

ME660A-MSC	ME660AE-MSC
ME660A-MST	ME660AE-MST
ME661A-MSC	ME661AE-MSC
ME661A-MST	ME661AE-MST
ME662A-SSC	ME662AE-SSC
ME662A-SST	ME662AE-SST
ME663A-SSC	ME663AE-SSC
ME661A-MRJ	ME661AE-MRJ
ME662A-SRJ	ME662AE-SRJ

FlexPoint™ 232

CUSTOMER SUPPORT INFORMATION Order toll-free in the U.S.: Call 877-877-BBOX (outside U.S. call 724-746-5500)
 FREE technical support 24 hours a day, 7 days a week; Call 724-746-5500 or fax 724-746-0746
 Mailing address: Black Box Corporation, 1000 Park Drive, Lawrence, PA 15055-1018
 Web site: www.blackbox.com
 E-mail: info@blackbox.com

Overview and Description:

The FlexPoint™ 232 converts between asynchronous RS-232 and fiber with baud-rate auto-sensing, supporting speeds of up to 115,200 baud. The following multimode (MM) and single-mode (SM) models are described here:

Model	Wavelength	Fiber	Distances
ME660A-MSC	850nm	MM/SC	2.5km/1.5mi.
ME660A-MST	850nm	MM/ST	2.5km/1.5mi.
ME661A-MSC	1310nm	MM/SC	5km/3.1mi.
ME661A-MST	1310nm	MM/ST	5km/3.1 mi.
ME662A-SSC	1310nm	SM/SC	28km/16.8mi.
ME662A-SST	1310nm	SM/ST	28km/16.8mi.
ME663A-SSC	1310nm	SM/LH/SC	58km/35mi.
ME661A-MRJ	1310nm	MM/MT-RJ	5km/3.1mi.
ME662A-SRJ	1310nm	SM/MT-RJ	28km/16.8mi.

Power Adapter Notice:

- 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.
- This product should always be used only with the supplied power unit.
- Models shipped with international power supplies are capable of auto switching from 100-230V, and are supplied with a U.S. type NEMA 5-15 power cable.
- For products being shipped outside of the U.S., the user is required to install a properly grounded IEC 320 appliance cable with a minimum rating of 10 AMPs.
- User-supplied cables must meet the required safety agency approvals, applicable international standards and electrical ratings for the region.

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 232 can be solo-mounted using a wall-mounting kit or the DIN-Rail kit. It can also be rack-mounted using a 5-position shelf or a high-density 14-unit FlexPoint Powered Chassis.

RS-232 Cable Attachment:

Attach the FlexPoint 232 port via a male DB9 terminated or unterminated straight through RS-232 serial cable to a DTE or DCE device.

Note: Use RS-232 cables that are compliant with the specifications that are outlined in RS-232 cable specifications.

Fiber Optic Cable Attachment:

Connect the fiber cables between the two FlexPoint 232 converters. The transmit (Tx) must attach to the receive side and the receive (Rx) must attach to the transmit side.

Note: Use fiber cables that are compliant with the specifications that are outlined in fiber cable specifications.

Switch Settings:

DB9 to DTE / DB9 to DCE Switch:

When connecting the RS-232 cable to terminal equipment such as a computer or controller, set the switch to "DTE", up. When connecting to communication equipment such as a modem or printer, set the switch to "DCE", down (factory setting).

(Please refer to pin assignments for more detailed information)

Fiber Loopback Switch:

This switch will allow the entire fiber segment to be tested at either of the FlexPoint 232 converters without having to set switches on both units simultaneously. When this switch is set to "Fiber Loopback", the local unit's fiber Tx port will be

encoded to carry a remote loopback protocol over the fiber cable. This remote loopback protocol will set the far end FlexPoint 232 converter to a loopback mode of operation and return a signal over the fiber cable to the originating unit. An LED on the local and remote FlexPoint 232 converters will blink fast to show a confirmation that the fiber segment is communicating properly between the converters. A slow blink will indicate an error condition over the fiber segment. By returning the switch to the "normal" position the converters will resume to normal operation.

Fiber Cable Specifications:

Multimode (standard)

Cable: 50/125, 62.5/125, 100/140 μm
 Wavelength: 850nm
 Max Distance: 2.5km/1.5 mi.

