

FOXCOM
Complete RF-2-Fiber Solutions



Gold Interfacility Link
Installation and User's Guide

Preliminary

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Foxcom Inc.
Princeton Forrestal Village
136 Main Street Suite 300
Princeton, NJ 08540
USA

Tel: 609-514-1800
Toll free: 1-866-ONEPATH
Fax: 609-514-1881

Foxcom Ltd.
Beit Meir
16 Hataasia Street,
Har Tuv A, Ind Zone,
Beit Shemesh 99052
Israel

Tel: +972-2-589-9888
Fax: +972-2-589-9898

Website: www.foxcom.com
e-mail: sales@foxcom.com

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Warranty and Repair Policy

Foxcom performs testing and inspection to verify the quality and reliability of our products. Foxcom uses every reasonable precaution to ensure that each unit meets specifications before shipment. Customers are asked to advise their incoming inspection, assembly, and test personnel as to the precautions required in handling and testing our products. Many of these precautions are to be found in this manual.

The products are covered by the following warranties:

General Warranty

Foxcom warrants to the original purchaser all standard products sold by Foxcom to be free of defects in material and workmanship for 24 months from date of shipment from Foxcom. During the warranty period, Foxcom will repair or replace any product that Foxcom proves to be defective. This warranty does not apply to any product which has been subject to alteration, abuse, improper installation or application, accident, electrical or environmental over-stress, negligence in use, storage, transportation or handling.

Specific Product Warranty Instructions

All Foxcom products are warranted against defects in workmanship, materials and construction, and to no further extent. Any claim for repair or replacement of units found to be defective on incoming inspection by a customer must be made within 30 days of receipt of shipment, or within 30 days of discovery of a defect within the warranty period.

This warranty is the only warranty made by Foxcom and is in lieu of all other warranties, expressed or implied. Foxcom sales agents or representatives are not authorized to make commitments on warranty returns.

Returns

In the event that it is necessary to return any product against above warranty, the following procedure shall be followed:

1. Return authorization is to be received from Foxcom prior to returning any unit. Advise Foxcom of the model, serial number, and discrepancy. The unit may then be forwarded to Foxcom, transportation prepaid. Devices returned collect or without authorization may not be accepted.
2. Prior to repair, Foxcom will advise the customer of our test results and any charges for repairing customer-caused problems or out-of-warranty conditions etc.
3. Repaired products are warranted for the balance of the original warranty period, or at least 90 days from date of shipment.

Limitations of Liabilities

Foxcom's liability on any claim, of any kind, including negligence for any loss or damage arising from, connected with, or resulting from the purchase order, contract, quotation, or from the performance or breach thereof, or from the design, manufacture, sale, delivery, installation, inspection, operation or use of any equipment covered by or furnished under this contact, shall in no case exceed the purchase price of the device which gives rise to the claim.

EXCEPT AS EXPRESSLY PROVIDED HEREIN, FOXCOM MAKES NO WARRANTY, EXPRESSED OR IMPLIED, WITH RESPECT TO ANY GOODS, PARTS AND SERVICES PROVIDED IN CONNECTION WITH THIS AGREEMENT INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. FOXCOM SHALL NOT BE LIABLE FOR ANY OTHER DAMAGE INCLUDING, BUT NOT LIMITED TO, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH FURNISHING OF GOODS, PARTS AND SERVICE HEREUNDER, OR THE PERFORMANCE, USE OF, OR INABILITY TO USE THE GOODS, PARTS AND SERVICE.

The Company's exclusive warranty and the remedy provided for breach thereof shall not apply to:

1. Any Product used or operated other than pursuant to the Company's written instructions,
2. Damage or deficiencies resulting from accident, alteration, modification, misuse, tampering, negligence, improper maintenance, installation or abuse,
3. Use of any Product other than at the Installation Site,
4. Use of any Product that is defective or damaged due to misuse, accident, or neglect, or due to external electrical stress, lightning or other acts of nature,
5. Use of any Product by a person who is not any authorized employee of the Customer, or
6. Used other than as explicitly authorized in writing by the Company.

Reporting Defects

The units were inspected before shipment and found to be free of mechanical and electrical defects.

Examine the units for any damage which may have been caused in transit. If damage is discovered, file a claim with the freight carrier immediately. Notify Foxcom as soon as possible.

Note Keep all packing material until you have completed the inspection.

Precautions

Personal Safety

OPTICAL RADIATION

Applying power to the transmitter unit will create a laser energy source operating in Class I as defined by IEC 825-1. Use either an infrared viewer, optical power meter or fluorescent screen for optical output verification.

AC POWER HAZARD

The rackmount power supply line is EMI filtered. The chassis is connected to earth ground in compliance with safety requirements. Always use the 3-prong AC plug with earth ground to avoid possibility of electrical shock hazard to personnel.

Equipment Safety

1. The output of the receiver is AC coupled and can withstand the bias from a satellite receiver. **Do not exceed 25V DC bias.**
2. The input of the transmitter has an optional built-in bias for inserting DC power up the coax to the LNB. Make certain that any equipment or test equipment connected to the transmitter input can withstand this bias.
3. Do not allow any dirt or foreign material to get into the optical connector bulkheads. This may cause damage to the polished optical connector end faces.
4. The optical fiber jumper cable bend radius is 3 cm. Smaller radii can cause excessive optical loss and/or fiber breakage.
5. If multiple transmitters are installed in the chassis allow sufficient room for adequate ventilation; otherwise the units may overheat causing possible safety hazard or equipment damage.
6. Fuses: The 7180M chassis does not have fuses. If the unit fails, pull the power supply out from the chassis and then push it back in.
7. When several units are installed on one 7180M chassis, ensure that the total units' current consumption (including any LNB bias) does not exceed 6A.

1 Introduction to the Gold Interfacility Link

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The Sat-Light™ Gold IFL transmits the frequency band of 10-2200MHz over single mode fiber from a satellite antenna LNB to control room equipment

up to 10 kilometers away while preserving excellent signal quality. The Gold IFL consists of an optical transmitter which receives the L-Band signal from the LNB and an optical receiver which connects to a satellite receiver.

The Gold modules plug into the 7180M, a 3U chassis/power supply, which enables expansion of the system to accommodate up to 8 Sat-Light modules. Accessories include the Model 7001P Power Supply, the Model 2040 1:1 Redundant Switch, the Model 2100 Amplifier, the 2300 Relay Adaptor, and the Model 7050 Serial Data Multiplexer, an asynchronous data link.

The Gold IFL is a broadband transmission link; all standard satellite modulation formats can be transmitted transparently (i.e. QPSK, FM, etc.). The RF signal is directly modulated and adds virtually no phase noise to the original signal. The direct modulation, coupled with the Gold Links RF circuitry, guarantees superior signal quality. The Gold IFL is capable of more than 35 dB carrier to noise performance in a full band or single carrier environment¹.

The Gold IFL features both Automatic Gain Control (AGC) and Manual Gain Control (MGC). AGC at transmitter site sets and maintains optimum operation over a wide range of input signal levels. At the receiver site MGC allows adjustment of the RF level regardless of optical power or distance from the transmission site. Front panel RF tests ports, RSSI signals, LEDs, and back panel monitors and alarms allow for Complete system status monitoring and for interfacing with monitor and control (M&C) systems. Featuring a DFB laser diode, the Gold IFL operates over a wide temperature range, without needing to be cooled. The L-Band Gold transmitter units are equipped with a switchable 13/18/22KHz LNB powering.

1.1 Options

The Gold IFL comes with a variety of options:

1. External LNB powering; allows injecting LNB powering form external source.
2. 50 Ω SMA or 75 Ω /F type, female connectors.
3. G5000 unit; the Gold links can be installed in a G5000 Outdoor enclosure
4. Standalone unit; the Gold IFL can be installed as a standalone unit. If the Gold is used as a standalone, a separate power supply must be used.

1.2 Product Drawings

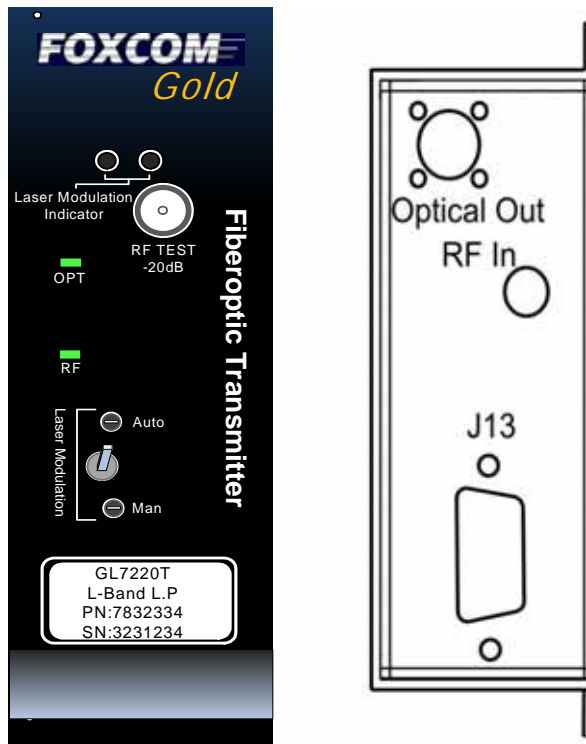


Figure 1 Gold Transmitter Front and Rear Panels

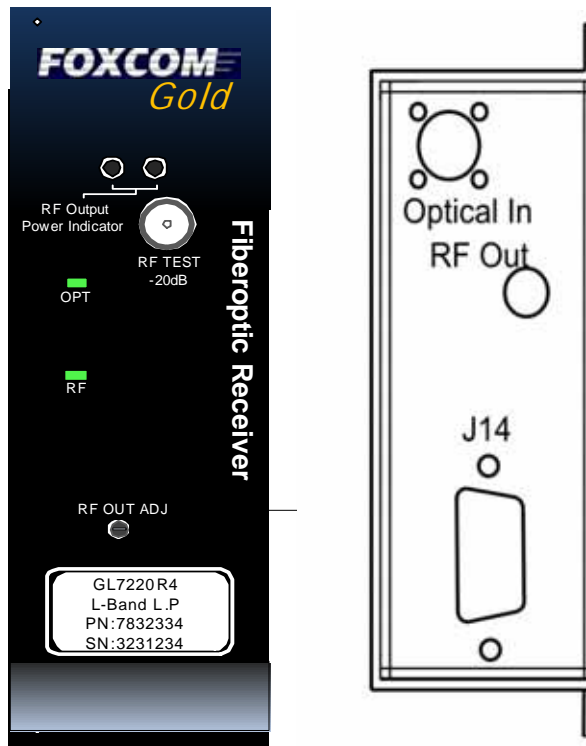


Figure 2 Gold Receiver Front and Rear Panels

1.3 Panel Descriptions

On the Front Panel of the Gold Transmitter and Receiver units are two LEDs.

LED Name	LED Function
Laser	Indicates if the laser is functioning
RF	Indicates if the RF input is within the operating limits [see website for operating limits]

Table 1 Gold Transmitter LEDs

LED Name	LED Function
Opt.	Indicates if the optical input power is above the minimal level
RF	Indicates if the RF output power is within the operating limits [see website for operating limits]

Table 2 Gold Receiver LEDs

1.4 Block Diagrams

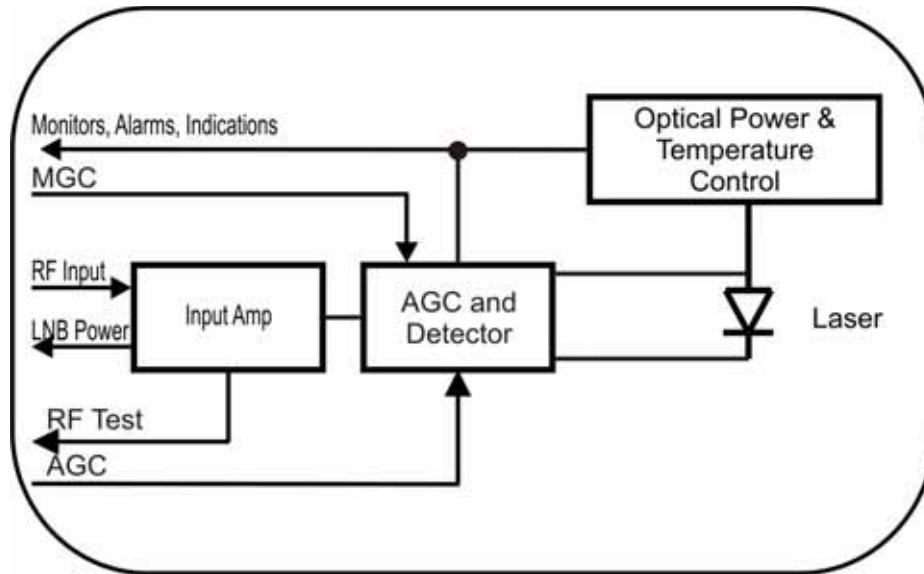


Figure 3 Gold Transmitter Block Diagram

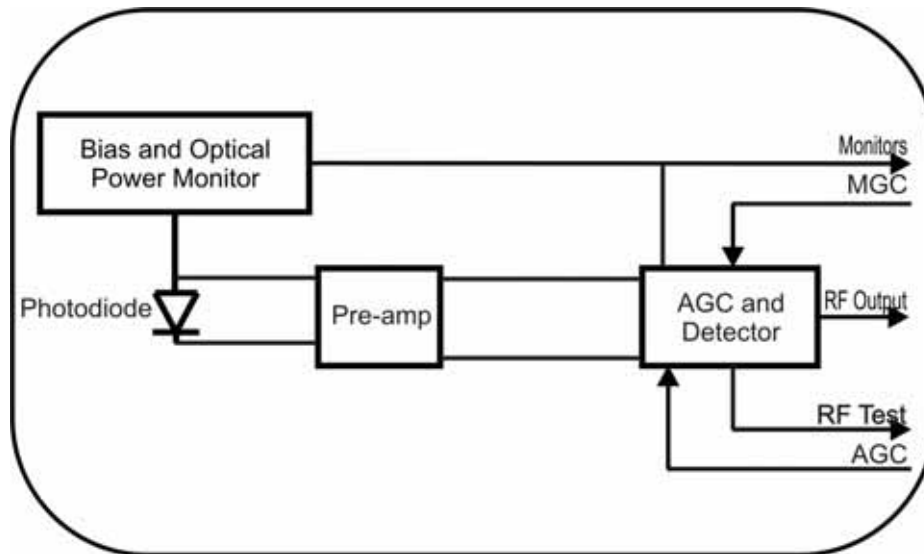


Figure 4 Gold Receiver Block Diagram

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To set up the *Gold Interfacility Link* Transmitter/Receiver units ⁴:

1. Set up the transmitter
2. Connect the fiber optic cable
3. Set up the receiver
4. Power the IFL
5. Connect the back panel jumpers
6. Monitor the input/output signal
7. Align the fiber optic link

Observe all warnings and cautions mentioned at the beginning of this manual. (See **Important Information** on page iii). If you have a problem after setting up, see **Chapter 5: Troubleshooting**, on page 29.

