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A **BELDEN** BRAND

# CommLink FXC-S201

Intercom Link

User Manual

M4050-9900-201

2015-05-13

[www.grassvalley.com](http://www.grassvalley.com)

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Title	CommLink FXC-S201 User Guide
Part Number	M4050-9900-201
Revision	13 May 2015

## Electromagnetic Compatibility



This equipment has been tested for verification of compliance with FCC Part 15, Subpart B requirements for Class A digital devices.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital 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 case the user will be required to correct the interference at his own expense.



This equipment has been tested and found to comply with the requirements of **Directive 2014/30/EU - Electromagnetic Compatibility**

- EN 55022 Conducted emissions, Class A
- EN 55022 Radiated emissions, Class A
- EN 61000-3-2 Harmonic current emission limits
- EN 61000-3-3 Voltage fluctuation and flicker limitations
- EN 61000-4-2 Electrostatic discharge immunity
- EN 61000-4-3 Radiated electromagnetic field immunity - RF
- EN 61000-4-4 EFT immunity
- EN 61000-4-5 Surge immunity
- EN 61000-4-6 Conducted immunity
- EN 61000-4-8 Power frequency magnetic field immunity
- EN 61000-4-11 Voltage dips, short-interruption and voltage variation immunity



ADAP-AC-04 - External Power Supply  
**2006/95/CE - Low Voltage Directive**

EN 60950-1, 2nd Edition, 2006 +A1 :2009 + A1 :2011

IEC 60950-1, 2nd Edition, 2005 + A1

UL 60950-1, 2nd Edition, 2006

Safety of Information Technology Equipment



EN 60825- Safety of Laser  
Class 1 laser product





# toc

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# About CommLink FXC-S201

This chapter provides an overview of the CommLink FXC-S201 Fiber Optic Intercom Link and includes the safety and warranty information about it.

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## About CommLink FXC-S201

CommLink™ FXC-S201 Intercom Link is a fiber-optic transceiver system that uses one or two strands of fiber to carry two channels of production intercom, allowing robust voice and data connectivity over distances up to 40KM (about 25 miles). The CommLink utilizes a dual-fiber transceiver SFP, or a Wavelength Division Multiplexing (WDM) SFP for bidirectional signal transmission on a single fiber strand. In the WDM scenario, all fiber links must consist of a 1310 nm unit at one end and a 1550 nm unit at the other. See [Wavelength-Division Multiplexing \(WDM\)](#) on page 3 for information about Wavelength-Division Multiplexing and the use of CommLink units.

The CommLink is compatible with the industry's most popular intercom systems:

- Party line
  - Clear-Com®
  - RTS® TW
- Digital Matrix
  - Clear-Com® MatrixPlus/Eclipse
  - RTS® Adam/Cronus/Zeus
- Generic 4-Wire and Data
  - Two Channels of bidirectional audio
  - Two paths of bidirectional dataRS422 or RS485

In a special usage case, multi-strand fiber optic cable can be used for more than one signal - one to the CommLink FXC-S201 and one carrying HD Video (see [Example CommLink FXC-S201 Usage Scenarios](#) on page 13).

## About this User Guide

This User Guide is designed to cover all of the various options, so not every page in this guide will apply to your specific system.

## Unpacking the CommLink FXC-S201 Fiber Optic Intercom Link

Individual items shipped with a CommLink FXC-S201 system depend on the particular configuration.

Please consult your packing slip and purchase order to ensure that you have received all of the expected components. Inspect all components for scratches and other mechanical damage, and inspect the electrical connectors for bent or damaged pins and latches. Report any missing or damaged components to Grass Valley. See [Product Returns](#) on page 2.

You must use your own video and audio cables to make connections for Video, Tally, Black Burst/Genlock, Base Station monitor, intercom, and other ancillary signals and equipment. Suggestions for these cables are discussed later in this User Guide.

### Product Returns

In the unlikely event of damage to your CommLink FXC-S201 Fiber Optic Intercom Link during shipping or delivery, take note of any damage with the delivery or shipping service. If any component does not work correctly out of the box, contact Grass Valley (see [Contact Us](#) on page 25).

If the problem cannot be remedied through a service telephone, you will receive an RMA number (Return of Merchandise Authorization). Take note this RMA number inside and outside of all shipping boxes and on all documentation provided with the items to be returned.

### Ordering Information

Part Number	Description
FXC-S201-W13	Commlink, Standalone, WDM, 1310 nm, 1 fiber
FXC-S201-W15	Commlink, Standalone, WDM, 1550 nm, 1 fiber
FXC-S201-S13	Commlink, Standalone, 1310 nm, dual fiber
ADAP-AC-04	AC Power Adapter; 120/240 VAC in; 4-pin XLR; 4A; 15 VDC out



# 2 System Overview

This chapter presents an overview of the CommLink FXC-S201 Fiber Optic Intercom Link components and options.

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## Fiber Overview

Fiber Optics and Fiber Optic Cable are at the heart of the CommLink FXC-S201 Fiber Optic Intercom Link Fiber Optic Intercom Link System. The CommLink system features the ability to multiplex and de-multiplex a variety of video, audio, and data signals so that they can be carried over a thin strand of Fiber Optic cable for long distances.

The specific theory and operation of Fiber Optics is beyond the scope of this document, but you need to be aware of the different types of Fiber Optic Cable and Fiber Optic Cable Connectors. Most CommLink FXC-S201 Fiber Optic Intercom Link applications will use Single Mode Fiber with ST Connectors.

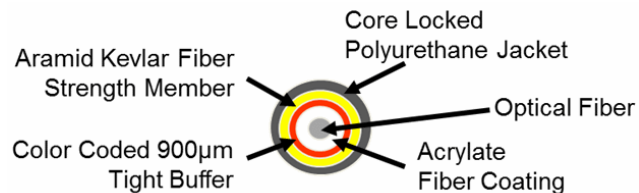


Fig. 2-1: Single Mode Fiber Optic Cable Cross-Section

## Wavelength-Division Multiplexing (WDM)

Fiber optic communication is enhanced by the use of Wavelength-Division Multiplexing (WDM). With WDM, multiple optical carrier signals can be carried on a single optical fiber by using different wavelengths of laser light for each carrier. The full theory of WDM is beyond the scope of this manual, but it is important to understand that by using equipment with different transmitter wavelengths on opposite ends of a fiber optic cable, signals can be sent in both directions over that single cable.

CommLink FXC-S201 units intended for WDM use are available with transmitter wavelengths of 1310 nm and 1550 nm, and a WDM link requires one of each, as illustrated in [Figure 2-2](#).