Multimode (long-haul)

Cable: 50/125, 62.5/125, 100/140 μm
 Wavelength: 1310nm
 Max Distance: 5km/3.1 mi.

Singlemode

Cable: 9/125 μm
 Wavelength: 1310nm
 Max Distance: 28km/16.8 mi.

Singlemode (long-haul)

Cable: 9/125 μm
 Wavelength: 1310nm
 Max Distance: 58km/36 mi.

RS-232 Cable Specifications:

Gauge 22 to 24 AWG
 Mutual Capacitance 12 to 50 pF/ft.
 Maximum Distance 15.2 m/50 ft.

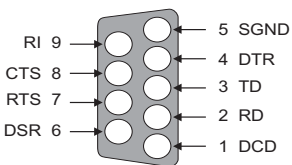
LED Indicators:

LED	Color	Function	Description
Power:	Yellow	Solid	Power applied
DTE/DCE:	Green	Solid	DTE selected
	Yellow	Solid	DCE selected
DB9/232:	Green	Solid/Blink	Link / Data received
Fiber Link:	Green	Solid	Link
	Green	Blink fast	Fiber loop-back is good
	Green	Blink slow	Error in fiber loop-back

Switches:

Description	Function
DB9 to DTE / DCE:	Data Terminal / Data Communication
Fiber Loop-back:	Loop-back / Normal

FlexPoint 232 Pin Assignments



PIN	PIN SIGNAL	ABBR	DTE	DCE
1	Data Carrier Detect	DCD	IN	OUT
2	Received Data	RD	IN	OUT
3	Transmitted Data	TD	OUT	IN
4	Data Terminal	DTR	OUT	IN
5	Signal Ground	SGND	-	-
6	Data Set Ready	DSR	IN	OUT
7	Request To Send	RTS	OUT	IN
8	Clear To Send	CTS	IN	OUT
9	Ring Indicator	RI	IN	OUT

TRADEMARKS

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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 numériques de la 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

- Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
- Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
- Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
- Todas las instrucciones de operación y uso deben ser seguidas.
- 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.
- El aparato eléctrico debe ser usado únicamente con carritos o pedales que sean recomendados por el fabricante.
- El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
- 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.
- 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 bloquear la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
- El equipo eléctrico debe ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
- 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.

- Precación debe ser tomada de tal manera que la tierra física y la polarización del equipo no sea eliminada.
- 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.
- El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
- En caso de existir, una antena externa deberá ser localizada lejos de las líneas de energía.
- El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
- Cuidado debe ser tomado de tal manera que objetos líquidos no sean derramados sobre la cubierta u orificios de ventilación.
- Servicio por personal calificado deberá ser provisto cuando:
 - A: El cable de poder o el contacto ha sido dañado; u
 - B: Objetos 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 aparato ha sido tirado o su cubierta ha sido dañada.

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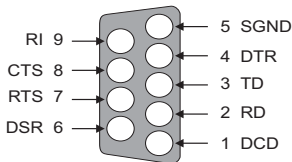
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Switches:

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PIN	PIN SIGNAL	ABBR	DTE	DCE
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5	Signal Ground	SGND	-	-
6	Data Set Ready	DSR	IN	OUT
7	Request To Send	RTS	OUT	IN
8	Clear To Send	CTS	IN	OUT
9	Ring Indicator	RI	IN	OUT



U.S. Power Supply International Power Supply

ME660A-MSC	ME660AE-MSC
ME660A-MST	ME660AE-MST
ME661A-MSC	ME661AE-MSC
ME661A-MST	ME661AE-MST
ME662A-SSC	ME662AE-SSC
ME662A-SST	ME662AE-SST
ME663A-SSC	ME663AE-SSC
ME661A-MRJ	ME661AE-MRJ
ME662A-SRJ	ME662AE-SRJ

FlexPoint™ 232

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Overview and Description:

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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 numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par le ministère des Communications du Canada.

NORMAS OFICIALES MEXICANAS (NOM)

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- Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
- Todas las instrucciones de operación y uso deben ser seguidas.
- 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.
- El aparato eléctrico debe ser usado únicamente con carritos o pedelstales que sean recomendados por el fabricante.
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- 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.
- 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.
- El equipo eléctrico debe ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
- 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.

