McBasic 10/100

Operation Manual

B&B ELECTRONICS

Make The Right Connections

FCC Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class A computing device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which the user will be required to correct the interference at his own expense.
Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.
The use of non-shielded I/O cables may not guarantee compliance with FCC RFI limits. 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 classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par le ministère des Communications du Canada.

LIMITED LIFETIME WARRANTY

Effective for products of B&B Electronics shipped on or after May 1, 2013, B&B Electronics warrants that each such product shall be free from defects in material and workmanship for its lifetime. This limited lifetime warranty is applicable solely to the original user and is not transferable.

This warranty is expressly conditioned upon proper storage, installation, connection, operation and maintenance of products in accordance with their written specifications.

Pursuant to the warranty, within the warranty period, B&B Electronics, at its option will:

1. Replace the product with a functional equivalent;

2. Repair the product; or

3. Provide a partial refund of purchase price based on a depreciated value.

Products of other manufacturers sold by B&B Electronics are not subject to any warranty or indemnity offered by B&B Electronics, but may be subject to the warranties of the other manufacturers.

Notwithstanding the foregoing, under no circumstances shall B&B Electronics have any warranty obligations or any other liability for: (i) any defects resulting from wear and tear, accident, improper use by the buyer or use by any third party except in accordance with the written instructions or advice of the B&B Electronics or the manufacturer of the products, including without limitation surge and overvoltage conditions that exceed specified ratings, (ii) any products which have been adjusted, modified or repaired by any party other than B&B Electronics or (iii) any descriptions, illustrations, figures as to performance, drawings and particulars of weights and dimensions contained in the B&B Electronics' catalogs, price lists, marketing materials or elsewhere since they are merely intended to represent a general idea of the products and do not form part of this price quote and do not constitute a warranty of any kind, whether express or implied, as to any of the B&B Electronics' products.

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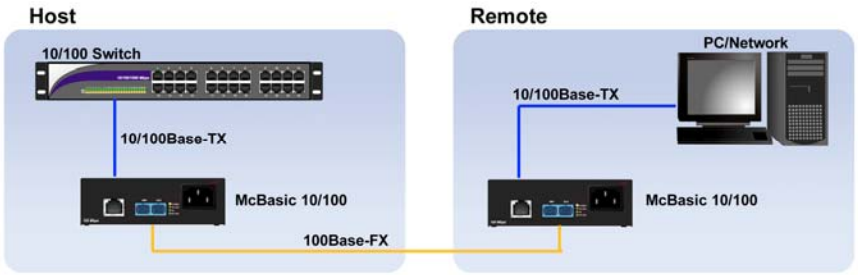
The McBasic 10/100 module is a low-cost, standalone, IEEE 802.3 single-conversion media converter which converts between:

- 10Base-T twisted pair and 10Base-FL multi-mode or single-mode fiber
- 100Base-TX twisted pair and 100Base-SX multi-mode fiber or 100Base-FX single-mode fiber

The McBasic 10/100 is a 1U high, standalone unit that includes diagnostic LEDs for each port and an internal, universal (100/240 VAC) power supply.



In many networks, the media converter is typically installed as a pair, between two copper-based end devices. The McBasic 10/100 can also be installed as a single media converter, between one copper-based device and the other a fiber-based device. However, when connected to certain fiber-based devices, there may be difficulty in the installation: if a link partner that is connected to the McBasic media converter is powered down on the copper port, noise on the copper segment may be detected and transferred to the fiber line. A result of the noise will generate errors that look like CRC errors. Some fiber-based devices many detect this noise and disable the fiber segment.

Installing the McBasic 10/100

The McBasic 10/100 comes ready to install. The only adjustments that may need to be made after installation are:

- Configuring the mode of operation and other features on the unit.
- Setting the twisted pair port for a crossover workstation or pass-through connection.

