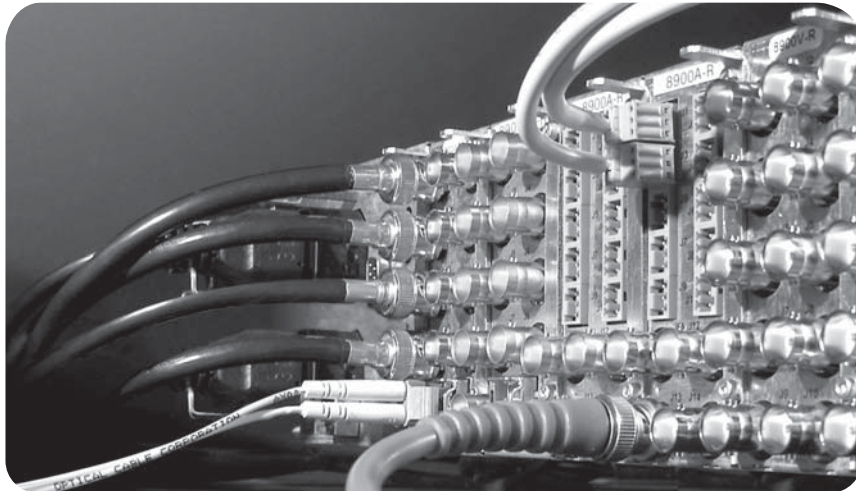grass valley

8943CF
4 CH ELECTRICAL TO FIBER CONVERTER

Instruction Manual

Software Version 1.0.2

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8943CF

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For further information on the Grass Valley product take back system please contact Grass Valley at + 800 80 80 20 20 or +33 1 48 25 20 20 from most other countries. In the U.S. and Canada please call 800-547-8949, and ask to be connected to the EH&S Department. Additional information concerning the program can be found at: www.grassvalley.com/about/environmental-policy

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Contents

Contents

Preface

About This Manual

This manual describes the features of a specific 8900 module in the GeckoFlex Signal Processing System families. As part of this module family, it is subject to Safety and Regulatory Compliance described in the GeckoFlex 8900 Series frame documentation (see the *GeckoFlex Frames 8900FX/FF/FFN Signal Processing System Instruction Manual).*

All Modular product manuals can be found on-line in PDF format at this link:

www.grassvalley.com/docs/modular

8943CF 4 Channel Electrical to Fiber Converter Module

Introduction

This manual covers installation, configuration, and operation of the 8943CF 4 Channel Electrical to Fiber Converter module.

Module Features

The 8943CF module is a four channel electrical to optical converter (dual transmitter) with both electrical and fiber optic outputs. The module can accommodate a variety of high definition video inputs up to 3 Gb/s as well as DVB/ASI, AES, and MADI interfaces.

The following features are available with this module:

- Two module set including a hot-swappable front and rear module and up to two optional single-mode dual transmitter fiber optic SFP devices mounted on the front module circuit board. Fiber optic model options are given in Table 1 on page 10.

- Up to ten 8943CF modules in the same 2 RU GeckoFlex frame.

- Four electrical BNC inputs to up to four fiber optic outputs and an identical electrical BNC output for each channel.

- Re-clocking for stable long distance signals or re-clocking bypass for non-SDI signals.

- Supports both HD or SD formats and passes embedded audio present in the incoming video stream.

- CWDM (Coarse Wavelength Division Multiplexing) capability when combined with 8939FCA and 8939FCB Passive CWDM Optical Mux/Demux modules and 8943FC 4 Channel Fiber to Electrical Converter modules and other Grass Valley fiber-ready modules.

- SNMP and product health monitoring is supported through the 8900NET module with applications such as NetCentral.

- Software updating using the NetConfig Networking application.

The 8943CF can be populated with any of the dual transmitter SFP devices listed in Table 1, depending on the application desired. SFP devices come in kits containing the SFP device, a mounting bracket, and a fiber cable assembly. Kit part numbers are indicated by a -K at the end of the part number. Refer to Figure 3 on page 14 for a kit example.

The SFP devices are capable of handling bit rates from 143 Mb/s up to 3 Gb/s. Refer to Table 1 for the current SFP models for use with the 8943CF modules.

Note   This manual shows 8943CF and 8943FC CWDM functionality in conjunction with the 8939FCA and 8939FCB fiber optic Mux/Demux modules. There are other applications for CWDM application not covered here.

Table 1. Fiber Optic Dual Transmitter SFP Devices

SFP Device	Type	Frequencies	
SFP-1310-M1DTX-K	Dual Transmitters	1310nm	1310nm
SFP-1310-M1DTX[1]			
SFP-1310-M2DTX[1]			
SFP-CWDM3G-1-K		1470nm	1490nm
SFP-CWDM3G-1[1]			
SFP-CWDM3G-2-K		1510nm	1530nm
SFP-CWDM3G-2[1]			
SFP-CWDM3G-3-K		1550nm	1570nm
SFP-CWDM3G-3[1]			
SFP-CWDM3G-4-K		1590nm	1610nm
SFP-CWDM3G-4[1]			
SFP-CWDM3G-5-K		1310nm	1330nm
SFP-CWDM3G-5[1]			
SFP-CWDM3G-6-K		1350nm	1370nm
SFP-CWDM3G-6[1]			
SFP-CWDM3G-7-K		1390nm	1410nm
SFP-CWDM3G-7[1]			
SFP-CWDM3G-8-K		1430nm	1450nm
SFP-CWDM3G-8[1]			

[1] Spare SFP devices can be purchased without a kit, but initial installation requires the full kit.

Installation

The 8943CF model consists of a front and rear module set that can only be installed in a GeckoFlex frame. Two optional fiber optic dual transmitter SFP device kits, shipped separately, must also be installed for full functionality of the module.

Installation of the 8943CF module set is a process of:

1. Placing the 8900CF-R rear module in a rear frame slot,

2. Installing the fiber optic SFP devices on the front module,

3. Placing the front module in the corresponding front slot,

4. Cabling the signal ports, and

5. Setting module parameters with on-board switches or with the web browser interface or the Newton Control Panel.

All GeckoFlex front and rear modules can be inserted and removed from an GeckoFlex frame with power on.

Note   Modules and SFP devices are sensitive to static damage, use standard anti-static precautions when handling components.

Module Placement in the GeckoFlex Frame

There are ten front and rear cell locations in the 2 RU GeckoFlex frame (Figure 1) to accommodate either audio, analog and digital video modules.

Figure 1. GeckoFlex Frame
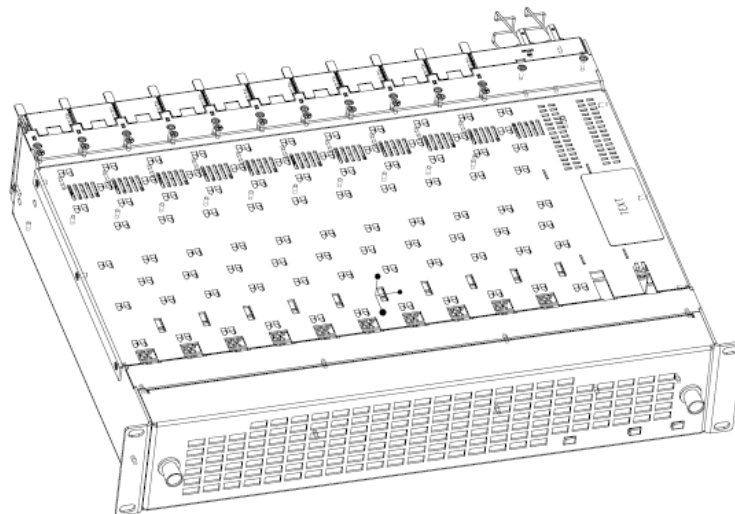
Module Installation Precautions

Please read and follow the precautions listed below before installing the front and rear modules and any optional fiber optic SFP devices:

• Use standard anti-static procedures during installation. As modules can be installed or removed when the GeckoFlex frame is powered up, before removing the cover, please use an anti-static bracelet tied to a metal part of the frame.

• Install the rear module first, then install the fiber optic SFP device option(s) on the front module, then install the front module.

• When installing or removing a rear module, loosen or tighten the screws holding the retainer clips to the frame manually with the retainer clip tool provided inside the front cover of the frame or use a 2 mm (5/64") hex screwdriver. Please do not use an electric screw-driver.

Note   On newer 751- version GeckoFlex frames, a Rear Retainer Clip removal tool and 2 extra retainer clips and screws for installing them are provided on the inside of the frame cover.

• Make every effort to leave the screws holding the retainer clips in place (do not remove them completely). They are very small and can easily drop into other equipment causing a shorting hazard. (Two turns of the screw should be enough to loosen the screws, 3 turns or more will remove it.)

• When installing a rear module, tighten the screws on the retainer clips just until snug. Do not apply more force than is necessary to seat the rear module. Refer to the **Mechanical** specifications given in Table 6 on page 53.

• If using a fiber optic SFP device on the fiber-ready front module, handle it carefully, use anti-static precautions, and read the *Fiber Optic Cleaning Requirement on page 14* before cabling.

Rear Module Installation

To install the rear module, refer to Figure 2 and the instructions below:

1. To remove a blank rear adapter cover (or a rear module already present), manually loosen the two screws holding each retainer clip on the rear adapter cover or rear module to the frame with the retainer clip tool provided inside the front cover of the frame (newer model frames only) or a 2 mm (5/64") hex screwdriver. Do not remove the screws.

Note   To remove a rear module already installed, follow the same steps. It is helpful to first remove the front module so the rear can be pulled out more easily.

2. After loosening the retainer clip screws, pull up on each retainer and completely remove it, leaving the screws in place.

3. Remove the blank rear adapter cover by inserting needlenose pliers into the slots in the blank cover and pulling it off.

4. Insert the rear module into the empty slot, guiding it carefully.

5. Replace each retainer clip over the two screws on both sides of the module and push down to seat the retainer clip.

6. Tighten the two screws on each retainer clip just until they come into contract with the retainer clip then tighten about a 1/4 turn more (maximum torque is 4-5 inch-lb/0.45-0.6Nm). Do not force or torque the screws too tightly. The clips should not bend or be bowed.

Note   All unused rear slots in a GeckoFlex frame should have a blank rear adapter cover installed.

Figure 2. Installing Rear Module

Use retainer clip or needlenose pliers to pull out blank after removing retainer clips
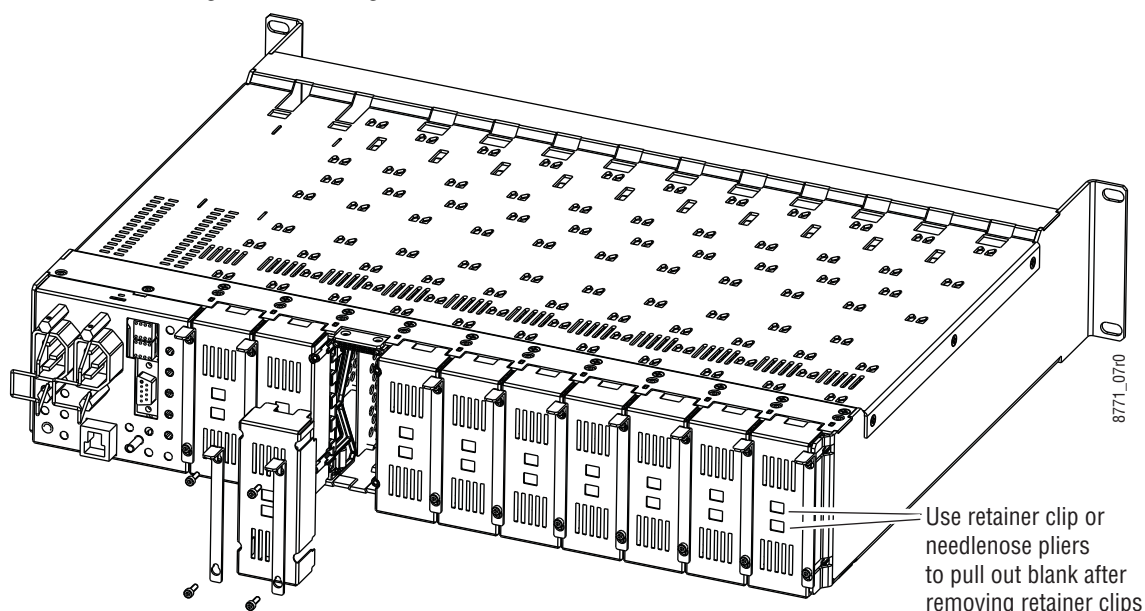
Fiber Optic SFP Device Installation

Two optional dual channel CWDM transmitter SFP devices can be installed on an 8943CF module. Both are installed on the front of the module circuit board. The type of SFP device depends on the application of the module and the 8939FCA or 8939FCB module it will be feeding. Refer to Table 1 on page 10 for a list of available optional fiber optic SFP devices.