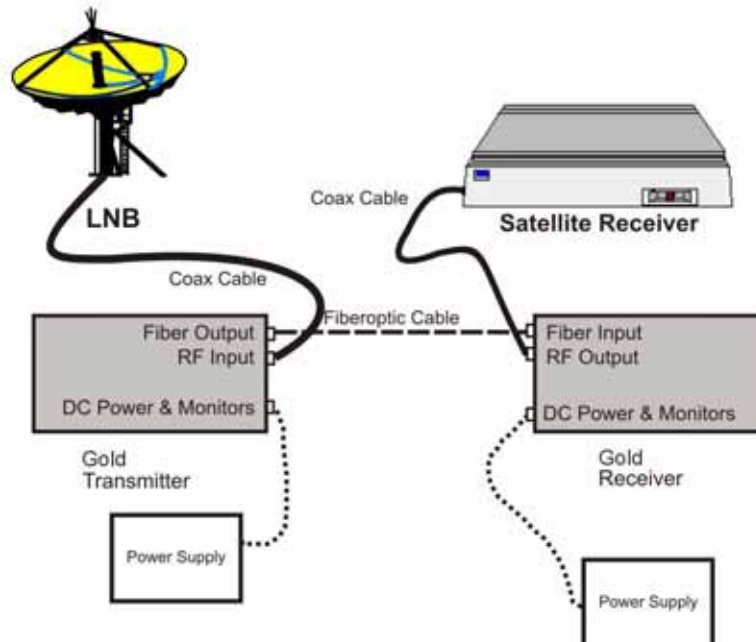


Figure 6 Typical application of a *Gold Interfacility Link* unit

4. This section gives instructions on installing the transmitter and receiver in a chassis rackmount. See **Appendix 2 Installing a Standalone Unit** on page 35 for instructions on installing standalone units.

2.1 Setting up the Transmitter

1. Place the Gold Transmitter in the 7180M Chassis.
2. Apply AC power to the chassis. The Laser LED should be lit.
3. If available Use an optical power meter to measure the optical power. Insert the meter's cable into the transmitter's optical connector. Power levels should be between 2 to 4dBm.
4. On the rear panel, connect the coax cable to the RF Input Connector.
5. On the rear panel, connect the fiber optic cable to the optical connector.
6. On the Transmitter front panel, switch the Gain Control Toggle switch to the appropriate operating mode. See Figure 2 Gold Transmitter Front and Rear Panels on page 3
7. Adjust the Gain Control Potentiometer to give a 4Volt DC reading on the transmitter front panel Modulation Level indicator.

Note If neither LEDs are lit, see **Chapter 5: Troubleshooting**, on page 29.

Caution *When monitoring the voltage outputs only use a high resistance DVM.*

2.1.1 Transmitter RF Interference

Strong "out-of-band" signals, (i.e. microwave communications, cellular phone sites or other interferences etc.) present and detected by the Gold transmitter input AGC may cause internal level changes. These level changes may cause the link signal to noise and total power to change in real time. Verify any interfering signals by switching the Gain Control to MGC mode and checking the transmitter RF test point with a spectrum analyzer.

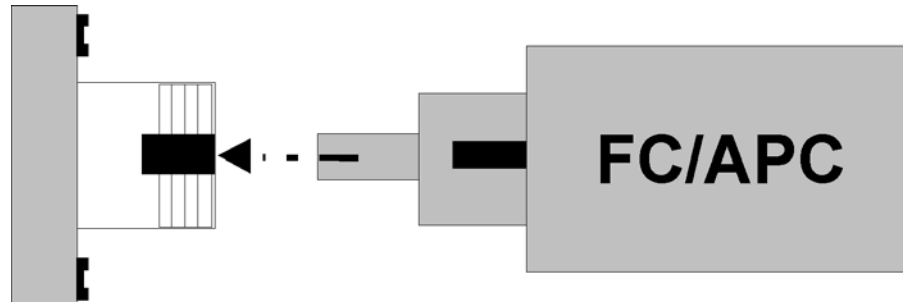
2.1.2 Connecting the Fiber Optic Cable

BEFORE CONNECTING THE CABLE:

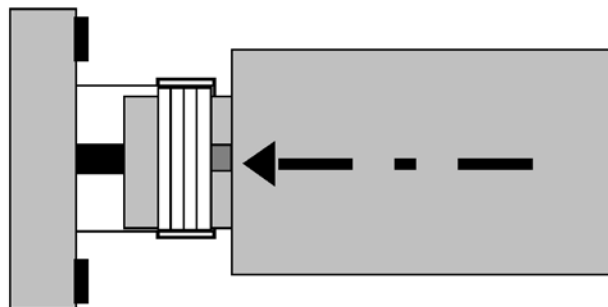
- The fiber cable must be either fusion spliced or connected via FC/APC connectors.
- Wipe the connector with a lint-free cotton cloth.
- Note the polarity key of the optical connector before inserting

TO CONNECT THE FIBER OPTIC CABLE

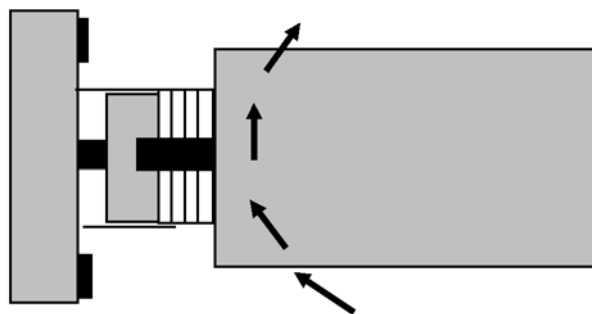
1. Line up the polarity key.



2. Insert the connector.



3. Tighten the connector.



Caution *Do not apply any glue, silicon adhesive, or any other material to the fiber optic connector.*

2.2 Setting up the Receiver

1. Place the Gold Receiver in any of the 7180M Chassis, unless a 2040 RF Switch is installed (see Figure 7 7810M Chassis Rear View on page 12).

Note Slots 2 and/or 5 of the 7180M are reserved for the 2040 RF switch(es).

2. Apply AC power to the chassis.
3. On the rear panel connect the fiber optic cable to the Optical Connector.
4. Use an optical power meter to measure the optical power coming to the Receiver from the fiber optic cable. The power levels of the Receiver should be the power level measured at the Transmitter minus the fiber loss.
5. On the rear panel, connect the coax cable to the RF Output Connector.
6. Adjust the Gain Control Potentiometer to give the desired RF output power. Using a small screwier driver, turn the potentiometer (located on the front panel) to increase or decrease the gain.

Note The potentiometer is 10 turn potentiometer.

To **increase** the gain, turn the Gain Control clockwise.

To **decrease** the gain, turn the Gain Control counterclockwise.

For more information see section **2.6 Aligning the Fiber Optic Link** on page 15.

Note If neither LEDs are lit, see **5 Troubleshooting** on page 29.

2.3 Powering the IFL

- Transmitter power requirement: 14 or 18 VDC⁵ @ 300 mA (excluding LNB Drive option).
- Receiver power requirement: 14 or 18 VDC⁵ @ 280 mA.
- The Standalone Transmitter/Receiver is powered by a Foxcom supplied external DC power supply.
- The Rackmount Transmitters/Receivers are plugged into the 7810M rackmount chassis. The chassis can accept and power up to eight units.

Note At temperatures below 10°C, the Transmitter's internal heater will require an additional 100 mA. The Transmitter's total power requirement will then be 400 mA.

Caution *Ensure that there is a good airflow around the chassis rackmount.*

-
5. At least one power supply, either a 14 VDC or an 18 VDC, depending on customer specifications, must be installed in the 7180M chassis. Up to two rackmounted power supplies may be installed on the chassis. The two power supplies must have the **same** voltage, either two 14VDC or two 18 VDC.

External Power Supply: An external power supply may be used. The external power supply is connected via connector J11. If an external power supply is used this must be specified when ordering the 7000IFL and the chassis. The voltage level provided by the external power supply is customer-defined any may be different from the internal voltage power supply.

2.4 7180M Chassis

The 7180M chassis provides power to the plug in units. The power supply is a switching type. Each plug-in regulates its own voltage. The power supply provides:

- 14 or 18 VDC stable
- AC input; 100 - 240 VAC
- Units can be plugged in “hot standby”.

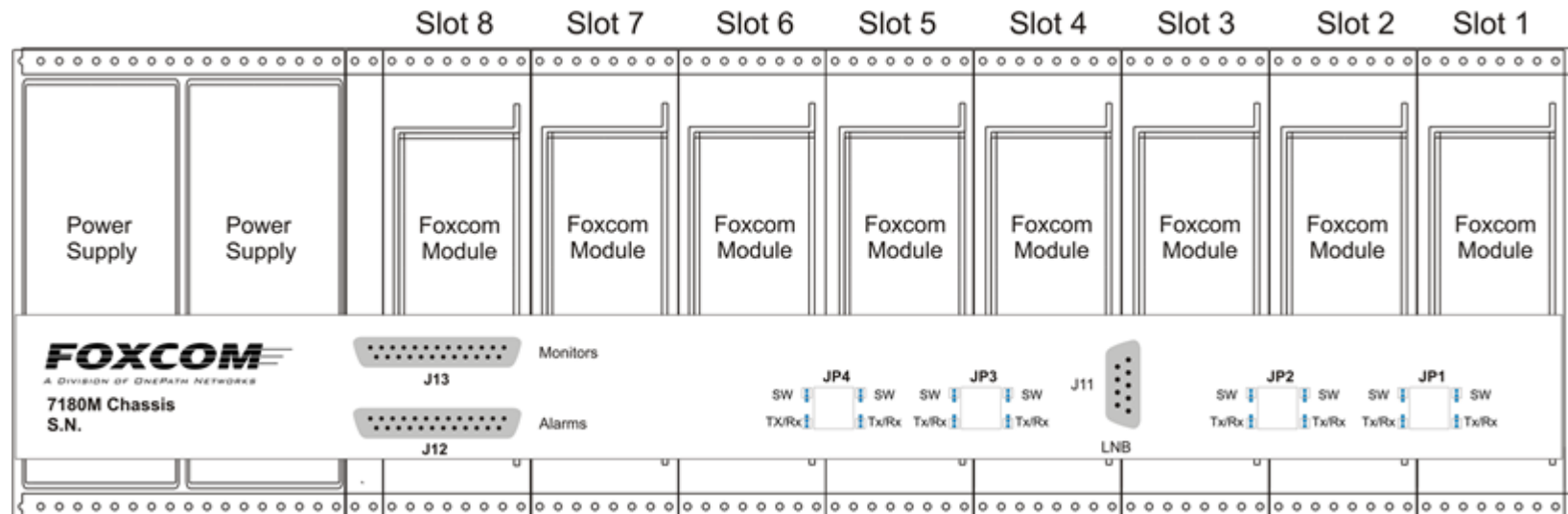


Figure 7 7180M Chassis Rear View

2.4.1 Connecting the Backplane Jumpers

On the rear panel of the 7180M backplane are product selectors (JP1 to JP4). The 3-pin selectors (male) are the connecting point between the slots and the backplane. One pin is for the transmitter/receiver (Tx/Rx), one is for the optional 2040 1:1 Redundant Switch, and one is for the 7180M chassis. A 2-pin jumper (female) is placed on the relevant pins to complete the connection between the 7180M and the units. For example, if a 2040 RF Switch is used, the jumper is placed on the Switch-7180M pins.

To connect the jumpers:

1. Each jumper has two sets of pins, upper and lower. The upper pins are labeled SW (Switch) and the lower pins Tx/Rx (Transmitter/Receiver).
2. If the 7180M has transmitter or receiver units only, place all jumpers on the lower two pins.