Two units with the same transmit wavelength will not work for WDM operation over a single-fiber cable.

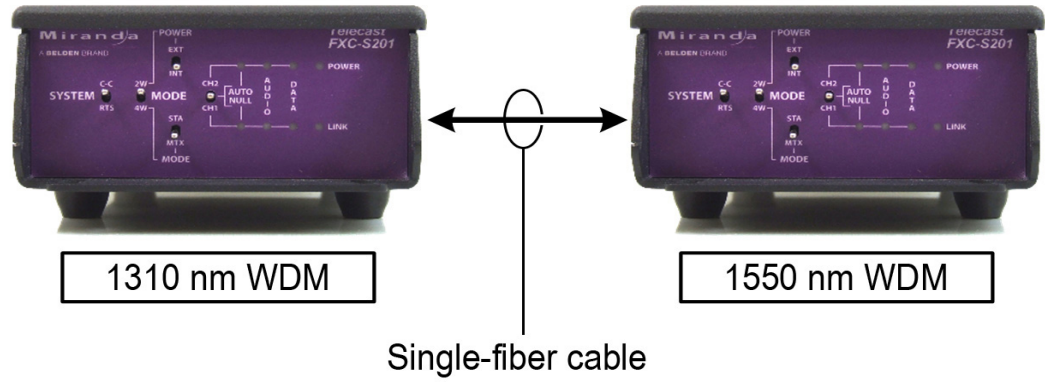


Fig. 2-2: Pairing Different WDM Factor CommLink Units

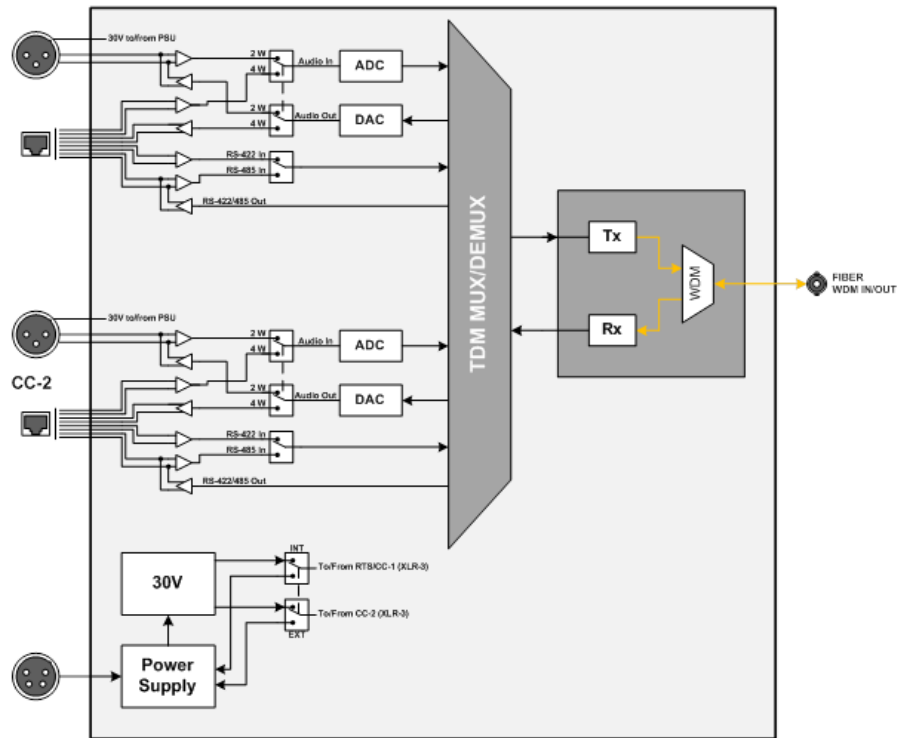


Fig. 2-3: FXC-S201 Block Diagram - WDM Version

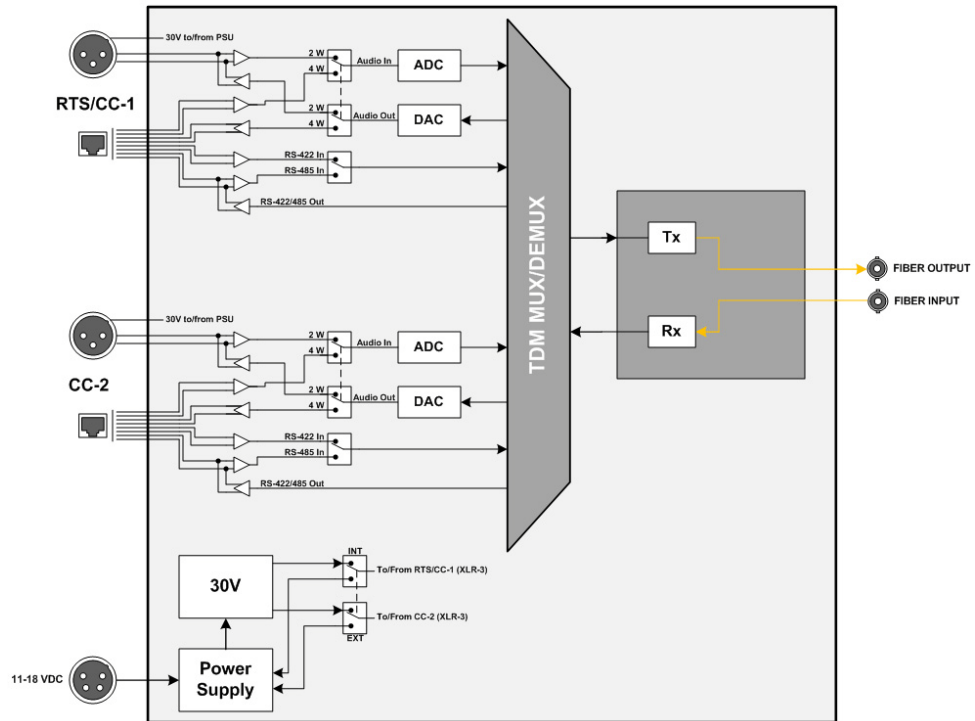


Fig. 2-4: FXC-S201 Block Diagram - Dual Fiber Version

## CommLink FXC-S201 Front and Rear Panel Components

### CommLink FXC-S201 Fiber Optic Intercom Link Front Panel

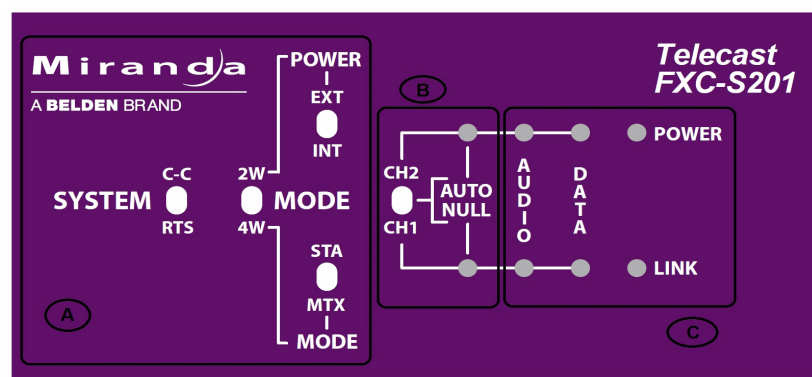


Fig. 2-5: CommLink FXC-S201 Fiber Optic Intercom Link Front Panel

The CommLink FXC-S201 Fiber Optic Intercom Link has three features:

- Area A: System Configuration Switches
- Area B: Auto Null Control and Indicators
- Area C: System Status Indicators

### Area A - System Configuration Switches

The four switches in this section allow the configuration of the CommLink FXC-S201 Fiber Optic Intercom Link for the particular intercom environment in use. See [Example CommLink FXC-S201 Usage Scenarios](#) on page 13 below for examples of how these switches interact.

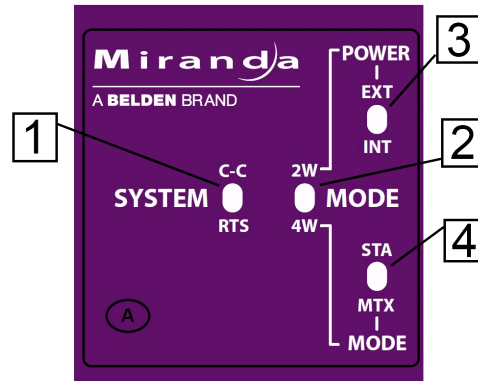


Fig. 2-6: System Configuration switches

- 1: System Switch - sets the CommLink FXC-S201 Fiber Optic Intercom Link in either RTS mode or Clear-Com (C-C) mode
- 2: Mode Switch - sets the CommLink FXC-S201 Fiber Optic Intercom Link in either Two Wire (2W) or Four Wire (4W) mode
- 3: 2W Power Switch - sets the CommLink FXC-S201 power mode to either externally powered (EXT) or internally powered (INT). This switch is only operational when the Mode Switch is set to 2W.
