BLACK BOX®

LMC1003A-R3
LMC1004A-R3
LMC1009A-R3
LMC1012A

FlexPoint™ Gx

Description:
The FlexPoint Gx converts between 1000Base-X (Sx/Lx) Gigabit Ethernet fiber and 1000Base-T twisted pair (RJ45 UTP) cabling. The fiber optic (F/O) port supports Auto-Negotiation (AN) which automatically detects and advertises the Duplex and Pause ability of the connected remote device. The multimode (MM) and single-mode (SM) models are described here:

Model	Fiber	Distance
LMC1003A-R3	850nm,MM,SC	220m* / 720 ft.
LMC1004A-R3	1310nm,SM,SC	10km / 6.2 mi.
LMC1009A-R3	1310nm,SM,LC	10km / 6.2 mi.
LMC1012A	850nm, MM, LC	220m* / 720 ft.

* Distances for multimode are dependent on fiber cable used:
OM1 62.5 micron, 220 m; OM2 50 micron, 550m

Power Adapter Notice:
1. When using in a stand-alone configuration, this product is intended to be and must be used only with a Listed Direct Plug-In Power Unit marked "Class VI" and rated at 9Vdc, 1 Amp.

2. This product should only be used with Black Box Supplied Power Unit.

> **WARNING!**
> **Before inserting the Power Adapter, verify that the power on the unit is appropriate for your AC line voltage source.**

Mounting and Cable Attachment:
The FlexPoint Gx can be mounted standalone using a wall-mounting kit or a DIN-rail bracket. It can also be rack-mounted using a 5-unit shelf or a high-density 14-unit FlexPoint Powered Chassis. An 18-60VDC power adapter is available for standalone or DIN-rail mounted applications.

Attach the FlexPoint Gx UTP via a category 5 or higher cable to a 1000Base-T Ethernet device. Attach the FlexPoint Gx fiber via a single-mode or multimode (as needed) cable to a 1000Base-X Gigabit Ethernet device (make sure to use the correct wavelength source for the model being used). The FlexPoint transmit (Tx) must attach to the receive side on the other device; the receive (Rx) must attach to the transmit.

DIP-Switch Settings:
F/O Auto-Negotiation "Auto-Neg/Manual" DIP-Switch:
When the FlexPoint Gx is connected to a UTP device and a F/O device, the F/O Auto-Negotiation transparently allows the two devices to negotiate Duplex and Pause modes with each other.

Setting this DIP-switch to "Auto-Neg" (factory default) enables the FlexPoint Gx's F/O port to detect the Duplex and Pause modes of the connected F/O device. The FlexPoint Gx's UTP port then negotiates with the connected UTP device based on the modes detected by the F/O port. Both the FlexPoint Gx and the connected F/O device must have their Auto-Negotiation enabled for this process to work.

Setting this DIP-switch to "Manual" will disable the F/O port's ability to detect the Duplex and Pause modes of the connected F/O device. The FlexPoint Gx's UTP port negotiates with the connected UTP device based on the modes configured by the UTP "Full-Duplex/Half-Duplex" and "Pause Enable/Pause Disable" DIP-switches.

Note that in F/O Auto-Negotiation (AN) mode, connecting the F/O cables before connecting the UTP cables causes the F/O LED to blink steadily. The blinking LED turns solid when the UTP Link is on.

Note that when F/O Auto-Negotiation is in the "Enable" position, all the other DIP-switches have no effect when the links are established.

UTP "Full-Duplex/Half-Duplex" DIP-Switch:
This DIP-switch has no affect if the FlexPoint Gx is in F/O AN mode. This DIP-switch configures the Duplex capability when the UTP port is Auto-Negotiating with the connected UTP device. Setting the DIP-switch to "Full-Duplex" (factory default) allows the UTP port to Auto-Negotiate to Full-Duplex or Half-Duplex. Setting the DIP-switch to "Half-Duplex" forces the UTP port to Auto-Negotiate only to Half-Duplex.

UTP "Pause Enable/Pause Disable" DIP-Switch:
This DIP-switch has no affect if the FlexPoint Gx is in F/O AN mode. This DIP-switch configures the Pause capability when the UTP is Auto-Negotiating with the connected UTP device based on the modes detected by the F/O port. Both the FlexPoint Gx and the connected F/O device must have their Auto-Negotiation enabled for this process to work.