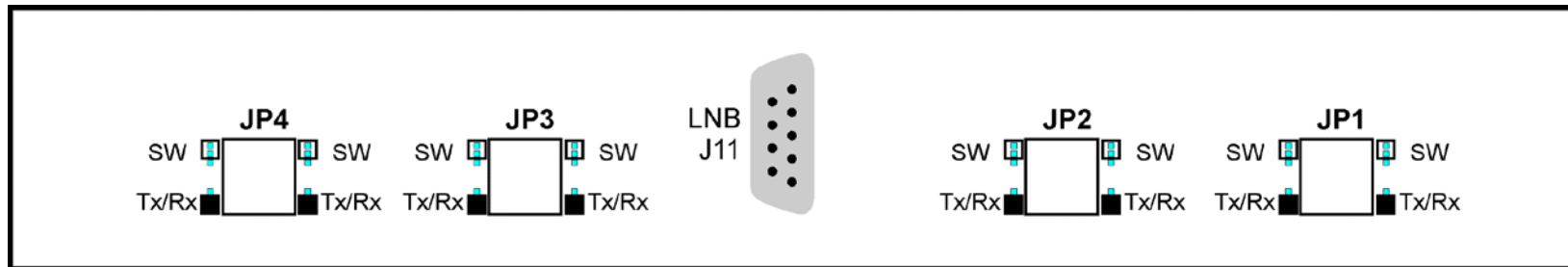


Figure 8 Jumper Installation Transmit and Receive Units only

3. If the 2040 RF Switch is installed in Slot 2, place the JP1 and JP2 jumpers on the higher two pins and the JP3 and JP4 jumpers on the lower two pins.

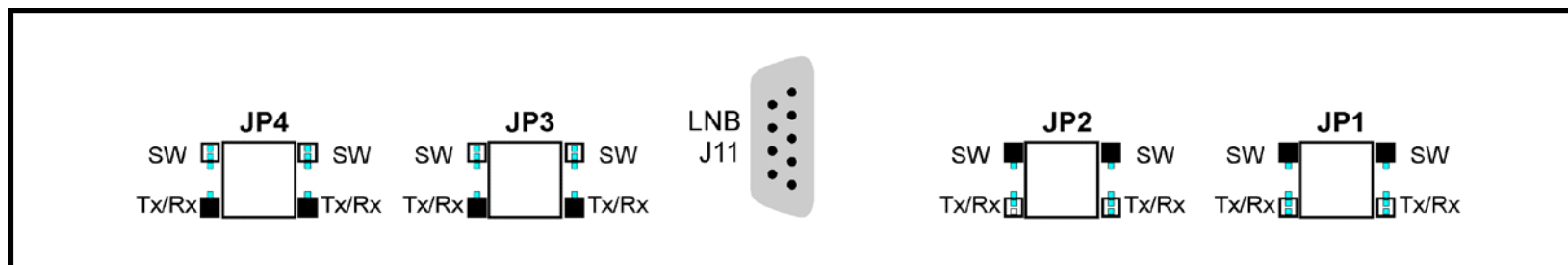


Figure 9 Jumper Installation: 2040 Switch in Slot 2

4. If the 2040 RF Switch is installed in Slot 5, place the JP1 and JP2 jumpers on the lower two pins and the JP3 and JP4 jumpers on the higher two pins.

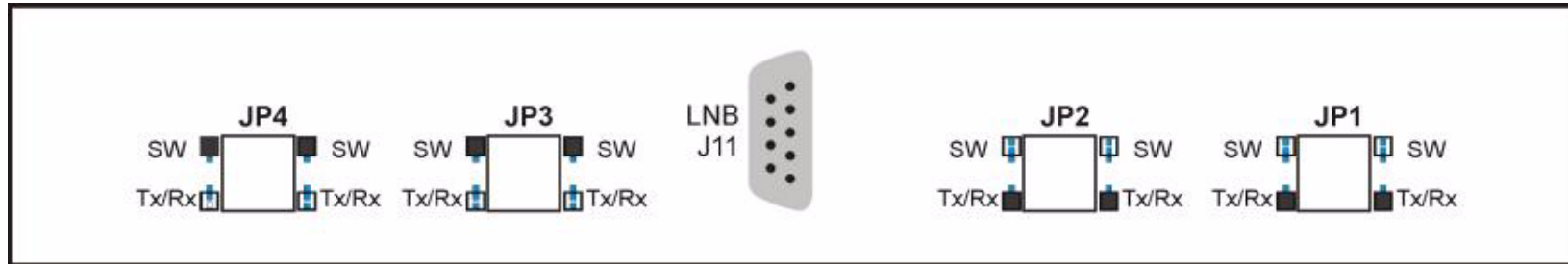


Figure 10 Jumper installation: 2040 switch in slot 5

5. If 2040 RF Switches are installed in Slots 2 and 5, place the JP1, JP2, JP3, and JP4 jumpers on the higher two pins.

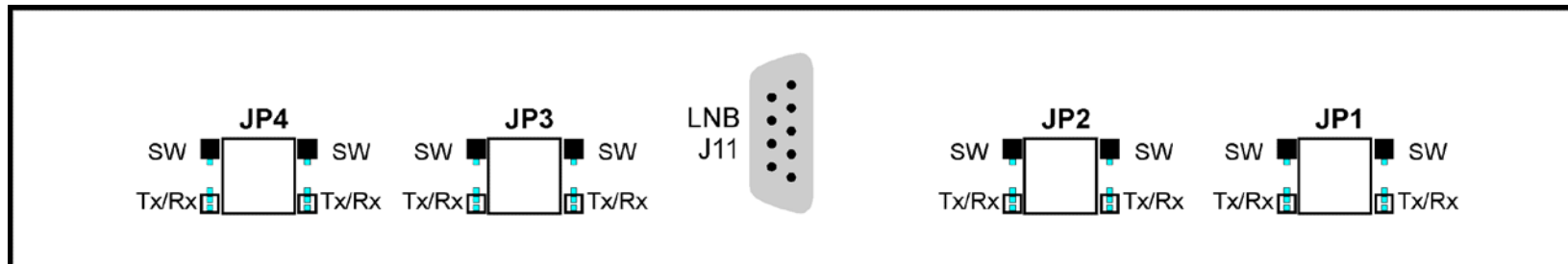


Figure 11 Jumper Installation: Switch 2040 in slots 2 and 5

2.5 Monitoring the Input/Output Signal

On the front panel of the 7000T Transmitter and the 7000R Receiver is a female F-connector. This connector, which is labeled RF test, is used to monitor the Input RF signal sent to the Transmitter laser, and the RF output signal from the Receiver. The attenuation is 20 dB \pm 2.

2.6 Aligning the Fiber Optic Link

The final step in installing the *Gold Interfacility Link* is re-adjusting the Receiver Gain Control for unity gain.

To set the unity gain⁶:

1. Set Signal Generator 1 to -5 dBm at 10 MHz. Alternatively measure the optional input level.
2. Set up the system as shown in **Figure 12 7000 Fiber Optic Alignment Setup**.
3. Adjust the Receiver Gain Control for -5 dBm reading on the power meter.

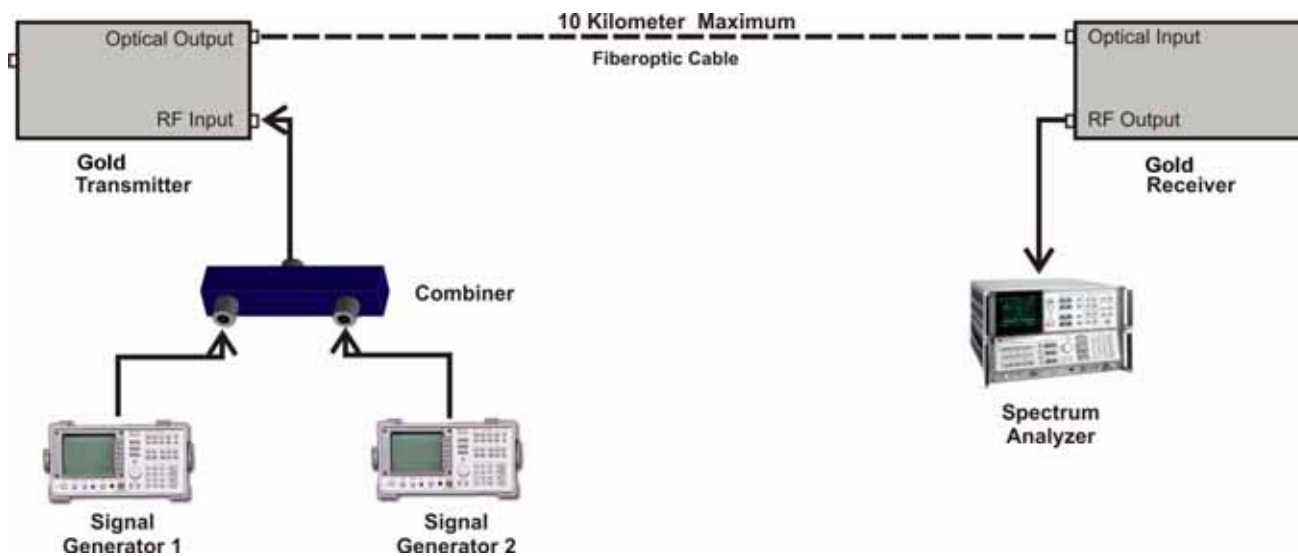


Figure 12 7000 Fiber Optic Alignment Setup

6. If you are unable to perform this procedure, see **Chapter 4: Manual Gain Control**, on page 27.

3 Product Specifications

Chapter 3 covers the following specifications:

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3.1 Gold Interfacility Link Specifications

RF Specifications	
Frequency Range ¹	10–2200MHz
Flatness 10 – 2200 MHz	± 2.25dB [typical]
Flatness @ any 36 MHz	± 0.4dB [max.]
Input/Output Return loss	13dB (F) / 14dB (SMA)
Intermodulation products ²	Adjustable 40 to 55dBc
Input signal range [total power] ³	0 to -25dBm
Output signal range [total power]	+5 to -25dBm
Maximum input without damage	+10dB
CNR @ 36 MHz	55dB
Gain control	Tx: AGC/MGC RxMGC
Link gain	Adjustable ±10 dB [within total power range]
RF connector	F-type female / SMA female
Noise Figure	18dB [typical]
SFDR ⁴	102dB Hz ^{2/3} @ -25 dBm [typical]
Test port coupling (BNC)	20 ± 2dB

Table 3 Gold Interfacility Link Specifications

1. Different Gold Modules with different RF Bandwidth are available ; please refer to our Website for complete model listing and updated datasheets
2. At nominal conditions
3. Roughly equivalent to 10 channels of FM @ -50 to -30 dBm /channel
4. @ maximum input power

Optical Specifications	
Optical Wavelength	1310/1550/CWDM
Optical power output	3dBm/2mW
Optical connector	FC/APC
Optical budget/budget distance	4dB / 10km
Optical return loss	-50dB
Optical connector loss	0.5dB/mated pair
Physical Specifications	
Chassis capacity	8 plug-ins, and 2 power supplies
Chassis size	19" x 5.25" x 7"
Standalone size	5" x 4.8" x 1.6"
Power for chassis	100 or 240 VAC 50/60 Hz 90 Watts [max.]
Power for standalone	
Transmitter	+12 VDC @ 300 mA max.(400 mA < 10° C)
Receiver	+12 VDC @ 280 mA max.
Operating Temperature Range	-10°C to +55°C
Storage Temperature Range	-40°C to +85°C

All specifications are subject to change without prior notice

Gold Interfacility Link Specifications [cont.]