- 4: 4W Mode Switch - sets the CommLink FXC-S201 to run in Station (STA) mode or Matrix (MTX) mode. This switch is only operational when the Mode Switch is in 4W mode.

When connecting two CommLink FXC-S201 Fiber Optic Intercom Link units via fiber cable, each CommLink FXC-S201 unit must be independently set for the configuration requirements at that end of the fiber link.

### Area B - Auto Null Operation

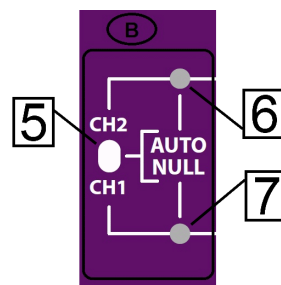


Fig. 2-7: Auto Null switch and indicator

Please see [Using the Auto-Null Function](#) on page 21 below on the Auto Null function.

- 5: Auto Null switch: this three-position spring-loaded momentary switch activates the Auto Null process for either Channel 1 (CH1) or Channel 2 (CH2).
- 6: Channel 1 Auto Null Activity Indicator: blinks Green while the Nulling process occurs.
  - This indicator will be a solid Green to indicate the process is complete and good.
  - This indicator will be Red if there was a problem with the null. (see [Using the Auto-Null Function](#) on page 21 for more information)
- 7: Channel 2 Auto Null Activity Indicator: behaves the same as the Ch1 Auto Null activity indicator

### Area C - System Status Indicators

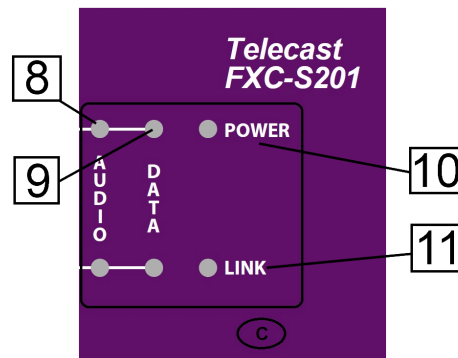


Fig. 2-8: System Status Indicators

- 8: Audio Activity Indicator
  - Green when audio activity is below 0 db
  - Red when audio activity is above 0 db
- 9: Data Activity Indicator
  - Green when there is data activity on the particular channel
- 10: Power Indicator
  - Green indicates power
- 11: Link Status Indicator
  - Green indicates link is good
  - Red indicates link is bad or non-existent.

