IE-iMcV-Gigabit TX/SFP
iMcV-Gigabit TX/FX

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.

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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.

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NOTE
Unless noted otherwise, all references to the IE-iMcV-Gigabit TX/SFP in this manual are also applicable to the iMcV-Gigabit TX/FX.

The SNMP manageable IE-iMcV-Gigabit TX/SFP Module provides a single conversion between 1000 Base-T twisted pair and 1000 Base-SX/LX fiber. Each IE-iMcV-Gigabit TX/SFP includes one RJ-45 connector and one pair of SC fiber optic connectors, and/or an SFP port, which can support any fiber type; dual strand available in LC connectors, and Single Strand Fiber SFPs available in SC connectors. IE-iMcV-Gigabit TX/SFP Modules install into any modular, SNMP manageable iMediaChassis, as well as the MediaChassis series, which is unmanaged. The IE-iMcV-Gigabit TX/SFP offers an extended temperature range of -40C to +85C; when installed in an IE-MediaChassis/1 or 2, available in AC and DC, the module can be installed in challenging heat or cold-related environments.

NOTE
All IE-iMcV-Gigabit TX/SFP Modules, including 1300 nm multi-mode and 1310 nm single-mode (TX/LX), 850 nm multi-mode fiber (TX/SX) and single-strand versions (TX/SSLX) will be referred to as IE-iMcV-Gigabit TX/SFP throughout this guide except where differences need to be indicated.

Installing an iMcV−Module

iMcV-Modules install in IMC Networks' SNMP manageable iMediaChassis series or in any MediaChassis.

To install an iMcV-Module:

1. Remove the blank bracket covering the slot where the module is to be installed by removing the screws on the outside edges of the bracket.

2. Slide the iMcV-Module into the chassis, via the cardguides, until the module is seated securely in the connector.

3. Secure the module to the chassis by tightening the captive screw.

4. Save any "blanks" removed during installation for future use if the configuration requirements change.

CONFIGURATION INSTRUCTIONS

IE-iMcV-Gigabit TX/SFP Modules have user-configurable features.   Refer to the matrix for configuring both managed (via an SNMP compatible management application such as iView[2]) and unmanaged IE-iMcV-Gigabit TX/SFP Modules.

MANAGED MODULES

To manage one or more IE-iMcV-Gigabit TX/SFP Modules, an SNMP agent must be present in the chassis: To configure Managed Modules, install the module first, and then configure using the management software.

CONFIGURATION CONTROL

Some iMcV-Modules offer Configuration Control; labels on the front faceplate are identified as such. Configuration Control has been implemented to assist the end user by retaining the latest configuration regardless of how that configuration was implemented (via DIP Switch settings or SNMP). Historically, SNMP would override DIP Switch settings. If changes are made via DIP Switch settings, then hardware settings determine the configuration of the board. If changes are made to the module via iView[2], the SNMP settings determine the configuration of the board.

Utilizing Configuration Control, the end user has three conditions under which the configuration of the iMcV-Module may be impacted:

- Installing an IE-iMcV-Gigabit TX/SFP into a chassis already loaded with iMcV-Modules or replacing an IE-iMcV-Gigabit TX/SFP

    - The iMcV-Module will transfer its saved configurations. The IE-iMcV-Gigabit TX/SFP will not override the module's configuration.

- Replacing the same type of iMcV-Module

    - If the DIP Switch settings are the same as the settings on the removed iMcV-Module, the IE-iMcV-Gigabit TX/SFP determines the configuration settings.

    - If the DIP Switch settings are different, then the configuration of the module is determined by the DIP Switch settings. (The settings are forwarded to the IE-iMcV-Gigabit TX/SFP and the value is saved.)

- Installing a new model of iMcV-Module

    - If another type of module is installed into the same slot in a chassis, the IE-iMcV-Gigabit TX/SFP clears the memory of the previous configuration for that slot; the settings of a new module are adopted and stored in the IE-iMcV-Gigabit TX/SFP

The SNMP Write Lock switch does not impact any iMcV-Module or IE-iMcV-Module with Configuration Control. Removing and installing a new SNMP Management Module will no longer impact these modules either. However, if there is a mixture of iMcV-Modules with and without Configuration Control, the Write Lock Switch and a new SNMP Management Module must be taken into consideration.If the command cleandb is applied to an SNMP Management Module, all the settings for the modules will be removed, but the Configuration Control modules will still be based on the last change made, while those without Configuration Control will be set to their default settings.

NOTE
If the end user has a mixture of standard iMcV-Modules as well as Configuration Control iMcV-Modules, it is important to understand how SNMP and DIP Switches will impact the cards depending on their capability. Standard iMcV-Modules cannot be upgraded to Configuration Control capability, so it is strongly recommended to set the DIP Switches on the modules and then configure them via software to match the same settings.

