BLACK BOX®
NETWORK SERVICES

LMC100A-SC-R2	LMC100A-RJ-R2
LMC100AE-SC-R2	LMC100AE-RJ-R2
LMC100A-SMSC-R2	LMC100A-SMSC-XLH-R2
LMC100AE-SMSC-R2	LMC100AE-SMSC-XLH-R2
LMC100A-R2	LMC100A-SMRJ-R2
LMC100AE-R2	LMC100AE-SMRJ-R2
LMC100A-SM-R2	LMC100A-SMSC-SLH-R2
LMC100AE-SM-R2	LMC100AE-SMSC-SLH-R2
LMC100A-SMSC-LH-R2	LMC100A-LC
LMC100AE-SMSC-LH-R2	LMC100AE-LC
	LMC100A-SMLC
	LMC100AE-SMLC

FlexPoint™ 10/100

Overview and Description:

The FlexPoint 10/100 converts between Fast Ethernet fiber 100Base-Fx and 10Base-T or 100Base-Tx twisted pair (RJ45 UTP) cabling. It operates in half duplex (HD) or full duplex (FD).

The following FlexPoint 10/100 models are described here:

Model	Fiber Type	Distance
LMC100A-SC-R2	1310nm, MM, SC	2km / 1.2 mi.
LMC100AE-SC-R2	1310nm, MM, SC	2km / 1.2 mi.
LMC100A-SMSC-R2	1310nm, SM, SC	28km / 17.4 mi.
LMC100AE-SMSC-R2	1310nm, SM, SC	28km / 17.4 mi.
LMC100A-R2	1310nm, MM, ST	2km / 1.2 mi.
LMC100AE-R2	1310nm, MM, ST	2km / 1.2 mi.
LMC100A-SM-R2	1310nm, SM, ST	28km / 17.4 mi.
LMC100AE-SM-R2	1310nm, SM, ST	28km / 17.4 mi.
LMC100A-SMSC-LH-R2	1310nm, SM, SC	58km / 35 mi.
LMC100AE-SMSC-LH-R2	1310nm, SM, SC	58km / 35 mi.
LMC100A-RJ-R2	1310nm, MM, MTRJ	2km / 1.2 mi.
LMC100AE-RJ-R2	1310nm, MM, MTRJ	2km / 1.2 mi.
LMC100A-SMSC-XLH-R2	1550nm, SM, SC	85km / 52.8 mi.
LMC100AE-SMSC-XLH-R2	1550nm, SM, SC	85km / 52.8 mi.
LMC100A-SMRJ-R2	1310nm, SM, MTRJ	28km / 17.4 mi.
LMC100AE-SMRJ-R2	1310nm, SM, MTRJ	28km / 17.4 mi.
LMC100A-SMSC-SLH-R2	1550nm, SM, SC	110km / 68 mi.
LMC100AE-SMSC-SLH-R2	1550nm, SM, SC	110km / 68 mi.
LMC100A-LC	1310nm, MM, LC	2km / 1.2mi.
LMC100AE-LC	1310nm, MM, LC	2km / 1.2mi.
LMC100A-SMLC	1310nm, SM, LC	28km / 17.4mi.
LMC100AE-SMLC	1310nm, SM, LC	28km / 17.4mi

Installation and Configuration:

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 2" and rated at 9VDC, 1 Amp.
2. This product should always be used only with the Supplied Power Unit.

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

Mounting and Cable Attachment:

The FlexPoint 10/100 can be solo-mounted using a wall-mounting kit, or rack-mounted using a 5-position shelf or a high-density 14-unit FlexPoint Powered Chassis.

Attach the FlexPoint 10/100 UTP via a category 5 cable to a 10Base-T or 100Base-Tx Ethernet device. Attach the FlexPoint 10/100 fiber via cable to a 100Base-Fx Fast Ethernet device. The FlexPoint transmit (Tx) must attach to the receive side on other device; the receive (Rx) must attach to the transmit.

Switch Settings:

"RJ45 Cross-Over" Switch:

When connecting the UTP to a hub or switch, set switch to "Straight-Through" (factory setting). When connecting to a workstation, set it to "Cross-Over."

"UTP Auto/UTP Manual" Switch:

Setting the switch to "Auto" (factory setting) enables the UTP port to determine the speed and duplex mode automatically. If the connected device cannot provide the proper signal to indicate its own mode of operation, the "Manual" switch should be used. This feature allows connections with devices that do not auto-negotiate properly.

"UTP 10/UTP 100" Switch:

When the "Auto/Manual" switch is in "Manual" position, the "UTP 10/UTP 100" switch determines the speed of operation for the UTP port. When set to "UTP 100" (factory setting), the UTP port will operate at 100 Mbps. When set to "UTP 10" the UTP port will operate at 10 Mbps. Adjust the 10/100 Mbps switch to the speed of the connecting device and check for link status.