Setting this DIP-switch to "Manual" will disable the F/O port's ability to detect the Duplex and Pause modes of the connected F/O device. The FlexPoint Gx's UTP port negotiates with the connected UTP device based on the modes configured by the UTP "Full-Duplex/Half-Duplex" and "Pause Enable/Pause Disable" DIP-switches.

connected UTP device. Setting the DIP-switch to "Pause Enable" (factory default) allows the UTP port to Auto-Negotiate to Symmetrical and Asymmetrical Pause. Setting the DIP-switch to "Pause Disable" forces the UTP port to Auto-Negotiate only to No Pause.

"Link Prop./Link Isolate" DIP-Switch:
This DIP-switch has no affect if the FlexPoint Gx is in F/O AN mode. Setting this DIP-switch to "Link Prop." allows the link state to propagate from the UTP port to the F/O port, and allows the link state to propagate from the F/O port to the UTP port. The loss of a receive link on the F/O port causes the transmit link of the UTP port to be turned off, and the loss of a receive link on the UTP port causes the transmit link on the F/O port to be turned off.

This allows the loss of a link to be propagated and detected by SNMP or other managed network devices to which the FlexPoint Gx is connected.

Only the first loss of a receive link detected by the FlexPoint Gx turns off the transmit link of the other port. An additional loss of receive link on the other port has no effect to the FlexPoint Gx. The FlexPoint Gx returns to normal operation when the first loss of receive link is restored.

When set to "Link Isolate" (factory default), the generation and detection of link presence is done at each point-to-point segment. Loss of a receive link on any port has no effect on transmit signals of the other port.

LED Indicators:

LED	Color	Status	Description
Power	Amber	On	Power applied
FDX/HDX	Amber	On	UTP Full-Duplex
		Off	UTP Half Duplex
F/O Link/Rx	Green	On	Fiber Link
		Flash	Data received
		Blink (1Hz)	**In F/O "Auto-Neg." mode:** Fiber cable connected, but Fiber Link disabled due to UTP or return Fiber Link not ready
		Off	No Fiber Link
UTP Link/Rx	Green	On	UTP Link
		Flash	Data received
		Blink (1Hz)	**In F/O "Manual" mode w/ "Link Prop.":** UTP cable connected, but UTP Link disabled due to loss of Fiber Rx
		Off	No UTP Link

Specifications:

Description	1000Base-T UTP to 1000Base-X Fiber Converter with Auto-Negotiation
Protocols	802.3ab, 1000Base-T, 1000Base-X
UTP Cable Type	EIA/TIA 568A/B Category 5 and higher
Fiber Cable Type	Multimode:50/125,62.5/125 um Single-mode: 9/125 um
UTP Connector Type	RJ45
Fiber Connector Type	Dual fiber: SC, LC
Controls	DIP-Switches, LED Display
Power Requirements	
AC Adapter Input [US]	120VAC 240mA 60Hz
AC Adapter Input [Universal]	100-250VAC 500mA 50-60Hz
DC Adapter Input (Model LMC204A) [Optional]	18-60VDC
Dimension (WxDxH)	W:4.6" x D:3.3" x H:0.85"
Weight	6 oz.
Compliance	UL, CE, FCC Class A
Temperature	
Operational	0 to +50ºC
Storage	-50 to +80ºC
Humidity (non-condensing)	0% to 95%
Altitude [ft]	Up to 10,000
MTBF [hrs]	850,000
MTTR	5 min.

FEDERAL COMMUNICATIONS COMMISSION AND CANADIAN DEPARTMENT OF COMMUNICATIONS RADIO FREQUENCY INTERFERENCE STATEMENTS

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to be cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numéirques de las classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par le ministère des Communications du Canada.

NORMAS OFICIALES MEXICANAS (NOM)
ELECTRICAL SAFETY STATEMENT

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc.
6. El aparato eléctrico debe ser usado únicamente con carritos o pedelstales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra or superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u ostros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.
12. Precación debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:
    A: El cable de poder o el contacto ha sido dañado; u
    B: Objectos han caído o líquido ha sido derramado dentro del aparato; o
    C: El aparato ha sido expuesto a la lluvia; o
    D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
    E: El aparto ha sido tirado o su cubierta ha sido dañada.

