IE-iMcV-MediaLinX TX/SFP

iMcV-MediaLinX TX/SFP

USER MANUAL

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ABOUT THE IE-IMCV-MEDIALINX & -IMCV-MEDIALINX

OVERVIEW

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

The SNMP manageable IE-iMcV-MediaLinX TX/SFP module provides a single conversion between 10/100 Base-T twisted pair and 100 Base-SX/FX fiber. Each IE-iMcV-MediaLinX TX/SFP includes one RJ-45 connector and one pair of ST or SC fiber optic connectors, and/or an SFP port, which can support any fiber type at 155Mbps; dual strand available in LC connectors, and Single Strand Fiber SFPs available in SC connectors. IE-iMcV-MediaLinX TX/SFP modules install into any modular, SNMP manageable iMediaChassis, as well as the MediaChassis series, which is unmanaged. The IE-iMcV-MediaLinX TX/SFP offers an extended temperature range of -40 to +85 °C; when installed in an IE-MediaChassis/1 or 2. Available in AC and DC, module scan be installed in challenging heat or cold-related environments.

NOTE: *Some options require items that are sold separately, available from B+B SmartWorx.*

INSTALLING AN IMCV MODULE

iMcV modules install in B+B SmartWorx SNMP manageable iMediaChassis series or in any MediaChassis/IE-MediaChassis series.

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 card guides, 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.

NOTE: *All modules are hot-swappable.*

NOTE: *Some options require items that are sold separately, available from B+B SmartWorx.*

CONFIGURATION INSTRUCTIONS

IE-iMcV-MediaLinX TX/SFP modules have user-configurable features. Refer to the matrix for configuring both managed (via an SNMP compatible management application such as iView²) or the DIP Switch configuration table for unmanaged IE-iMcV-MediaLinX TX/SFP modules.

MANAGED MODULES

To manage one or more IE-iMcV-MediaLinX TX/SFP modules, an SNMP agent must be present in the chassis: the iMediaChassis series requires an SNMP Management Module. To configure managed modules, install the module first, and then configure using the management software. Module details will provide information such as serial number, date code and part number as well as product-specific features.

CONFIGURATION CONTROL

Some iMcV modules offer Configuration Control (labels on 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 via iView^2, the SNMP settings determine the configuration of the board.

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

- Installing an IE-iMcV-MediaLinX TX/SFP into a chassis already loaded with iMcV modules or replacing an IE-iMcV-MediaLinX TX/SFP.
  - The iMcV module will transfer its saved configurations. The IE-iMcV-MediaLinX 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-MediaLinX 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-MediaLinX 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-MediaLinX 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-MediaLinX 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.

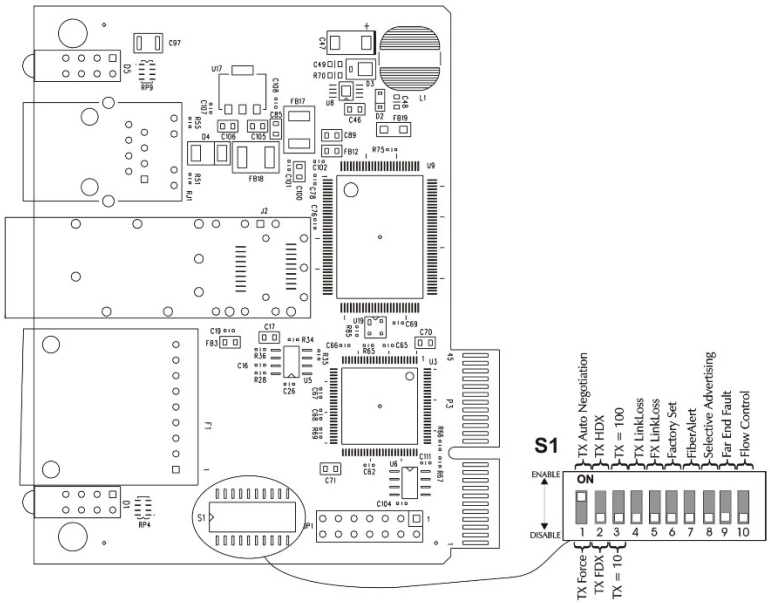
If the command *cleandb* is applied to an SNMP Management Module, all the settings for the modules will be removed; but the Configuration Control modules will still be based on the last change made, while those without Configuration Control will be set to their default settings.

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 IE-iMcV-MediaLinX TX/SFP modules for desired features listed in the table below. After configuring the DIP Switches for the desired settings, install the module and connect the appropriate cables.

DIP Switch on S1	Feature	DIP Switch Options	Default Setting
1	Auto Negotiation	ON	ON
2	TX FDX	OFF	OFF
3	TX 100Mbps	ON	OFF
4	TX 10Mbps	OFF	OFF
5	TX LinkLoss	OFF	OFF
6	FX LinkLoss	ON	OFF
7	FiberAlert	OFF	OFF
8	Selective Advertising	OFF	OFF
9	Far End Fault	OFF	OFF
10	Flow Control	OFF	OFF



FX LINKLOSS, TX LINKLOSS, LINK FAULT PASS-THROUGH, FIBERALERT, FAR End Fault

IE-iMcV-MediaLinX TX/SFP modules include troubleshooting features such as TXLL, FXLL, LFPT, FA and FEF that help locate *silent failures* on a network. Before attempting to install the module(s), it is wise to understand how these features work and react to a specific network configuration.