"UTP Full Duplex/UTP Half Duplex" Switch:

When the "Auto/Manual" switch is in "Manual" position, the "UTP Full Duplex/UTP Half Duplex" switch determines the duplex operation mode for the UTP port. When set to "Full Duplex" (factory setting), the UTP port will operate in full duplex. When set to "Half Duplex" the UTP port will operate in half duplex. Adjust the half/full-duplex switch to accommodate the connecting device and check for link status.

Half duplex must be used when connecting to a hub. Full duplex should be used when connecting switches or between a switch and a full-duplex workstation.

"Fiber Full Duplex/Fiber Half Duplex" Switch:

Since the IEEE 802.3 standard defines the Ethernet 10Base-FL fiber differently than the Fast Ethernet 100Base-Fx, it should be noted that they are incompatible. The FlexPoint 10/100 supports 100Base-Fx only. It operates in a half- or full-duplex mode of operation. This switch controls the half/full-duplex operation of the fiber port.

Half duplex should be used when connecting to a hub (with a shared/non-switched fiber port) or a workstation that supports only half-duplex. Full duplex can be used when connecting to a switch or a workstation that supports full-duplex operation.

LED Indicators:

LED	Color	Description
Power:	Yellow	Power applied
UTP Auto:	Green	Auto-Negotiation enabled
UTP FDx:	Green	Full-Duplex detected
UTP Link:	Green	Link / Data received
UTP 10:	Yellow	10 Mbps link detected
UTP 100:	Green	100 Mbps link detected
Fiber FDx:	Green	Full-Duplex selected
F/O Link:	Green	Link / Data received

SPECIFICATIONS:

- **Protocol:** IEEE 802.3
- **Connectors & Cables:**
  Twisted Pair UTP: RJ45, Category 5 or higher
  Fiber: SC, ST or MT-RJ
  Multimode: 50/125, 62.5/125, 100/140μm
  Single-mode: 9/125μm

- **Supported Distances:**

	Half-Duplex	Full-Duplex
Twisted Pair UTP:	100m/328ft.	100m/328ft.
MM 1310nm fiber:	412m/1,350ft.	2km/1.2mi.
SM 1310nm fiber:	412m/1,350ft.	28km/16.8mi.
SM 1310nm LH fiber:	412m/1,350ft.	58km/36mi.
SM 1310nm XLH fiber:	412m/1,350ft.	85km/52.8 mi.
SM 1310nm SLH fiber:	412m/1,350ft.	110km/68.4 mi.

- **Dimensions / Weight:** W:3.0"xD:4.0"xH:1.0" / 6oz.
- **Power:** 9VDC/500mA or 5VDC/750mA
- **Temperature:** 0 to 40 degrees C
- **Humidity:** 0-90% (non-condensing)

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 les 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 conectado 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 física 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:

LED	Color	Description
Power:	Yellow	Power applied
UTP Auto:	Green	Auto-Negotiation enabled
UTP FDx:	Green	Full-Duplex detected
UTP Link:	Green	Link / Data received
UTP 10:	Yellow	10 Mbps link detected
UTP 100:	Green	100 Mbps link detected
Fiber FDx:	Green	Full-Duplex selected
F/O Link:	Green	Link / Data received

SPECIFICATIONS:

- **Protocol:** IEEE 802.3
- **Connectors & Cables:**
  - **Twisted Pair UTP:** RJ45, Category 5 or higher
  - **Fiber:** SC, ST or MT-RJ
    - **Multimode:** 50/125, 62.5/125, 100/140µm
    - **Single-mode:** 9/125µm
- **Supported Distances:**

	Half-Duplex	Full-Duplex
Twisted Pair UTP:	100m/328ft.	100m/328ft.
MM 1310nm fiber:	412m/1,350ft.	2km/1.2mi.
SM 1310nm fiber:	412m/1,350ft.	28km/16.8mi.
SM 1310nm LH fiber:	412m/1,350ft.	58km/36mi.
SM 1310nm XLH fiber:	412m/1,350ft.	85km/52.8 mi.
SM 1310nm SLH fiber:	412m/1,350ft.	110km/68.4 mi.

- **Dimensions / Weight:** W:3.0"xD:4.0"xH:1.0" / 6oz.
- **Power:** 9VDC/500mA or 5VDC/750mA
- **Temperature:** 0 to 40 degrees C
- **Humidity:** 0-90% (non-condensing)

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 les 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 pedestales 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 de 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 o 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 física 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.

LMC100A-SC-R2
LMC100AE-SC-R2
LMC100A-SMSC-R2
LMC100AE-SMSC-R2
LMC100A-R2
LMC100AE-R2
LMC100A-SM-R2
LMC100AE-SM-R2
LMC100A-SMSC-LH-R2
LMC100AE-SMSC-LH-R2

LMC100A-RJ-R2
LMC100AE-RJ-R2
LMC100A-SMSC-XLH-R2
LMC100AE-SMSC-XLH-R2
LMC100A-SMRJ-R2
LMC100AE-SMRJ-R2
LMC100A-SMSC-SLH-R2
LMC100AE-SMSC-SLH-R2
LMC100A-LC
LMC100AE-LC
LMC100A-SMLC
LMC100AE-SMLC

FlexPoint™ 10/100

Overview and Description:

The FlexPoint 10/100 converts between Fast Ethernet fiber 100Base-Fx and 10Base-T or 100Base-Tx twisted pair (RJ45 UTP) cabling. It operates in half duplex (HD) or full duplex (FD) mode.

