



**Emcore SITU28xx SITU3xxx and SIRU3xxx Product Operating Instructions**  
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**CAUTION! Maximum SIRU300x Receiver Optical Input Power is +12 dBm (15 mW)!**

**CAUTION! Maximum SIRU304x Receiver Optical Input Power is +10 dBm (10 mW)!**

**CAUTION! Maximum SITU3xxx Transmitter RF input Power is +25 dBm!**

**Operating Instructions**

**SITU/SIRU 1550 nm Externally Modulated Fiber Optic Transmitter Link**

**Applicability:**

These instructions apply to all SITU28xx and SITU3xxx Ku/Ka band externally modulated transmitter and all SIRU3xxx Ku/Ka band receiver products and describe the process to connect, verify and operate the units. If only a SITU or SIRU is used, please reference only the appropriate sections of these instructions

<b>SITU2800</b>	7 dBm Optical Output 0.05 - 18 GHz TX
<b>SITU3000</b>	7 dBm Optical Output 0.05 - 22 GHz TX
<b>SITU3001</b>	10 dBm Optical Output 0.05 - 22 GHz TX
<b>SITU3040</b>	7 dBm Optical Output 0.05 - 40 GHz TX
<b>SITU3041</b>	10 dBm Optical Output 0.05 - 40 GHz TX
<b>SIRU3000</b>	0.05 - 22 GHz RX
<b>SIRU3040</b>	0.05 - 40 GHz RX

**Package Contents:**

1. Instructions and test data sheets
2. SITU28xx or 3xxx Externally modulated transmitter module
3. SITU power harness

***And/Or***

4. SIRU30xx High input power fiber optic receiver
5. SIRU power harness

**Other Equipment You May Need:**

1. APC SM fiber optic patch cord(s)
2. Variable optical attenuator (optional)
3. Optical connector cleaner
4. Optical power meter

**\*Avoid connecting SMA male connectors to 2.9 mm K-type female connectors, as SMA male connector pins can damage 2.9 mm K-type female connector pins. Improper connector mating may result in system signal degradation above 18 GHz when SMA connectors are used in lieu of RX 2.9 mm K connectors**



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5. RF signal source, VNA, spectrum analyzer or other means of generating and measuring the appropriate RF input signal.
6. 2.9 mm “K” type or SMA RF test cables\*

#### Instructions:

1. Carefully unpack transmitter and receiver modules
2. Remove protective cover from transmitter DB-15 connector if in place.
3. Remove protective cover from receiver DB-9 connector if in place.
4. Connect leads from SITU power harness to power supplies. Follow the marking on each harness lead and note correct polarity of DC connections. Do not yet connect to SITU module. Turn on supplies and verify correct supply voltages. For reference, the SITU D-connector pin-out is shown below

#### SITU TX D-Connector Pin-Out

Pin	Function	Comments
1	+15 VDC	
2	-15 VDC	
3	+5 VDC	
4	-5 VDC	
5	Laser Current Monitor	1 V/A
6	Optical Power Monitor	0.25 V/mW
7	NC	
8	NC	
9	TX Power Control	0V off; 5V, on
10	NC	
11	NC	
12	GND	
13	GND	
14	GND	
15	NC	

5. Connect leads from SIRU power harness to power supplies. Note correct polarity of DC connections. Do not yet connect to SIRU module. Turn on supplies and verify correct supply voltages. For reference, the SIRU D-connector pin-out is shown below:

**\*Avoid connecting SMA male connectors to 2.9 mm K-type female connectors, as SMA male connector pins can damage 2.9 mm K-type female connector pins. Improper connector mating may result in system signal degradation above 18 GHz when SMA connectors are used in lieu of RX 2.9 mm K connectors**



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SIRU RX D-Connector Pin-Out

Pin	Function	Comments
1	+15 V	
2	n/c	
3	n/c	
4	GND	
5	n/c	
6	Photodiode Monitor	0.1 V/mA typical
7	n/c	
8	n/c	
9	n/c	