UNMANAGED MODULES

Before installing, configure the IE-iMcV-Gigabit TX/SFP Module for desired features. The diagram indicates the available features and settings for the module. After configuring the switch for the desired settings, install the module and connect the appropriate cables. For further information, refer to the Installing an iMcV-Module section.
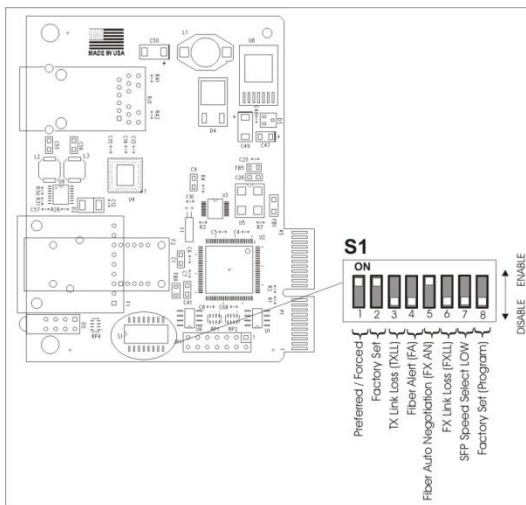
DIP Switch on S1	Feature	Default Setting

1	Preferred / Forced	ON
2	Factory use – Do Not Change	ON
3	TX Link Loss (TXLL)	OFF
4	Fiber Alert (FA)	OFF
5	FX Auto Negotiation	ON
6	FX Link Loss (FXLL)	OFF
7	SFP Speed Select LOW	OFF
8	Factory set (Program)	OFF

NOTE
DSW #7 is not applicable to 1x9 version. The Default would be: Factory set: OFF

LINKLOSS, FIBERALERT AND LINK FAULT PASS-THROUGH

IE-iMcV-Gigabit TX/SFP Modules include the troubleshooting features FiberAlert, TXLL, FXLL and LFPT that help locate *silent failures* on a network. Before attempting to install the module(s), understand how these features work and react to a specific network configuration. Modules ship from the factory with troubleshooting features disabled.

** WARNING **
Installing modules without understanding the effects of LinkLoss and FiberAlert can cause functioning units to appear flawed or even non functional.

Link Integrity

During normal operation, link integrity pulses are transmitted by all point-to-point Ethernet devices. When an IMC Networks media converter receives valid link pulses, it knows that the device to which it is connected is up and sending pulses, and that the copper or fiber cable coming from that device is intact. The appropriate "LNK" (link) LED is lit to indicate this.


The IMC Networks media converter also sends out link pulses from its copper and fiber transmitters, but normally has no way of knowing whether the cable to the other device is intact and the link pulses are reaching the other end. The combination of FiberAlert and LinkLoss allows this information to be obtained, even when physical access to a remote device (and its link integrity LED) is not available.

TX LinkLoss (TXLL)

TX LinkLoss is a troubleshooting feature. When a fault occurs on the twisted pair segment of a conversion, TX LinkLoss detects the fault and passes this information to the fiber segment. If a media converter is not receiving a twisted pair link, TX LinkLoss disables the transmitter on the media converter's fiber port. This results in a loss of the link on the device connected to the fiber port, and the TXLL LED will blink.

FiberAlert (FA)

FiberAlert minimizes the problems associated with the loss of one strand of fiber. If a strand is not available, the IMC Networks device at the receiver end notes the loss of link. The
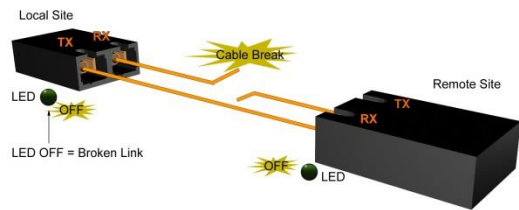
device will then stop transmitting data and the link signal until a signal or link pulse is received. The result is that the link LED on BOTH sides of the fiber connection will go out indicating a fault somewhere in the fiber loop. Using FiberAlert, a local site administrator is notified of a fault and can quickly determine where a cable fault is located.

WARNING
Enable FiberAlert on one side of a media conversion only. Enabling it on both sides would keep both transmitters off indefinitely.

Modules ship from the factory with troubleshooting features disabled.

FX Auto Negotiation on IE-iMcV-Gigabit TX/SFP

The IE-iMcV-Gigabit TX/SFP Module includes a FX Auto Negotiation feature which negotiates duplex mode. This feature must be enabled or disabled on both ends of the connection or there may be difficulty establishing a link. If the device being connected to the IE-iMcV-Gigabit TX/SFP Module does not support Auto Negotiation, disabling the feature on the IE-iMcV-Gigabit TX/SFP Module forces the link up.

DIP Switch settings for FX AN:

DIP Switch	Default Setting
S1-5	FX AN = ON

FX LinkLoss (FXLL)

FX LinkLoss is a troubleshooting feature. When a fault occurs on the fiber segment of a conversation, FX LinkLoss detects the fault and passes this information to the twisted pair segment. If a media converter is not receiving a fiber link, FX LinkLoss disables the transmitter on the media converter's twisted pair port. This results in a loss of link on the device connected to the twisted pair port, and the FXLL LED will blink.