The optional strap-mount SFP Fiber Optic kit (Figure 3) for GeckoFlex fiber-ready modules includes:

- One Strap Mount Fiber Optic SFP device (labeled for type) with dust covers

- Mounting bracket for SFP device installation

- Fiber cable assembly (with dust covers) for connecting the SFP device to front module LC adapter

Figure 3. SFP SFP Device Kit
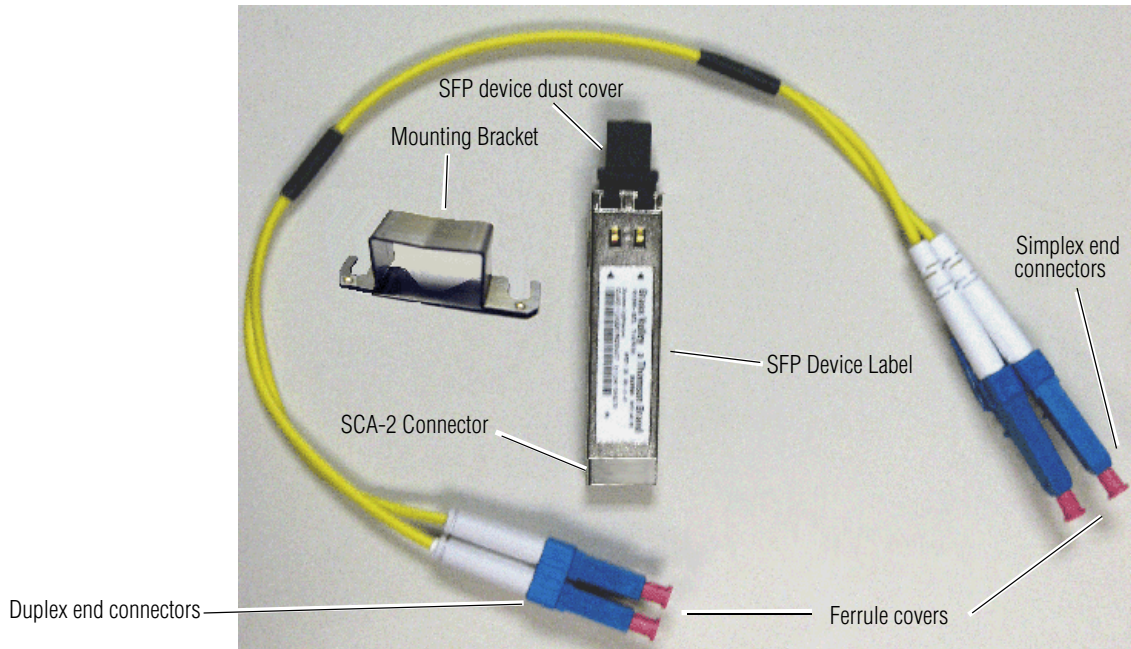
Fiber Optic Cleaning Requirement

Before making any fiber optic cable mating connections in the SFP device or cabling and after every de-mating cycle, use an industry standard fiber optic cleaning kit, including oil-free compressed air, to clean the fiber connectors and the connectorized fiber end faces. This helps ensure optimum performance of the fiber optic interface. Industry standard fiber optic cleaning kits can be purchased on the web and in electronics stores.

Installation of each SFP device involves three steps:

1. Mount the metal bracket to the SFP device,

2. Mount the SFP device and bracket on the front of the 8943CF front module, and

3. Install the fiber cable assembly to the SFP device and the rear fiber optic LC adapter connectors.

CAUTION Use industry standard practice fiber optic cleaning and anti-static handling procedures when installing and cabling the fiber optic devices or after any de-mating cycle. Refer to *Fiber Optic Cleaning Requirement on page 14*.

Mount Metal Bracket to SFP Device

Attach the mounting bracket to the SFP device as shown below.

1. Insert the narrow end (SCA-2 connector) of the SFP device into the mounting bracket, label side up with the open slots on the bracket pointing to the rear as shown by the direction of the arrow in Figure 4.
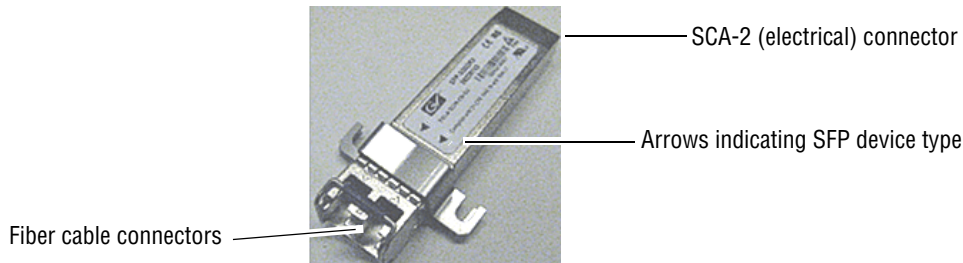
Figure 4. Mounting Bracket
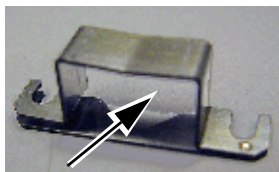
2. Attach the mounting bracket to the SFP device by sliding the bottom part of the bracket as far as it will go (Figure 5) on the bottom side of the SFP device to hold it in place without forcing it. Make sure the open bracket slots point towards the SCA-2 (electrical) connector on the SFP device.

Figure 5. Attach Bottom of Bracket to SFP Device

V-connection

SCA-2 (electrical) connector
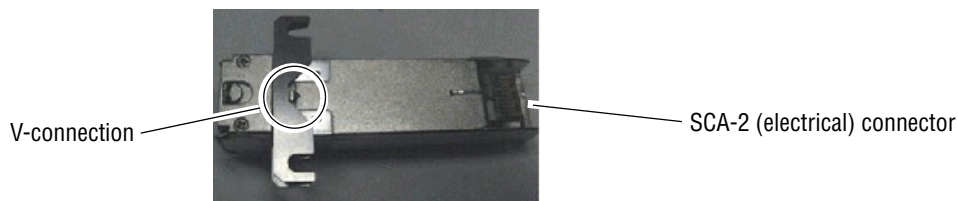
3. The finished installation should look like the example in Figure 6. The label will list the GV Model number, the GV part number, and the manufacturer's part number. Also note the two arrows on the label will indicate signal direction as shown in the dual transmitter example in Figure 6 (arrows pointing out). A dual receiver will have two arrows pointing in, and a transceiver will have one input and one output arrow.

Figure 6. Finished Bracket Mounting

SCA-2 (electrical) connector

Arrows indicating SFP device type

Fiber cable connectors

Once you have put the mounting brackets onto the two SFP devices, install them on the top (component) side of the circuit board and cable them to the LC adapter output connectors on the main module with the fiber cable assemblies provided.

Figure 7 shows an empty circuit board and the connector locations (J4 and J6) where the SFP devices will be installed.

Figure 7. Example of a Complete SFP Installation

J4 - F3/F4

J6 - F1/F2
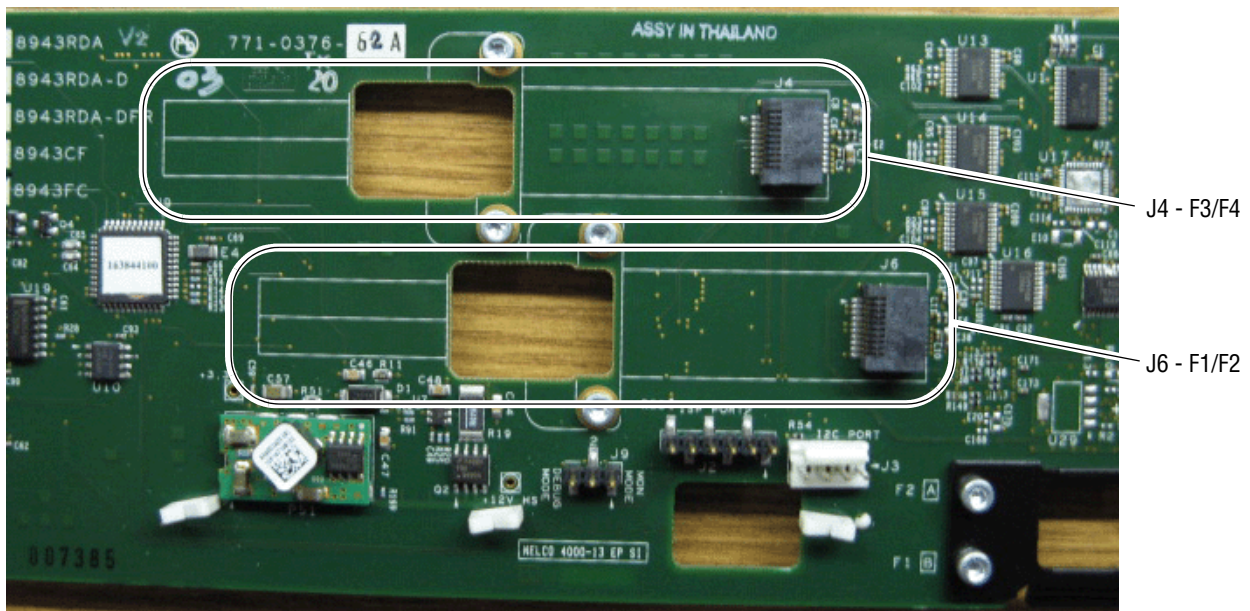
Fiber Channel 1 and 2 SFP Device and Fiber Cable Installation

Note   Before making any fiber connections, refer to the *Fiber Optic Cleaning Requirement on page 14*.

After preparing the SFP devices for installation, install the transmitter SFP device you wish to use for the Fiber Channel 1 and Fiber Channel 2 outputs as follows:

Note   This example uses a dual fiber transmitter with 1610nm (F1) and 1590nm (F2) as shown in Figure 8.

1. Remove the black rubber dust cover from the SFP device and clean the fiber faces of both the SFP device and connector J6 as described in *Fiber Optic Cleaning Requirement on page 14*.

2. Align the SFP device with the right angle bottom SCA-2 connector (J6) and the mounting screws on the 8943CF module (Figure 8).

3. Loosen the two screws slightly (do not remove them completely) with a torx screwdriver so the mounting bracket straps can slide under the screws.

4. Slide the SFP device towards the SCA-2 connector so the electrical connector on the SFP device engages with the SCA-2 connector until the connector is completely covered and the straps are underneath the two screws.

5. Tighten the screws to secure the SFP device to the front module.

Figure 8. Install F1 and F2 SFP Devices

Now install the fiber cable assembly from the SFP device to the rear connector as described below.

1. Remove the dust covers from the fiber cable assembly connectors to expose the LC ferrules (the ends of the fiber optic cable).

2. Clean the LC ferrules of the connectors (and after every de-mating cycle) using an industry standard fiber optic cleaning kit as described in *Fiber Optic Cleaning Requirement on page 14*. Also visually inspect the LC ferrules for damage or blockage before connecting them.

3. Remove the rubber dust cover from the SFP device connector end. Insert the duplex end of the fiber cable assembly (the two fiber optic cables connected together) into the SFP device by holding the strain relief boot directly behind the connector housing as shown in Figure 9. Push on the strain relief until you hear a click, indicating the connectors are properly mated.

4. Route the fiber cable assembly through the two plastic fiber guides as shown in Figure 9 to hold it in place.

Figure 9. SFP Device Installation for F1 and F2
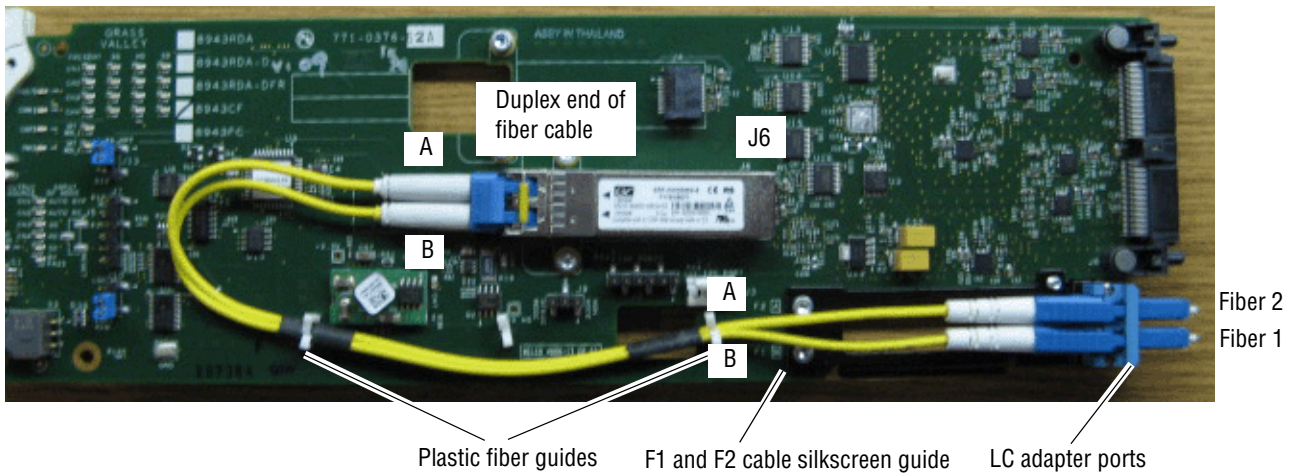
5. Insert the simplex ends of the fiber cable assembly (the two fiber optic connectors that are separate) into the LC adapter ports at the rear of the module. Fiber 1 (B) is the bottom cable from the SFP device (1610nm for this example) and Fiber 2 (A) is the top cable (1590nm for this example). Note the silkscreened F1 (B) and F2 (A) as shown in the detail in Figure 10.

Figure 10. F1 and F2 Fiber Cable Silkscreen Guide Detail
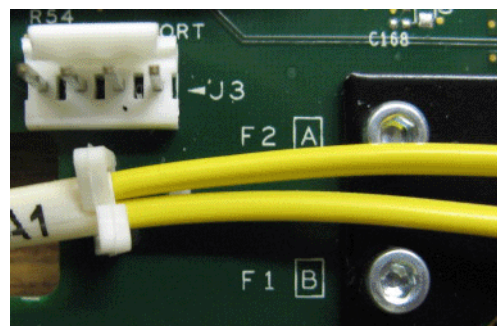
Channel 3 and Channel 4 SFP Device and Fiber Cable Installation

Repeat the SFP device installation procedure for the second SFP device in the top SCA-2 connector, J4, of the module. This SFP device will output Fiber Channel 3 (1570nm) and Fiber Channel 4 (1550nm).

Follow the instructions for installing the SFP device in connector J4 in the same manner as the instructions for J6 starting on page 17, steps 1 through 5. The finished installation of the Fiber Channel 3 and Fiber Channel 4 SFP device should resemble the one in Figure 11.

