

iMcV-Giga-MediaLinX TX/SFP

iMcV-Giga-MediaLinX TX/LX/SX

USER MANUAL



B+B SMARTWORX

Powered by

ADVANTECH

Advantech B+B SmartWorx - Americas

707 Dayton Road

Ottawa, IL 61350 USA

Phone 1 (815) 433-5100

Fax 1 (815) 433-5105

Advantech B+B SmartWorx - Europe

Westlink Commercial Park

Oranmore, Co. Galway, Ireland

Phone +353 91-792444

Fax +353 91-792445

www.advantech-bb.com

support@advantech-bb.com

CONTENTS

About iMcV-Giga-MediaLinX..... 4

 Configuring iMcV-Giga-MediaLinX TX/SFP 4

 Installing iMcV-Giga-MediaLinX TX/SFP Modules 4

 Managed Modules 5

 Configuration Control & SNMP Management..... 5

 Inserting an iMcV module..... 6

 Inserting a management module..... 6

 Unmanaged Modules..... 7

 Selective Advertising (TX Port)..... 8

 Force Mode for Duplex (TX Port)..... 8

 Force Mode for Speed (TX Port)..... 8

 FX LinkLoss, TX LinkLoss, FiberAlert, LFPT, Far End Fault..... 9

 Link Integrity 9

 FX LinkLoss (FXLL)..... 9

 TX LinkLoss (TXLL) 10

 FiberAlert (FA)..... 10

 Link Fault Pass Through (LFPT)..... 11

 Far End Fault (FEF) 11

 AutoCross Feature for Twisted Pair Connection 11

 Auto Negotiation (TX and FX) 12

 Auto Negotiation TX..... 12

 FX Auto Negotiation (FX Port) 12

 Flow Control 12

 LED Operation..... 13

Troubleshooting 14

Specifications..... 14

B+B SmartWorx Technical Support..... 15

Statements, Precautions, Guidelines, Regulatory..... 15

 FCC Radio Frequency Interference Statement..... 15

 Electrostatic Discharge (ESD) Precautions 16

 Fiber Optic Cleaning Guidelines..... 16

Regulatory, Standards, Compliances 17

ABOUT IMCV-GIGA-MEDIALINX

The iMcV-Giga-MediaLinX TX/SFP provides a single conversion between 10/100/1000 Base-T twisted pair and 1000 Base-SX/FX fiber. This device Auto Negotiates speed and duplex on the copper port and the fiber is fixed at 1000Mbps. There is a fixed fiber and an SFP version available; both support jumbo frames up to [frame size] MTU.

The iMcV-Giga-MediaLinX TX/FX, fixed fiber transceiver model, includes one 10/100/1000Mbps RJ45 connector and one 1000Mbps SC fiber connector that can support Single Mode fiber or Multi Mode fiber in Dual Strand or Single Strand fiber.

The iMcV-Giga-MediaLinX TX/SFP, SFP port-based model, includes one 10/100/1000Mbps RJ-45 connector and one SFP port that was designed to support MSA-compliant 100Mbps or 1000Mbps SFPs. The model will detect the SFP and run at the speed for which the SFP was designed. SFPs can be purchased from B+B SmartWorx to accommodate Single Mode or Multi Mode fiber in Single Strand or Dual Strand fiber.

Both models include LFPT, a diagnostic feature that can be enabled via a DIP Switch. LFPT forces a port “down” state on one port when link is lost on the other port. The result is the link fault passes through the device.

Understanding LFPT is critical to operating the device, for more information, please refer to the Link Fault Pass Through (LFPT) section.

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

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

CONFIGURING IMCV-GIGA-MEDIALINX TX/SFP

The iMcV-Giga-MediaLinX TX/SFP can be configured with features such as LinkLoss, FiberAlert, LinkFault Pass Through, Auto Negotiation, Duplex Mode and Speed. The following sections include instructions for configuring both managed (via an SNMP-compatible management application such as iView²) and unmanaged modules.

