filtering criteria to determine if it can be forwarded. Up to 64 tag VLAN groups can be created.
- **Metro Mode**. Quickly set up an environment that contains six or seven port-based VLAN groups.
- **Double-Tag Mode**. The switch treats all frames as untagged, so all incoming tagged packets become double-tagged packets.

For proper load balancing in VLAN applications, the switch uses an 802.1w Rapid Spanning Tree (RST) algorithm for creating a loop-free Layer 2 topology.

Control access and traffic for greater security.

The switch offers a number of security features, including 802.1x user authentication. This prevents unauthorized access via a network. You can also limit the number of MAC addresses assigned to each port.

For alarm notification, configure the switch to send an e-mail, mobile phone message, or both when up to 24 possible predefined trap events occur.

In addition, the switch offers Internet Group Management Protocol (IGMP) snooping capabilities. It establishes multicast groups to forward a multicast packet to the member ports. This preserves bandwidth when sending IP multicast packets over a network and keeps transmissions going only to ports that have requested them.

You can also restrict traffic using the switch's broadcast/multicast storm suppression. You control the rate limit for each of the switch's ports, setting threshold values that dictate at what count packets are to be discarded.

Plus, the switch can forward packets up to 9K in size before discarding them, so you're able to ensure reliable data transmission. Simply specify the maximum packet length that each switch port can accept (up to 1532 or 9208 bytes).

Highly manageable, stackable, and path-reliable.

Control the switch through a console connected via the included DB9 cable to its RS-232 serial port, as well as a Web-based management tool running an SNMP agent via one of its Ethernet ports. With the SNMP agent, you monitor, configure, and control each port's activity.

You can use the management software to access and control any one port on the switch for MIBs, spanning tree, and port-aggregation status, multicast traffic, VLAN, and priority status, and illegal reporting. Trap logs keep a record of traps occurring on the switch (up to 120 entries), displaying each trap event by time and type.

The switch's intelligent software offers per-port traffic monitoring counters, system information snapshot upon login capabilities, and port mirroring controls. Port mirroring copies traffic from a specific port to a target port, thus helping track network errors or abnormal packet transmission without interrupting the data flow across the network.

For greater port density, you can physically stack up to 16 L2 Managed Ethernet Switches and manage them all via one IP address using Virtual Stacking Management (VSM). In this configuration, the switches are seen as part of a logically segmented VLAN—an expanded network that doesn't require the expense or configuration of additional hardware to implement. With multiple switches grouped in a single LAN, one switch serves as the master machine and the others as slave devices.

For mission-critical applications, use multiple L2 Managed Ethernet Switches, configuring each with a redundant backup bridge path. Then, if a failure occurs on one switch, you'll still be able to guarantee the transmission and reception of packets via a secondary link on your network. In a VSM master-slave configuration, you can configure more than two devices as the master device for master redundancy.

LGB1005A

TECH SPECS

Access Control — 802.1x; Management Access Policy Control; SNMP v1, v2c network management
Bandwidth Control — Supports ingress, non-unicast, and egress bandwidth rating management with a resolution of 1 Mbps
Flow Control — 802.3x compliant for full duplex; backpressure flow control for half-duplex
Forwarding/Filtering Packet Rate — 1000 Mbps: 1,488,000 pps;
100 Mbps: 148,800 pps;
10 Mbps: 14,880 pps
Frame Buffer — 400 KB on-chip
MAC Addresses — 8K
MIB Files — Interface MIB, Address Translation MIB, Statistics Group 1, History Group 2, Alarm Group 3, Event Group 9, IP MIB, ICMP MIB, TCP MIB, UDP MIB, SNMP MIB, FC 1213 MIB (MIB-II), RFC 1757 RMON MIB, RFC 1493 Bridge MIB, RFC 1643 Ethernet MIB, Enterprise MIB
Protocols — LACP: Port trunking with 8 trunking groups, up to 12 ports for each group;
GVRP/GARP: 802.1q;
Multicasting: IGMP snooping including active and passive mode;
STP/RSTP: 802.1d/1w
QoS Supported — Layer 4 TCP/UDP port and ToS classification; 802.1p QoS with two-level priority queue; priority in a Q-in-Q tag
Standards — IEEE 802.3 (10BASE-T twisted-pair copper), IEEE 802.3u (100BASE-TX twisted-pair copper); IEEE 802.3ab (1000BASE-TX twisted-pair copper), IEEE 802.3z (1000BASE-SX/LX Ethernet), IEEE 802.3x flow control, ANSI/IEEE 802.3 autonegotiation, IEEE 802.1q VLAN
Switching Capacity — Non-blocking wire-speed performance; supports jumbo frame support up to 9K; broadcast/multicast storm suppression; port mirroring
Transmission Mode — 10-/100-Mbps support for full or half-duplex; 1000-Mbps support for full duplex only
User Controls — (1) Reset button
VLAN Capabilities — Port-based VLANs; IEEE 802.1q tag-based VLANs, up to 256 active VLANs; Q-in-Q for enabling subscriber aggregation
CE Approval — Yes
Connectors — Twisted-pair ports: (8) RJ-45;
SFP slots: (16) SFP ports for plugging in optional SFP modules;
Serial: (1) DB9 F (RS-232)
Indicators — LEDs: System: (1) Power;
(1) CPU (blinks when CPU is active);
Each twisted-pair port: (1) LINK/ACT (lights when connectivity with remote device is detected/blinks when traffic is detected),
(1) 10/100/1000 Mbps (lights green when 1000-Mbps speed is detected/lights amber when 100-Mbps speed is detected/off when 10-Mbps speed or no twisted-pair link is detected);
SFP fiber slots: (1) LINK/ACT (lights when good SFP connection with remote device is detected/blinks when any traffic is present)
Operating Environment — Temperature: 32 to 104°F (0 to 40°C);
Humidity: 5 to 90%, noncondensing
Power — Input: 100–240 VAC, 50–60 Hz, autosensing;
Consumption: 30 W
Size — 1.7"H x 17.4"W x 8.2"D (4.3 x 44.2 x 20.8 cm)
Weight — 6.6 lb. (3 kg) with unpopulated SFP fiber slots

What's included

- ✦ L2 Managed Ethernet Switch
- ✦ (1) AC power cord
- ✦ (1) DB9 female to DB9 female RS-232 cable
- ✦ Rackmount kit with mounting ears and hardware
- ✦ (4) rubber feet
- ✦ CD-ROM containing a user manual
- ✦ Printed quick-start guide

Item	Code
L2 Managed Ethernet Switch, (8) 1000BASE-TX Copper + (16) SFP Slots	**LGB1005A**
For fiber uplinks via the SFP slots, add multiple modules…	
850-nm Multimode Gigabit SFP Module	**LGB200C-MLC**
1310-nm Single-Mode Gigabit SFP Module	**LGB200C-SLC10**
1550-nm Single-Mode Gigabit SFP Module	**LGB200C-SLC30**

NOTE: For a full list of compatible BLACK BOX® SFP Modules, contact our FREE Tech Support.