The following FlexPoint 10/100 models are described here:

Model	Fiber Type	Distance
LMC100A-SC-R2	1310nm, MM, SC	2km / 1.2 mi.
LMC100AE-SC-R2	1310nm, MM, SC	2km / 1.2 mi.
LMC100A-SMSC-R2	1310nm, SM, SC	28km / 17.4 mi.
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LMC100A-R2	1310nm, MM, ST	2km / 1.2 mi.
LMC100AE-R2	1310nm, MM, ST	2km / 1.2 mi.
LMC100A-SM-R2	1310nm, SM, ST	28km / 17.4 mi.
LMC100AE-SM-R2	1310nm, SM, ST	28km / 17.4 mi.
LMC100A-SMSC-LH-R2	1310nm, SM, SC	58km / 35 mi.
LMC100AE-SMSC-LH-R2	1310nm, SM, SC	58km / 35 mi.
LMC100A-RJ-R2	1310nm, MM, MTRJ	2km / 1.2 mi.
LMC100AE-RJ-R2	1310nm, MM, MTRJ	2km / 1.2 mi.
LMC100A-SMSC-XLH-R2	1550nm, SM, SC	85km / 52.8 mi.
LMC100AE-SMSC-XLH-R2	1550nm, SM, SC	85km / 52.8 mi.
LMC100A-SMRJ-R2	1310nm, SM, MTRJ	28km / 17.4 mi.
LMC100AE-SMRJ-R2	1310nm, SM, MTRJ	28km / 17.4 mi.
LMC100A-SMSC-SLH-R2	1550nm, SM, SC	110km / 68 mi.
LMC100AE-SMSC-SLH-R2	1550nm, SM, SC	110km / 68 mi.
LMC100A-LC	1310nm, MM, LC	2km / 1.2mi.
LMC100AE-LC	1310nm, MM, LC	2km / 1.2mi.
LMC100A-SMLC	1310nm, SM, LC	28km / 17.4mi.
LMC100AE-SMLC	1310nm, SM, LC	28km / 17.4mi

Installation and Configuration:

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 2" and rated at 9VDC, 1 Amp.

2. This product should always be used only with the Supplied Power Unit.

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

Mounting and Cable Attachment:

The FlexPoint 10/100 can be solo-mounted using a wall-mounting kit, or rack-mounted using a 5-position shelf or a high-density 14-unit FlexPoint Powered Chassis.

Attach the FlexPoint 10/100 UTP via a category 5 cable to a 10Base-T or 100Base-Tx Ethernet device.

Attach the FlexPoint 10/100 fiber via cable to a 100Base-Fx Fast Ethernet device. The FlexPoint transmit (Tx) must attach to the receive side on other device; the receive (Rx) must attach to the transmit.

Switch Settings:

"RJ45 Cross-Over" Switch:

When connecting the UTP to a hub or switch, set switch to "Straight-Through" (factory setting). When connecting to a workstation, set it to "Cross-Over."

"UTP Auto/UTP Manual" Switch:

Setting the switch to "Auto" (factory setting) enables the UTP port to determine the speed and duplex mode automatically. If the connected device cannot provide the proper signal to indicate its own mode of operation, the "Manual" switch should be used. This feature allows connections with devices that do not auto-negotiate properly.

"UTP 10/UTP 100" Switch:

When the "Auto/Manual" switch is in "Manual" position,

the "UTP 10/UTP 100" switch determines the speed of operation for the UTP port. When set to "UTP 100" (factory setting), the UTP port will operate at 100 Mbps. When set to "UTP 10" the UTP port will operate at 10 Mbps. Adjust the 10/100 Mbps switch to the speed of the connecting device and check for link status.

"UTP Full Duplex/UTP Half Duplex" Switch:

When the "Auto/Manual" switch is in "Manual" position, the "UTP Full Duplex/UTP Half Duplex" switch determines the duplex operation mode for the UTP port. When set to "Full Duplex" (factory setting), the UTP port will operate in full duplex. When set to "Half Duplex" the UTP port will operate in half duplex. Adjust the half/full-duplex switch to accommodate the connecting device and check for link status.

Half duplex must be used when connecting to a hub. Full duplex should be used when connecting switches or between a switch and a full-duplex workstation.

"Fiber Full Duplex/Fiber Half Duplex" Switch:

Since the IEEE 802.3 standard defines the Ethernet 10Base-FL fiber differently than the Fast Ethernet 100Base-Fx, it should be noted that they are incompatible. The FlexPoint 10/100 supports 100Base-Fx only. It operates in a half- or full-duplex mode of operation. This switch controls the half/full-duplex operation of the fiber port.

Half duplex should be used when connecting to a hub (with a shared/non-switched fiber port) or a workstation that supports only half-duplex. Full duplex can be used when connecting to a switch or a workstation that supports full-duplex operation.