3.2 Model Dimensions

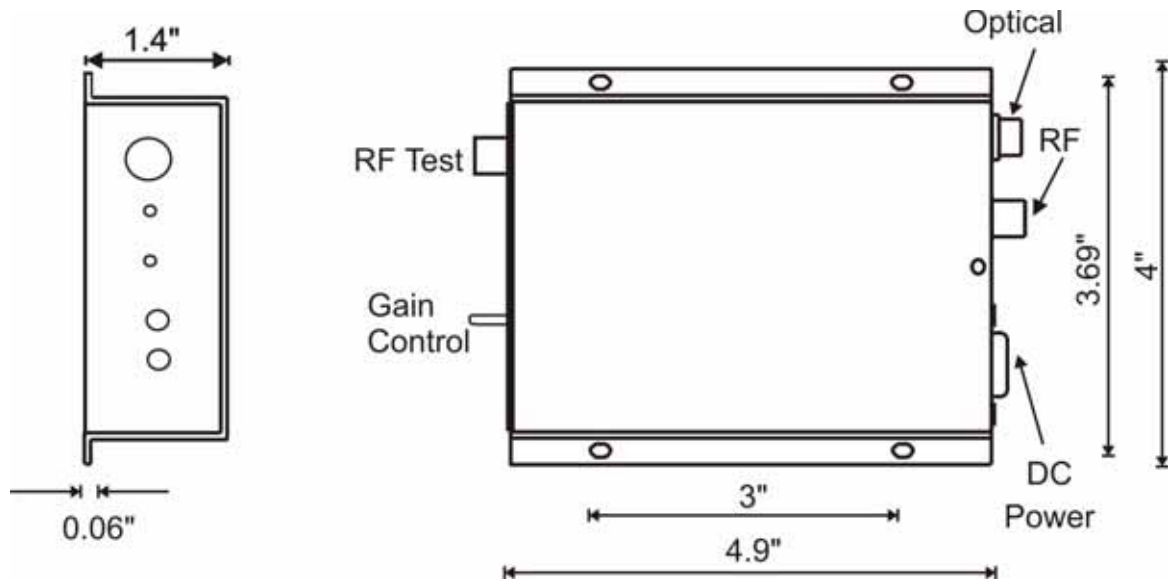


Figure 13 Unit dimensions

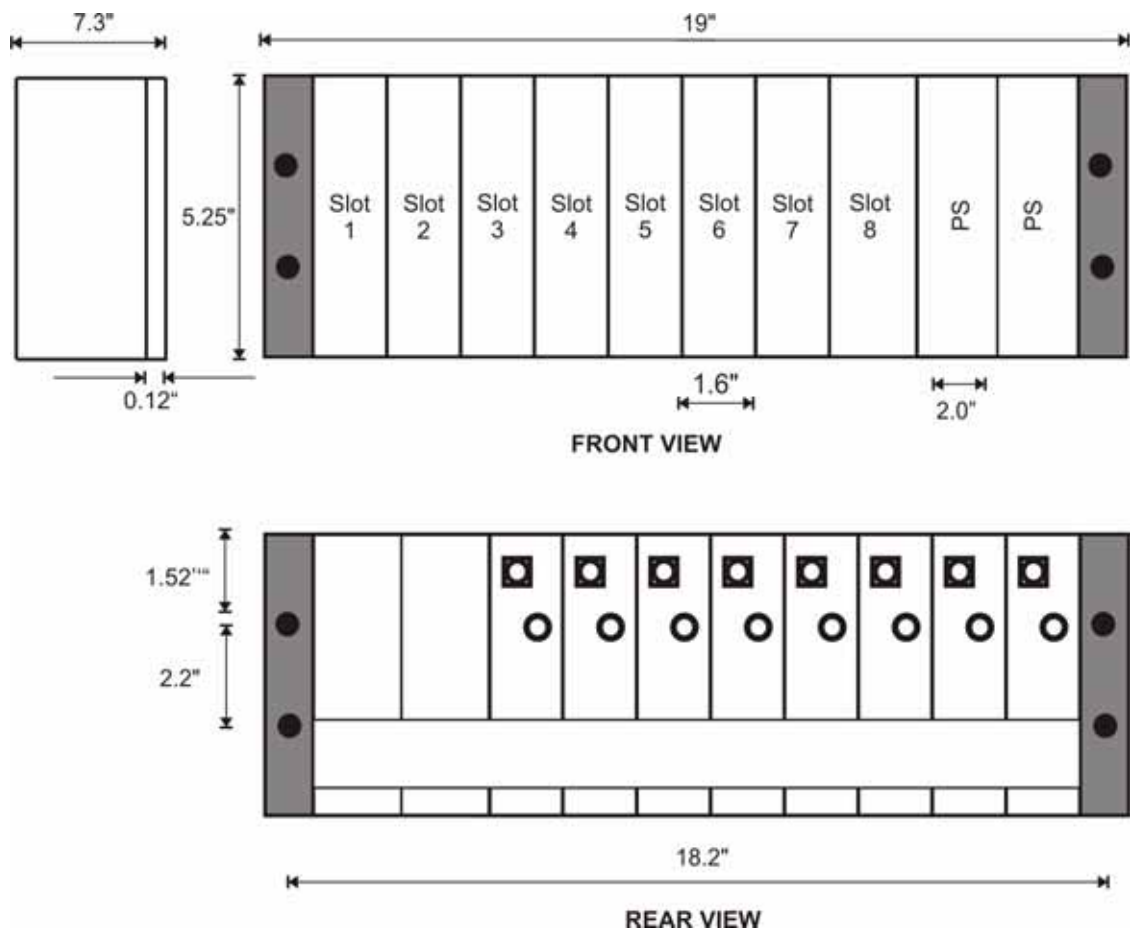


Figure 14 7810M Chassis dimensions

3.3 Gold Interfacility Link Pinouts

Table 4 Gold Transmitter Pinout

Standalone 9-Pin Connector	7180M Chassis Backplane Connector	2380 Relay Adapter Connector	Name	Description
1	—	—	+12V Power	300 mA [exc. LNB option] ¹
2	—	—	—	Not Used
3	J11-P9 J12-P25 J13-P25	J-P25 J4-P25	GND	Chassis Ground
4	J13-P1 to J13-P8	J4-P1 to J4-P8	RF-LD	RF Laser Modulation Indicator ; Range 3 to 5V ²
5	J13-P9 to J13-P16	J4-P9 to J4-P16	RF-IP	RF Input Power Indicator range 3 to 4V
6	J13-P17 to J13-P24	J4-P17 to J4-P24	—	Not Used
7	J12-P1 to J12-P8	J2: P1-P2 P3-P4, P5-P6 P7-P8, P9-P10 P11-P12, P13-P14 P15-P16	RF-A	RF Alarm : Open Drain interface. ³ Sinks current when RF level is low, up to 100 mA.
8	J12-P9 to J12-P16	See note below	OP-A	Optical Alarm : Open Drain Interface ³ . Sinks current at low optical, up to 100 mA.
9	J11-P1 to J11-P6		LNB bias [optional] ⁴	External LNB Bias

1. 400 mA below 10°C

2. Recommended AGC set point is 4V ±0.5

3. If the 2380 Relay Adapter is installed, the alarms are dry contact. See **Appendix 3 The 2380 Relay Adapter** on page 37.

4. Dependent on order

Note If a 2380 Relay Adapter is installed RF and Optical Levels are measured together; the alarm indicates a problem in either the RF or Optical Levels.

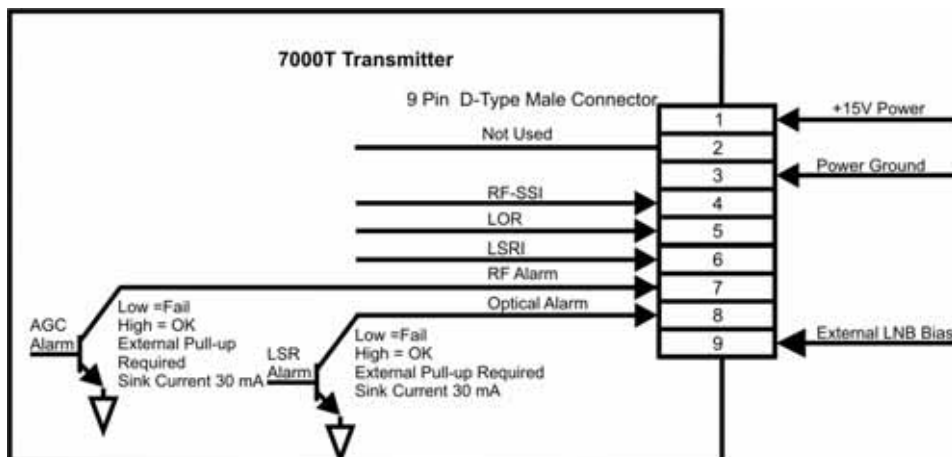


Figure 15 Gold Transmitter pinout

Table 5 Gold Receiver Pinout

Standalone 9 Pin Connector	7180M Chassis Backplane Connector	2380 Relay Adapter Connector	Name	Description
1	—	—	+12V Power	DC 280 mA
2	—	—	—	Not Used
3	J11-P9 J12-P25 J13-P25	J2-J25 J4-P25	GND	Chassis Ground
4	J13-P1 to J13-P8	J4-P1 to J4-P8	RF-OP	RF Output Signal Indicator Range 3 to 4V
5	J13-P9 to J13-P16	J4-P9 to J4-P16	OP-IP	Optical In Power indicator Range 3 to 4V
6	—	—	—	Not Used
7	J12-P1 to J12-P8	J2: P1-P2 P3-P4, P5-P6 P7-P8, P9-P10 P11-P12 P13-P14 P15-P16	RF-A	RF Alarm: Open Drain interface ¹ . Sinks current when RF level is low, up to 100 mA.
8	J12-P9 to J12-P16	See note below	OP-A	Optical Alarm: Open Drain interface ¹ . Sinks current when optical level is low, up to 100 mA.
9	—	—	Spare	Not Used

1. If the 2380 Relay Adapter is installed, the alarms are dry contact. See **Appendix 3 The 2380 Relay Adapter** on page 37.

Note If a 2380 Relay Adapter is installed RF and Optical Levels are measured together; the alarm indicates a problem in either the RF or Optical Levels.

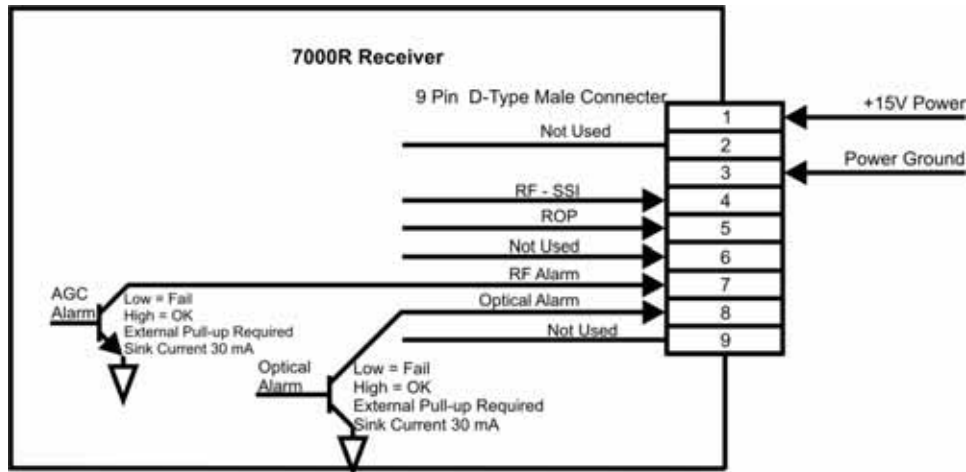


Figure 16 Gold Receiver pinout

Caution *When monitoring the voltage outputs use only a high resistance DVM.*

3.4 7180M Chassis Pinouts

The unit's pins are found at the backplane of the 7180M chassis. The 7180M chassis backplane incorporates eight slots. Pinouts from the 9-pin connector at each slot are sent through the backplane assembly to the two 25-pin D-connectors, J12 and J13, and one 9-pin connector, J11. Any monitor voltages to be measured may be done between the chassis ground and the required pin. For more information about pinouts, see **Appendix 4 Pinout Charts and Diagrams** on page 43.

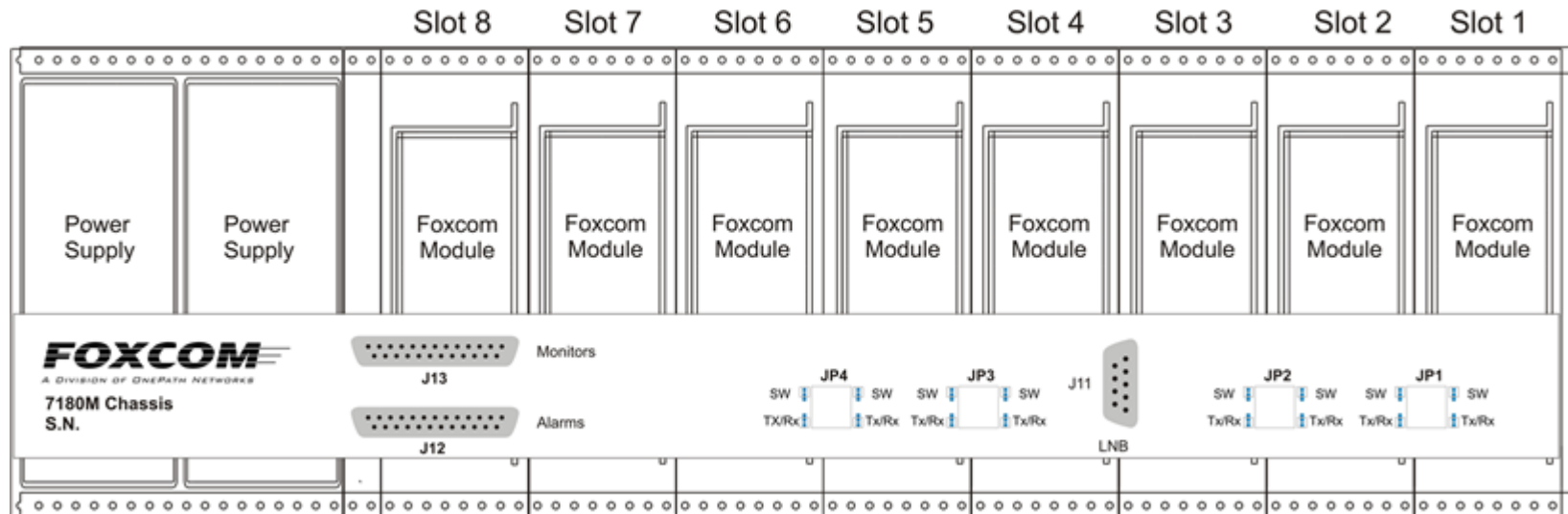


Figure 17 7180M Chassis rear view

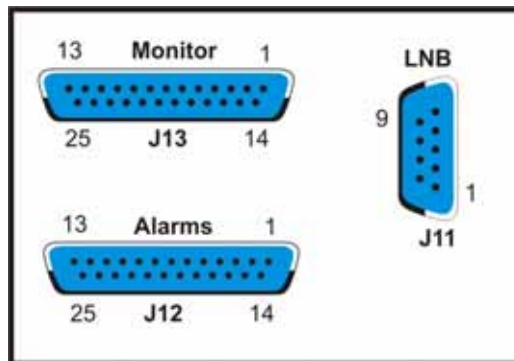


Figure 18 7180M Chassis Pin numbers

3.4.1 7180M Alarm Connector Pinouts [J12]

Pin No.	Function	Name	Slot No.
1	RF Alarm	RfAlm1	1
2	RF Alarm	RfAlm2	2
3	RF Alarm	RfAlm3	3
4	RF Alarm	RfAlm4	4
5	RF Alarm	RfAlm5	5
6	RF Alarm	RfAlm6	6
7	RF Alarm	RfAlm7	7
8	RF Alarm	RfAlm8	8
9	Optical Alarm	OptAlm1	1
10	Optical Alarm	OptAlm2	2
11	Optical Alarm	OptAlm3	3
12	Optical Alarm	OptAlm4	4
13	Optical Alarm	OptAlm5	5
14	Optical Alarm	OptAlm6	6
15	Optical Alarm	OptAlm7	7
16	Optical Alarm	OptAlm8	8
17			
18			
19			
20			
21	Standby Power Supply	SPSNOP	
22	Standby Power Supply	SPSCOM	
23	Main Power Supply	MPSNOP	
24	Main Power Supply	MPSCOM	
25	Chassis Ground	GND	