6. Disable power supplies
7. Connect SITU test power harness to SITU module DB-15 connector
8. Connect SIRU test power harness to SIRU module DB-9 connector
9. Remove protective cap from transmitter RF input.
10. Establish the appropriate reference signal for the RF input. Measure the RF input signal level.
11. Connect RF input cable to transmitter RF input connector\*. **Do not exceed +25 dBm RF input power.**
12. Remove protective cap from receiver RF output.
13. Connect RF output cable to receiver RF output connector\*.
14. Remove protective caps from the transmitter optical output and the receiver optical input.
15. APC fiber optic patch cords must be used. Properly clean fiber optic patch cord connectors prior to connection to transmitter or receiver. Do not attempt to clean transmitter or receiver fiber connector interfaces.
16. Connect transmitter fiber optic output to the fiber optic patch cord. APC fiber optic connectors must be used.
17. Enable power supplies
18. Measure the optical power at the end of the fiber optic patch cord that will connect to the receiver optical input connector prior to connecting to the receiver. Note the measured power level in dBm.

**CAUTION! Maximum SIRU300x Receiver Optical Input Power is +12 dBm (15 mW)!**

**CAUTION! Maximum SIRU304x Receiver Optical Input Power is +10 dBm (10 mW)!**

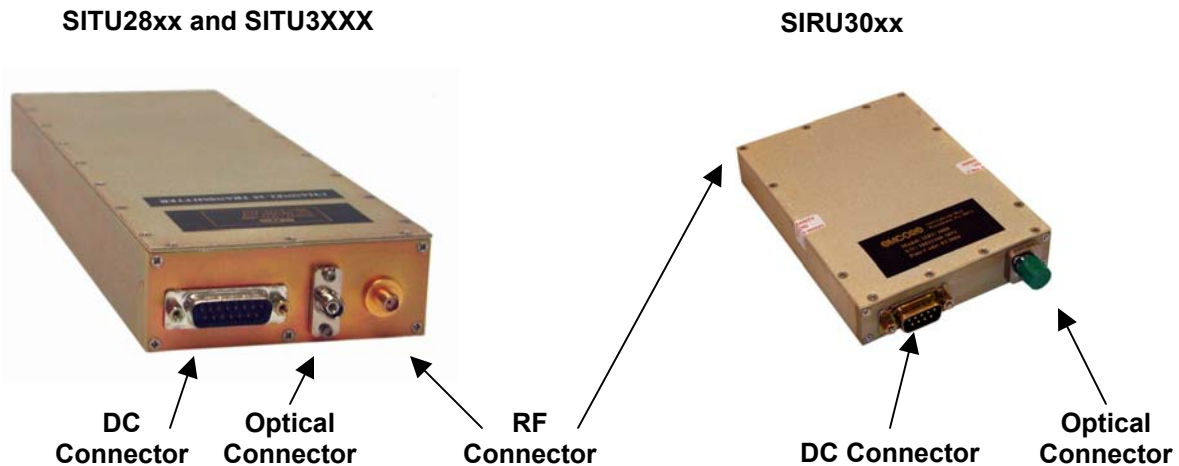
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19. Clean and connect the APC connector.
20. The transmitter and receiver module can be connected “back to back” with a single patch cord. The optical input threshold of the receiver is higher than the optical output of the transmitter. Alternatively, a variable optical attenuator can be placed between the transmitter and receiver module as a means to simulate optical link loss.