INSTALLING IMCV-GIGA-MEDIALINX TX/SFP MODULES

The iMcV-Giga-MediaLinX TX/SFP can be installed in any B+B SmartWorx chassis with a blank slot. To install a module, remove the blank bracket covering the slots (if present) and slide the module into the chassis, via the card guides, until the module is seated securely in the connector. Secure the module to the chassis by tightening the captive screw.

MANAGED MODULES

To manage one or more iMcV-Giga-MediaLinX TX/SFP (s), an SNMP agent must be present in the chassis. To configure Managed Modules, the end user can set DIP Switches or use the iView² software.

CONFIGURATION CONTROL & SNMP MANAGEMENT

As SNMP needs have grown, many network administrators who own the iMediaChassis series are installing an SNMP Management Module to manage and monitor B+B devices in the network. As a result, B+B SmartWorx offers Configuration Control on many iMcV modules that it offers.

Configuration Control solves these issues:

1. When non-Configuration Control iMcV modules are placed in a managed chassis, the iMcV module's DIP Switches are ignored and the iMcV module is configured by the chassis' management module. If the management module is removed or fails, the iMcV modules will revert back to the DIP Switch settings. When an iMcV module changes from management module settings to DIP Switch settings, the traffic across the iMcV module will drop for a very brief period of time.
2. When introducing a management module to a chassis full of working non-Configuration Control iMcV modules, the iMcV modules will stop using the DIP Switch setting and start using the management module settings. When an iMcV module changes from DIP Switch setting to management module settings, the traffic across the iMcV modules will drop for a very brief period of time.
3. When removing an old iMcV module and replacing it with a different model iMcV module, the configuration of the old iMcV module remains.

Configuration Control supports these features:

1. Any module, iMcV module or management module, can be changed under power without losing any configuration.
2. The Management module can be added to a chassis without losing any configuration.
3. The Management module should not be "Mission Critical". If the management module should be removed or fail the iMcV modules should not experience an interruption in service.
4. Any module, including the management module, can be changed with the *identical* module under power; and the configuration from the removed module will be automatically copied to the new module.

5. iMcV module DIP Switch settings can be used to make initial configuration settings overriding the management module's setting. (See examples.)

INSERTING AN IMCV MODULE

1. Without Configuration Control

- DIP Switches are ignored and the iMcV module takes the configuration from the management module. This could be the default configuration or from a previously installed module.

2. With Configuration Control

- If the iMcV module is different (model or DIP Switch settings) from the iMcV module installed in the slot previously, then the DIP Switch settings are used for configuration. This configuration is then copied up to the management module.
- If the iMcV module is exactly the same (model and DIP Switch settings) to the iMcV module previously installed, the iMcV module will use the settings from the management module.

INSERTING A MANAGEMENT MODULE

• Without Configuration Control

- iMcV modules in an unmanaged chassis use DIP Switch settings. When the management module is inserted, the iMcV modules use the configuration stored in the management module. This will more than likely change the configuration of the iMcV modules - at the very least causing a short interruption in data flowing through the iMcV modules.