Table 6 7180M Alarm Connector [J12] Pinouts

3.4.2 7180M Monitor Connector Pinout [J13]

Pin No.	Function Transmitter/ Receiver	Name	Slot No.
1	RF-Laser Mod/RF-Output Mon	RFLD/RFOP	1
2	RF-Laser Mod/RF-Output Mon	RFLD/RFOP	2
3	RF-Laser Mod/RF-Output Mon	RFLD/RFOP	3
4	RF-Laser Mod/RF-Output Mon	RFLD/RFOP	4
5	RF-Laser Mod/RF-Output Mon	RFLD/RFOP	5
6	RF-Laser Mod/RF-Output Mon	RFLD/RFOP	6
7	RF-Laser Mod/RF-Output Mon	RFLD/RFOP	7
8	RF-Laser Mod/RF-Output Mon	RFLD/RFOP	8
9	RF-Input/Opt-Input Mon	RFIP/RFOP	1
10	RF-Input/Opt-Input Mon	RFIP/RFOP	2
11	RF-Input/Opt-Input Mon	RFIP/RFOP	3
12	RF-Input/Opt-Input Mon	RFIP/RFOP	4
13	RF-Input/Opt-Input Mon	RFIP/RFOP	5
14	RF-Input/Opt-Input Mon	RFIP/RFOP	6
15	RF-Input/Opt-Input Mon	RFIP/RFOP	7
16	RF-Input/Opt-Input Mon	RFIP/RFOP	8
17	Not Used		
18	Not Used		
19	Not Used		
20	Not Used		
21	Not Used		
22	Not Used		
23	Not Used		
24	Not Used		
25	Chassis Ground	GND	

Table 7 7180M Monitor Connector [J13] Pinout

3.4.3 LNB Connector Pinout [J11]

Pin No.	Function	Name	Slot No.
1	LNB Powering	LNB	1
2	LNB Powering	LNB	2
3	LNB Powering	LNB	3
4	LNB Powering	LNB	4
5	LNB Powering	LNB	5
6	LNB Powering	LNB	6
7	LNB Powering	LNB	7
8	LNB Powering	LNB	8
9	Chassis GRound	GND	1

Table 8 LNB Connector Pinout

3.4.4 7180M and Redundancy Switching

The 2040 Switch provides optional 1:1 redundancy switching for all Foxcom Interfacility Links. If the customer chooses to add redundancy switching to the link, the pin connector jumpers need to be moved. Detailed instructions on moving the jumpers are provided in the *Model 2040 1:1 Redundant Switch Installation and User's Guide (Document Number 93-005-26-A1)*.

4 Manual Gain Control

All internal adjustments have been set up at the factory; the only user adjustments are input and output RF signal levels accessible from the front panel and described in the following sections.

To adjust the Transmitter Gain:

1. Set the input power to the expected power level.
2. Set the gain at the nominal level.

To adjust the Receiver Gain:

1. Set the input power to the expected power level.
2. Set the gain to the nominal level.

Note The potentiometer is a 10 turn potentiometer.

5 Troubleshooting

The *7000 Interfacility Link* unit was tested before it left the factory. However if you are experiencing difficulties see the list below for possible solutions. If you are still experiencing problems, attempt to isolate and identify the malfunctioning unit before consulting Foxcom's technical support.

5.1 Troubleshooting the Transmitter

Problem	Possible Cause
1. Laser LED not on	<ol style="list-style-type: none"> No DC power to the unit. Possible power supply problem or AC power input problem. Check the power supply fuse. Verify LSRI monitor is between 0.4 and 1.0 mW. If not, laser may have overheated. Disconnect power or remove plug and allow to cool. Try again with better airflow. If an optical power meter is available, measure the optical power out of the transmitter. The power should be between 0.4 and 1.0 mW. If an optical power meter is not available, use another receiver to determine if there is optical power emerging from the transmitter (use a 5 meter jumper cable). If there is no optical power, then the transmitter unit is malfunctioning. <p>If any or all the above are not within the guidelines, the transmitter unit is faulty.</p>
2. Transmitter AGC LED is illuminated in MGC mode	No problem. The AGC LED has no meaning in MGC mode. (Turn the AGC potentiometer all the way to either side and the LED should go out.
3. In AGC mode the LED is not illuminated	<ol style="list-style-type: none"> The input signal is out of range (either too high or too low.); verify signal out of the RF Test Point or the RF signal Pin #4. even if slightly out of range, the unit may still function, although you will register an alarm condition. AGC circuit is not working. Use MGC and/or contact factory.
4. AGC LED illuminated with no input signal	Unit may be receiving stray RF "pick up". Solution: Provide RF input or use 75 Ω termination at input.

Table 9 Troubleshooting the Transmitter

5.2 Troubleshooting the Receiver

Problem	Possible Cause
<p>1. Lack of RF signal present at Receiver, yet optical power is functioning.</p>	<p>a. If the unit has an LNB drive option, verify correct LNB bias is coming down the center of the RF connector at the transmit site.</p> <p>b. Verify dish is pointed and correctly receiving satellite signals.</p> <p>c. Set gain switch to manual, and check for signal present at RF Test point at Transmitter (assuming spectrum analyzer is available). If a spectrum analyzer or power meter is not available then use a DVM. Adjust the Gain Control for RF Signal Strength (RSSI) reading of 3 to 7V (See Table 5 7000R Receiver Pinout on page 21).</p> <p>Conclusion: If signal still not present then transmitter input stage amplifier is defective. Contact factory.</p>
<p>2. No optical power, LED not illuminated</p>	<p>a. No optical power, LED not illuminated. Transmitter is not functioning, see above.</p> <p>b. There is a break or severe bend in the fiber optic cable. Use an optical power meter or another functioning receiver unit to verify optical power coming down the fiber.</p> <p>c. Optical power too low, too many splits, too long a distance (thus exceeding optical budget). System <i>may still function</i> without LED illuminated although at reduced performance.</p>
<p>3. Optical power light illuminated with disconnected optical input.</p>	<p>Leaky photodiode or DC Amplifier offset. Unit may still function, otherwise contact factory.</p>
<p>4. Receiver AGC LED is illuminated while in MGC mode.</p>	<p>No problem; the AGC Led has no meaning in MGC mode. Turn the AGC potentiometer all the way to either side and the LED should extinguish.</p>
<p>5. In AGC mode the LED is not illuminated.</p>	<p>a. The input signal is out of range (either too high or too low); check RF Test Point to verify signal output.</p> <p>b. AGC circuit is not working, use MGC and/or contact factory.</p>
<p>6. In AGC mode the LED flickers.</p>	<p>a. Almost out of range of the AGC.</p> <p>b. Stray RF signals leaking back into the optical receiver unit from the satellite receiver or other attached equipment; use MGC or 'pad' the optical receiver output.</p>

Table 10 Troubleshooting the Transmitter

Appendix 1 Cleaning Fiber Optic Connections

Appendix 1.1 Cleaning Procedures for FC/APC Connectors	32
Appendix 1.2 Cleaning Procedure for FC/APC Bulkhead Ports.....	33
Appendix 1.2.1 Swab Method	33
Appendix 1.2.2 Compressed Air Method	33

The unit has an FC/APC angle polished optical connector for very high optical return loss performance. The units are specified into single mode fiber i.e. 9/125 micron core diameter. Full performance is specified only for low return loss optical plant - meaning that the fiber must be fusion spliced and all connections or splices must have a return loss greater than -60 dB. With these guidelines in mind, link lengths beyond 20 kilometers (DFB based products) can be achieved with high performance. Specific performance and/or design assistance is available by request from Foxcom.

If there is low/no signal or noisy signal at a Foxcom module, the connector should be cleaned. Dirt on the inside connector tip can impair the flow of light causing problems in signal transmission. Foxcom modules are sealed but dirt can occasionally enter during installation and alignment.

The input and output optical ports of all Foxcom equipment are known in the fiber optic world as bulkhead ports. Foxcom uses FC/APC connectors.

The following materials are representative of the types of cleaning materials that should be used for cleaning the fiber optic ports and connectors. They are available from several suppliers.

Description	Manufacturer
Kim wipes	Kimberly Clark
Cletop Automatic Connector Cleaner	Cletop
fiber optic Swab	Cletop or FIS
fiber optic Compressed Air	Chemtronics

Table 11 Cleaning materials

Wiping clothes should be made of lint free alcohol free nonabrasive materials. Swabs should have a tightly wrapped tip and be talcum-free. For removing dust from receptacles, a canned compressed gas is recommended. Do not use commercial compressed air because of risk of contamination.

Appendix 1.1 Cleaning Procedures for FC/APC Connectors

Use a Kim Wipe to gently wipe the end face surface of the connector. Alternatively a Cletop automatic connector cleaner can be used.



Figure 19 Wiping the connector with a Kim wiper

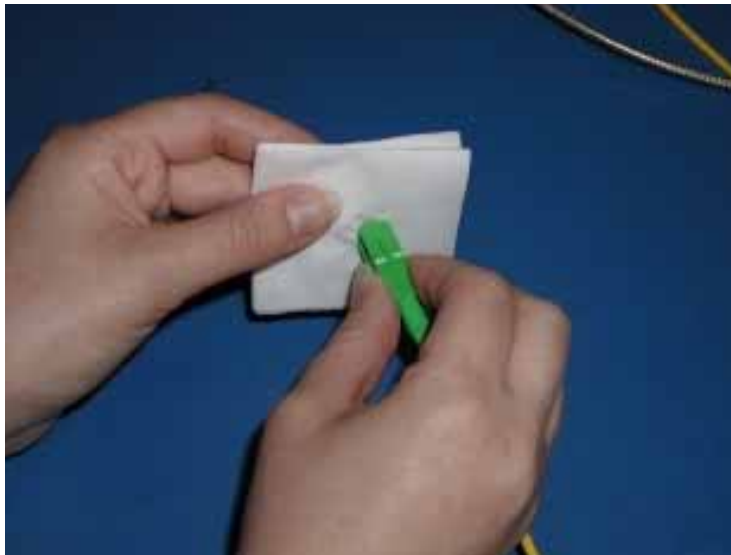


Figure 20 Wiping the connector with a Kim wiper [2]

Appendix 1.2 Cleaning Procedure for FC/APC Bulkhead Ports

Caution *Clean the transmitter and receiver optical ports only when there is evidence of contamination or reduced performance.*

Appendix 1.2.1 Swab Method

Using a clean fiber optic cleaning swab, gently wipe out the optical port. Discard the swab after use.



Figure 21 Cleaning the Optical Port

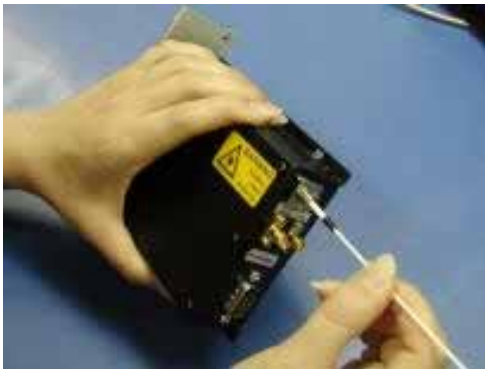


Figure 22 Cleaning the Optical Port [2]

Appendix 1.2.2 Compressed Air Method

Using the extension tube of the compressed air, blow into the port to remove any dust or debris. Do not allow the tube to touch the bottom of the port. Do not use commercial compressed air due to potential oil contamination.

Note To prevent contamination, the optical ports should be connected or covered with a dust cap at all times.

Use dry air or nitrogen only.

Appendix 2 Installing a Standalone Unit

To install the 7000T-STD or 7000R-STD Standalone:

1. Place the Gold unit on the standalone flange, matching the holes.
2. Using four screws (#4 or #6) secure the unit and the flange to the wall.
3. Apply AC power to the standalone power supply unit.
4. Connect the Gold unit to the power supply. The Laser LED should be lit.

All remaining steps are the same as in the product manual. See sections **2.1 Setting up the Transmitter** on page 8 and **2.2 Setting up the Receiver** on page 10.

Appendix 3 The 2380 Relay Adapter

The following section describes how to install the 2380 Relay adapter onto the 7180M Chassis. The 2380 Relay adapter assembly provides dry contact output signals as an option to the standard open collector signals available on the 7180M chassis backplane.

If the 2380 Relay adapter is ordered separately from the 7180M chassis, it must be mounted by the user. The 2380 is mounted directly over the connectors on the 7180M backplane, as shown below.

Appendix 3.1 Installing the 2380 Relay Adapter

Appendix 3.1.1 Parts Required for Installing the 2380

- 2380 Relay Adapter
- Two pin guides
- Four one-inch screws
- Screw driver

Appendix 3.1.2 Mounting the the 2380 Relay Adapter

1. **Very Important:** Disconnect the electricity **before** performing this procedure.
2. Make sure that you have all the needed equipment.
3. Install the pin guides.