LINK INTEGRITY

During normal operation, link integrity pulses are transmitted by all point-to-point Ethernet devices. When a B+B SmartWorx 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 B+B SmartWorx 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.

FX LINKLOSS (FXLL)

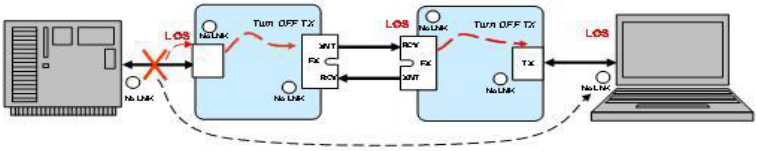
FX LinkLoss is a troubleshooting feature. When a fault occurs on the fiber segment of a conversation, FX LinkLoss detects the fault and passes this information to the twisted pair segment. If a media converter is not receiving a fiber link, FX LinkLoss disables the transmitter on the media converter’s 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.

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 link on the device connected to the fiber port, and the TXLL 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-MediaLinX 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.

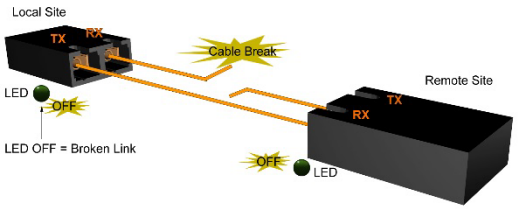


Regardless, if there is a break in segment 1, 2 or 3, the link will drop on the switches at both ends. The link fault is passed through the media converters and observed at each end. It acts just as it would if the devices were directly connected.

FIBERALERT (FA)

By default, FA is turned Off. When enabled, if a fault occurs on the fiber line, affecting data in one direction, FA stops sending a signal in the opposite direction. FXLL will act on this lack of signal propagating the loss of like to the copper port when FXLL is enabled.

FiberAlert minimizes the problems associated with the loss of one strand of fiber. If a strand is unavailable, the B+B SmartWorx 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.*

FAR END FAULT

By default, FEF is disabled. When enabled, and a fault occurs on the fiber line, affecting data in one direction, an FEF signal will be sent in the opposite direction, indicating the fault. FXLL will act on this signal propagating the loss of link to the **cop**per port when FXLL is enabled.

FEF VERSUS FA

FEF is preferred when the devices at both ends of the fiber can interpret the FEF signal. This allows FEF to be turned On at both ends, which will engage the FEF regardless of which direction the fault occurs. (Please refer to diagram on previous page.) For example, if a fault should occur on segment 2 in the direction of segment 1 to 3, FEF would be engaged on the IE-iMcV-MediaLinX TX/SFP between segment 2 and 3. This would then send a signal back to the IE-iMcV-MediaLinX TX/SFP between segment 1 and 2. If the IE-iMcV-MediaLinX TX/SFP between segment 1 and 2 is in a managed chassis, the chassis would send a trap that the port is down. Alternatively, if the IE-iMcV-MediaLinX TX/SFP is not in a managed chassis, FXLL could be engaged to propagate the fault onto the copper port; this would cause segment 1 to show no link on both ends.

FA is used when connecting to a device that does not support FEF. If an FEF signal is sent to a device that does not support FEF, the device acts as if there is still a good connection. The FEF signal is mistaken for data. FA works similar to FEF in that, when there is a fault in one direction of the fiber, it acts on the fiber in the opposite direction. But, unlike FEF, FA sends no signal. Because of this, FA cannot be enabled on both ends. If it is enabled at both ends and a fault occurs, FA will turn signal off in the opposite direction; the device on the other side of the fiber will see the loss of signal and engage FA, turning off signal. The net result will be the signal turned off in both directions, even after the fault has been repaired.

It is highly recommended that only one is chosen - either FEF or FA. If both are selected. FA will take precedence over FEF.

AUTO NEGOTIATION ON IE-IMCV-MEDIALINX TX/SFP

IE-iMcV-MediaLinX TX/SFP modules include the Auto Negotiation feature. When Auto Negotiation is enabled, the module negotiates as a 10/100 Mbps full-duplex device. If the connected device can operate at 100 Mbps full-duplex, a link is established. Auto Negotiation (DIP Switch #1) is enabled by default.

If the twisted pair port on the other device does not have the ability to Auto Negotiate or a half-duplex connection is desired, then Auto Negotiation must be disabled. The IE-iMcV-MediaLinX TX/SFP is capable of 10 Mbps (half and full duplex) as well as 100 Mbps (half and full duplex).

The following diagram shows a typical application with three possible configurations.