• With Configuration Control

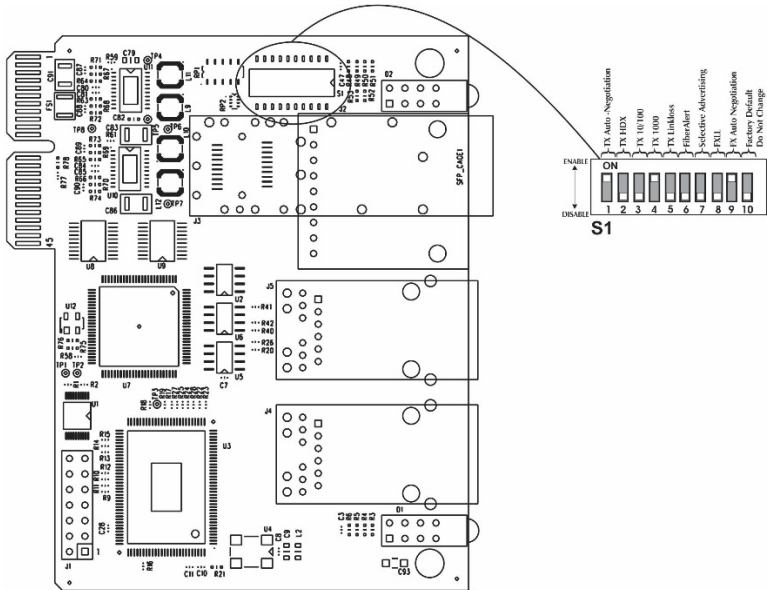
- The iMcV modules copy their configuration up to the management module. The iMcV modules keep working with no configuration change and no interruption in data.

NOTE: *If the end user has a mixture of standard iMcV modules and 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.*

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

UNMANAGED MODULES

Before installing, configure the iMcV-Giga-MediaLinX TX/SFP modules for desired features. The table below indicates the available features and settings for the iMcV-Giga-MediaLinX TX/SFP modules. After configuring desired settings, install the module and connect appropriate cables (see *Installing iMcV-Giga-MediaLinX TX/SFP* section for more information).



DIP Switch on S1	Feature	Default Setting
1	TX Auto Negotiation	ON
2	TX Port-HDX (ON) or FDX (OFF)	OFF
3	TX Port-100 (ON) or 10 (OFF)	OFF
4	TX Port-1000	ON
5	TX LinkLoss (TXLL)	OFF
6	FiberAlert	OFF
7	Selective Advertising	OFF
8	FX LinkLoss (FXLL)	OFF
9	FX Auto Negotiation	ON
10	Factory Configured—Do Not Change	OFF

SELECTIVE ADVERTISING (TX PORT)

Selective Advertising, when used in combination with Auto Negotiation, advertises only the configured speed and duplex mode for the twisted-pair port. This allows configuration of both the twisted-pair port's speed (10, 100 or 1000 Mbps) and Duplex Mode (FDX or HDX). Selective Advertising (Switch 7) functions only with Auto Negotiation (Switch 1) enabled.

Selective Advertising Configuration			
Desired Speed/Duplex	Switch 2: Duplex	Switch 3: Speed (100Mbps)	Switch 4: Speed (1000Mbps)
TX Port-1000 - FDX	ON	OFF	ON
TX Port-100 - FDX	ON	ON	OFF
TX Port-100 - HDX	OFF	ON	OFF
TX Port-10 - FDX	ON	OFF	OFF
TX Port-10 - HDX	OFF	OFF	OFF

FORCE MODE FOR DUPLEX (TX PORT)

The twisted pair port on the iMcV-Giga-MediaLinX TX/SFP can be set to either Half-Duplex or Full-Duplex operation in 10, 100, 1000Mbps (1000 Mbps is always FDX). Before manually setting duplex mode, disable Auto Negotiation by setting DIP Switch 1 to **OFF**.

- The twisted pair port is configured for Full-Duplex by default, which is the **ON** position on DIP Switch 2.
- Configure the twisted pair port for Half-Duplex by setting DIP Switch 2 to the OFF position.

FORCE MODE FOR SPEED (TX PORT)

The speed on the twisted pair port (10, 100, or 1000 Mbps) can also be set to forced mode. Before manually setting the speed mode, disable Auto Negotiation by setting DIP Switch 1 to **OFF**.

- Configure the twisted pair port for 10 Mbps operation by setting both DIP Switches 3 and 4 to the **OFF** position.
- Configure the twisted pair port for 100 Mbps operation by setting DIP Switch 3 to the **ON** position and DIP Switch 4 to **OFF**.
- Configure the twisted pair port for 1000 Mbps operation by setting DIP Switch 4 to the **ON** position. (When **ON**, Switch 4 overrides Switch 3).