Figure 11. SFP Device Installation for Ch 3 and Ch 4

Slide bracket straps under screws and tighten.

SCA-2 connector, J4

Now install the Fiber Channel 3 and 4 fiber cable assembly from the SFP device to the rear LC adapter as described below.

1. Remove the dust covers from the fiber cable assembly connectors to expose the LC ferrules (the ends of the fiber optic cable).

2. Clean the LC ferrules of the connectors (and after every de-mating cycle) using an industry standard fiber optic cleaning kit as described in *Fiber Optic Cleaning Requirement on page 14*. Also visually inspect the LC ferrules for damage or blockage before connecting them.

3. Remove the rubber dust cover from the SFP device connector end. Insert the duplex end of the fiber cable assembly (the two fiber optic cables connected together) into the SFP device by holding the strain relief boot directly behind the connector housing as shown in Figure 12 on page 20. Push on the strain relief until you hear a click, indicating the connectors are properly mated.

4. Route the Fiber Channel 3 and 4 fiber cable assembly through the remaining top side plastic fiber guide as shown in Figure 12 then insert the simplex ends through the square opening below ISP connector, J2, to the back side of the module.

Figure 12. SFP Device Installation for Fiber Ch 3 and Ch 4

Plastic fiber guide   Square hole in circuit board
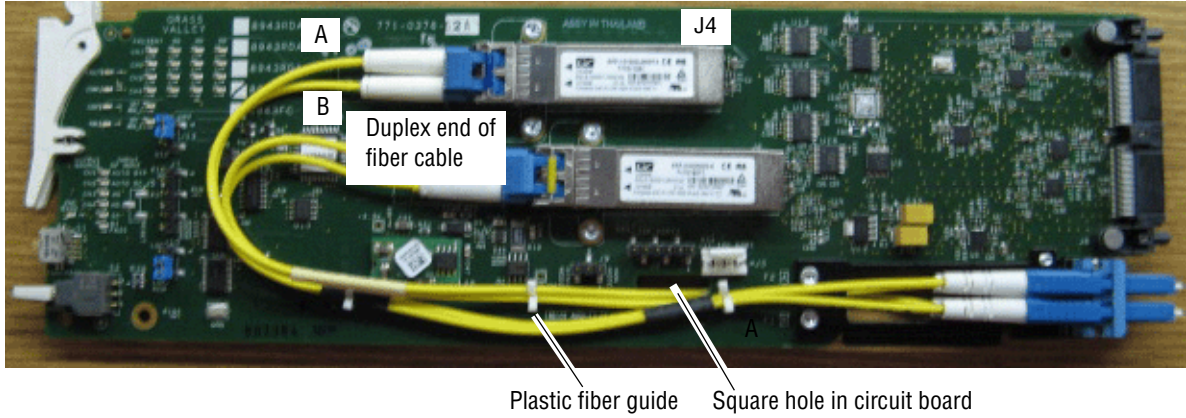
5. Put the fiber cable assembly through the cable guide on the back of the circuit board to hold it in place (Figure 13).

Note the silkscreened F3 (B) and F4 (A) guides as shown in the detail in Figure 13.

*Figure 13. F3 and F4 Fiber Cable Silkscreen Guide Detail*
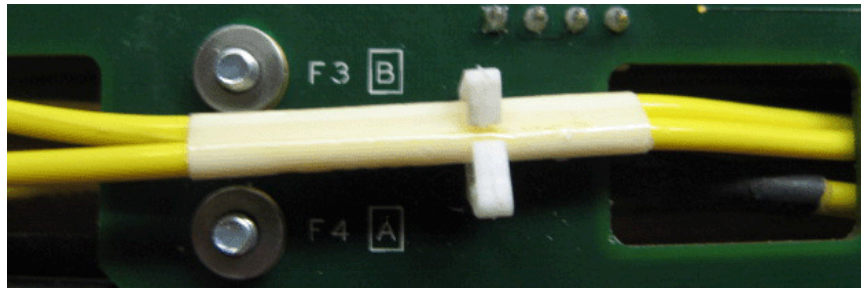
6. Insert the simplex ends of the fiber cable assembly (the two fiber optic connectors that are separate) into the LC adapter ports at the rear of the module (shown in Figure 14). Fiber Channel 4 (A) (1550nm) is the top cable from the SFP device and Fiber Channel 3 (B) (1570nm) is the bottom cable.

Figure 14. F3 and F4 Fiber Cable Silkscreen Guide Detail
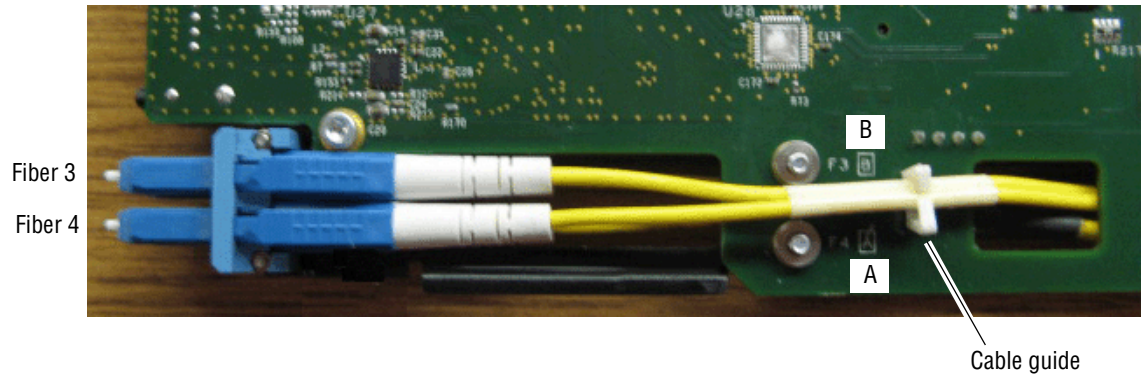
The fiber optic outputs from the rear module are shown in Figure 15.

Figure 15. Fiber Optic Outputs
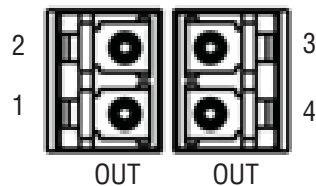
For the SFP device types and cabling examples used in this procedure, the following frequencies should be output from this connector:

• Fiber Out 1 = 1610nm

• Fiber Out 2 = 1590nm

• Fiber Out 3 = 1570nm
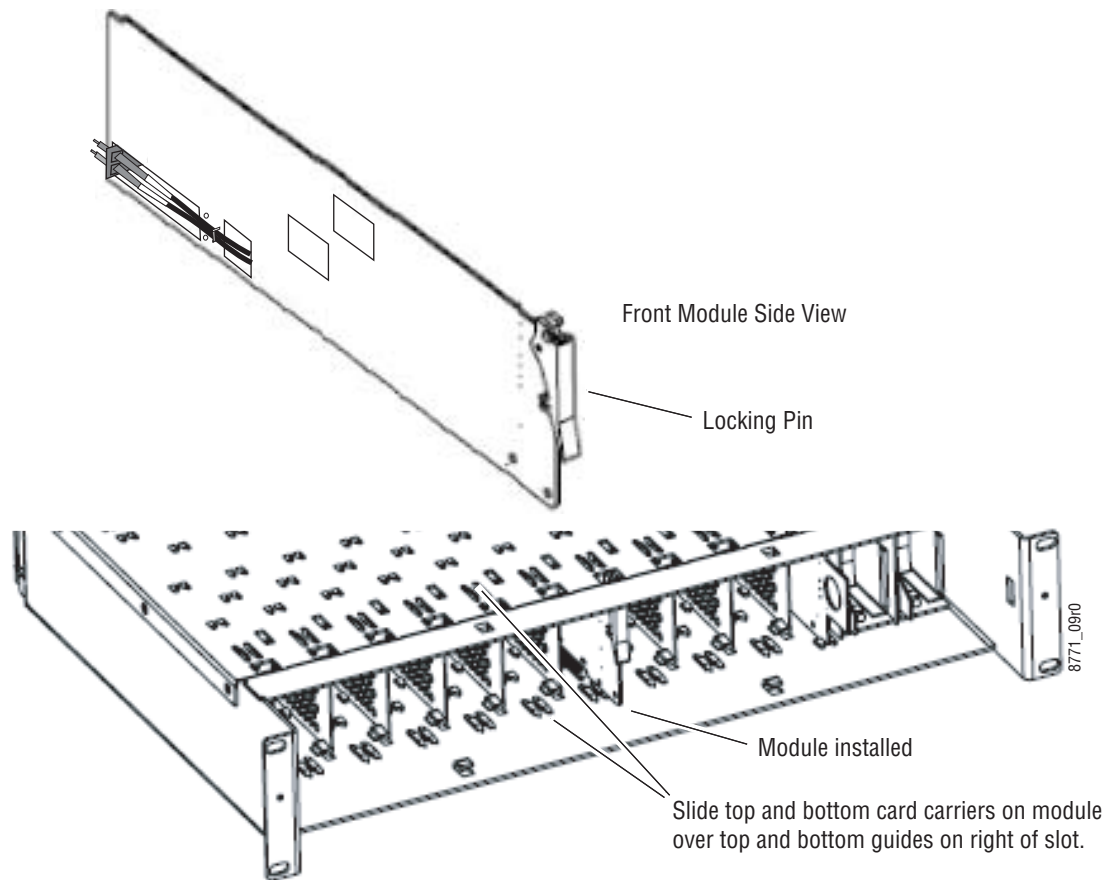
• Fiber Out 4 = 1550nm

If you are using 8943CFs to multiplex 9 or 16 frequencies through the 8939FCA/FCB modules, the other 8943CFs should be equipped with the SFP devices with the frequencies described in *CWDM Configuration on page 25*.

Front Module Installation

After installing the rear module and SFP devices on the front module, install the front module as follows:

1. Remove the front cover of the frame.

2. Locate the corresponding front slot.

3. Before installing the module, set the Local/Remote onboard jumper as described in *Local/Remote Jumper on page 37*.

4. Clean the fiber optic connections as described in the *Fiber Optic Cleaning Requirement on page 14*.

5. Insert the front module so that the module top and bottom edges go through the upper and lower raised rail guides on the right of the top and bottom of the slot (Figure 16).

6. Carefully slide the module into the rear connector.

7. Lock the front module ejector tab into the locking pin.

8. Replace the front cover for configuring the module using remote controls.

Figure 16. Front Module Installation

Front Module Side View

Locking Pin

Module installed

Slide top and bottom card carriers on module over top and bottom guides on right of slot.

8771_09r0

Cabling

Cabling is done on the rear BNCs of the 8943CF-R module illustrated in Figure 17.

Note   Before making any fiber connections, refer to the *Fiber Optic Cleaning Requirement on page 14*.

Figure 17. 8943CF-R Rear Module
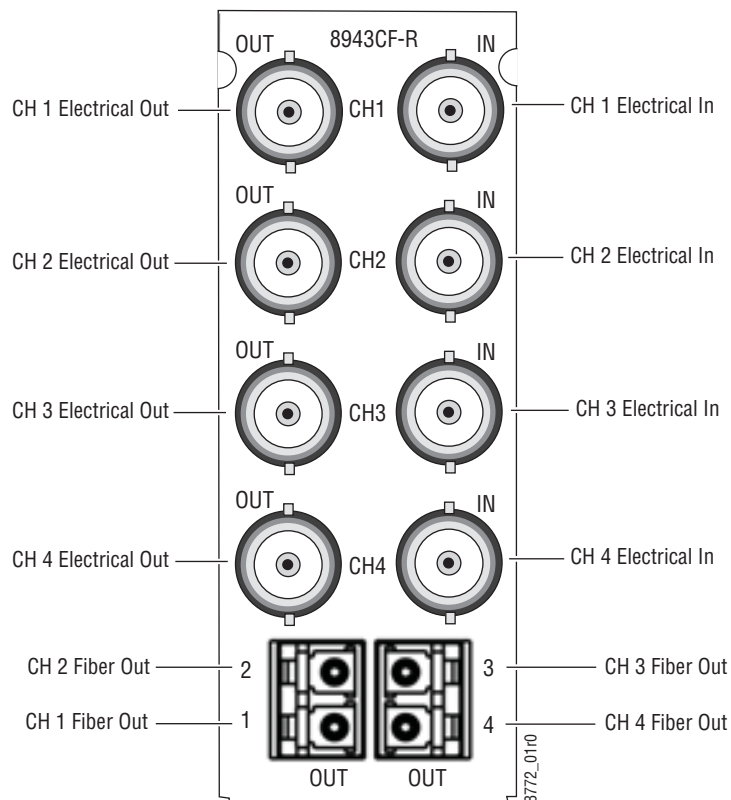
Attenuation Requirements

Some shorter length cable runs will require attenuation to prevent over-driving the receiver causing bit errors to occur on the fiber link. Use the following guidelines for adding attenuation:

- The 1310nm Dual Transmitter (SFP-13103G-M1DTX) requires no attenuation between fiber transmitter and receiver connections at any cable lengths.

- CWDM devices used with 8939FCA modules for a mux/demux configuration (page 25) with a cable run from 0-12 km (7.5 miles), must be attenuated by 3 dB between 8939FCA COM ports.

- All CWDM devices used in a point-to-point configuration with a cable run from 0-20 km (12.4 miles), must be attenuated by 5 dB between fiber transmitter and receiver connections.

Electrical Inputs

Connect a signal conforming to the to the specifications given in Table 6 on page 53 to the coax inputs for Channel 1 -4 as labeled on the rear of the 8943CF-R module.

Electrical Outputs

There are four electrical coax video outputs corresponding to Channel 1-4 as labeled on the rear of the 8943CF-R module.

Fiber Optic Outputs

There are four fiber optic output ports corresponding to Channel 1-4 as labeled on the rear of the 8943CF-R module (Figure 17 on page 23).

Note   Before making any fiber connections, refer to the *Fiber Optic Cleaning Requirement on page 14*.