## CommLink FXC-S201 Fiber Optic Intercom Link Back Panel

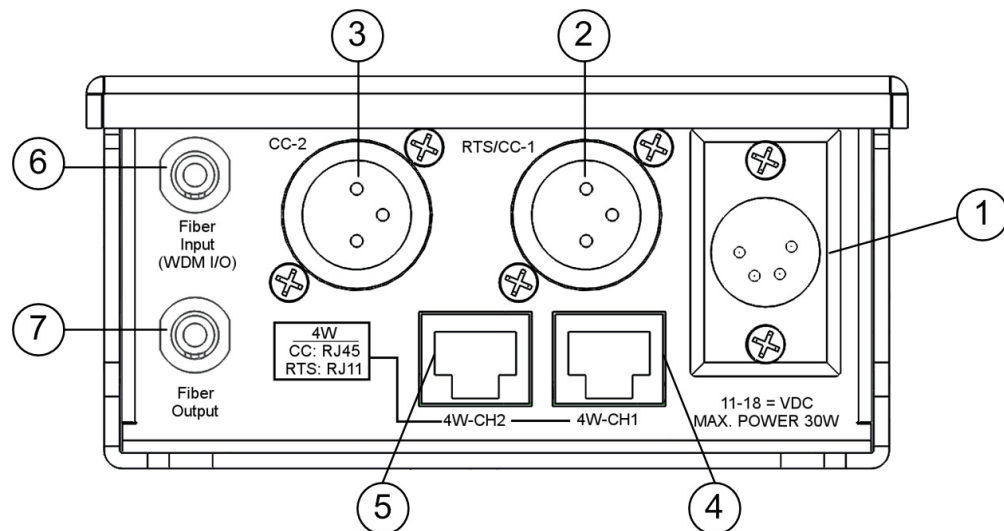


Fig. 2-9: CommLink FXC-S201 Back Panel

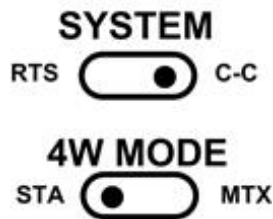
- 11-18 VDC Power Connector** - for use with the ADAP-AC-04 Power Supply. This power supply has a 4-pin XLR connector. See [CommLink FXC-S201 Fiber Optic Intercom Link Port State and Power Options](#) on page 11 for wiring information.
- RTS/CC-1 Chassis Mounted XLR Connector** - for RTS TW operation or Channel 1 of Clear-Com two wire operation
- CC-2 Chassis Mounted XLR Connector** - for Channel 2 of Clear-Com two wire operation. Not active when the system is in RTS-TW mode.  
Connectors 4 and 5 operate in one of 4 modes, depending on system configuration. These connectors can be used with RJ45 cables or RJ11 cables. See [CommLink FXC-S201 Fiber Optic Intercom Link Matrix and Station Connectors](#) on page 9 for more information and for wiring information.
- 4W-CH1 Connector** - 8 Conductor RJ45/RJ11 connector for Channel 1 in 4-wire operation.
- 4W-CH2 Connector** - 8 Conductor RJ45/RJ11 connector for Channel 2 in 4-wire operation.
- Fiber Input (WDM I/O)**- ST Connector for Fiber Optic Cable. Connect the input fiber in a two-fiber system. Connect the single fiber cable here for WDM operation.
- Fiber Output** - ST Connector for Fiber Optic Cable. Connect the output fiber in a two-fiber system. There is no connection here for WDM operation.  
Read the Using Fiber Optics Guide for information on how to manage and deploy your fiber optics cabling, safety precautions, tips & tricks, and recommendations for creating complex fiber optic networks. You can find a copy of this document on the Support portal (see [Contact Us](#) on page 25).

## CommLink FXC-S201 Fiber Optic Intercom Link Matrix and Station Connectors

Both the RTS and Clear-Com system matrix systems use data wiring to carry intercom audio and data. Clear-Com systems use an 8-wire "network" cable with RJ45 connectors. RTS systems use a 6-wire cable with RJ11 connectors similar to standard telephone wiring. However, telephone wiring will not work as it is only 4-wire.

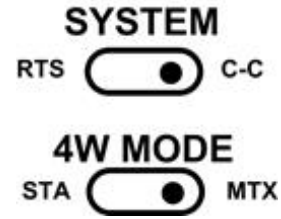
The CommLink FXC-S201 Fiber Optic Intercom Link Configuration is shown for each intercom mode. The switch position is indicated. In all cases, the 4W/2W switch is in the 4W position.

### Clear-Com Mode Wiring and Switch Settings



Signal	Pin #
RS-422 data receive (+)	1
RS-422 data receive (-)	2
Audio receive (+)	3
Audio send (+)	4
Audio send (-)	5
Audio receive (-)	6
RS-422 data send (+)	7
RS-422 data send (-)	8

*To Remote Station*



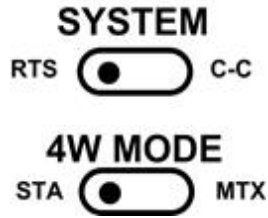
Signal	Pin #
RS-422 data send (+)	1
RS-422 data send (-)	2
Audio send (+)	3
Audio receive (+)	4
Audio receive (-)	5
Audio send (-)	6
RS-422 data receive (+)	7
RS-422 data receive (-)	8

*To Matrix Frame*

Fig. 2-10: Clear-Com Mode - Switch Settings and 4W Data Connector Pinouts

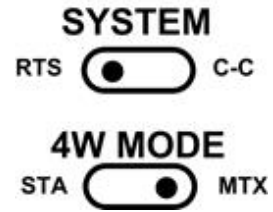
### RTS Mode Wiring and Switch Settings

In all cases the 4W/2W switch is in the 4W position.



Signal	Pin #
N/C	1
Data -	2
Audio Out (MTX ->SAT) (+)	3
Audio In (STA ->MTX) (+)	4
Audio to Matrix (-)	5
Audio from Matrix (-)	6
Data +	7
N/C	8

*To Remote Station*



Signal	Pin #
N/C	1
RS485 Data -	2
Audio In (MTX ->STA) (+)	3
Audio Out (SAT-> MTX) (+)	4
Audio Out (SAT-> MTX) (-)	5
Audio In (MTX ->STA) (-)	6
RS485 Data +	7
N/C	8

*To Matrix Frame*

*Fig. 2-11: RTS Mode - Switch Settings & 4W Data Connector Pinouts*



## CommLink FXC-S201 Fiber Optic Intercom Link Power Options

The CommLink FXC-S201 Fiber Optic Intercom Link is powered through an attached external power supply or from power received from the Two-Wire intercom connection.

The following table shows how a CommLink FXC-S201 Fiber Optic Intercom Link unit can be powered:

Model	12 Volt Power Supply	30 Volt Power Supply	30 Volt Power Output to Belt Packs*
FXC-S201-W13 FXC-S201-W15 FXC-S201-S13	ADAP-AC-04 with 4-pin XLR	Can be powered from Intercom system when in Two-Wire mode	30 Volts is provided on RTS/CC-1 and CC-2 XLR connectors.

\* 30 Volts is output from the CommLink FXC-S201 unit when it has 12V power applied. When no 12V power is applied (2W Power switch is on EXT), the CommLink FXC-S201 Fiber Optic Intercom Link unit derives power from the intercom connection and all Belt-Packs derive power from the Intercom system or from internal power sources.

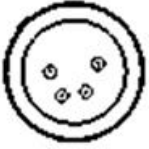
When powered by the 12 Volt power supply, the CommLink FXC-S201 Fiber Optic Intercom Link will power five intercom belt packs (10 total on the system) or two remote matrix stations per channel. If the system has self-powered belt packs attached (30V), and the external 12 Volt power supply is also attached, the 12 Volt supply takes priority in powering the CommLink FXC-S201 unit.