Link Fault Pass-Through (LFPT)

Link Fault Pass-Through (LFPT) is a troubleshooting feature that combines TX and FX LinkLoss from both the local and remote IE-iMcV-Gigabit TX/SFP Modules. LFPT is enabled by turning on both FX and TX LinkLoss on both modules. This feature allows either end of the conversion to detect a link fault occurring at the other end of the media conversion chain.
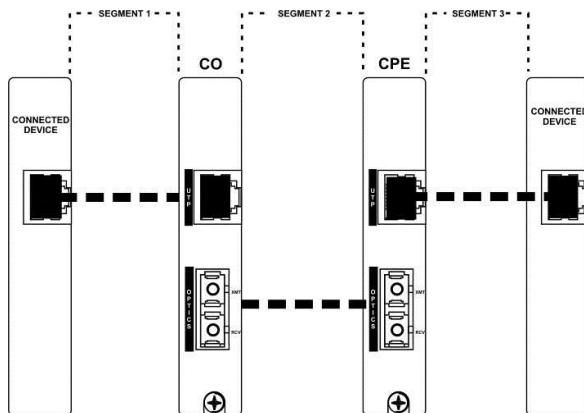
Regardless if there is a break in segment 1, 2 or 3, the link will drop on the switches at both ends. The link fault is passed through the media conversion and is observed at each end. It acts just like it would if the devices were directly connected.

ADDITIONAL GIGABIT FEATURES

SFP Speed Select

The SFP Speed Select LOW for DIP Switch #7 allows the customer to select the optical data rate if supported by dual rate SFPs. Typically this switch will be set OFF to select HIGH speed operation if using 100/1000Mbps SFPs.

Preferred/Forced Mode

The IE-iMcV-Gigabit TX/SFP Module also includes a Preferred/Forced Modes for Master/Slave negotiation. Preferred Mode helps determine whether the module should act as a Master or Slave. Forced Mode should typically only be used when connecting to some legacy switches, or when there is difficulty establishing a link. The default is Preferred Mode (S1-1 is ON). This feature is hardware configurable only.

Since most switches today typically function as Masters, IMC Networks recommends configuring IE-iMcV-Gigabit TX/SFP as indicated in the table.

| DIP Switch	Default Setting
S1-1	ON (Preferred) OFF (Forced)

AutoCross Feature for Twisted Pair Connection

All twisted pair ports on the IE-iMcV-Gigabit TX/SFP include AutoCross, a feature that automatically selects between a crossover workstation and a straight-through connection depending on the connected device.

LED OPERATION

Each IE-iMcV-Gigabit TX/SFP Module features diagnostic LEDs that provide information on features and ports.

LNK/ACT   Glows green when a twisted pair link is established.

                 Blinks green when activity is detected. Located on RJ-45 connector.

FDX   Glows amber when port is operating in Full-Duplex Mode on the RJ-45
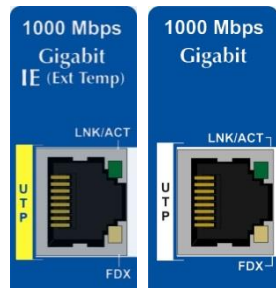
connector.

FXLL   Glows green when FX LinkLoss is enabled on the port.

        Blinks when a fault occurs on the fiber port and actively disables the copper port.

TXLL   Glows green when TX LinkLoss is enabled on the port.

        Blinks when a fault occurs on the copper port and actively disables the fiber port.

LNK   Glows green when fiber link is established.

FA   Glows amber when FiberAlert is enabled.

        Blinks when a fault occurs on the RCV fiber line and actively disables the XMT fiber line.

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.

If using a high powered device (which is designed for long distance installations) for a short distance installation, the fiber transmitters may overdrive the receivers and cause data loss. If this is the case, an optical

attenuator may need to be added to the connection.

SPECIFICATIONS

Environmental

Operating Temperature

IE: -40°F to +185°F (-40°C to +85°C)

Non-IE: +32°F to +122°F (0°C to +50°C)

Storage Temperature

-13°F to +158°F (-25°C to +70°C)

Humidity

5 - 95% (non-condensing)

Power Consumption (Typical)

IE-iMcV-Gigabit TX/SFP w/LFPT: 0.55Amp

Fiber Optic Specifications

For fiber optic specifications, please visit:

http://www.bb-elec.com

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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 IMC Networks 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.

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.

CERTIFICATIONS

CE: The products described herein comply with the Council Directive on Electromagnetic Compatibility (2004/108/EC).

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Class 1 Laser product, Luokan 1 Laserlaite,

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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ISO 9001:2008 REGISTERED   RoHS   Made in USA

Document Number 50-80825-00 B2   **August 2013**