For the fiber output ports, the 8943CF-R rear module shall follow the channel allocation convention shown in Figure 18. Optical channel 1 and channel 3 are mapped to the B side of standard duplex fiber connector and channel 2 and channel 4 are mapped to the A side of a standard duplex fiber connector.

Figure 18. 8943CF to 8943CF Fiber Transmit Channels
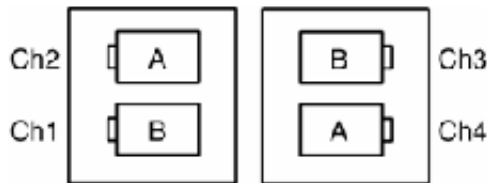
8943CF to 8943FC Connections

When connecting an 8943CF module directly to an 8943FC (point-to-point), a non-crossing duplex fiber cable is required shown in Figure 19. Refer to *Attenuation Requirements on page 23* for cable length attenuation notes.

Non-crossing is in reference to the logical A/B nomenclature associated with the duplex connector illustrated below. Side 1A connects to side 2A and side 1B connects to side 2B. Refer to Figure 19.

*Figure 19. Non-Crossing Duplex Fiber Cable*

CWDM Configuration

The 8943CF module can be used for CWDM (Coarse Wavelength Division Multiplexing) in various configurations in conjunction with 8939FCA/8939FCB modules and 8943FC modules as well as other fiber-ready modules from Grass Valley. Two main examples are given in this manual.

CWDM Configuration for 9 Channels

One use of CWDM involves the ability to multiplex and demultiplex up to 9 channels of video in as shown in the simple block diagram in Figure 20.

Figure 20. Simple CWDM Block Diagram
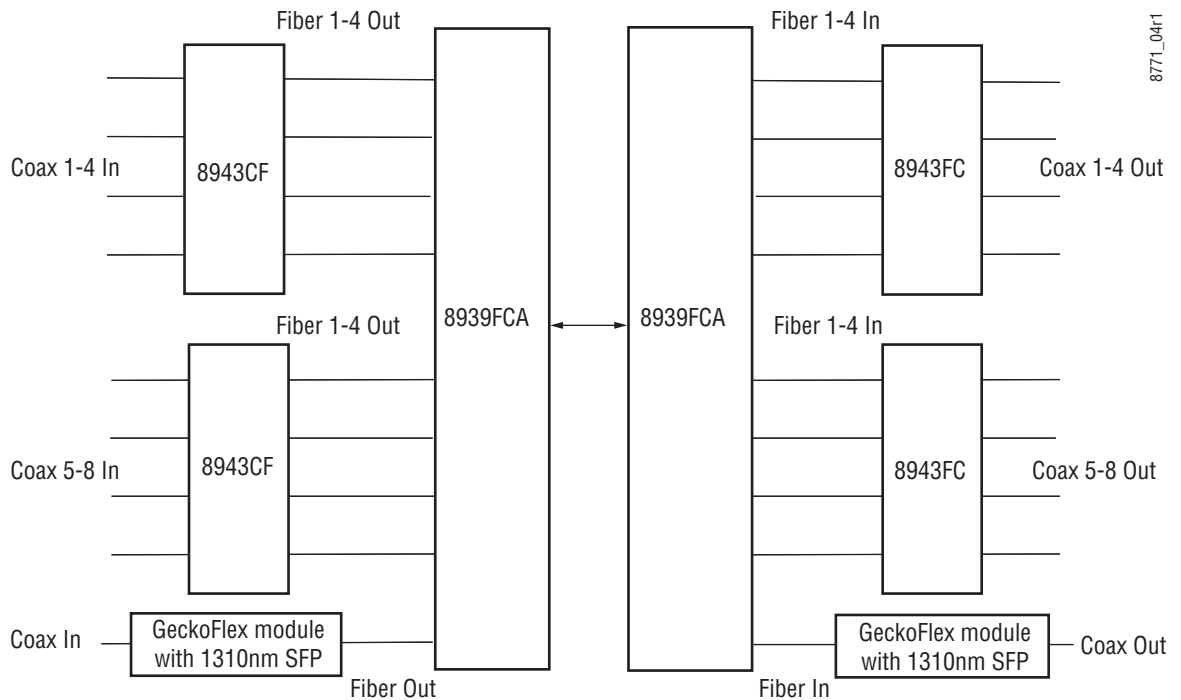
When an 8943CF module is populated with CWDM SFP devices, a standard crossing duplex cable is required when connecting the 8943CF modules to the 8939FCA modules.

Crossing is in reference to the logical A/B nomenclature associated with the duplex connector illustrated in Figure 21 where side 1A connects to side 2B and side 1B connects to side 2A.

Figure 21. Standard Crossing Duplex Fiber Cable
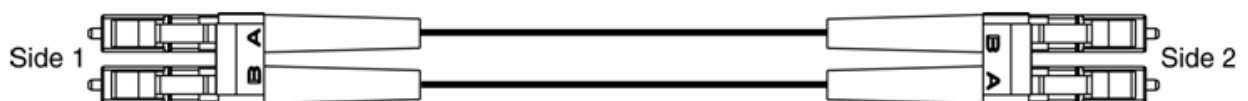
To utilize this nine channel Mux/Demux application, the following Grass Valley modules are needed:

- Two 8943CF 4 Channel Electrical to Fiber Converter modules with one of each type of CWDM SFP device

- Two 8943FC 4 Channel Fiber to Electrical Converter modules with one of each type of CWDM SFP device

- Two fiber-ready Grass Valley GeckoFlex modules with 1310nm SFP devices

As shown in the detailed block diagram in Figure 22 on page 27, two 8943CF (Electrical to Fiber converters) at Location A are used to feed 8 channels of video to an 8939FCA. To utilize this application, one of each of the following four CWDM SFP device types must be installed on the two 8943CF modules:

- SFP-CWDM3G-1-K Dual Transmitter (1490nm/1470nm frequencies)

- SFP-CWDM3G-2-K Dual Transmitter (1510nm/1530nm frequencies)

- SFP-CWDM3G-3-K Dual Transmitter (1550nm/1570nm frequencies)

- SFP-CWDM3G-4-K Dual Transmitter (1590nm/1610nm frequencies)

Note   The four SFP devices can be installed in any location on the two 8943CF modules as long as the outputs are cabled to the correct frequency input on the 8939FCA. The installation configuration shown here is for clarity only.

The 1310nm fiber output from a Grass Valley GeckoFlex module is cabled to the EXP (Expansion) port on the 8939FCA.

The 8939FCA module multiplexes these 9 frequencies down to a single output from the COM port. A single fiber cable carries these 9 video fiber channels to the COM port of the 8939FCA at Location B.

The 8939FCA at Location B acts as a demultiplexer and outputs 9 fiber video channels to two 8943FC (fiber to electrical) modules, each with two SFP-13103G-M1DRX-K Dual Receiver SFP devices installed and a Grass Valley fiber-ready module. This SFP device will accept input frequencies from 1270nm to 1610nm.

Refer to *Attenuation Requirements on page 23* concerning the attenuation needed depending on the length of cable run between 8939FCA COM ports.

Figure 22. 8939FCA CWDM Configuration

8772_041

Location B

Coax Ouputs

GeckoFlex Fiber-Ready Module

1310-DRL Submodule

8935FC Fiber Inputs

3 4
IN IN
IN IN
2 1

Electrical Outputs

Ch 1 Ch 1
Ch 2 Ch 2
Ch 3 Ch 3
Ch 4 Ch 4

Ch 1 Ch 1
Ch 2 Ch 2
Ch 3 Ch 3
Ch 4 Ch 4

8943FC
Connector J4
SFP-13103G-M1DRX-K
1270 > 1610nm
Connector J6
SFP-13103G-M1DRX-K
1270 > 1610nm

8943FC
Connector J4
SFP-13103G-M1DRX-K
1270 > 1610nm
Connector J6
SFP-13103G-M1DRX-K
1270 > 1610nm

Fiber In 1 from 1610nm
Fiber In 2 from 1590nm
Fiber In 3 from 1570nm
Fiber In 4 from 1550nm

Fiber In 1 from 1530nm
Fiber In 2 from 1510nm
Fiber In 3 from 1490nm
Fiber In 4 from 1470nm

8939FCA

EXP

CH7 1590nm
CH5 1550nm
CH3 1510nm
CH1 1470nm

COM
CH8 1610nm
CH4 1570nm
CH4 1530nm
CH2 1490nm

Demultiplexer

Single-mode fiber cable

* see note for inline attenuation requirements)

Distance of up to 50km

Location A

Multiplexer

8939FCA

EXP

CH7 1590nm
CH5 1550nm
CH3 1510nm
CH1 1470nm

COM
CH8 1610nm
CH4 1570nm
CH4 1530nm
CH2 1490nm

Fiber Out

GeckoFlex Fiber-Ready Module

SFP-13103G-M1DTX

8935CF Fiber Outputs

3 4
OUT OUT
OUT OUT
2 1

Fiber Out 1 to 1610nm
Fiber Out 2 to 1590nm
Fiber Out 3 to 1570nm
Fiber Out 4 to 1550nm

Fiber Out 1 to 1530nm
Fiber Out 2 to 1510nm
Fiber Out 3 to 1490nm
Fiber Out 4 to 1470nm

8943CF
Connector J6
SFP-CWDM3G-4-K
1590nm & 1610nm
Connector J4
SFP-CWDM3G-3-K
1550nm & 1570nm

8943CF
Connector J6
SFP-CWDM3G-2-K
1510nm & 1530nm
Connector J4
SFP-CWDM3G-1-K
1470nm & 1490nm

Coax In

Electrical Inputs

Ch 1
Ch 2
Ch 3
Ch 4

Ch 1
Ch 2
Ch 3
Ch 4

*Note: In this configuration (8959FCA to 8939FCA utilizing CWDM transmitters), if the distance between 8939FCA modules is less than 12 km (7.5 m), a 3 dB attenuator must be installed somewhere between the COM ports on the 8939FCA modules to prevent overdriving the receiver causing bit errors to occur on the link.

CWDM 16 Channel Configuration

The 8943CF and 8943FC can also be used with the 8939FCA and the 8939FCB to provide 16 channels of video over a single fiber connection.

As shown in the simple block diagram in Figure 23, the two 8939FCB module COM ports can be connected to the 8939FCA module EXP ports to provide another eight channels of video, for a total of 16 channels over one fiber.

The 8939FCB must be set up in a similar manner as the 8939FCA (CH1 – CH8) only using a different set of CWDM fiber optic SFP devices with frequencies pairs from 1310nm to 1450nm (CH9 – CH16).

Figure 23. 8939FCA and 8939FCB Simple Block Diagram

To utilize a 16 channel configuration using the 8939FCA and 8939FCB modules, follow the setup below.

Install the CWDM fiber optic SFP devices on the 8943CF as described in *CWDM Configuration on page 25*. You will be using the EXP ports to connect to the 8939FCB instead of a 1310nm GeckoFlex fiber-ready module.

The 8943CF modules feeding the 8939FCA should have the following fiber optic SFP devices installed for channels 1-8:

- SFP-CWDM3G-1-K Dual Transmitter (1490nm/1470nm frequencies)
- SFP-CWDM3G-2-K Dual Transmitter (1510nm/1530nm frequencies)
- SFP-CWDM3G-3-K Dual Transmitter (1550nm/1570nm frequencies)
- SFP-CWDM3G-4-K Dual Transmitter (1590nm/1610nm frequencies)

The eight additional channels are provided by two 8943CF modules feeding the 8939FCB with the following CWDM transmitter SFP devices:

- SFP-CWDM3G-5-K Dual Transmitter (1310nm/1330nm frequencies)
- SFP-CWDM3G-6-K Dual Transmitter (1350nm/1370nm frequencies)
- SFP-CWDM3G-7-K Dual Transmitter (1390nm/1410nm frequencies)
- SFP-CWDM3G-8-K Dual Transmitter (1430nm/1450nm frequencies)

The 8943FC modules receiving the fiber from the 8939FCA and the 8939FCB should have SFP-13103G-M1DRX-K Dual Receivers installed in all SFP locations. Refer to the detailed diagram in Figure 24 on page 30.