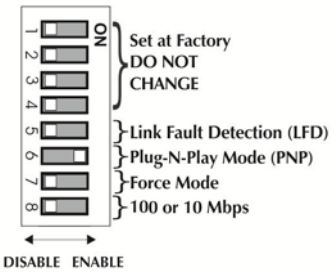
To install McBasic 10/100:

1. First make sure the unit is placed on a suitable flat surface, leaving some space at the back of the unit.
2. Attach the cables between the McBasic 10/100 and each device that will be interconnected.
3. Plug the unit into a reliable, filtered power source.

NOTE
All network cables must be connected before the link LEDs will glow.

Configuring the McBasic 10/100

The McBasic 10/100 features an 8-position DIP Switch for configuring the unit. This switch is accessed through a cut-out in the bottom of the unit. After configuring the switch, power down the unit and then power up again for the DIP Switch changes to take effect.



The following table provides simplified definitions of the function of each switch. Refer to the following sections for more detail.

Feature	Switch	Function	Default
LFD	S5	Link fault detection available in force mode only (S7 is ON)	OFF
PNP (AN)	S6	Plug-N-Play available when force mode is disabled (S7 is OFF)	ON
Force	S7	Force mode forces the module to operate at 10 or 100 Mbps as determined by S8	OFF
10/100	S8	When ON, operates at 10 Mbps. When OFF, operates at 100 Mbps. Available when force mode is enabled (S7 is ON)	OFF
DIP Switches S1-S4 are factory configured—DO NOT CHANGE			

Twisted Pair Crossover/Pass-Through Switch

The McBasic 10/100 has a Crossover/Pass-Through push-button switch, located on the faceplate next to the RJ-45 connector, for setting the twisted pair connection type.

Select a Pass-Through connection by pressing the push-button IN. A Crossover connection is selected when the push-button is OUT. If not sure which connection is needed, set the push-button to whatever setting makes the twisted pair LNK (link) LED glow.

Modes of Operation

The McBasic 10/100 has four modes of operation:

- Auto Negotiation/PNP
- FORCE 10Mbps
- FORCE 100Mbps
- Selective Advertising AN (All OFF)

NOTE
The McBasic 10/100 cannot be set for Half- or Full-Duplex manually. Duplex is determined by the link partners connected to the McBasic 10/100.

The McBasic 10/100 media converter is typically installed in pairs and provides compatibility with legacy 10BASE-FL devices, while also providing support for 100Mbps devices. This is a PHY based device to allow very low propagation delays but in turn the speed and duplex of both its copper and fiber ports must be the same. For the McBasic to function properly, the copper port must have link before the fiber port will link up.

In a back to back configuration, both units must have the Plug-N-Play (PNP) switch set to ON for the copper ports to auto negotiate from end to end. In this mode the fiber link becomes transparent allowing the units at both ends of the link to function as if they were connected over one copper line. All auto negotiation signaling is the result of signaling received on the ports of the unit. Only use this mode with two McBasic media converters installed in pairs, back to back.

With all switches set to OFF**,** the unit sends its own Auto Negotiation (AN) signaling on the copper port. This advertises both FDX and HDX with the physical speed that is detected on the fiber line. This signaling cannot occur until this fiber port is active. If auto negotiation signaling is also received over the fiber from the far end equipment, the auto negotiation signaling on the copper port will include this information.

In all of the FORCE modes, no auto negotiation signals are sent or acted on. The unit will blindly send the speed assigned and supports either FDX or HDX data. The LFD function is only available in the FORCE modes.

Selective Advertising is a mode in which the speed and duplex for the copper and the fiber are specifically advertised. This mode is available when DSW 5-8 are set to OFF.

Switch	Selective Advertising	PNP (AN)	Force 100	Force 10	Force 100 LFD	Force 10 LFD
LFD	OFF	OFF	OFF	OFF	ON	ON
PNP	OFF	ON	OFF	OFF	OFF	OFF
FORCE	OFF	OFF	ON	ON	ON	ON
10/100	OFF	OFF	OFF	ON	OFF	ON

Troubleshooting Features

The McBasic 10/100 media converters include two advanced troubleshooting features to help locate "silent failures" on the network.