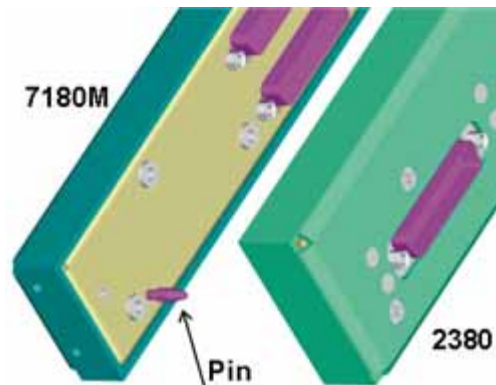


Figure 23 Installing the guide pins

4. Mount the unit onto the pin guides.

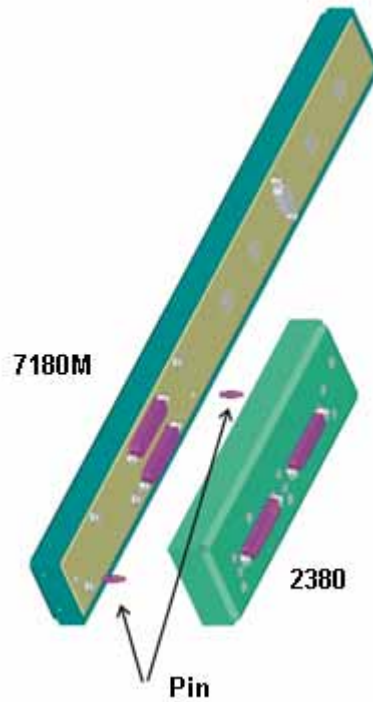


Figure 24 Mounting the adapter

5. Mount the four screws. The screws must be installed in the order shown in Figures 25 and 26.

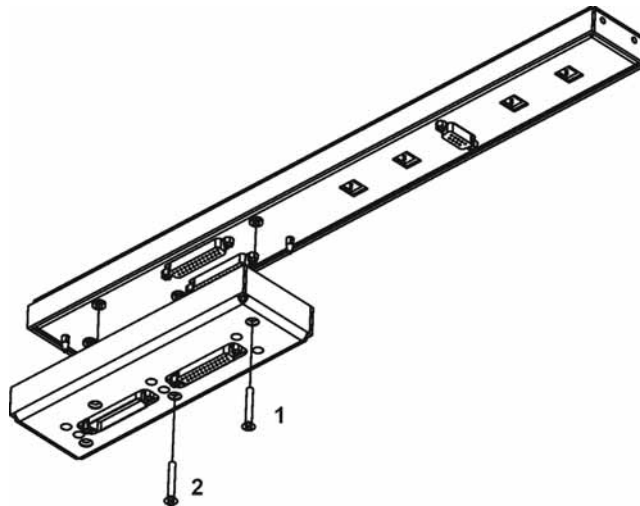


Figure 25 Mounting the screws [1]

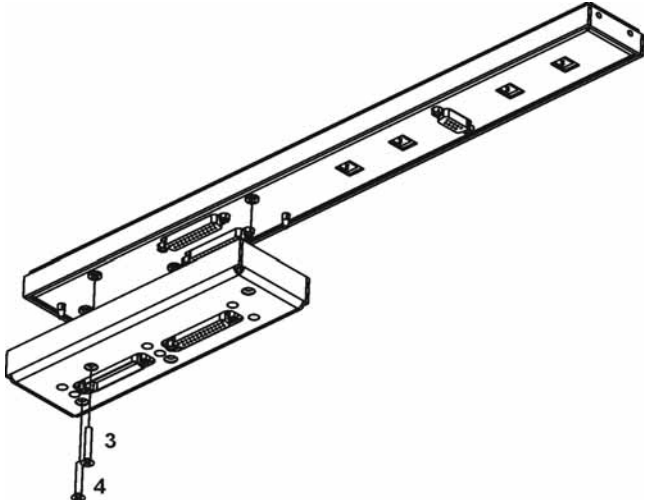
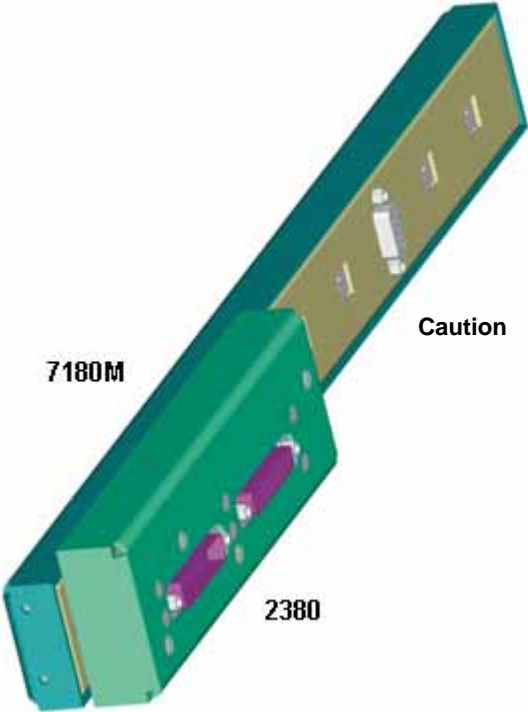


Figure 26 Mounting the screws [2]



Caution *Use only the mounting screws provided by Foxcom. Other screws can permanently damage the unit!*

Figure 27 Mounted 2380

6. Connect the cables.

Appendix 3.2 2380 Dimensions and Front Panel Label

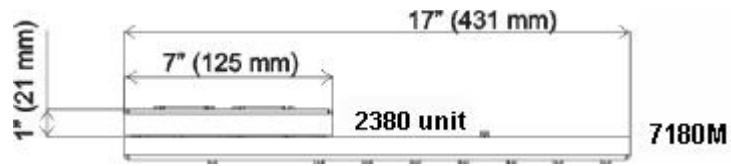


Figure 28 2380 Dimensions

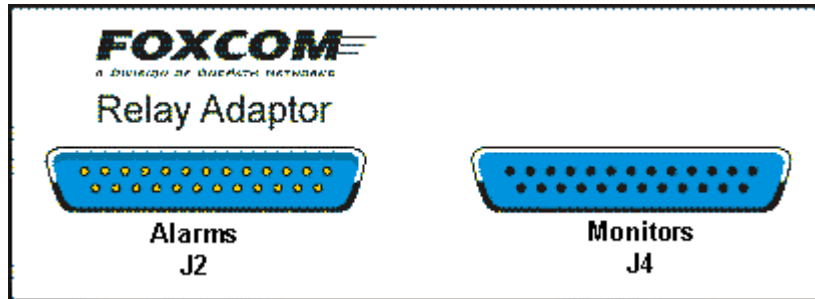


Figure 29 2380 Front Label

Appendix 3.3 2380 Adapter Pinouts

Pin Number	Function	Name	Slot Number
1	Alarm	NOP1	1
2	Alarm	COM1	1
3	Alarm	NOP2	2
4	Alarm	COM2	2
5	Alarm	NOP3	3
6	Alarm	COM3	3
7	Alarm	NOP4	4
8	Alarm	COM4	4
9	Alarm	NOP5	5
10	Alarm	COM5	5
11	Alarm	NOP6	6
12	Alarm	COM6	6
13	Alarm	NOP7	7
14	Alarm	COM7	7
15	Alarm	NOP8	8
16	Alarm	COM8	8
17			
18			
19			
20			
21			
22			
23	Main PS Alarm	MPSA	
24	Standby PS Alarm	SPSA	
25	Power Supply Comm.	PSCOM	

Table 12 2380 Alarms pinout [J2]

Note Alarms in Pins 1 through 16 function if there is either an RF or Optical signals failure.

Pin Number	Function	Name	Slot Number
1	RF-Laser Mod/ RF-Output Mon	RFLD/ RFOP	1
2	RF-Laser Mod/ RF-Output Mon	RFLD/ RFOP	2
3	RF-Laser Mod/ RF-Output Mon	RFLD/ RFOP	3
4	RF-Laser Mod/ RF-Output Mon	RFLD/ RFOP	4
5	RF-Laser Mod/ RF-Output Mon	RFLD/ RFOP	5
6	RF-Laser Mod/ RF-Output Mon	RFLD/ RFOP	6
7	RF-Laser Mod/ RF-Output Mon	RFLD/ RFOP	7
8	RF-Laser Mod/ RF-Output Mon	RFLD/ RFOP	8
9	RF-Input/Opt- Input Mon	RFIP/ RFOP	1
10	RF-Input/Opt- Input Mon	RFIP/ RFOP	2
11	RF-Input/Opt- Input Mon	RFIP/ RFOP	3
12	RF-Input/Opt- Input Mon	RFIP/ RFOP	4
13	RF-Input/Opt- Input Mon	RFIP/ RFOP	5
14	RF-Input/Opt- Input Mon	RFIP/ RFOP	6
15	RF-Input/Opt- Input Mon	RFIP/ RFOP	7
16	RF-Input/Opt- Input Mon	RFIP/ RFOP	8
17	Not Used	LSRI2	1
18	Not Used	LSRI2	2
19	Not Used	LSRI3	3
20	Not Used	LSRI4	4
21	Not Used	LSRI5	5
22	Not Used	LSRI6	6
23	Not Used	LSRI7	7
24	Not Used	LSRI8	8
25	Chassis Ground	GND	

Table 13 2380 Monitor Connector pinout [J4]

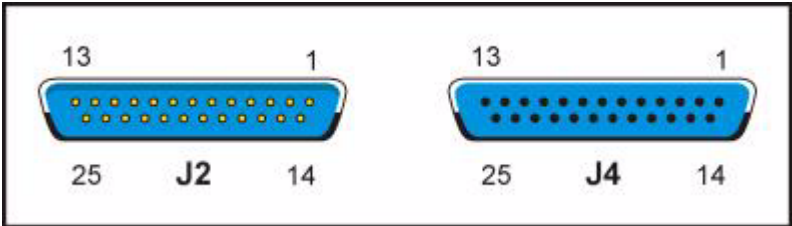


Figure 30 2380 Pin numbers

Appendix 4 Pinout Charts and Diagrams

Figures 31 through 36 give detailed pinout information for the 7180M chassis, the 2380 Relay Adaptor and the 2040 RF Switch.

Figure 31	Standard 7180M and 7180M with 2380 Relay Adapter Pinout	44
Figure 32	7180M with 2040 RF Switch Pinout	46
Figure 33	Pinout of 7180M Jumper with 2040 RF Switch in slots 2 and 5.	48
Figure 34	Pinout of 7180M Jumper with 2040 RF Switch in slot 2.	49
Figure 35	Pinout of 7180M Jumper with 2040 RF Switch in slot 5.	50
Figure 36	Pinout of 7180M Jumper with Transmitter and Receiver units only.	51