Figure 24. 8939FCB Configuration
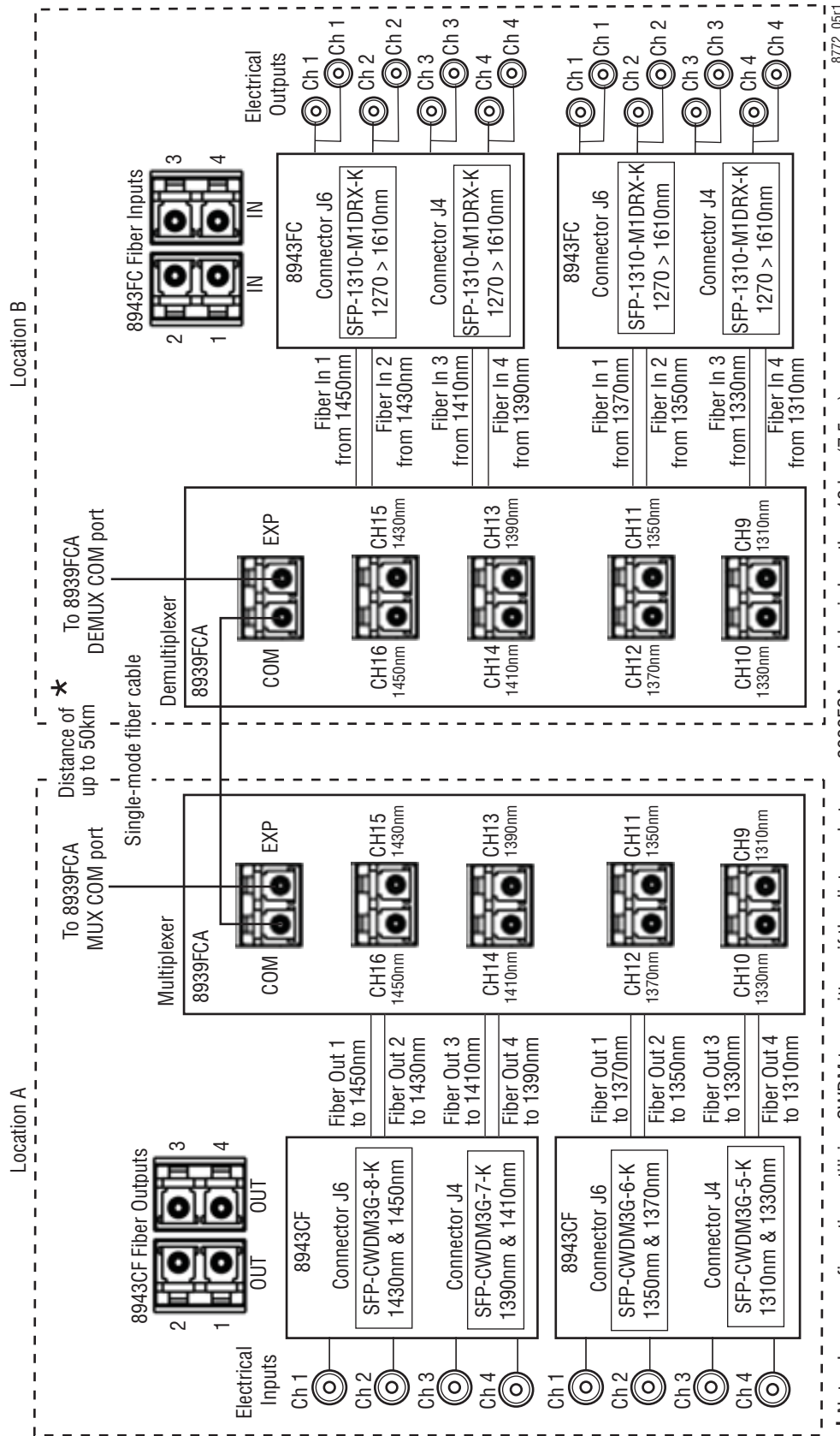
Configuration and Monitoring

8943CF module configuration and monitoring can be performed locally using the onboard controls or using a web browser GUI interface or the Newton Control Panel when the 8900NET Network Interface module is present in the GeckoFlex frame. Control and monitoring is described in the following sections:

- Operating Modes Overview –
- Local Configuration and Monitoring –
- Remote Configuration and Monitoring –

Input Operating Modes Overview

Each of the four channels must be configured for the desired input mode. This can be done using the on-board switches, on the Settings web page using the web browser interface, or with the Newton Control Panel. The different modes of operation are described in this section. Input signal monitoring differs between modes as described in each mode section below. For an input signal monitoring summary, refer to Table 3 on page 36.

The 8943CF supports the following modes of operation:

- Auto Reclock/Bypass mode
- Auto Reclock/Mute mode
- 3G 2970M mode
- HD 1485M mode
- SD 270M mode
- Manual Bypass HD/3G
- Manual Bypass SD

Auto Reclock/Bypass Mode

In this mode, the electrical inputs are equalized and fed to the reclocker. If the specific bit rates of 270Mb/s, 1485Mb/s, or 2970Mb/s are analyzed by the module, it will reclock the signal at the determined bit rate and feed this signal to both the electrical BNC and the fiber optic outputs. With input reporting enabled, the input signal will be reported as **Present**.

If a bit rate other than 270Mb/s, 1485Mb/s, or 2970Mb/s is detected by the module or no input signal is detected, reclocking will not be performed and the signal will be automatically bypassed to the outputs. With input reporting enabled, the input signal will be reported as **Not Monitored**.

Auto Reclock/Mute Mode (Default)

In this mode, the electrical inputs are equalized and fed to the reclocker. If the specific bit rates of 270Mb/s, 1485Mb/s, or 2970Mb/s are analyzed by the module, it will reclock the signal at the determined bit rate and feed this signal to both the electrical BNC and the fiber optic outputs. With input reporting enabled, the input signal will be reported as **Present**.

If the input signal is not 270Mb/s, 1485Mb/s, or 2970Mb/s, or the signal input is not present, the output of the reclocker will be muted and the outputs will be static (muted). With input reporting enabled, the input signal will be reported as **Not Present**.

3G 2970M Mode

In this mode, the electrical inputs are equalized and fed to the reclocker. If the bit rate is analyzed as 2970Mb/s (3G), the module will reclock the signal at the determined bit rate and feed this signal to both the electrical BNC and the fiber optic outputs. With input reporting enabled, the input signal will be reported as **Present**.

If no input signal or a signal other than 2970Mb/s (3G) is detected by the module, the output of the reclocker will be muted and the outputs will be static (muted). With input reporting enabled, the signal input will be reported as **Not Present**.

HD 1485M Mode

In this mode, the electrical inputs are equalized and fed to the reclocker. If the bit rate is analyzed as 1485Mb/s (HD), the module will reclock the signal at the determined bit rate and feed this signal to both the electrical BNC and the fiber optic outputs. With input reporting enabled, the input signal will be reported as **Present**.

If no input signal or a signal other than 1485Mb/s is detected by the module, the output of the reclocker will be muted and the outputs will be static (muted). With input reporting enabled, the signal input will be reported as **Not Present**.

SD 270M Mode

In this mode, the electrical inputs are equalized and fed to the reclocker. If the bit rate is analyzed as 270Mb/s (SD), the module will reclock the signal at the determined bit rate and feed this signal to both the electrical BNC and the fiber optic outputs. With input reporting enabled, the input signal will be reported as **Present**.

If no input signal or a signal other than 270Mb/s is detected by the module, the output of the reclocker will be muted and the outputs will be static (muted). With input reporting enabled, the signal input will be reported as **Not Present**.

Manual Bypass HD/3G Mode

In this mode, the electrical inputs are equalized and fed to the reclocker. The bit rate is analyzed by the module. If the bit rate is analyzed as 1485Mb/s or 2970Mb/s, the module will reclock the signal at the determined bit rate and feed this signal to the both the electrical BNC and the fiber optic outputs. With input reporting enabled, the input signal will be reported as **Present**.

If a bit rate other than 1485Mb/s or 2970Mb/s is detected by the module or no input signal is detected, reclocking will not be performed and the signal will be automatically bypassed to the outputs. With input reporting enabled, the input signal will be reported as **Not Monitored**.

Manual Bypass SD Mode

In this mode, the electrical inputs are equalized and fed to the reclocker. The bit rate is analyzed by the module. If the bit rate is analyzed as 270Mb/s, the module will reclock the signal at the determined bit rate and feed this signal to the both the electrical BNC and the fiber optic outputs. With input reporting enabled, the input signal will be reported as **Present**.

If a bit rate other than 270Mb/s is detected by the module or no input signal is detected, reclocking will not be performed and the signal will be automatically bypassed to the outputs. With input reporting enabled, the input signal will be reported as **Not Monitored**.

Local Monitoring and Configuration

The 8943CF module can be configured and monitored locally using on-board rotary and paddle switches and the status and configuration LEDs mounted on the top of the module circuit board. If an 8900NET (Net Card) module is present for providing remote monitoring, refer to *Remote Monitoring and Controls* .

Local On-board Status Monitoring LEDs

As shown in Figure 25, there are three sets of on-board status LEDs on the top of the circuit board for local monitoring:

• Module status for FAULT, POWER, COMM, and CONF.

• Signal PRESENT and RATE DETECTED (3G, HD, or SD).

• Fiber optic SFP device PRESENT.

Refer to Table 2 on page 35 for an description of each LED color and function.

Figure 25. On-board Status LED Monitoring
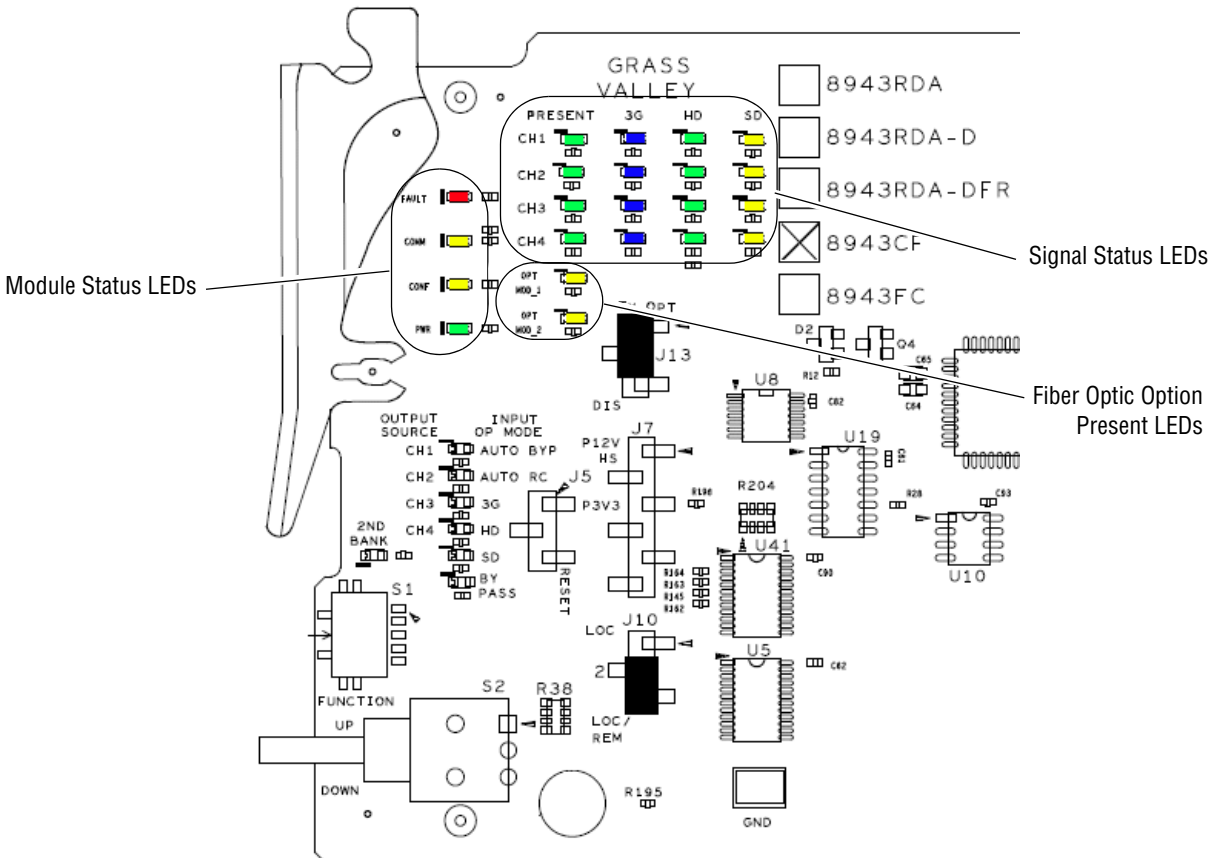
Table 2. On-board Module Status LED Names and Conditions

LED	Indication	Condition
Module Status LEDs		
FAULT (red)	Off	Normal operation, module OK.
	On continuously	Module has detected an internal fault.
	Flashing	Configuration problems. Check inputs and settings. Missing video input.
COMM (yellow)	Off	No activity on frame communication bus.
	Flashing	Locate Module command received by the module from a remote control system.
	Pulse (short duration	Activity present on the frame communication bus.
CONFIG (yellow)	Off	Module is in normal operating mode, no configuration change in progress or initialization complete.
	On continuously	Module is initiating or changing operating modes.
	Flashing	Locate Module command received by the module from a remote control system.
PWR (green)	Off	No power to module or module's DC/DC converter failed.
	On continuously	Normal operation, module is powered.
Input Signal Status LEDs		
CH1-4 PRESENT (green)	Off	No signal is present.
	On continuously	Input signal is either, 270Mb/s, 1485Mb/s, or 2970Mb/s.
CH1-4 3G (blue)	Off	Input signal is not 2970Mb/s.
	On continuously	Input signal is 2970Mb/s.
CH1-4 HD (green)	Off	Input signal is not 1485Mb/s.
	On continuously	Input signal is 1485Mb/s.
CH1-4 SD (yellow)	Off	Input signal is not 270Mb/s.
	On continuously	Input signal is 270Mb/s.
SFP Device OPTION PRESENT LEDs		
OPT MOD_1	Off	No fiber option transmitter SFP device is installed in position J6.
	On continuously	Fiber optic option transmitter SFP device is installed in position J6.
OPT MOD_2	Off	No fiber option transmitter SFP device is installed in position J4.
	On continuously	Fiber optic option transmitter SFP device is installed in position J4.

outlines the conditions that will result in the reported state of the input being **Present** or **Not Present** with the onboard LEDs and the conditions of the output based on the operating mode, the Input Presence, the actual input standard, and the Input Reporting State