## CommLink FXC-S201 Fiber Optic Intercom Link Port State and Power Options

The CommLink FXC-S201 Fiber Optic Intercom Link also manages the enabling of ports depending on the type of power supply and the system mode. The following table shows the different CommLink FXC-S201 Fiber Optic Intercom Link states:

System Mode	Power Supply	Internal 30 Volt Supply	Belt Pack Power	4W Ports
2W	30V from Intercom System	Disabled	Self-powered or from Intercom System	Disabled
2W	12 Volt External & Belt-Packs are powered internally or from the intercom system	Disabled	Self-powered or from Intercom System	Disabled
2W	12 Volt External	Enabled	From CommLink	Disabled
4W	12 Volt External	Disabled	Disabled	Enabled
2W to 4W or 4W to 2W Conversion	12 Volt External	Can be used	Self-powered or from Intercom System or from CommLink FXC-S201 Fiber Optic Intercom Link 30V supply	Enabled but with RS422/485 data transfer disabled

## FXC-S201 Power Connector - 4 Pin XLR Connector Wiring

	Pin	Function
	1	Ground
	2	Unused
	3	Unused
	4	+ Power 12 VDC

This matching connector is from either an ADAP-AC-04 or a customer-supplied 12VDC power supply.

## Fiber ADAP Power Supply



*Note - provided power supply may differ from unit pictured.*

*Fig. 2-12: Power Supply*

# 3

## Setting Up the CommLink FXC-S201

This chapter explains how to set up and configure the CommLink FXC-S201 Fiber Optic Intercom Link system.

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<i>CommLink FXC-S201 Configurations</i> .....	19
<i>CommLink FXC-S201 Switch Configuration</i> .....	20

### About Setting up the CommLink FXC-S201

Use of the CommLink FXC-S201 Fiber Optic Intercom Link system first requires the setup and connection of the Intercom System and the CommLink FXC-S201 units. The second step is the proper configuration or setting of switches on the CommLink FXC-S201 front panel. If two-wire systems are in use, the Auto Null function should be employed.

Each system setup is based on the appropriate mix of the three physical types of the CommLink FXC-S201 Fiber Optic Intercom Link. Depending on your particular operation the combination of units may be all the same physical type or a mix and match. Whatever the physical configuration of the units, the single-fiber solution requires a 1310nm WDM and 1550nm WDM pair. It makes no difference where the WDM units are placed in the system. If the CommLink FXC-S201 Fiber Optic Intercom Link is being used locally to convert between intercom system types, either WDM type can be used

### Example CommLink FXC-S201 Usage Scenarios

Five usage configurations are illustrated:

- Connecting a Two Channel Base System with Remote Belt Packs
- Connecting a Matrix Frame System with Two Remote Matrix Stations
- Connecting a Matrix Frame with Remote Belt Packs
- Connecting Two Matrix Stations System with a Matrix Frame with Video Multiplexed on to a Multi-Strand Fiber Cable (This is an example of "hybrid" use with the CommLink FXC-S201 Fiber Optic Intercom Link)
- Converting a Two Channel System to work with a Matrix Frame

## Connecting a Two Channel Base System with Remote Belt Packs

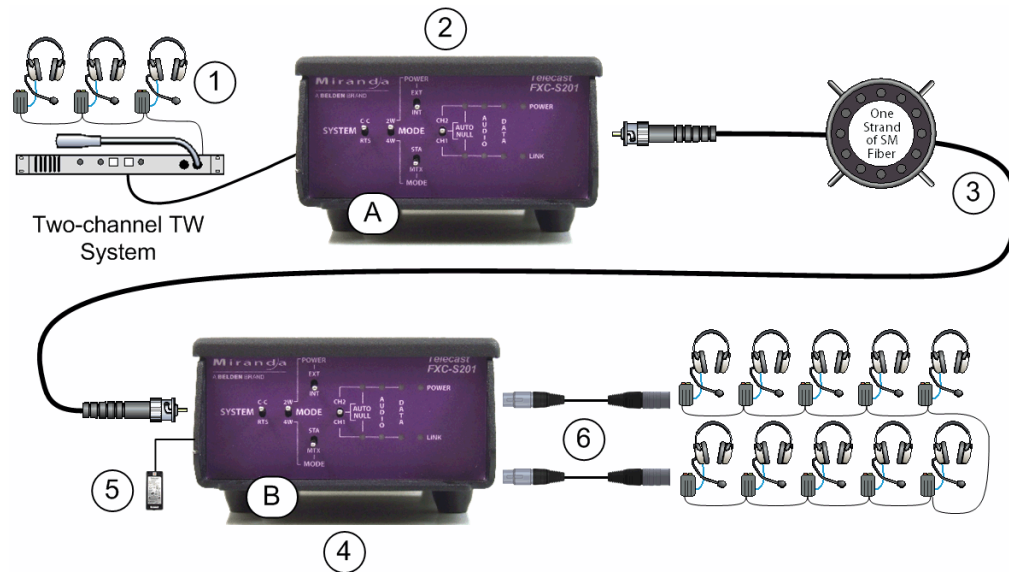


Fig. 3-1: Connecting a Two Channel Base System with Remote Belt Packs

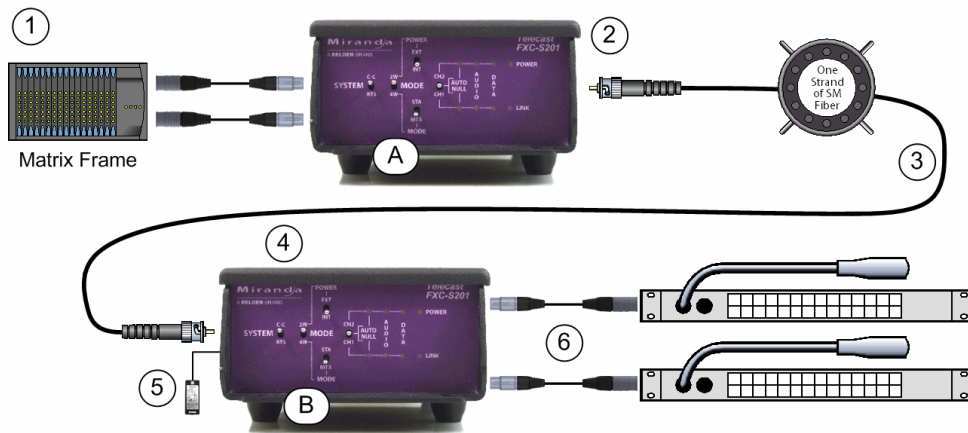
Connect the Two-Channel Two-Wire Intercom System (1) and CommLink FXC-S201 Fiber Optic Intercom Link Unit "A" (2). In this example it is assumed that the CommLink FXC-S201 Fiber Optic Intercom Link is powered from the intercom. Run a Single Strand Fiber Cable (3) between CommLink FXC-S201 Fiber Optic Intercom Link Unit "B" (4) and power the CommLink FXC-S201 Fiber Optic Intercom Link using the appropriate power supply (5).