- Transparency
- Link Fault Detection (LFD)

Transparency

Transparency is only available in PNP mode. Transparency treats the connection between the two end devices as if there were no media converters installed. In a typical application where two media converters are installed between two copper-based switches, the twisted pair cables as well as the fiber cable are seen as one entity. If a fault occurs on any segment between the two end devices, link LEDs on the end devices will go out. This prevents any failure on the link between the end units from going undetected.

As stated, transparency is available when McBasic 10/100 is operating in Auto Negotiation mode:

- S6 PNP (AN) must be ON
- S5 (LFD), S7 (Force) and S8 (10 or 100) must be OFF

Link Fault Detection in FORCE Modes (LFD)

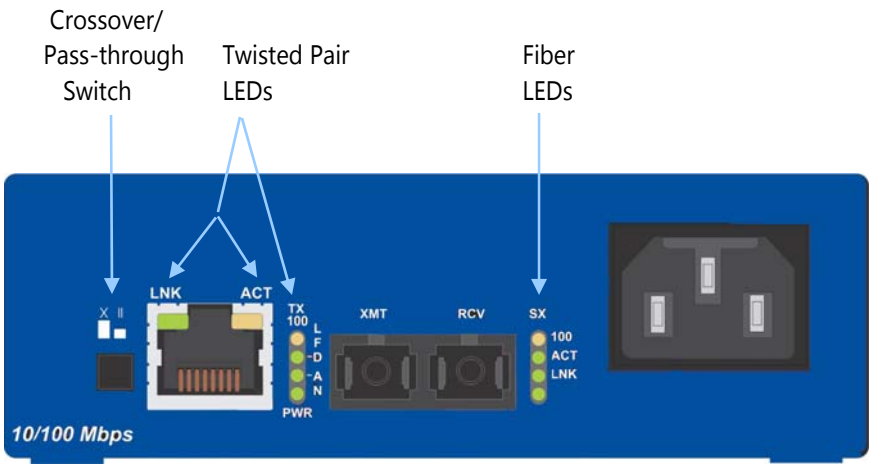
Link Fault Detection (LFD) is only available when using Force 10 or Force 100 mode and provides the same information as link fault pass through as does in PNP mode to detect silent failures. When LFD is enabled and the input link is down at one interface to the McBasic 10/100, the transmitter output on that interface is turned off for about 425ms every 3.8 seconds (i.e., blinking). It applies to both network interfaces and to both data rates. If the link at the other interface to the McBasic 10/100 is also down, there is no output. LFD causes the Link Up indicator of the link partner to blink.

When the McBasic 10/100 is in one of the FORCE modes, enable LFD by setting S5 to the ON position. Disable LFD by setting S5 to the OFF position.

In order for LFD to function properly, Force mode must be enabled by setting:

- S7 to ON with either S8 ON for 10 Mbps or S8 OFF for 100 Mbps
- S6 must also be ON

NOTE
When using the LFD feature, if the DIP Switches are in any other combination than listed above, the McBasic 10/100 may exhibit erratic behavior.



The McBasic 10/100 features several diagnostic LEDs per port (see illustration above). The LED functions for the McBasic 10/100 are:

Port	LED	Definition
Twisted Pair port	LNK	Glows green when a twisted pair link is established.
	ACT	Glows yellow when data is detected on the port.
	100	Glows yellow when 100 Mbps data is detected on the port.
	LFD	Glows green when Link Fault Detection is enabled. This feature is available only when force 10 or force 100 is enabled.
	PNP (AN)	Glows green when Auto Negotiation mode is enabled.
	PWR	Glows green when unit has power.
Fiber port	100	Glows yellow when 100 Mbps data is detected on the port.
	ACT	Glows green when data is detected on the port.
	LNK	Glows green when a fiber link is established.

NOTE
Before either LNK LED will glow solid, the twisted pair and fiber optic cables must be connected and the twisted pair crossover/ pass-through switch set correctly.

Installation Troubleshooting

During installation, first test the fiber and twisted pair connections with all troubleshooting features disabled, then enable these features (if desired) just before final installation. This will reduce the features' interference with testing. When working with units where the features cannot be disabled, both the twisted pair and fiber connections must be established before the link LEDs will light.