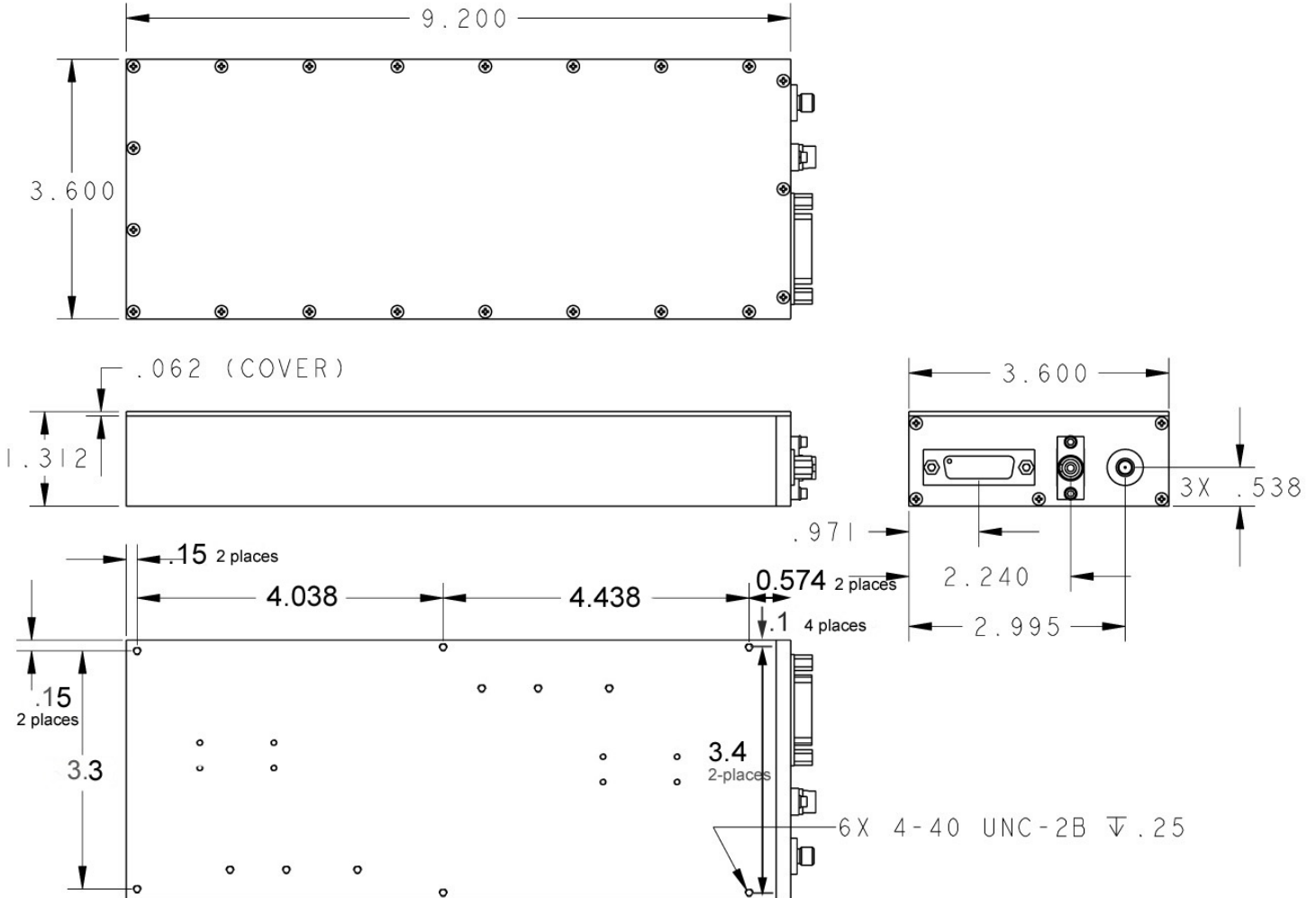
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21. Confirm that the RF link is established as measured at the output of the SIRU receiver.
22. The link gain of the system can be verified as follows. Take the measured optical input power at the input to the fiber optic receiver and multiply this value by a factor of 2. Since receiver RF output power changes 2 dB for each 1 dB change in optical input power, this value will be added to or subtracted from the reference link gain value. The supplied S21 swept response provides the reference link gain of the system as measured for 0 dBm received optical input power on the receiver. Using this plot, determine the link gain at 0 dBm for the frequency of interest. Then, add or subtract the value calculated above to determine what the link gain should be for the link as it is currently configured. This value should match what is measured over the test link as it is currently configured.