Table 3. Reported Input/Output Status Summary

Operating Mode	Input Carrier Detect[1]	Reclocker Locked	PRES LED	3G LED	HD LED	SD LED	Output	Reporting	Reported Input State
Auto Reclock/Bypass	Not Present	N/A	Off	Off	Off	Off	N/A	Disabled	Not Monitored
								Enabled	Not Monitored
Auto Reclock/Bypass	Present	N/A	Green	Off	Off	Off	Input Signal	Disabled	Not Monitored
								Enabled	Present
Auto Reclock/Bypass	Present	Not 270M, 1485Mb/s, or 2970Mb/s	Green	Off	Off	Off	Input Signal	Disabled	Not Monitored
								Enabled	Present
Auto Reclock/Bypass	Present	270Mb/s	Green	Off	Off	Yellow	Reclocked 270Mb/s	Disabled	Not Monitored
								Enabled	Present
Auto Reclock/Bypass	Present	1485Mb/s	Green	Off	Green	Off	Reclocked 1485Mb/s	Disabled	Not Monitored
								Enabled	Present
Auto Reclock/Bypass	Present	2970Mb/s	Green	Blue	Off	Off	Reclocked 2970Mb/s	Disabled	Not Monitored
								Enabled	Present
Auto Reclock/Mute	Not Present	N/A	Off	Off	Off	Off	Muted	Disabled	Not Monitored
								Enabled	Not Present
Auto Reclock/Mute	Present	Not 270M, 1485Mb/s, or 2970Mb/s	Off	Off	Off	Off	Muted	Disabled	Not Monitored
								Enabled	Not Present
Auto Reclock/Mute	Present	270Mb/s	Green	Off	Off	Yellow	Reclocked 270Mb/s	Disabled	Not Monitored
								Enabled	Present
Auto Reclock/Mute	Present	1485Mb/s	Green	Off	Green	Off	Reclocked 1485Mb/s	Disabled	Not Monitored
								Enabled	Present
Auto Reclock/Mute	Present	2970Mb/s	Green	Blue	Off	Off	Reclocked 2970Mb/s	Disabled	Not Monitored
								Enabled	Present
Fixed 270M/Mute	Not Present	N/A	Off	Off	Off	Off	Muted	Disabled	Not Monitored
								Enabled	Not Present
Fixed 270M/Mute	Present	Not 270Mb/s	Off	Off	Off	Off	Muted	Disabled	Not Monitored
								Enabled	Not Present
Fixed 270M/Mute	Present	270Mb/s	Green	Off	Off	Yellow	Reclocked 270Mb/s	Disabled	Not Monitored
								Enabled	Present
Fixed 1485M/Mute	Not Present	N/A	Off	Off	Off	Off	Muted	Disabled	Not Monitored
								Enabled	Not Present
Fixed 1485M/Mute	Present	Not 1485Mb/s	Off	Off	Off	Off	Muted	Disabled	Not Monitored
								Enabled	Not Present
Fixed 1485M/Mute	Present	1485Mb/s	Green	Off	Green	Off	Reclocked 1485Mb/s	Disabled	Not Monitored
								Enabled	Present
Fixed 2970M/Mute	Not Present	N/A	Off	Off	Off	Off	Muted	Disabled	Not Monitored
								Enabled	Not Present
Fixed 2970M/Mute	Present	Not 2970Mb/s	Off	Off	Off	Off	Muted	Disabled	Not Monitored
								Enabled	Not Present
Fixed 2970M/Mute	Present	2970Mb/s	Green	Blue	Off	Off	Reclocked 2970Mb/s	Disabled	Not Monitored
								Enabled	Present

[1] When a signal is missing on any input, the red FAULT LED will flash on the front of the module circuit board.

Local Mode Configuration

The module may be configured using the local on-board rotary switch and paddle switch in conjunction with the configuration LEDs shown in Figure 26. If an 8900NET (Net Card) module is present for providing remote configuration, refer to *Remote Monitoring and Controls* .

Local/Remote Jumper

The on-board jumper Local/Remote jumper, J10, (Figure 26) is set at the factory for local and remote (LOC/REM position, pins 2-3) to allow remote control. It can be changed to lock out remote control if desired (LOC position, pins 1-2).

TX OPT Jumper

The on-board TX OPT jumper J13, (Figure 26) enables or disables the fiber optic transmitter outputs when the optional fiber optic transmitter SFP devices are installed. Set jumper J13 to pins 1-2 to enable the fiber outputs and pins 2-3 to disable. When disabled, there will be a warning on the Settings web page (page 49) that the outputs are disabled with jumper J13.

Figure 26. On-board Configuration Switches and LEDs

555
55
5555

55555

Configuration and Monitoring
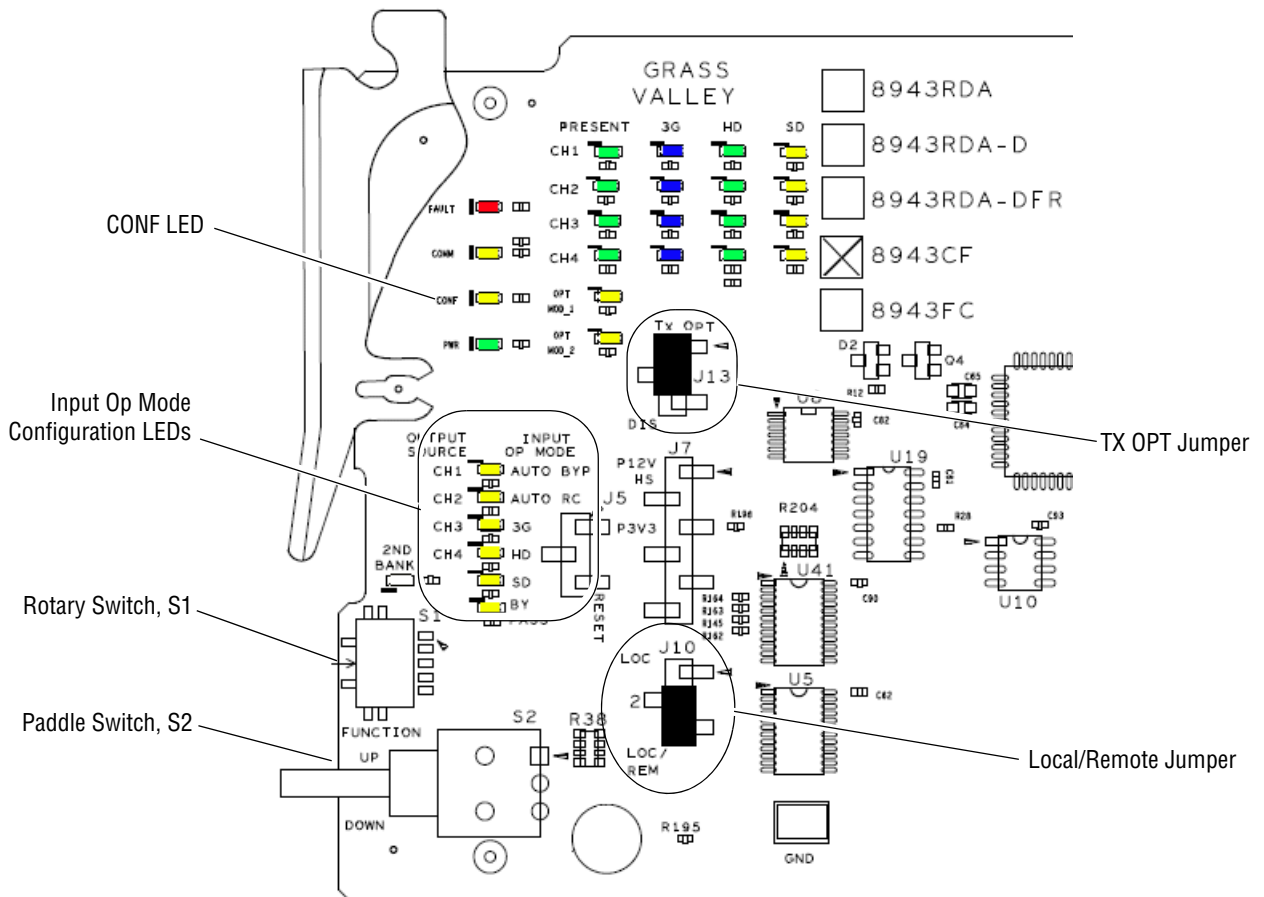
The local configuration controls are described below and shown in
Figure 26 on page 37. Refer to Table 4 for the switch settings to set each
parameter.

- Function (rotary) switch (S2) – this switch is used to access each of the
  four channels for configuration. The switch has 16 possible positions (0
  through 9 and A through F). Only positions 1, 2, 3, 4, and F are used (see
  Table 4). Bank 2 is also not used in this application.

- Paddle switch (S1) – scrolls through the available modes for the selected
  channel when the switch is held momentarily in either the up or down
  position.

- CONFIG (configuring) LED – when on, indicates the module is initial-
  izing or processing configuration information.

Table 4. Mode Configuration Functions

Function Switch Setting	Paddle Switch Up	Paddle Switch Down	Function Description
0	–	–	Park position for normal operation (paddle switch has no effect)
1	Auto By, Auto RC, 3G, HD, SD, or By.		Scroll to Channel 1 input operating mode
2			Scroll to Channel 2 input operating mode
3			Scroll to Channel 3 input operating mode
4			Scroll to Channel 4 input operating mode
5-9	–	–	Not used
A-E	–	–	
F	Recall		Recall factory defaults (all channels have Reporting Enabled and Auto/Mute mode selected).

Note When configuration is complete, the **Function** switch should be parked in an
unused position such as 0 during normal operation to avoid changing the
mode accidently with the paddle switch.

38 *8943CF — Instruction Manual*

Remote Monitoring and Controls

The 8943CF module can be configured and monitored when an 8900NET module is installed in the GeckoFlex frame using the web-based GUI or a networked Newton Control Panel.

8900NET Module Information

Refer to the *8900NET Network Interface Module Instruction Manual* for information on the 8900NET Network Interface module and setting up and operating the GeckoFlex frame network.

Note   The 8900NET module in the GeckoFlex frame is recommended to be running software version 4.3.0 or higher for proper remote and control panel operation. Upgrade software and instructions for the 8900NET can be downloaded from the Grass Valley web site at this location:

ftp://ftp.grassvalley.com/modular/8900/8900net/v4.3.0/

Newton Control Panel Configuration

A Newton Control Panel (hard and/or soft version) can be interfaced to the GeckoFlex frame over the local network when the 8900NET (Net Card) is present. Refer to the documentation that accompanies the Newton Modular Control System for installation, configuration, and operation.

Control panel access offers the following considerations for module configuration and monitoring:

- Ability to separate system level tasks from operation ones, minimizing the potential for on-air mistakes.

- Ability to group modular products—regardless of their physical locations—into logical groups (channels) that you can easily manipulate with user-configured knobs.

- Update software for applicable modules and assign frame and panel IP addresses with the NetConfig Networking application.

- Recommended for real-time control of module configuration parameters, providing the fastest response time.

Note   Not all module functions may be available with the control panel.

An example of the Newton Configurator is shown in Figure 27. Newton Control Panel parameters are listed in Table 8 on page 61.

Figure 27. Newton Configurator Example
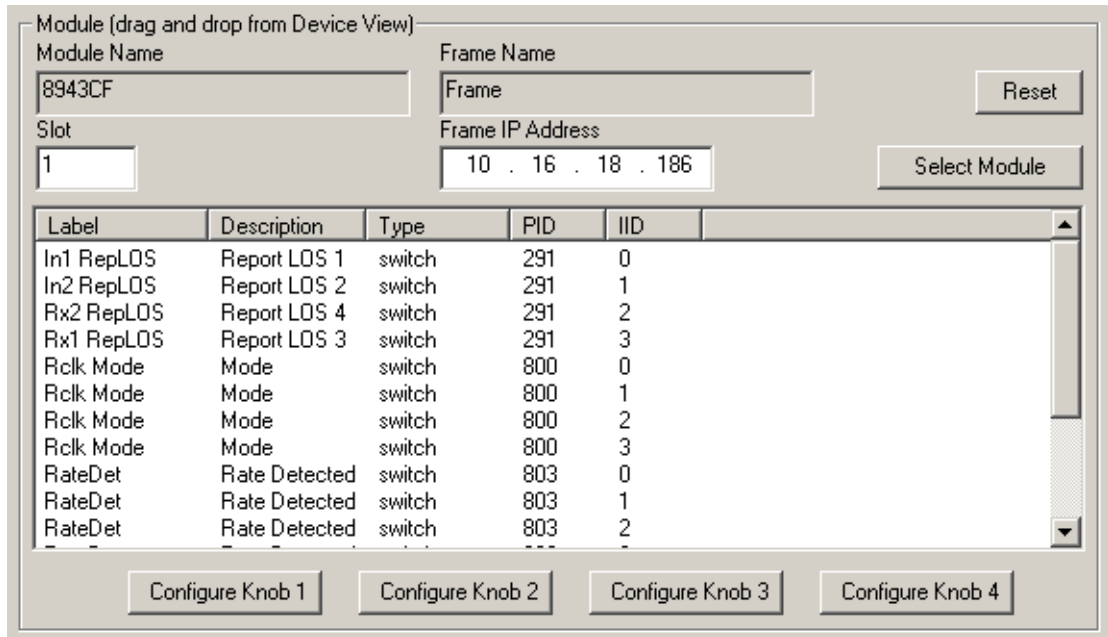
Web Browser Interface

The web browser interface provides a graphical representation of module configuration and monitoring.

Use of the web interface offers the following considerations (when applicable for the module):

• Provides complete access to all module status and configuration functions, including factory parameter default recalls, slot configuration, and SNMP monitoring controls.

• Web access will require some normal network time delays for processing of information.

• Configuration parameter changes may require pressing **Apply** button or **Enter**, upload processing time, and a manual screen refresh to become effective.

• Web interface recommended for setting up module and reporting status for SNMP and monitoring.

Refer to the Frame Status page shown in Figure 28 on page 41. The modules can be addressed by clicking either on a specific module icon in the frame status display or on a module name or slot number in the link list on the left.

Note   The physical appearance of the menu displays on the web pages shown in this manual represent the use of a particular platform, browser and version of 8900NET module software. They are provided for reference only. Displays will differ depending on the type of platform and browser you are using and the version of the 8900NET software installed in your system. The only recommended browser for optimum performance is the latest version of Internet Explorer. This manual reflects 8900NET software version 4.3.0, the latest release recommended.

For information on status and fault monitoring and reporting shown on the Status page, refer to *Status Monitoring *.

Figure 28. GeckoFlex Frame Status Page

The Links section lists the frame and its current modules. The selected link's Status page is first displayed and the sub-list of links for the selection is opened. The sub-list allows you to select a particular information page for the selected device.