FX LINKLOSS, TX LINKLOSS, FIBERALERT, LINK FAULT PASS THROUGH, FAR END FAULT

iMcV-Giga-MediaLinX TX/SFP includes troubleshooting features: FiberAlert, FX LinkLoss, and TX LinkLoss, that can help locate "silent failures" on the network. This section explains how FiberAlert and LinkLoss work, how they react in a network configuration, which should be understood before attempting to enable any of these features.

**** 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 a B+B SmartWorx media converter receives valid link pulses, it knows that the device to which it is connected is intact/active and sending pulses, and 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)

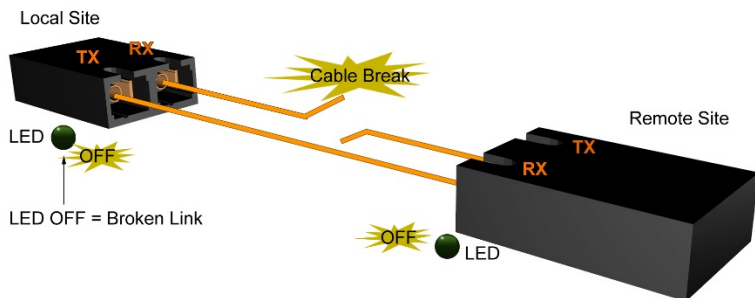
FX LinkLoss is a troubleshooting feature. When a fault occurs on the fiber segment of a conversation, FX LinkLoss detects the fault and passes this information to the twisted pair segment. If a media converter is not receiving a fiber link, FX LinkLoss disables the transmitter on the media converter's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

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. The result is a loss of the link on the device connected to the fiber port. TXLL LED will blink to also indicate that the copper port has lost link reporting the fault to the copper port.

FIBERALERT (FA)

FiberAlert minimizes 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 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.

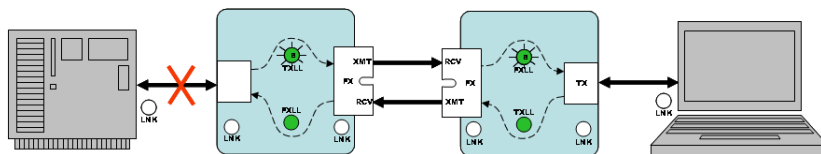


WARNING

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

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 iMcV-Giga-MediaLinX TX/SFP. LFPT is disabled 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.



FAR END FAULT (FEF)

FEF is permanently enabled for 100Mbps. 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. When enabling LFPT, FXLL will act on this signal propagating the loss of link to the copper port when FXLL is enabled. The FEF function can trigger the FA function and may keep both transmitters off indefinitely. For more information on LinkLoss, visit the B+B SmartWorx website or contact the B+B SmartWork Technical Support.

AUTOCROSS FEATURE FOR TWISTED PAIR CONNECTION

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

AUTO NEGOTIATION (TX AND FX)

AUTO NEGOTIATION TX

The iMcV-Giga-MediaLinX TX/SFP ships from the factory with Auto Negotiation enabled on the twisted pair port. In this mode, the twisted pair port negotiates for speed and duplex, autosensing 10 Mbps Full-Duplex, 10 Mbps Half-Duplex, 100 Mbps Full-Duplex, 100 Mbps Half-Duplex, or 1000 Mbps Full-Duplex with Flow Control. Auto Negotiation is set to ON by default.

FX AUTO NEGOTIATION (FX PORT)

The iMcV-Giga-MediaLinX TX/SFP includes the FX Negotiation feature, which allows Auto Negotiation or a Force Mode on the Gigabit fiber link. Enabled by default, it must be enabled or disabled on both ends of the connection to establish a link. Only enable this feature if the connecting device supports it. When FX Auto Negotiation is enabled, Fiber Alert does not need to be enabled.