Connect your intercom Belt Packs in normal daisy chain fashion to the CommLink FXC-S201 Fiber Optic Intercom Link. The number of Belt Packs will depend on whether they are self-powered or are powered by the CommLink FXC-S201 Fiber Optic Intercom Link. When powered by the CommLink FXC-S201 Fiber Optic Intercom Link you can expect 5 units to work per channel.

Remember that CommLink FXC-S201 Fiber Optic Intercom Link "A" must have a WDM factor different from CommLink FXC-S201 Fiber Optic Intercom Link "B." You must use a WDM @1550nm unit at one end of the fiber cable and a WDM@1310nm at the other end of the fiber cable.

FXC-S201 Unit	System Switch	Mode Switch	4W Switch	2W Power Switch
#A in drawing	Match Intercom	2W	NA	EXT
#B in drawing	Match Intercom	2W	NA	INT

## Connecting a Matrix Frame System with Two Remote Matrix Stations



*Fig. 3-2: Connecting a Matrix Frame System with Two Remote Matrix Stations*

Connect the Intercom Matrix (1) and CommLink FXC-S201 Fiber Optic Intercom Link Unit "A" (2). Run a Single Strand Fiber Cable, or dual cable if used (3) between CommLink FXC-S201 Fiber Optic Intercom Link Unit "B" (4) and power the CommLink FXC-S201 Fiber Optic Intercom Link using the appropriate power supply (5).

Connect your two intercom Matrix Stations (6) and provide power locally. Remember that CommLink FXC-S201 Fiber Optic Intercom Link "A" must have a WDM factor different from CommLink FXC-S201 Fiber Optic Intercom Link "B." You must use a WDM @1550nm unit at one end of the fiber cable and a WDM@1310 at the other end of the fiber cable.

FXC-S201 Unit	System Switch	Mode Switch	4W Switch	2W Power Switch
#A in drawing	Match Intercom	4W	MTX	NA
#B in drawing	Match Intercom	4W	STA	NA

## Connecting a Matrix Frame with Remote Belt Packs

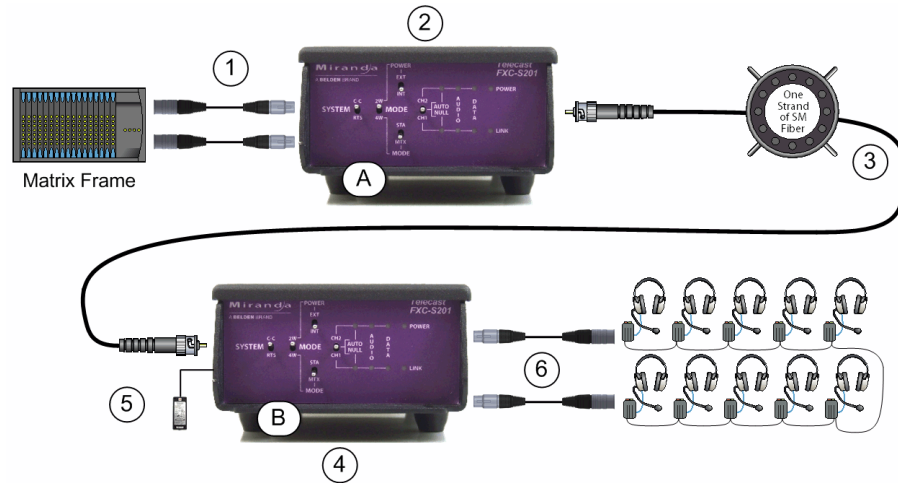


Fig. 3-3: Connecting a Matrix Frame with Remote Belt Packs

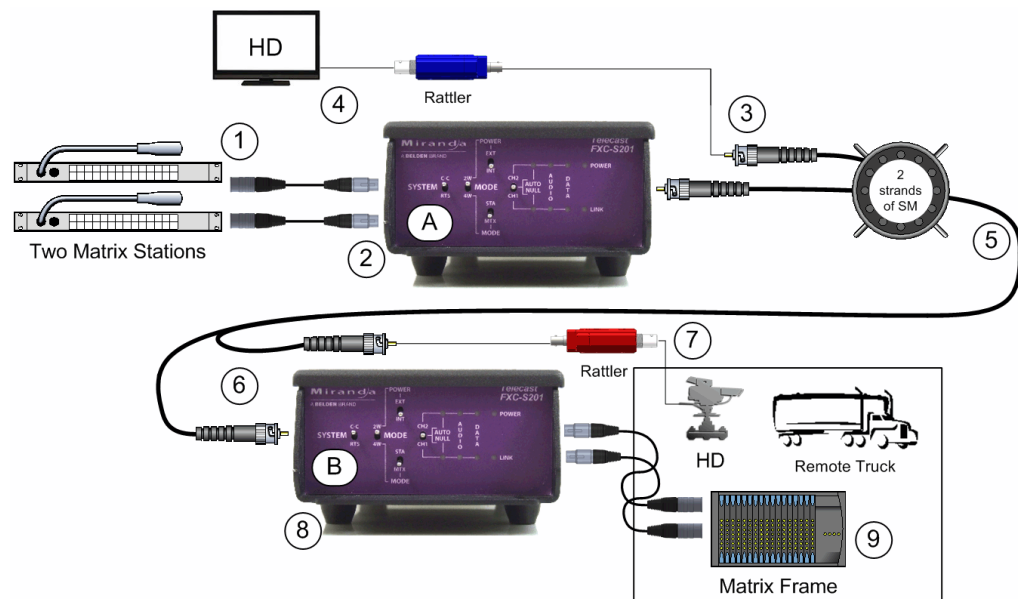
Connect the Intercom Matrix (1) and CommLink FXC-S201 Unit "A" (2). Run a Fiber Cable (single or dual strand, as required) (3) between CommLink FXC-S201 Units "A" (2) and "B" (4) and power the CommLink FXC-S201 using the appropriate power supply (5).