1

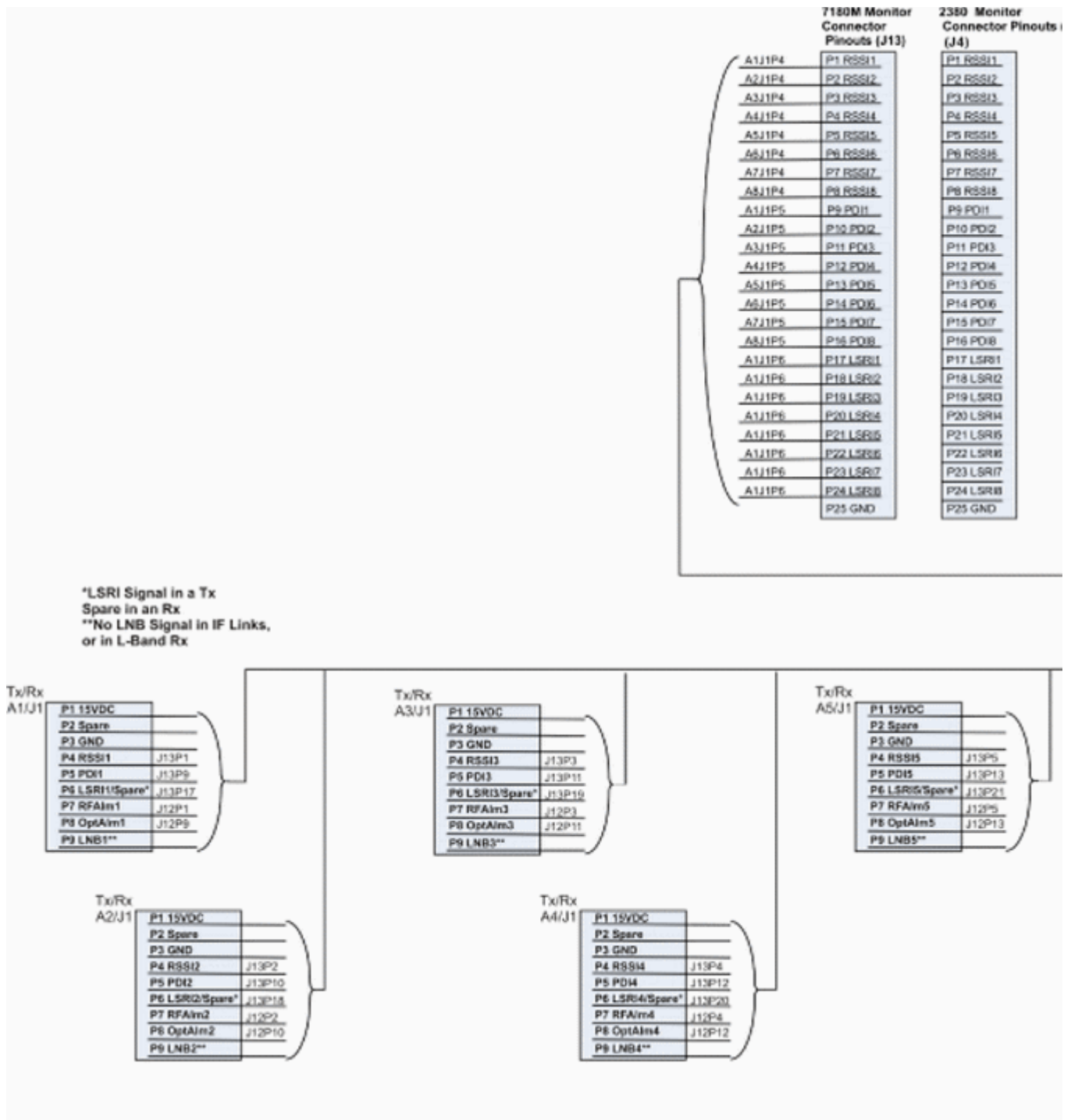
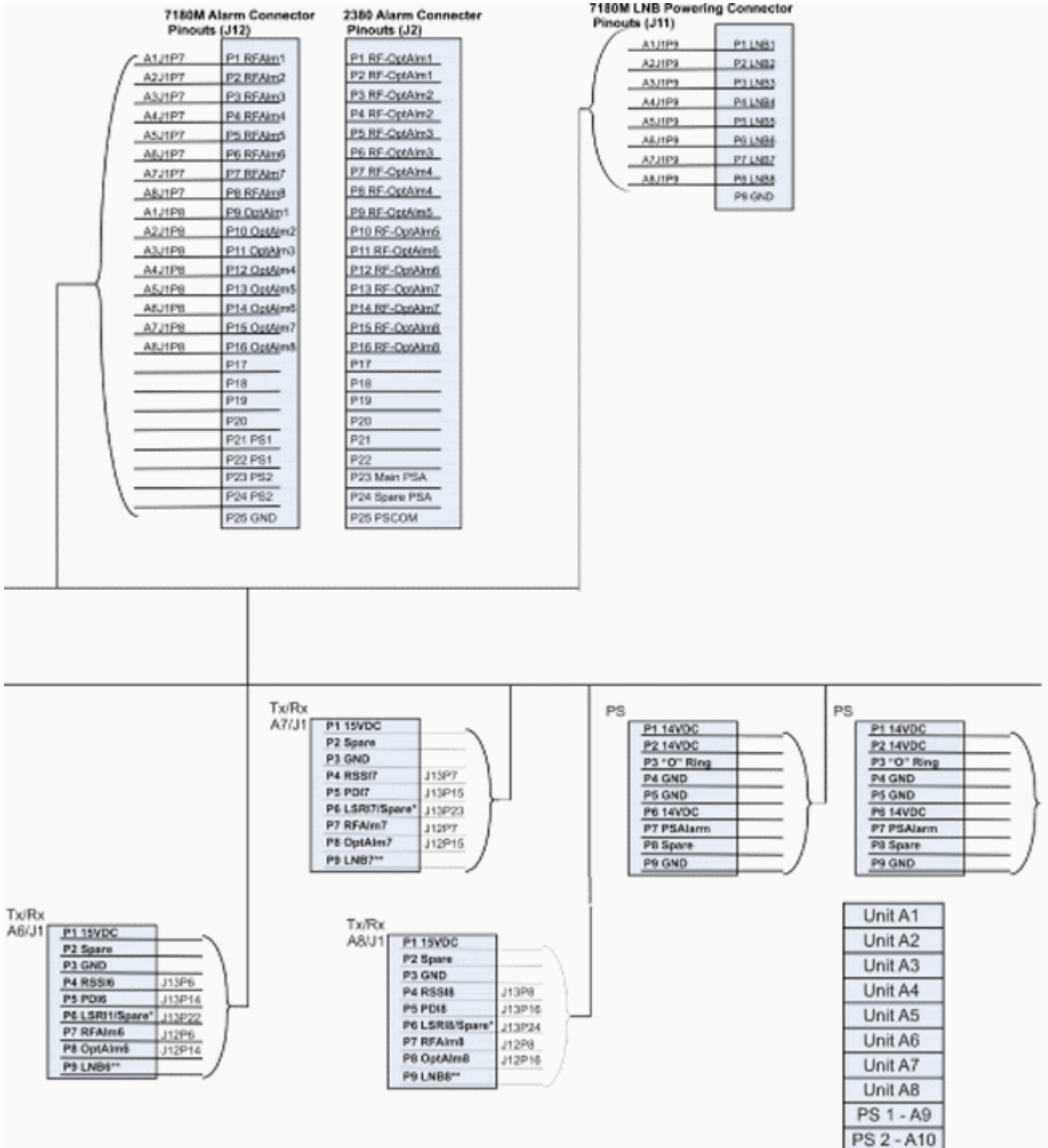


Figure 31 Standard 7180M and 7180M with 2380 Relay Adapter Pinout



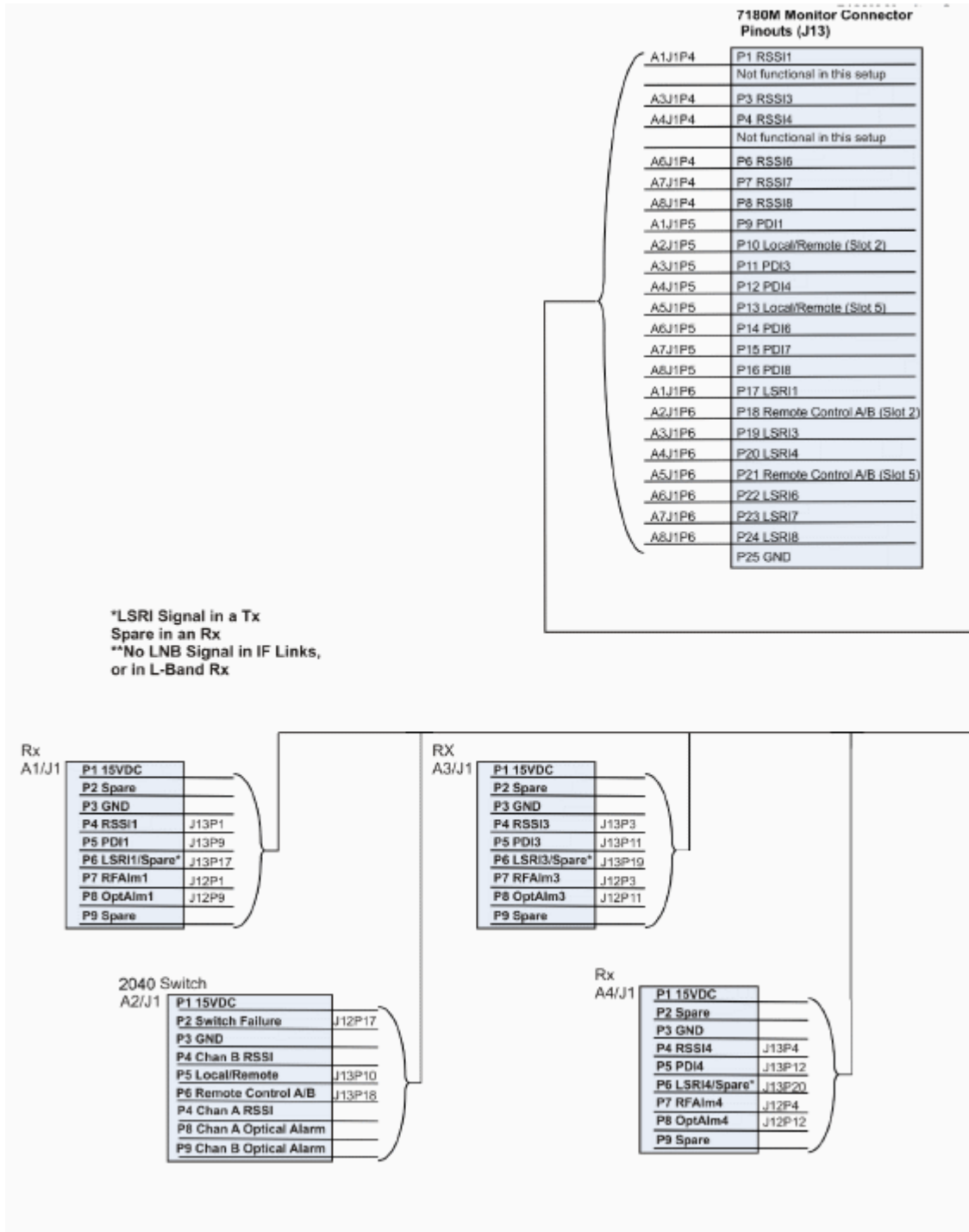
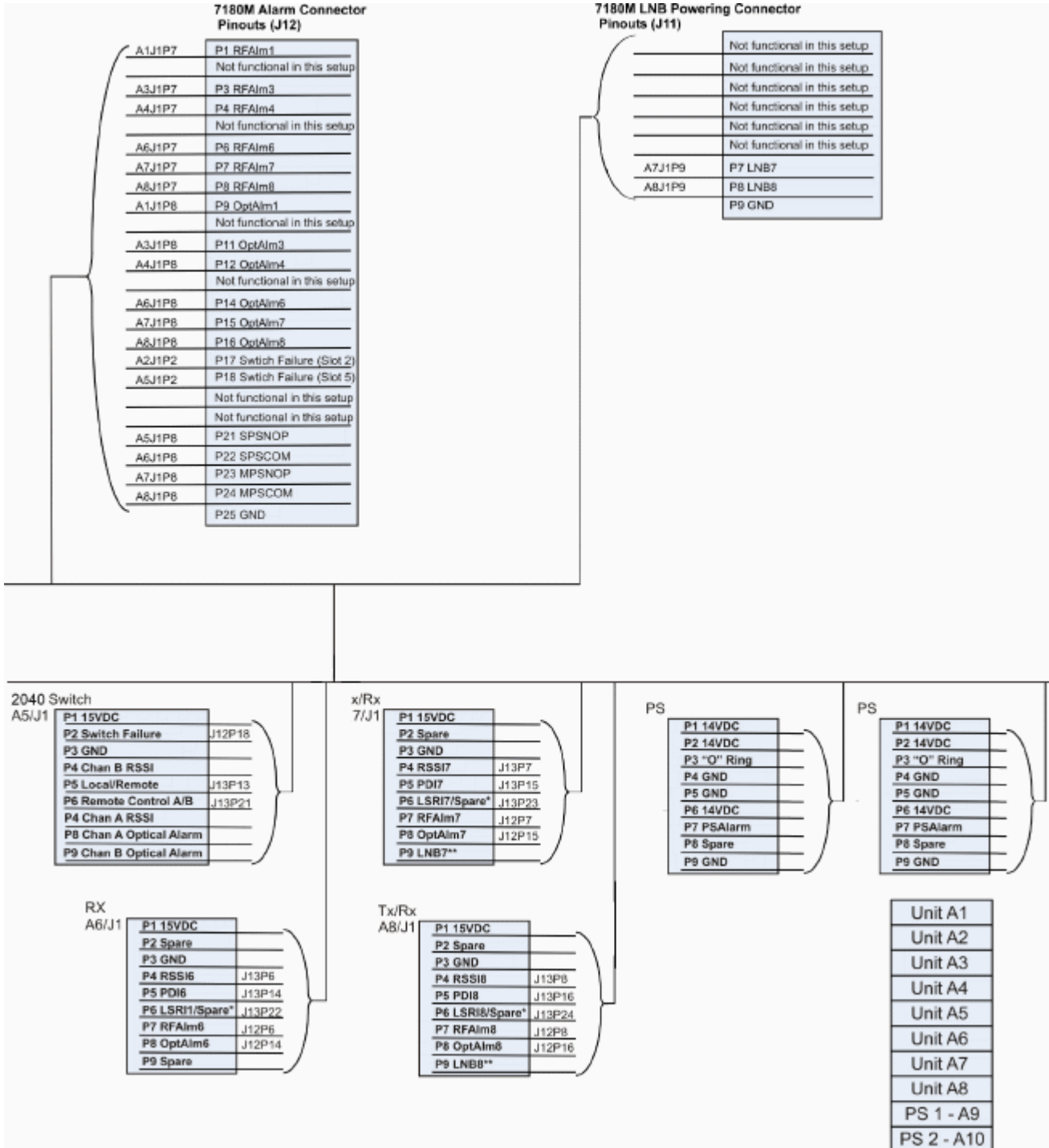