Content display section displays the information page for the selected frame or module (frame slot icons are also active links).

Refresh button for manual update of page

Status

Model: 8900FFN Description: Module Frame
Frame Location: not assigned
Frame Health Alarm WARN Temperature Status PASS
Power Status   PASS

Front Cover No Cover

Properties
Vendor   Thomson, Grass Valley Software Version 4.3.0
Media Slots 10   Network Config   Network configuration stored on frame

Frame
  Status
  Configuration
  Connections
  Frame Alarm Reporting
  LED Reporting
  SNMP Reporting
  Power Supply/Demand
  1 8943CF
  2 8943CF
  3 Media Slot 3
  4 8943FC
  5 8943FC
  6 Media Slot 6
  7 Media Slot 7
  8 Media Slot 8
  9 8943RDA-DFR
  10 8943RDA-DFR
  11 8900NET
  12 Power Supply 1
  13 Power Supply 2

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Web Page Links

The web interface GUI provides the following links and web pages for the 8943CF modules (Figure 29):

- Status – reports input video status for each of the electrical BNC inputs, presence, type, and status of optional fiber optic SFP devices, module slot serial number, and software/firmware version information (page 43),

- I/O Config – shows the presence of the signals on a specific connector, allows naming of each input and enables or disables the signal reporting (page 47),

- Settings – reports the input signal status, locked rate, and SFP device type, and provides controls for setting the operating mode and enabling or disabling input reporting for each of the four channels (page 48), and

- Slot Config – provides Locate Module and Slot Memory functions along with links to the 8900NET SNMP, LED Reporting, and Frame Alarm configuration web pages (page 50).

Figure 29. 8943CF Web Page Links

1 8943CF
  Status
  I/O Config
  Settings
  Slot Config

Status Web Page

Use this link — 1 8943CF
Status
I/O Config
Settings
Slot Config

The Status web page reports the status of the input signal for each of the electrical video inputs (Channel 1-4), front and rear module information and status, and information and status on the top (J4) and bottom (J6) fiber optic SFP devices.

GeckoFlex Module Physical Structure

This graphic reports the status for each of the following items:

- BNC Input 1-4 – indicates the status of the video input to the module from the coax BNCs. Refer to the *I/O Config Web Page on page 47* for information on disabling the input status reporting.

- Fiber/BNC Out 1-4 – not monitored.

- Frame Bus – indicates the status of the communication bus to the 8900NET module.

- Rear Module – indicates status of the 8943CF-R module.

- Front Processing Module – indicates status of the 8943CF front module.

- Fiber Module 1 – indicates the status of the optional fiber optic SFP device installed in connector J6 on the top side of the module.

- Fiber Module 2 – indicates the status of the fiber optic SFP device installed in connector J4 on the top side of the module.

Color coding of the display and the Status LED indicate status. Refer to *Status Monitoring on page 56* for a complete explanation of the color coding.

Fiber Modules

The Fiber Modules read-only section reports the type (TX-TX), the wavelengths, if the SFP Device handles 3G signals (Y or N), and the part number, when an optional SFP transmitter device is installed in Fiber Module 1 (connector J6) or Fiber Module 2 (connector J4) on the top side of the front module circuit board.

Warning Messages

When the module detects a fiber optic error, a warning message will appear in the Fiber Modules table. Other errors will be displayed based on color coding of the graphics as described in *Status Monitoring on page 56*.

Other Status Reporting

A read-only section at the bottom of the Status web page gives information about the module such as part number, serial number, hardware revision and software and firmware versions, and asset tag number (assigned on the Slot Config web page on page 50).

The Status web page shown in Figure 30 show all inputs present and locked and no errors of any type.

Figure 30. 8943CF Status Web Page – No Error Messages

Figure 31 illustrates the Status web page reporting that the top SFP device is not installed.

Figure 31. 8943CF Status Web Page – No Fiber 1 SFP Device Installed

Status

Model: 8943CF Description: 4ch CF SD/HD/3G DA
Frame Location: not assigned , Slot: 1

Gecko Flex Module Physical Structure

Input Ch 1
Input Ch 2
Input Ch 3
Input Ch 4

8943CF-R

8943CF

Fiber Module 1

Fiber Module 2

Outputs

Frame Bus
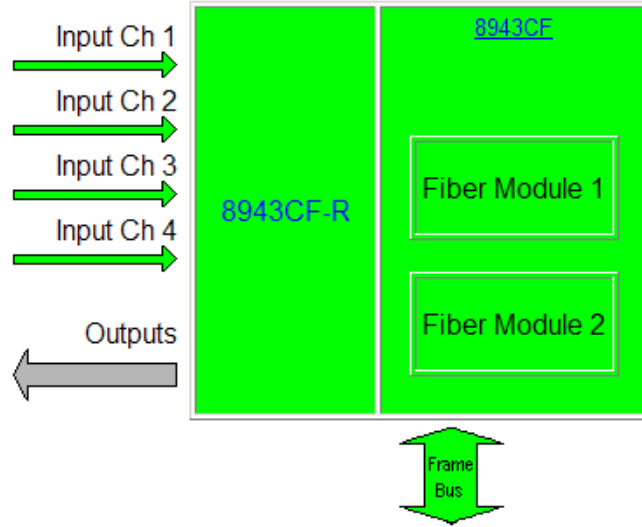
Fiber Modules

Type	Wavelength		3G	Part Number
MISSING	-	-	-	-
TX/TX	1550 nm	1570 nm	Y	711019151

Part Number: 771-0376--62A
Serial Number: BT11080065
Hardware Revision: 62A
Software Version: 1.0.2
Asset Tag:

The input status of all four channels is reflected (in the Status LED on each web page) and reported (to upper level devices such as the 8900NET module and SNMP traps) remotely in a collective state. Table 5 shows how the collective input status of all four channels is generated and reported for various channels states.

Table 5. Collective Remote Reporting Status of All Channels

Channel 1 Input Status	Channel 2 Input Status	Channel 3 input Status	Channel 4 Input Status	Collective Input Status
Not Monitored	Not Monitored	Not Monitored	Not Monitored	Not Monitored
Not Present	N/A	N/A	N/A	Not Present
N/A	Not Present	N/A	N/A	Not Present
N/A	N/A	Not Present	N/A	Not Present
N/A	N/A	N/A	Not Present	Not Present
Present	Not Monitored	Not Monitored	Not Monitored	Present
Not Monitored	Present	Not Monitored	Not Monitored	Present
Not Monitored	Not Monitored	Present	Not Monitored	Present
Not Monitored	Not Monitored	Not Monitored	Present	Present
Present	Present	Not Monitored	Not Monitored	Present
Present	Not Monitored	Present	Not Monitored	Present
Present	Not Monitored	Not Monitored	Present	Present
Not Monitored	Present	Present	Not Monitored	Present
Not Monitored	Present	Not Monitored	Present	Present
Not Monitored	Not Monitored	Present	Present	Present
Present	Present	Present	Not Monitored	Present
Present	Present	Not Monitored	Present	Present
Present	Not Monitored	Present	Present	Present
Not Monitored	Present	Present	Present	Present
Present	Present	Present	Present	Present

I/O Config Web Page

Use
this
link

Use the I/O Config web page (Figure 32) for the 8943CF-R rear module for rear module configuration and signal status reporting.

All of the input and output connectors on the corresponding 8943CF-R rear module are illustrated on the I/O Config web page. The inputs can be configured with the following controls:

- **Signal Names** – type of the desired input name (up to 12 characters) into the corresponding boxes for each input. The status of each input is indicated by the color of the display. The color legend is under the table.

Note   The status color yellow can also indicate that the input is invalid.

- **Reporting Enabled** – the status reporting of the input can be enabled or disabled at the module level by selecting or deselecting the corresponding checkbox in the **Reporting Enabled** column for each input.

Figure 32. I/O Config Web Page – 8943CF-R Rear

Settings Web Page

Use the Settings web page (Figure 33 on page 49) set the input operating mode for each channel, enable the fiber optic outputs, and monitor the rate detected and signal state for each channel.

Inputs

Select the input operating mode for each channel by selecting a mode from the channel pulldown from one of the following choices:

- Auto Reclock/Bypass mode

- Auto Reclock/Mute mode

- 3G 2970M mode

- HD 1485M mode

- SD 270M mode

- Manual Bypass HD/3G

- Manual Bypass SD

Each of the operating modes are described in detail in *Input Operating Modes Overview on page 31*.

Outputs

Enable the fiber optic outputs by selecting the checkbox next to the transmitter output. Two CWDM transmitter SFP devices must be installed before all fiber outputs will be available.

Note   As shown in Figure 33 on page 49 at the bottom of the web page, if on-board jumper J13 is set to disable the fiber outputs, a warning message will appear at the bottom of the outputs section.

Set Defaults

Use the **Set Defaults** button at the bottom of the page to recall factory defaults, Input Reporting Enabled and Auto/Mute mode, for each channel.

Figure 33. Settings Web Page – Default Settings

Fiber output jumper
disabled warning

Slot Config Web Page

Use
this
link

Use the Slot Config web page shown in Figure 34 to perform the following functions on the module:

- Locate Module

- Slot Identification

- Slot Memory

- Frame Health Reporting

- LED Reports

- SNMP Trap Reports

Each of these functions is described in detail below.

Figure 34. Slot Config Web Page

Slot Config

Model: 8943CF Description: 4ch CF SD/HD/3G DA
Frame Location: not assigned , Slot: 1

Locate Module

Off

Slot Identification

Name: 8943CF   Default

Asset Tag:

Slot Memory

☐ Restore upon Install

Learn Module Config

Frame Health Reports

LED Reports

SNMP Trap Reports

Locate Module

Selecting **Flash** from the **Locate Module** pulldown flashes the yellow COMM and CONF LEDs on the front of the module so it can be located in the frame.

Slot Identification

You may identify the module by typing a specific name in the **Name** field. The assigned name is stored on the 8900NET module and travels with the 8900NET module if it is moved to another frame. Select **Default** to enter the factory default module name.

An asset identification may be entered in the **Asset Tag** field. This will appear on the module Status web page and in the NetConfig inventory report.

Slot Memory

The slot configuration for each media module is automatically polled and refreshed periodically (about every 50 minutes) by the 8900NET module when the **Always Slot Refresh** checkbox on the 8900NET Configuration web page (with 4.3.0 software) and/or the **Restore upon Install** checkbox on any media module Slot Config web page is selected.

When the **Restore upon Install** checkbox on any media module Slot Config web page has been selected, the current configuration from that module is saved in slot memory on the 8900NET module. This allows the current module to be removed and when another module of the same part number, and software version is installed, the configuration saved to the 8900NET module will be downloaded to the installed module. The **Restore upon Install** checkbox must be selected before the current module with the saved configuration is removed.

Note   Make sure all modules of the same model type are running the same software version and have the same part number silk-screened on the printed circuit board. Downloading a configuration to a module with a different software version or part number can produce unexpected results.

If a different type of module is installed in this slot, a warning message will state that the original module type has been replaced with another module type. In this case, a **Clear** button will appear allowing you to clear the stored configuration from the previous module.

You may also select the **Learn Module Config** button at any time to save the current configuration for this slot. The configuration is saved on the 8900NET module. If the 8900NET module is removed or powered down, the stored configurations are not saved.

When no **Restore upon Install** checkboxes on any of the media module Slot Config web pages are selected and the **Always Slot Refresh** checkbox on the 8900NET Configuration web page is unchecked, the slot refresh polling function on the 8900NET module will be disabled. See the **Always Slot Refresh** checkbox description in the *8900NET (Net Card) Network Interface Module Instruction Manual* for more details.

Note Uncheck the **Restore Upon Install** button before downloading new software.

Frame Health Reporting

This web page allows configuration of the alarms and warnings that are reported to the external Frame Health Alarm connector on the rear of the GeckoFlex frame. Refer to *8900NET Instruction Manual* for more details.

LED Reports Link

Select the LED Reports link to open the 8900NET LED Reporting web page. Normally, every module in the frame will report to the 8900NET module any Fault, Signal Loss, Reference Loss, or Config Error conditions. These conditions will be reflected by the status LEDs on the 8900NET module. Using this web page, any of these conditions can be disabled from being reported to the 8900NET module for each individual module and other components (power supplies, fans) in the frame

SNMP Trap Reports Link

Select the SNMP Trap Reports link to open the 8900NET SNMP Reporting web page. This link will only be present when SNMP Agent software has been installed on the 8900NET module. This web page allows configuration of which alarms and warnings that are reported to the SNMP management software.

Refer to the *8900NET Instruction Manual* for complete details on using the 8900NET web pages.

Software Updating

Software updating of the 8943CF modules is done using the NetConfig Networking Application PC option. This application is available free of charge from the Grass Valley web site.

The procedure for updating software with NetConfig is given in the 8943CF Release Notes when software updates become available. Check the Grass Valley web site for update information. Refer to *Contacting Grass Valley on page 4* for more information.

Specifications

Table 6 gives the overall specifications for the 8943CF module. Refer to Table 7 on page 55 for detailed specifications for the Dual Transmitter/Transceiver fiber optic SFP device options.