Connect your intercom Belt Packs in normal daisy chain fashion to the CommLink FXC-S201. The number of Belt Packs will depend on whether they are self-powered or are powered by the CommLink FXC-S201. When powered by the CommLink FXC-S201, you can expect 5 units to work per channel depending on cable runs

Remember that for a single-fiber solution, CommLink FXC-S201 Fiber Optic Intercom Links "A" and "B" must have different WDM factors. You must use a WDM @1550nm unit on one end of the fiber cable and a WDM@1310 at the other end of the fiber cable.

FXC-S201 Unit	System Switch	Mode Switch	4W Switch	2W Power Switch
#A in drawing	Match Intercom	4W	MTX	NA
#B in drawing	Match Intercom	2W	NA	INT

## Connecting a Two Matrix Stations System



*Fig. 3-4: Connecting Two Matrix Stations System with a Matrix Frame plus Video Multiplexed on the Multi-Strand Fiber Cable*

This usage scenario demonstrates the flexibility provided by Grass Valley products. In this case a multi-strand fiber cable with MX connectors is used in place of the single strand fiber cable. With the addition of the Break Out cable MXRR-4-08, fiber optic signals can be sent to multiple locations. Here a Grass Valley Rattler Mini HD/SDI Transmitter and Receiver are used to transmit HD video along the same fiber cable as the Intercom Link. A wide variety of set-ups are possible using different components. Please consult your Grass Valley dealer for more information.

The example calls for you to connect the Matrix Stations (1) and CommLink FXC-S201 unit "A" (2). Connect the CommLink FXC-S201 unit to the Break-Out Cable (3) and then connect the Break-Out cable to the multi-strand fiber cable (5). Connect the Rattler Receive Unit RRX 1679 (4) to your HD Video Display and to the Break Out Cable (3).

Connect the Fiber Cable (5) to a Break Out Cable (6) at the other end. The Break Out Cable then connects to CommLink FXC-S201 unit "B" (8) and to the Rattler Transmit Unit RTX 1660 (7). The Rattler is connected to your HD video source and the CommLink FXC-S201 is connected to the Intercom Matrix Frame (9).

## Converting a Two Channel System to work with a Matrix Frame



*Fig. 3-5: Converting a Two Channel System to work with a Matrix Frame*

Connect the Two-Channel Two-Wire Intercom System (1) and CommLink FXC-S201 Fiber Optic Intercom Link Unit (2). Power the CommLink FXC-S201 using the appropriate power supply (3).

Connect the Intercom Matrix (4).

Note that no fiber is used in this scenario; the single FXC-S201 acts as a format converter.

The System Switches should be set as follows:

- SYSTEM - Set for your Two Channel System - ClearCom (CC) or RTS
- MODE - Set to 2W
- 2W POWER - Set for your CommLink Unit



## CommLink FXC-S201 Configurations

The CommLink™ FXC-S201 Intercom Link comes in three different models, based on the SFP transceiver that is incorporated:

- dual-fiber transceiver;
- single fiber WDM 1310 nm transceiver,
- single-fiber WDM 1550 nm transceiver.

All models are supplied in a MiniMussel Shell enclosure suitable for use in harsh environments.

Please see [Ordering Information](#) on page 2.



Fig. 3-6: CommLink FXC-S201 Fiber Optic Intercom Link Physical Configuration

The system provides flexibility in the types of intercom systems that can be used, in that the system can link one type of party line system to another type of party line system, a matrix frame to two key panels, or act as a two-wire to four-wire hybrid adaptor via fiber or as a stand-alone local unit. Each of these operating modes is explained in detail later in this document.

### TWO-WIRE PARTYLINE MODE

Plug two channels of Clear-Com® PL (two XLRs) or RTS® TW (one XLR) into each CommLink module and connect them with a fiber cable. The system will "translate" between two systems so that you can have Clear-Com® at one end and RTS® at the other. It also translates the call lights.

### ADVANCED DSP AUTO-NULLING

Once the two-party system is connected, a toggle of the AUTO NULL switch provides a digital system null of the two-wire system, no matter what the load, without the need for manual adjustments.

### BELT PACK POWER

Each CommLink™ module can be powered from the Party line intercom circuit without an external power supply, like a belt pack. Alternately, with a 12VDC power source, the CommLink unit can act as a Party line power supply, providing enough 30VDC current to support approximately ten belt packs.

### FOUR-WIRE MATRIX MODE

The system links a MatrixPlus/Eclipse (Clear-Com®) or Adam (RTS®) family matrix frame and two of the system's key panels over a fiber strand. All of the key panel functionality is supported, including displays, controls, and communications to the matrix frame.

### HYBRID MODE

The CommLink system can be used to connect a matrix frame in a control room or truck with two party line channels in the venue, without the need for a separate hybrid adaptor.

A single CommLink unit can also act as a standalone digital system interface/system-to-system adapter, utilizing the digital auto-nulling system. Connect two-wire intercom systems to legacy fiber systems, two-way radios, satellite links, TV cameras, and other communications devices with 4-wire circuits.

## CommLink FXC-S201 Switch Configuration

The following decision tree traces the setting of the CommLink FXC-S201 Fiber Optic Intercom Link configuration switches.

- Set the System mode - Clear-Com (CC) or RTS
- Decide if you are operating in 2W or 4W
- If in 2W set your power to External (EXT) or Internal (INT) - this decides between using the power from the intercom system or Belt Packs (EXT) or providing internal power from the CommLink FXC-S201 Fiber Optic Intercom Link with the 12 Volt power supply (INT)
- If in 4W set the switch depending on whether you have an Intercom Matrix Station (STA) or Matrix (MTX) attached to the CommLink FXC-S201 Fiber Optic Intercom Link

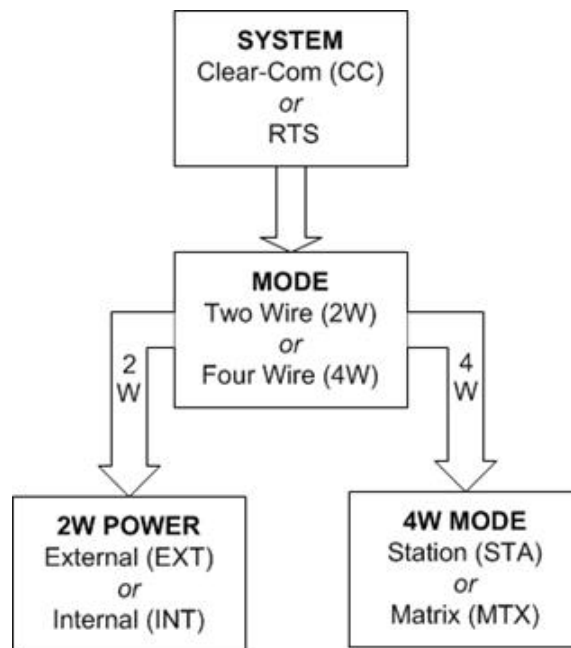


Fig. 3-7: Configuration Switch Decision Tree

# CommLink FXC-S201 Operation

# 4

This chapter describes the operation of CommLink FXC-S201 Fiber Optic Intercom Link. Please keep in mind that once the system is properly set up and configured there is very little to do during normal operation.