Figure 32 7180M with 2040 RF Switch Pinout



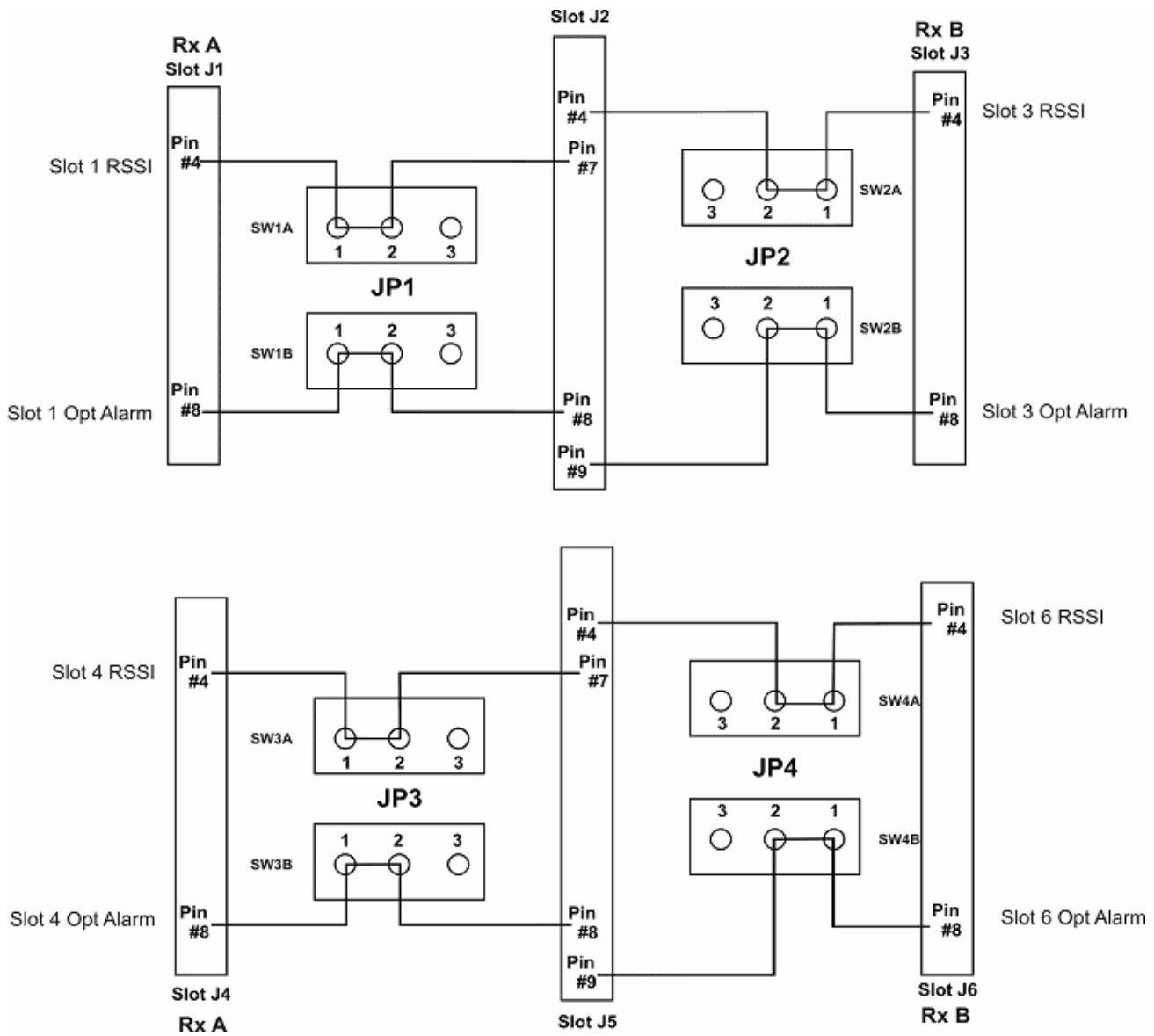


Figure 33 Pinout of 7180M Jumper with 2040 RF Switch in slots 2 and 5

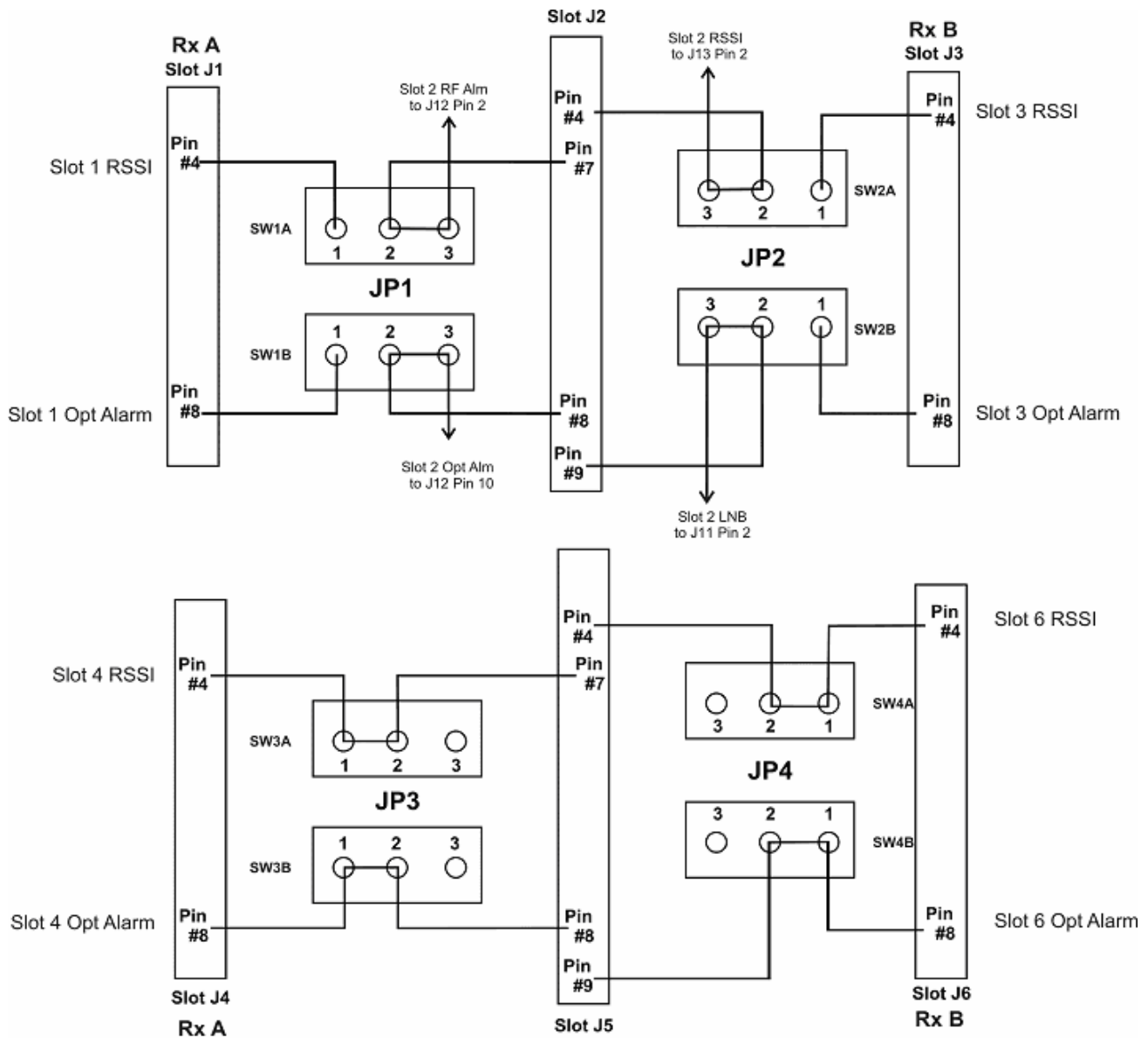


Figure 34 Pinout of 7180M Jumper with 2040 RF Switch in slot 2

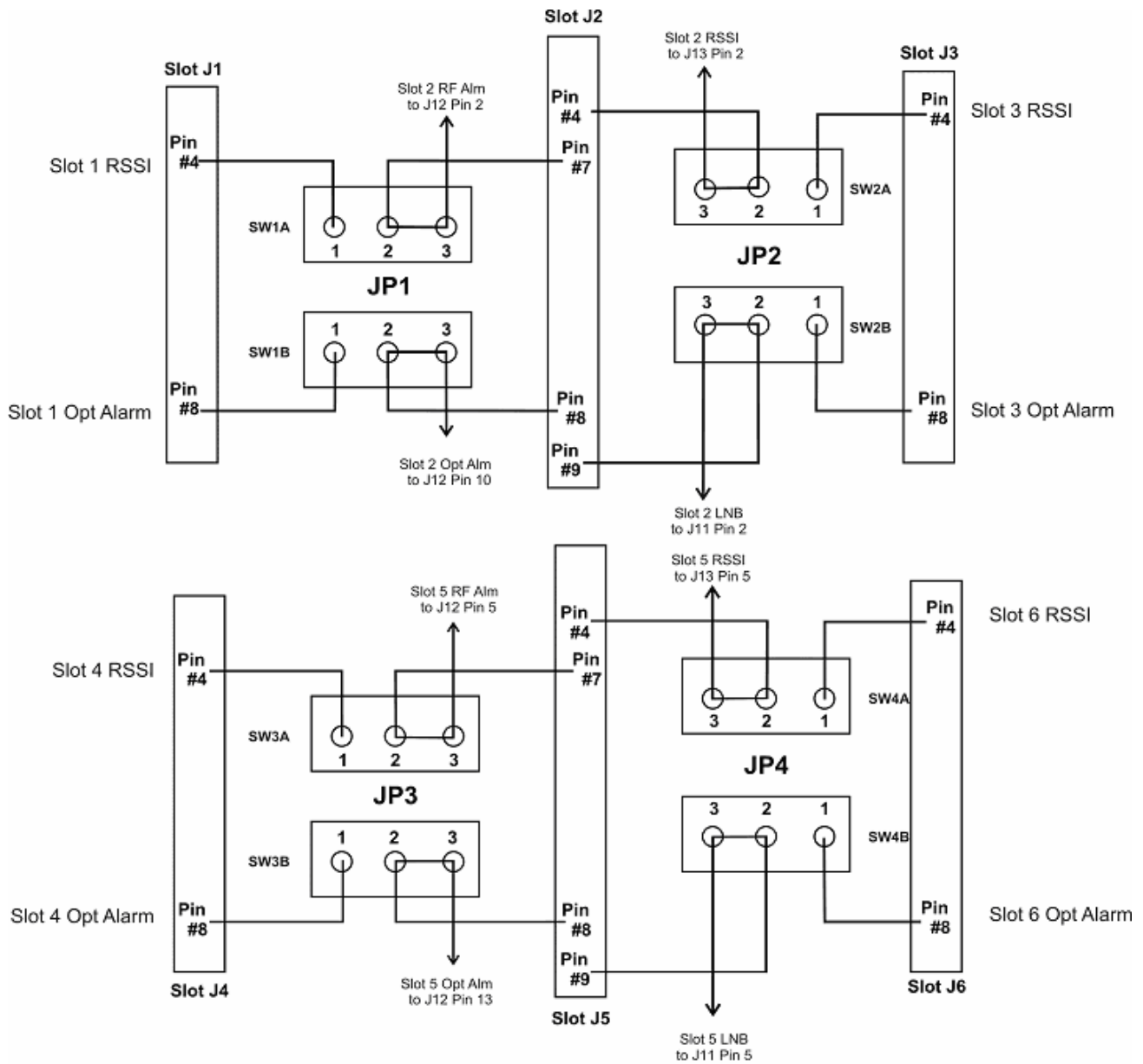


Figure 35 Pinout of 7180M Jumper with 2040 RF Switch in slot 5

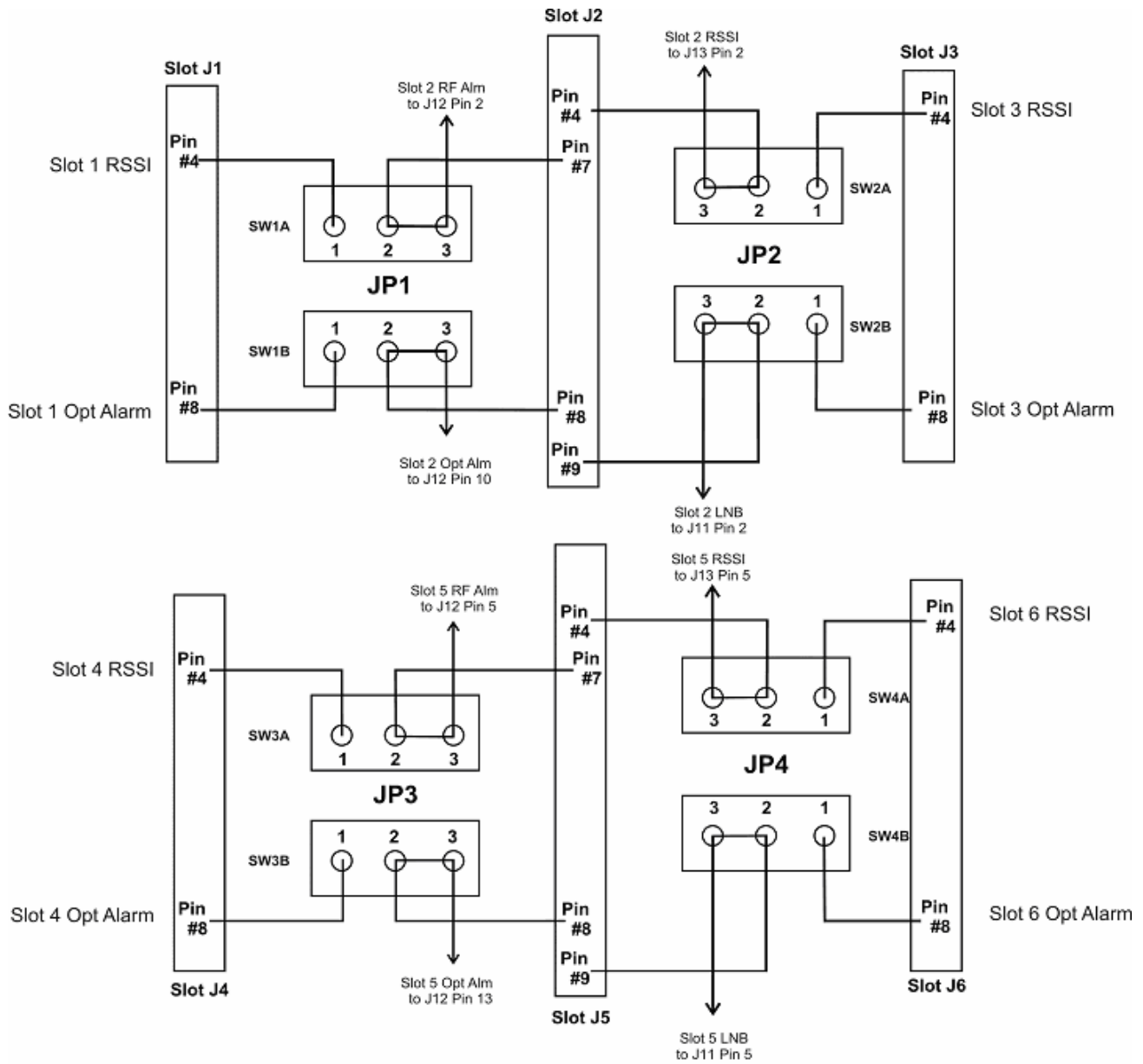


Figure 36 Pinout of 7180M Jumper with Transmitter and Receiver units only