Configure Auto Negotiation on an IE-iMcV-MediaLinX TX/SFP by adjusting the DIP Switch setting (for unmanaged modules) or via the management software. Refer to the DIP Switch table for switch location and settings.

If unsure of how to implement these features in a specific configuration, contact B+B SmartWorx Technical Support.

ADDITIONAL IE-IMCV-MEDIALINX TX/SFP FEATURES

SELECTIVE ADVERTISING

Selective Advertising, when used in combination with Auto Negotiation, advertises only the configured speed and duplex mode for the twisted pair port. If a specific speed and/or duplex mode are desired, B+B SmartWorx recommends using Selective Advertising, rather than Force Mode, when connecting to devices that only use Auto Negotiation.

Switch Settings for Selective Advertising Configuration

Function	Auto Negotiation	Selective Adv	Speed	Duplex
100 Mbps FDX	ON	ON	100	FDX
100 Mbps HDX	ON	ON	100	HDX
10 Mbps FDX	ON	ON	10	FDX
10 Mbps HDX	ON	ON	10	HDX
100 FDX/10 HDX	ON	OFF	100/10	FDX/HDX

FLOW CONTROL

Whether the copper port is configured for 10Mbps or 100Mbps, the only need for flow control is to pass congestion at the customer's location back up to the fiber port. If the copper port is supporting PAUSE due to the outcome of the Auto Negotiation process, then congestion on the copper port will cause PAUSE frames to be sent out the fiber port. In a like fashion, if congestion occurs on the fiber port, then the copper port will send PAUSE if flow control is enabled on the copper port through the outcome of Auto Negotiation. In half duplex mode, the unit will provide physical "Back Pressure" for flow control instead of PAUSE.

Flow control can be disabled via a DIP Switch or through SNMP management. If disabled, the copper port will not advertise a flow control capability. Flow control should be enabled if the end device, such as a switch, also has flow control capability, and it is enabled.

TX DUPLEX MODE

The Duplex Mode settings of the IE-iMcV-MediaLinX TX/SFP module are offered on DIP Switch #2: FDX:OFF, HDX:ON. The default duplex mode for IE-iMcV-MediaLinX TX/SFP is Full-Duplex. This mode is recommended if the End device does not offer Auto Negotiation, or is not desired.

AUTOCROSS FEATURE FOR TWISTED PAIR CONNECTION

All twisted pair ports on the IE-iMcV-MediaLinX 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-MediaLinX TX/SFP module features diagnostic LEDs that provide information on features and ports.

Twisted Pair LEDs

TXLL Glows when TX LinkLoss is enabled. Blinks when a fault occurs on the copper port and actively disables the fiber port.

100 Glows yellow when 100 Mbps is selected on port.

LNK/ACT Glows green when a link is established on port. Blinks green when data activity occur.

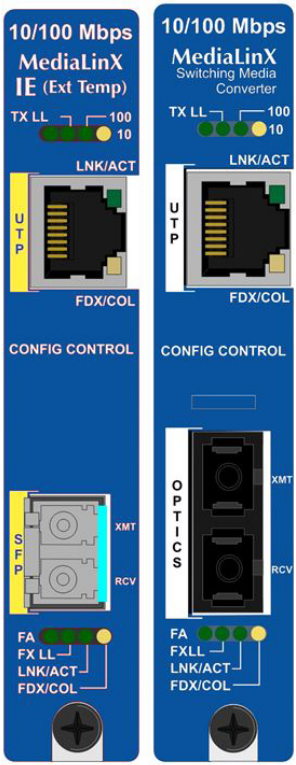
FDX/COL Glows yellow when port is in Full-Duplex mode. Blinks yellow when modules are being operated in Half-Duplex mode and collisions occur.

Fiber Optic LEDs

FXLL Glows green when FX LinkLoss is enabled. Blinks when a fault occurs on the fiber port and actively disables the copper port.

LNK/ACT Glows green when a link is established on port. Blinks green when data activity occurs.

FDX/COL Glows yellow when port is in Full-Duplex mode. Blinks yellow when modules are being operated in Half-Duplex mode and collisions occur.



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 connecting to an end device, such as another switch, be sure to use the same configuration on its port as well as the IE-iMcV-MediaLinX TX/SFP. For example, if the end device is set to a FORCE mode, then set the copper port of the IE-iMcV-MediaLinX TX/SFP to a FORCE mode as well.

If using a high-powered device (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 to +85°C (-40 to +185 °F)

Non-IE: 0 to +50 °C (+32 to +122 °F)

Storage Temperature

-25 to +70 °C (-13 to +158 °F)

Humidity

5 - 95% (non-condensing)

Power Consumption (Typical)

300mA

Fiber Optic Specifications

For fiber optic specifications, please visit the B+B SmartWorx website.

B+B SMARTWORX TECHNICAL SUPPORT

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STATEMENTS, GUIDELINES, PRECAUTIONS

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.

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 the factory 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 standalone 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 a 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 standalone 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.

STANDARDS/COMPLIANCES

CE

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

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

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.

Documentation Number: IE-iMcV-MediaLinX_iMcV-MediaLinX_4618m