- Precación debe ser tomada de tal manera que la tierra física y la polarización del equipo no sea eliminada.
- 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.
- El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
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- Cuidado debe ser tomado de tal manera que objetos líquidos no sean derramados sobre la cubierta u orificios de ventilación.
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 - El cable de poder o el contacto ha sido dañado; u
 - Objetos han caído o líquido ha sido derramado dentro del aparato; o
 - El aparato ha sido expuesto a la lluvia; o
 - El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
 - El aparato ha sido tirado o su cubierta ha sido dañada.

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040-01022-001 2/06

Model	Wavelength	Fiber	Distances
ME660A-MSC	850nm	MM/SC	2.5km/1.5mi.
ME660A-MST	850nm	MM/ST	2.5km/1.5mi.
ME661A-MSC	1310nm	MM/SC	5km/3.1mi.
ME661A-MST	1310nm	MM/ST	5km/3.1 mi.
ME662A-SSC	1310nm	SM/SC	28km/16.8mi.
ME662A-SST	1310nm	SM/ST	28km/16.8mi.
ME663A-SSC	1310nm	SM/LH/SC	58km/35mi.
ME661A-MRJ	1310nm	MM/MT-RJ	5km/3.1mi.
ME662A-SRJ	1310nm	SM/MT-RJ	28km/16.8mi.

Power Adapter Notice:

- 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.
- This product should always be used only with the supplied power unit.
- Models shipped with international power supplies are capable of auto switching from 100-230V, and are supplied with a U.S. type NEMA 5-15 power cable.
- For products being shipped outside of the U.S., the user is required to install a properly grounded IEC 320 appliance cable with a minimum rating of 10 AMPs.
- User-supplied cables must meet the required safety agency approvals, applicable international standards and electrical ratings for the region.

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 232 can be solo-mounted using a wall-mounting kit or the DIN-Rail kit. It can also be rack-mounted using a 5-position shelf or a high-density 14-unit FlexPoint Powered Chassis.

RS-232 Cable Attachment:

Attach the FlexPoint 232 port via a male DB9 terminated or unterminated straight through RS-232 serial cable to a DTE or DCE device.

Note: Use RS-232 cables that are compliant with the specifications that are outlined in RS-232 cable specifications.

Fiber Optic Cable Attachment:

Connect the fiber cables between the two FlexPoint 232 converters. The transmit (Tx) must attach to the receive side and the receive (Rx) must attach to the transmit side.

Note: Use fiber cables that are compliant with the specifications that are outlined in fiber cable specifications.

Switch Settings:

DB9 to DTE / DB9 to DCE Switch:

When connecting the RS-232 cable to terminal equipment such as a computer or controller, set the switch to "DTE", up. When connecting to communication equipment such as a modem or printer, set the switch to "DCE", down (factory setting).

(Please refer to pin assignments for more detailed information)

Fiber Loopback Switch:

This switch will allow the entire fiber segment to be tested at either of the FlexPoint 232 converters without having to set switches on both units simultaneously. When this switch is set to "Fiber Loopback", the local unit's fiber Tx port will be

encoded to carry a remote loopback protocol over the fiber cable. This remote loopback protocol will set the far end FlexPoint 232 converter to a loopback mode of operation and return a signal over the fiber cable to the originating unit. An LED on the local and remote FlexPoint 232 converters will blink fast to show a confirmation that the fiber segment is communicating properly between the converters. A slow blink will indicate an error condition over the fiber segment. By returning the switch to the "normal" position the converters will resume to normal operation.

Fiber Cable Specifications:

Multimode (standard)

Cable:	50/125, 62.5/125, 100/140 μm
Wavelength:	850nm
Max Distance:	2.5km/1.5 mi.

Multimode (long-haul)

Cable:	50/125, 62.5/125, 100/140 μm
Wavelength:	1310nm
Max Distance:	5km/3.1 mi.

Singlemode

Cable:	9/125 μm
Wavelength:	1310nm
Max Distance:	28km/16.8 mi.

Singlemode (long-haul)

Cable:	9/125 μm
Wavelength:	1310nm
Max Distance:	58km/36 mi.

RS-232 Cable Specifications:

Gauge	22 to 24 AWG
Mutual Capacitance	12 to 50 pF/ft.
Maximum Distance	15.2 m/50 ft.