To perform a physical loopback test on the Media Converter, have an appropriate fiber patch cable, and then follow the four easy steps to test:

Step 1 Configure the McBasic 10/100 to Force 100 Mbps mode.

Step 2 Connect the media converter to the twisted pair device with a twisted pair cable.

Step 3 Loop a single strand of fiber from the transmit port to the receive port of the media converter.

Step 4 Verify that both the twisted pair and fiber links on the converter. Refer to the LED Operation section.

NOTE
Use caution when conducting a loopback test. It is possible to create a network loop if connecting the media converter's twisted pair port to an active network. B&B Electronics recommends connecting the twisted pair cable to a computer when performing this type of test.

Electrostatic Discharge Precautions

Electrostatic discharge (ESD) can cause damage to any product, add-in modules or stand alone units, containing electronic components. Always observe the following precautions when installing or handling these kinds of products

1. Do not remove unit from its protective packaging until ready to install.
2. Wear an ESD wrist grounding strap before handling any module or component. If the wrist strap is not available, maintain grounded contact with the system unit throughout any procedure requiring ESD protection.
3. Hold the units by the edges; do not touch the electronic components or gold connectors.
4. After removal, always place the boards on a grounded, static-free surface, ESD pad or in a proper ESD bag. Do not slide the modules or stand alone units over any surface.

WARNING! Integrated circuits and fiber optic components are extremely susceptible to electrostatic discharge damage. Do not handle these components directly unless you are a qualified service technician and use tools and techniques that conform to accepted industry practices.

Fiber Optic Cleaning Guidelines

Fiber Optic transmitters and receivers are extremely susceptible to contamination by particles of dirt or dust, which can obstruct the optic path and cause performance degradation. Good system performance requires clean optics and connector ferrules.

1. Use fiber patch cords (or connectors, if you terminate your own fiber) only from a reputable supplier; low-quality components can cause many hard-to-diagnose problems in an installation.
2. Dust caps are installed at B&B Electronics to ensure factory-clean optical devices. These protective caps should not be removed until the moment of connecting the fiber cable to the device. Should it be necessary to disconnect the fiber device, reinstall the protective dust caps.
3. Store spare caps in a dust-free environment such as a sealed plastic bag or box so that when reinstalled they do not introduce any contamination to the optics.
4. If you suspect that the optics have been contaminated, alternate between blasting with clean, dry, compressed air and flushing with methanol to remove particles of dirt.

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Specifications

Environmental

Operating Temperature
+32°F to +122°F (0°C to +50°C)

Storage Temperature
-4°F to +158°F (-20°C to +70°C)

Humidity
5 to 95% (non-condensing)

Input Specifications

100-240 ±10% VAC, 50/60Hz, 1-0.5A

Fiber Optic Specifications

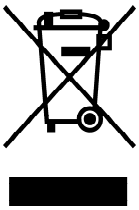
For fiber optic specifications, visit the B&B Electronics Web site at http://www.imcnetworks.com/adocs/fcs.asp

UL/CUL: Listed to Safety of Information Technology Equipment, including Electrical Business Equipment.

CE: The products described herein comply with the Council Directive on Electromagnetic Compatibility (2004/108/EC) and the Council Directive on Electrical Equipment Designed for use within Certain Voltage Limits (2006/95/EC). Certified to Safety of Information Technology Equipment, Including Electrical Business Equipment. For further details, contact B&B Electronics.

Class 1 Laser product, Luokan 1 Laserlaite,
Laser Klasse 1, Appareil A'Laser de Classe 1

European Directive 2002/96/EC (WEEE) requires that any equipment that bears this symbol on product or packaging must not be disposed of with unsorted municipal waste. This symbol indicates that the equipment should be disposed of separately from regular household waste. It is the consumer's responsibility to dispose of this and all equipment so marked through designated collection facilities appointed by government or local authorities. Following these steps through proper disposal and recycling will help prevent potential negative consequences to the environment and human health. For more detailed information about proper disposal, please contact local authorities, waste disposal services, or the point of purchase for this equipment.



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