FLOW CONTROL

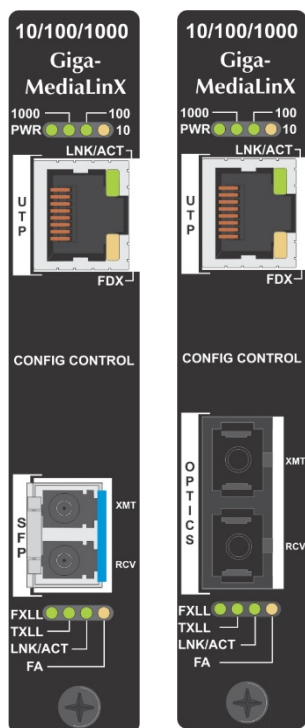
Flow Control is used to throttle the END device to avoid dropping packets during network congestion. Flow Control is enabled by Default when the port is set to Auto Negotiation. The copper port will automatically use the physical layer back pressure for Flow Control when configured to Half Duplex Operation.

LED OPERATION

Each iMcV-Giga-MediaLinX TX/SFP module features diagnostic LEDs that provide information on features and ports.

PWR	Glow green when powered.
1000	Glow green at 1000 Mbps.
100	Glow green at 100 Mbps.
10	Glow amber at 10 Mbps.
LNK/ACT	Glow green when link is established. Blinks green when data activity occurs (this is true for both LNK/ACT LEDs).
FDX	Glow amber in Full-Duplex mode. Off in Half-Duplex mode.
FXLL	Glow green when FX LinkLoss is enabled. Blinks when FX LNK is lost.
TXLL	Glow green when TX LinkLoss is enabled. Blinks when TX LNK is lost.
LNK/ACT	Glow green when a link is established. Blinks green when data activity occurs.
FA	Glow amber when FiberAlert is enabled.

NOTE: *Blinking does not display within iView®.*



TROUBLESHOOTING

- During installation, test the fiber and twisted pair connections with all troubleshooting features disabled. Once the physical connections have been established, the troubleshooting features of LinkLoss and FiberAlert can be enabled by using the DIP Switches or configuring them using the iView² software. However, it is important to remember that software will override hardware settings.
- Although a specific link segment, either the copper or the fiber, can be established, if the LNK LEDS do not reflect a state of active power, it is best to connect both segments.
- If an SM fiber transceiver is deployed for a short distance application, saturation may occur, contributing to loss of data or link. In such a case, add an optical attenuator to the fiber connection.

SPECIFICATIONS

Operating Temperature

0 to +50 °C (+32 to +122 °F)

Storage Temperature

-25 to +70 °C (-13 to +158 °F)

Humidity

5 to 95% (non-condensing)

Power Consumption (typical)

Input Load: 500 mA

B+B SMARTWORX TECHNICAL SUPPORT

USA/Canada: 1 (800) 346-3119 (Ottawa IL USA)

Europe: +353 91 792444 (Ireland / Europe)

Email: support@advantech-bb.com

Web: www.advantech-bb.com

STATEMENTS, PRECAUTIONS, GUIDELINES, REGULATORY**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.

ELECTROSTATIC DISCHARGE (ESD) 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 units by the edges; do not touch the electronic components or gold connectors.
4. After removal, always place 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 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.

REGULATORY, STANDARDS, COMPLIANCES

CE The products described herein comply with the Council Directive on Electromagnetic Compatibility (2004/108/EC) For more information, contact B+B SmartWorx.



**Class 1 Laser product, Luokan 1 Laserlaitte,
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.



© 2018 B+B SmartWorx – powered by Advantech. All rights reserved. The information in this document is subject to change without notice. B+B SmartWorx assumes no responsibility for any errors that may appear in this document. iMcV-Giga-MediaLinX is a trademark of B+B SmartWorx. Other brands or product names may be trademarks and are the property of their respective companies.

Documentation Number: iMcV-Giga-MediaLinX_4618m