<i>Using the Auto-Null Function</i> .....	21
<i>Best Practices</i> .....	22
<i>Troubleshooting</i> .....	22

## Using the Auto-Null Function

The Auto-Null function is used only with CommLink FXC-S201 Fiber Optic Intercom Link units that are connected to Two-Wire system. Auto Null has no purpose with a Four Wire system.

### To use the Auto-Null Function

- 1 Before starting the Auto-Null process, ensure the following:
  - A: All headsets are connected
  - B: Headsets are not being worn by any operators
  - C: Headset microphones are off
- 2 To Auto Null Channel 1 (CH1), hold the Auto Null switch (A) in the direction of CH1. The system will generate a tone and the indicator (B) will blink green while the Nulling process occurs. This should take about 7.5 seconds.
- 3 Once the Auto Null process is complete, the tone will stop and the indicator will glow green. This indicator will be red if there was a problem with the null. This can occur if any of the items in Step 1 are not followed.
- 4 Once you troubleshoot the Null problem, perform Steps 1-3 again.
- 5 For Channel 2 (CH2), hold the Auto Null switch (A) in the direction of CH2. Steps 2 and 3 will then follow with the CH2 indicator being active (C).
- 6 After completing the Auto-Null process, check that side-tone operation and overall intercom performance on each intercom channel is correct.

## Best Practices

- Take every precaution to reduce the risk of damaging your eyes when handling the equipment.
- Protect the Fiber Optic Cable and the Fiber Optic Connectors. Always keep these capped unless they are being connected.
- Once the system is set up and running, carefully monitor the Link strength indicators at either of the CommLink FXC-S201 Fiber Optic Intercom Link units. Because the system is digital, the Signal Strength must either meet or exceed the operational requirements. When the Signal Strength is no longer strong enough, the signal stops.
- If introducing new equipment (intercom units, additional Belt-Packs, etc.) or new operators, be sure to do a comprehensive, realistic test run. A hands-on approach is the best way to understand how the system should work and what to do to ensure proper operation.
- Be as careful during System tear down as during System setup.

## Troubleshooting

Troubleshooting any technical issues with the CommLink FXC-S201 Fiber Optic Intercom Link System is similar to any piece of television production gear, with the exception of the core Fiber Optic technology.

The following is a list of checks to keep in mind:

- During power-up of the CommLink FXC-S201 Fiber Optic Intercom Link, the Auto Null indicators will turn Green, then Red, and then OFF. This indicates that these LEDs are working properly. These are the only indicators tested on power up.
- The Auto Null indicators will blink RED if any of the CommLink FXC-S201 Fiber Optic Intercom Link operating power levels are out of specification. This error condition will not likely affect operation, but it should be addressed as soon as possible. This error may require contacting Grass Valley Support (see [Contact Us](#) on page 25).
- Check all your cables for any broken connections or bad connectors.
- Check that your Power Supplies are working.
- If there is a power problem, check the fuses.
- If you cannot resolve the problem in the field, contact Grass Valley Fiber support (see [Contact Us](#) on page 25)

# 5 Specifications

## Intercom

Number of intercom channels..... 2

## 2-Wire (TW/PL)

Interface:..... Clear-Com PL: XLR3M x 2

..... RTS TW: XLR3M x 1

Max Level..... 2VP-P, @ 1KHz (equiv. to +18dBu in 4W)‡

Dyn. Range..... >85dB, ref. 2VP-P @ 1KHz ‡

Freq. Response ..... +.1/-3dB, 70Hz to 22kHz, ref. 2VP-P ‡

THD+N..... <0.1% @ 2VP-P ‡

I/O Impedance (100Hz to 20KHz):

Termination engaged (internal power) ..... 220Ω ±10%

Termination dis-engaged (external power) ..... ≥10KΩ

Nulling: ..... Automatic DSP

‡properly terminated (internal or external)

## 4-Wire (4W) Ports

Interface..... Clear-Com MatrixPlus/Eclipse: RJ45 x 2

..... RTS Adam/Cronus/Zeus: RJ11 x 2

Maximum Level (I/O, Unity Gain) ..... +18dBu

Dynamic Range ..... >85dB, ref. +18dBu

Frequency Response ..... +.1/-3dB, 35Hz-22kHz, ref. 0dBu

THD+N..... <0.05% @ +17dBu @ 1KHz

Input Impedance..... 10kΩ balanced

Output Impedance.... 30Ω balanced

Data: ..... Clear-Com: RS422, RTS: RS485

Crosstalk: ..... >85dB

## Electro-Optical

Operating Wavelength, standard ..... 1310/1550 nm (WDM) or 1310 dual fiber

Nominal Optical Loss Budget Values:

TX Laser output power..... -7 dBm

RX Sensitivity, HD/SDI..... -22 dBm

Link/Distance Limit\* ..... 15dB optical loss (40Km\*)

Fiber Compatibility... Single Mode

Optical Connector ..... ST

\*Maximum cable length varies due to optical cable quality, dirt/dust/contamination on connectors, and the number of in-line connectors.

**Mechanical/Environmental**

Dimensions (HxWxL) (no feet on case) .....2" x 4" x 10"  
Weight .....2.8 lb  
Power Consumption  
    2W with Local Power ..... 3 watts@10-18VDC  
    Powered from 2W System ..... 6 watts@10-18VDC  
    4W System ..... 3 watts@10-18VDC  
Temperature Range ..... -25° to +55°C  
Humidity Range ..... 0 to 95% RH, Non-condensing

**Compliance**

Laser Safety.....Class 1 Laser 21 CFR 1040.10  
RoHS



## **Grass Valley Technical Support**

For technical assistance, contact our international support center, at 1-800-547-8949 (US and Canada) or +1 514 333 1772.

To obtain a local phone number for the support center nearest you, please consult the *Contact Us* section of Grass Valley's Web site ([www.grassvalley.com](http://www.grassvalley.com)).

An online form for e-mail contact is also available from the Web site.

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