Table 6. 8943CF Specifications

Parameter	Value
Serial Digital Coax Input	
Connector	BNC
Input impedance	75 ohm with return loss > 15 dB
Input signal types (reclocked)	
SD-SDI	480i @ 59.94 576i @ 50Hz SMPTE 259M-1997
HD-SDI	1080p @ 59.94, 50, 24sf, 24f 1080i @ 59.94, 50 720p @ 59.94, 50 SMPTE 292M-1998 at 1.485/1.483 5Gb/s
3G-SDI	1080p @ 59.94, 50 SMPTE 424 at 2.97 Gb/s
DVB-ASI	270Mb/s
Input signal types (bypassed)	
	1 to 540 Mb/s
	AES 3ID-2001
	MADI
Cable equalization (for any of the above signal types using Belden 1694A cable)	Up to 300 meters for bit rates up to 270 Mb/s Up to 100 metes for bit rates from 270 Mb/s to 1.485Gb/s Up to 80 meters for bit rates from 270Mb/s to 2.97Gb/s
Serial Digital Coax Output	
Connector	BNC
Output impedance	75 ohm
Signal level (SD/HD-SDI)	800 mV p-p, ± 10% maximum
Return loss (typical)	• > 15 dB from 5 MHz to 1.5 GHz • > 10 dB from 1.5 GHz to 3 GHz
Output polarity	Non-inverted (all outputs)
Total jitter	≤ 0.2 UI p-p
Electrical Length	
Reclocked at 270Mb/s	10 ns
Reclocked at 1.5Gb/s	8 ns
Reclocked at 3Gb/s	8 ns
Bypass	7 ns

Table 6. 8943CF Specifications

Parameter	Value
Operating Modes	
Auto Reclock/Bypass	270 Mb/s./1485 Mb/s/2970 Mb/s bypass
Auto Reclock/Mute	270 Mb/s./1485 Mb/s/2970 Mb/s mute
Fixed reclock SD	270 Mb/s mode
Fixed reclock HD	1485 Mb/s mode
Fixed reclock 3G	2970 Mb/s mode
Manual bypass	SD mode
Manual bypass	HD/3G mode
Mechanical	
Supported frame type	GeckoFlex
Number of frame slots	Single slot
Rear module type	8943CF-R
Rear module retainer maximum screw torque	4-5 inch-lb./0.45-0.6Nm
Environmental	
Frame temperature range	Refer to GeckoFlex Frames 8900FX/FF/FFN Signal Processing Systems Instruction Manual at www.grassvalley.com/docs/modular
Operating humidity range	
Non-operating temperature	
Power	
Power consumption	7.5 Watts (with two SFP devices installed)

Table 7. Optional Dual Transmitter/Transceiver Specifications

Model Numbers	SFP-13103G -M1DTX-K SFP-13103G -M1DTX SFP-13103G -M2DTX	SFP-CWDM3G-1-K SFP-CWDM3G-1	SFP-CWDM3G-2-K SFP-CWDM3G-2	SFP-CWDM3G-3-K SFP-CWDM3G-3	SFP-CWDM3G-4-K SFP-CWDM3G-4	SFP-13103G -M1TRX-K SFP-13103G -M1TRX SFP-13103G -M2TRX
Wavelength 1	1310nm	1470nm	1510nm	1550nm	1590nm	1310nm
Wavelength 2	1310nm	1490nm	1530nm	1570nm	1610nm	N/A
Model Numbers		**SFP-CWDM3G-5-K SFP-CWDM3G-5**	**SFP-CWDM3G-6-K SFP-CWDM3G-6**	**SFP-CWDM3G-7-K SFP-CWDM3G-7**	**SFP-CWDM3G-8-K SFP-CWDM3G-8**	
Wavelength 1		1310nm	1350nm	1390nm	1430nm	
Wavelength 2		1330nm	1370nm	1410nm	1450nm	
Transmit Channels	2	2	2	2	2	1
Optical connectors	LC					
Fiber support	Single-mode					
Data Rate	143Mb/s to 2.9 Gb/s					
Power Output @ 2.97 Gb/s, 360 Mb/s, and 270 Mb/s	TX power: -7 to +2dBm (± 3dB)	TX Power: -2 to +5dBm (+3dB)				TX Power: -7 to +2dBm RX Power: -22 to -1 dB (± 3dB)
Maximum Distance with SFP-13103G-M1DRX-K SFP-13103G-M1DRX SFP-13103G-M2DRX @ 2.97 Gb/s	10 km	50 km				30 km
Maximum Distance with SFP-13103G-M1DRX-K SFP-13103G-M1DRX SFP-13103G-M2DRX @ 2.97 Gb/s	20 km	60 km				20 km
Minimum Distance with SFP-13103G-M1DRX-K SFP-13103G-M1DRX SFP-13103G-M2DRX @ 2.97 Gb/s	0 km (See Note[1])	0 km (see Note[2])				0 km (See Note[1])
Minimum Distance with SFP-13103G-M1DRX-K SFP-13103G-M1DRX SFP-13103G-M2DRX @ 2.97 Gb/s	N/A	50 km (see Note[3])				N/A
Optical Input Wavelength	N/A					

[1] The 1310nm Dual Transmitter (SFP-13103G-M1DTX) and Transceiver (SFP-13103G-M1TRX, SFP-13103G-M2TRX) require no attenuation between fiber transmitter and receiver connections at any cable lengths.

[2] All CWDM devices used in point-to-point configuration with a cable run from 0–20 km, must be attenuated by 6 dB between the fiber transmitter and receiver connections.

[3] cWDM devices used with 8939FCA or 8939FCA/8939FCB modules for a mux/demux configuration with a cable run from 0-12 km (7.5 miles), must be attenuated by 4 dB between 8939FCA or the 8939FCA/8939FCB COM ports.

Status Monitoring

There are a number of ways to monitor frame and module status. These methods are summarized here. For more detailed information, refer to the *8900NET (Net Card) Network Interface Module Instruction Manual* and the *8900 Gecko* or *8900 GeckoFlex Frame Instruction Manuals.*

All modular product documentation is available on-line in PDF format at this link*:*

www.grassvalley.com/docs/modular

The main status monitoring methods include the following:

• External frame alarm output on the rear of the 8900 frame with reporting from the Module Health Bus and other frame status alarm reports,

• LEDs on the Frame, 8900NET module, and individual frame media modules,

• Web browser status reporting for each frame component, and

• SNMP traps, captured by Grass Valley's NetCentral or another SNMP Manager Application.

Note   SNMP trap information is only available when an SNMP Agent has been installed and configured.

External Frame Alarm

An external Frame Alarm output is available on pins 8 and 9 of the RS-232 connector on the rear of the frame. The Frame Alarm outputs a voltage level indicating there is an alarm condition on the Module Health Bus or one of the other frame components reported to the Frame Monitor module in a Gecko 8900TF or GeckoFlex 8900FF frame or the 8900NET module in an 8900TFN and GeckoFlex 8900FFN frame.

• The Module Health bus is a separate line on the frame motherboard that provides a means for older or less capable modules (such as DAs with no microprocessor) that cannot communicate over the Frame (serial) bus to report warning and alarm conditions to the external Frame Alarm. All media modules in the frame report a voltage level to this line when a warning condition occurs on the module. The specific warning or module location is not reported, only an indication that an warning condition has occurred.

• Frame alarm reporting from other frame components can be enabled and disabled using DIP switches on the Frame Monitor and 8900NET module. For frames with an 8900NET module, the Frame Alarm Reporting web page allows configuration of the alarms and warnings that are reported to this external Frame Health Alarm*.*

LED Reporting

LEDs on the front of media modules, the Frame Monitor or 8900NET modules, and the front covers of the 8900TF/TFN and GeckoFlex FF/FFN frames indicate status of the frame and the installed power supplies, fans in the front covers, and module status. (The 8900TX-V/A and GeckoFlex 8900FX frames have no LED indicators on the front cover.)

- LED reporting from the modules in the frame to the 8900NET module is configurable using the 8900NET LED Reporting web page.

- The Status LEDs for this module are described in *Local On-board Status Monitoring LEDs on page 34*. LEDs for the 8900NET module are described in the *8900NET (Net Card) Network Interface Instruction Manual*.

Web Browser Interface

The 8900NET module controls a web browser GUI that indicates frame and module status on the following web pages:

- Frame Status web page – reports overall frame and module status in colored graphical and text formats. Refer to Figure 28 on page 41 for an example.

- Module Status web page (Figure 30 on page 44) – shows specific input and reference signal configuration error status to the module along with module status and information (part number, serial number, hardware version, software/firmware/boot versions, and Asset number (as assigned on the Slot Config web page).

- A Status LED icon on each web page reflects the module status on the module Status web page where warnings and faults are displayed and is a link to the module Status web page.

SNMP Reporting

The GeckoFlex 8900 Series system uses the Simple Network Monitoring Protocol (SNMP) internet standard for reporting status information to remote monitoring stations. When SNMP Agent software is installed on the 8900NET module, enabled status reports are sent to an SNMP Manager such as the Grass Valley's NetCentral application.

Status reporting for the frame is enabled or disabled with the configuration DIP switches on the 8900NET module. Most module status reporting items can be enabled or disabled on individual configuration web pages.

Service

The 8943CF modules make extensive use of surface-mount technology and programmed parts to achieve compact size and adherence to demanding technical specifications. Circuit boards should not be serviced in the field unless directed otherwise by Customer Service.

Power-Up Diagnostic Failure

If the module has not passed self-diagnostics, do not attempt to trouble-shoot. Return the unit to Grass Valley Customer Service (see *Module Repair*).

Troubleshooting

Electronic Circuit Breaker

An electronic circuit breaker on the module works during a fault condition or an overcurrent to cut off power to the module in place of a fuse.

If power has been cut off to module, remove the module and replace it in the frame to reset. If the problem persists contact Grass Valley Customer Service.

Module Repair

If the module is still not operating correctly, replace it with a known good spare and return the faulty module to a designated Grass Valley repair depot. Call your Grass Valley Customer Service representative for depot locations.

Refer to *Contacting Grass Valley on page 4* at the front of this document for the Grass Valley Customer Service contact information.

Functional Description

An overall block diagram for the 8943CF module is shown in Figure 35.

Figure 35. 8943CF Block Diagram

*Coax inputs and coax and fiber optic outputs are present on the 8943CF-R rear module
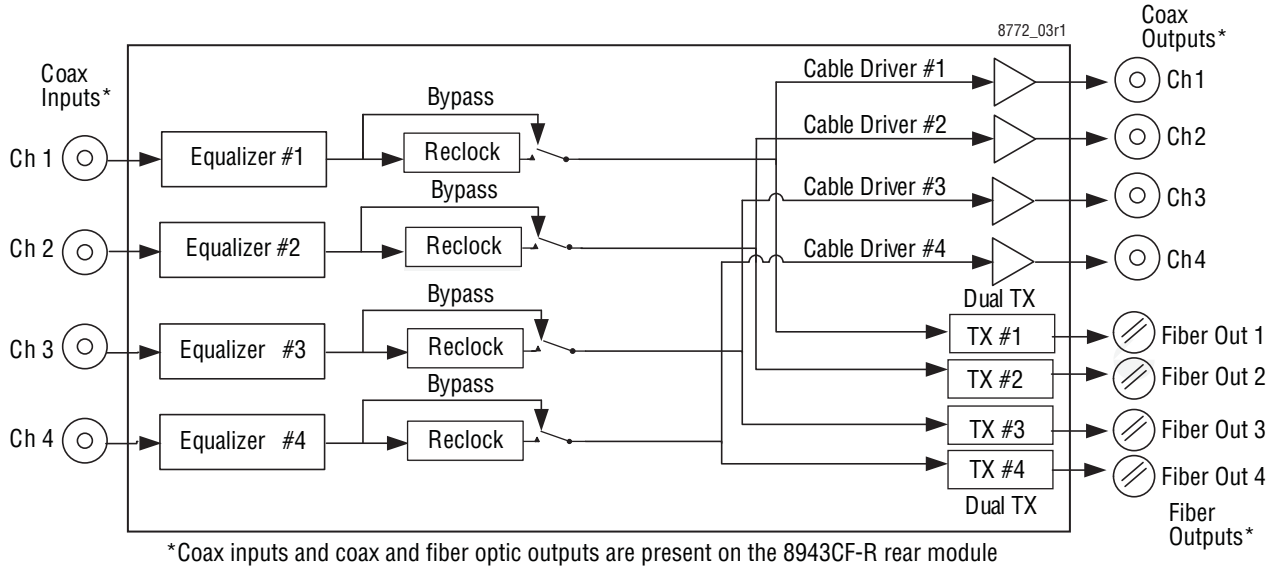
Configuration Summary Table

Table 8 provides a complete summary of the 8943CF module functions and a comparison of the functionality available with each control type along with the ranges and default values for each parameter and notes on each control.

Table 8. Summary of 8943CF Configuration Functions

Function Type	Default	Range/Choices Resolution	Web Page/ Function Name	Local Onboard Controls	Newton Control Panel
Assign Signal names for channels 1-4	Channel 1 Channel 2 Channel 3 Channel 4	Type in name (up to 11 characters)	I/O Config/ Signal Name Name channel 1-4	N/A (Defautls are used)	N/A
Reporting enable	Enabled	Enabled or Disabled	I/O Config/ Reporting Checkboxes for Ch1, Ch 2, Ch 3, and Ch4	N/A	In1 RepLoss In 2 RepLoss RX2 RepLoss RX2 RepLoss
Set Input Mode for Ch 1-4	Auto Reclock/Mute	Auto Reclock/Bypass, Auto Reclock/Mute, 3G 2970M, HD 1485M, SD 270M, Manual Bypass/HD 3G, or Manual Bypass SD.	Settings/ Inputs Ch 1 J1, Ch 2, J3, Ch 3 J5, Ch 4 J7	S2 = Pos 1, Ch 1 S1 = pos 2, Ch 2 S1 = Pos 3, Ch 3 S1 = Pos 4, Ch 4 Use paddle switch S1 to cycle to desired mode for selected channel.	Rclk Mode
Enable Fiber outputs (Tx)	Enabled	Enabled or Disabled	Settings/ Fiber Outputs Enable Select checkbox for Fiber TX 1, Fiber Tx 2, Fiber Tx 3, and Fiber Tx 4	Set onboard Jumper	OptEnable
Recall factory defaults	–	–	Settings/ **Set Defaults** button	S1 = F Push paddle switch S2 up.	Defaults

Index

Numerics

A

B

C

D

F

G

H

I