LED Indicators:

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		Off	UTP Half Duplex
F/O Link/Rx	Green	On	Fiber Link
		Flash	Data received
		Blink (1Hz)	**In F/O "Auto-Neg." mode:** Fiber cable connected, but Fiber Link disabled due to UTP or return Fiber Link not ready
		Off	No Fiber Link
UTP Link/Rx	Green	On	UTP Link
		Flash	Data received
		Blink (1Hz)	**In F/O "Manual" mode w/ "Link Prop.":** UTP cable connected, but UTP Link disabled due to loss of Fiber Rx
		Off	No UTP Link

Specifications:

Description	1000Base-T UTP to 1000Base-X Fiber Converter with Auto-Negotiation
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Weight	6 oz.
Compliance	UL, CE, FCC Class A
Temperature	
Operational	0 to +50ºC
Storage	-50 to +80ºC
Humidity (non-condensing)	0% to 95%
Altitude [ft]	Up to 10,000
MTBF [hrs]	850,000
MTTR	5 min.

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This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of the Canadian Department of Communications.

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15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.
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> **WARNING!**
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DIP-Switch Settings:
F/O Auto-Negotiation "Auto-Neg/Manual" DIP-Switch:
When the FlexPoint Gx is connected to a UTP device and a F/O device, the F/O Auto-Negotiation transparently allows the two devices to negotiate Duplex and Pause modes with each other.

Setting this DIP-switch to "Auto-Neg" (factory default) enables the FlexPoint Gx's F/O port to detect the Duplex and Pause modes of the connected F/O device. The FlexPoint Gx's UTP port then negotiates with the connected UTP device based on the modes detected by the F/O port. Both the FlexPoint Gx and the connected F/O device must have their Auto-Negotiation enabled for this process to work.

Setting this DIP-switch to "Manual" will disable the F/O port's ability to detect the Duplex and Pause modes of the connected F/O device. The FlexPoint Gx's UTP port negotiates with the connected UTP device based on the modes configured by the UTP "Full-Duplex/Half-Duplex" and "Pause Enable/Pause Disable" DIP-switches.

Note that in F/O Auto-Negotiation (AN) mode, connecting the F/O cables before connecting the UTP cables causes the F/O LED to blink steadily. The blinking LED turns solid when the UTP Link is on.

Note that when F/O Auto-Negotiation is in the "Enable" position, all the other DIP-switches have no effect when the links are established.

UTP "Full-Duplex/Half-Duplex" DIP-Switch:
This DIP-switch has no affect if the FlexPoint Gx is in F/O AN mode. This DIP-switch configures the Duplex capability when the UTP port is Auto-Negotiating with the connected UTP device. Setting the DIP-switch to "Full-Duplex" (factory default) allows the UTP port to Auto-Negotiate to Full-Duplex or Half-Duplex. Setting the DIP-switch to "Half-Duplex" forces the UTP port to Auto-Negotiate only to Half-Duplex.

UTP "Pause Enable/Pause Disable" DIP-Switch:
This DIP-switch has no affect if the FlexPoint Gx is in F/O AN mode. This DIP-switch configures the Pause capability when the UTP is Auto-Negotiating with the connected UTP device. Setting the DIP-switch to "Pause Enable" (factory default) allows the UTP port to Auto-Negotiate to Symmetrical and Asymmetrical Pause. Setting the DIP-switch to "Pause Disable" forces the UTP port to Auto-Negotiate only to No Pause.

"Link Prop./Link Isolate" DIP-Switch:
This DIP-switch has no affect if the FlexPoint Gx is in F/O AN mode. Setting this DIP-switch to "Link Prop." allows the link state to propagate from the UTP port to the F/O port, and allows the link state to propagate from the F/O port to the UTP port. The loss of a receive link on the F/O port causes the transmit link of the UTP port to be turned off, and the loss of a receive link on the UTP port causes the transmit link on the F/O port to be turned off.

This allows the loss of a link to be propagated and detected by SNMP or other managed network devices to which the FlexPoint Gx is connected.

Only the first loss of a receive link detected by the FlexPoint Gx turns off the transmit link of the other port. An additional loss of receive link on the other port has no effect to the FlexPoint Gx. The FlexPoint Gx returns to normal operation when the first loss of receive link is restored.

When set to "Link Isolate" (factory default), the generation and detection of link presence is done at each point-to-point segment. Loss of a receive link on any port has no effect on transmit signals of the other port.