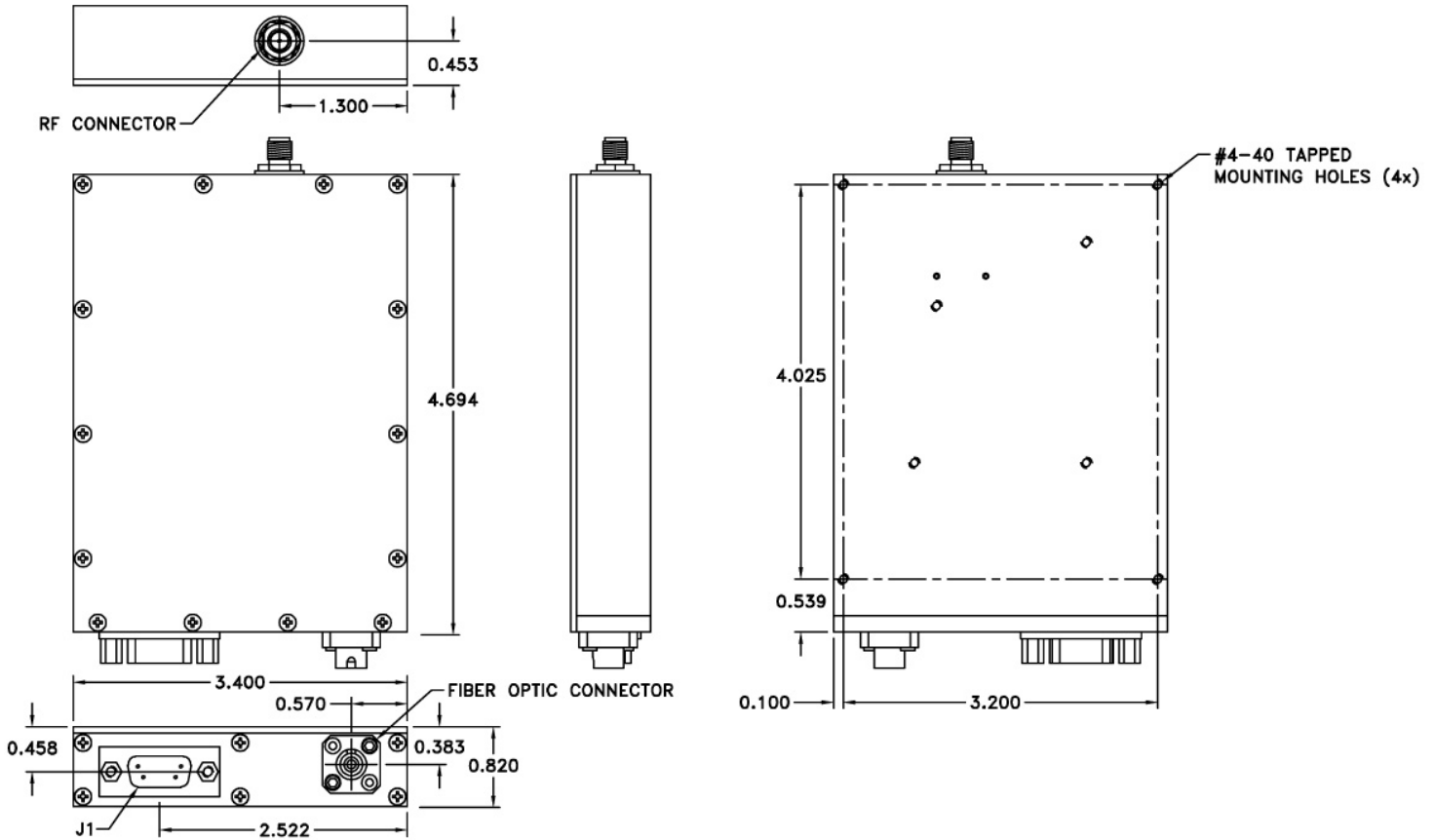


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**Package Outline Drawings:**
**SITU TX**


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**SIRU RX**



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