

Instruction Manual

Model 2116-288T190 Block Translator

June 2017, Rev. 0



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INSTRUCTION MANUAL

MODEL 2116-288T190 Block Translator

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2116-288T190 Block Translator, 27.8 - 28.8 GHz to 18.0 -19.0 GHz

1.0 General

1.1 Equipment Description

The 2116-288T190 Block Translator converts 27.8 - 28.8 GHz to 18.0 - 19.0 GHz with a local oscillator at 9.80 GHz. Front panel LEDs provide indication of DC Power, External 10 MHz, and PLL Alarm. The gain is -30 dB. Connectors are 2.92mm female for RF In, Super SMA female for RF Out and BNC female for the external reference input and reference output. A three-way switch controls which reference is being used for the internal LO. When in the AUTO or EXT position, the internal 100 MHz reference remains locked to the external 10 MHz as long as a +3 dBm \pm 3 dB, 10MHz reference (+/- 1PPM) signal is connected to the external reference input (Option E6-100). The External LO option W89 allows an external 9.8 GHz LO at +14 dBm \pm 2dB level, switched in place of the Internal LO by a SPDT toggle switch. The unit is powered by a 100-240 \pm 10% VAC power supply, and mounted in a 1 3/4" X 19" X 14" rack mount chassis.

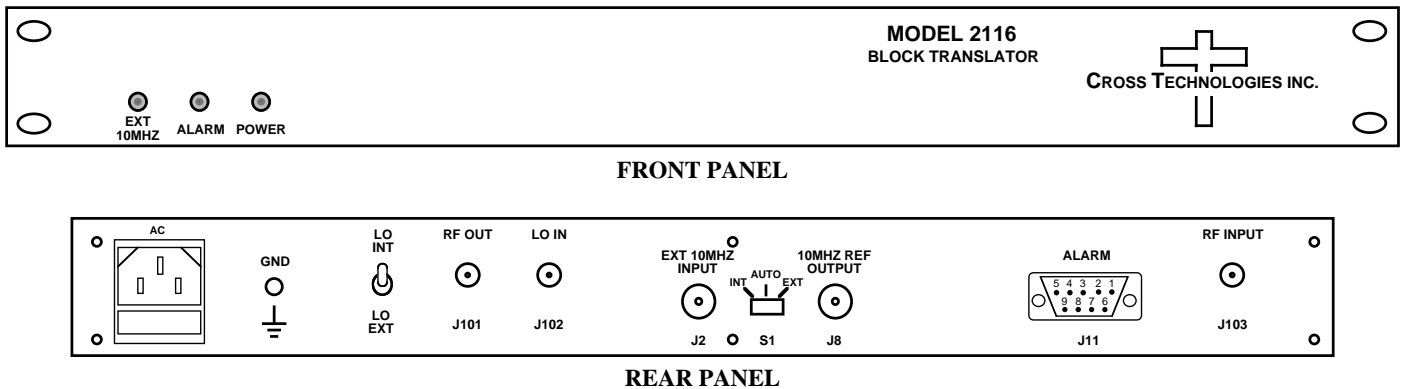


FIGURE 1.1 Front and Rear Panels

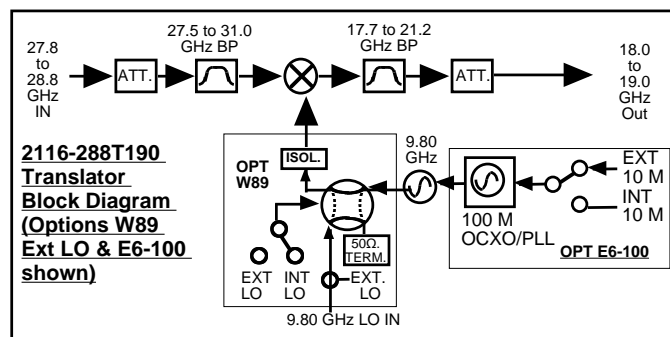


FIGURE 1.2 Block Diagram

1.2 Technical Characteristics

TABLE 1.0 2116-288T190 Block Translator Specifications*

Input Characteristics

Impedance/Return Loss	50Ω /12 dB Typical, 10dB minimum
Frequency	27.8 to 28.8 GHz
Input Level Range	-10 to 0 dBm
Input 1dB Compression	+10 dBm

Output Characteristics

Impedance/Return Loss	50 Ω/15 dB Typical, 14dBm minimum
Frequency	18.0 to 19.0 GHz
Output Level Range	-40 to -30 dBm
Output 1 dB Compression	-20 dBm

Channel Characteristics

Gain	-30 dB ± 2 dB at Fc
Input/Output Isolation	>50 dB, minimum
Intermodulation	>50 dBC for two carriers each at -5 dBm In
Spurious, Inband	SIGNAL RELATED <-50 dBC, typical, -40 dBC maximum; SIGNAL INDEPENDENT <-80 dBm
Spurious, Out of Band,2XLO	<-45 dBm, at 19.6 GHz at the output
Frequency Response	±2.0 dB, over frequency band;± 0.5 dB, 40 MHz BW
Frequency Sense	Non-inverting

LO Characteristics

LO Frequency	9.80 GHz
Frequency Accuracy	± 0.01 ppm max. over temp internal reference; external reference input
10 MHz In/Out Level	+3 dBm ± 3 dB

<i>Phase Noise @ F(Hz) ></i>	10	100	1K	10K	100K	1M	10M	100M
<i>9.800 GHz dBC/Hz, W/E6-100</i>	-45	-70	-85	-100	-100	-110	-130	-130
<i>Ext 10 MHz Ref.</i>	-127	-145	-150	-153	-153	-153	-153	-153

Ext LO Freq/Level, W89 9.80 GHz / +14dBm, ± 2 dB

Controls, Indicators

Power	Green LED
PLL Alarm	Red LED, External contact closure
Ext 10 MHz	GREEN/RED LED, Indicates Ext 10 MHz references is selected (rear panel DPDT switch)
10 MHz Reference	3-way switch (selects INTERNAL, EXTERNAL, or AUTO mode)

Other

RF In / RF Out Connectors	2.92 mm / Super SMA
10 MHz Connectors	BNC (female) 50Ω/75Ω
Alarm Connector	DB9 (female) - NO or NC contact closure on Alarm
Size	19 inch, 1RU standard chassis 1.75" high X 14.0" deep
Power	100-240 ±10 VAC, 47-63 Hz, 45 watts max

*+10°C to +40°C; Specifications subject to change without notice.

1.3 Environmental Use Information

- A. Rack-Mounting** - To mount this equipment in a rack, please refer to the installation instructions located in the user manual furnished by the manufacturer of your equipment rack.
- B. Mechanical loading** - Mounting of equipment in a rack should be such that a hazardous condition does not exist due to uneven weight distribution.
- C. Elevated operating ambient temperature** - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack may be greater than room ambient temperature. Therefore, consideration should be given to Tmra. (Maximum Recommended Ambient Temperature)
- D. Reduced air flow** - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised. Additional space between unit may be required.
- E. Circuit Overloading** - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits could have on over current protection and supply wiring. Appropriate consideration of equipment name plate rating should be used, when addressing this concern.
- F. Reliable Earthing** - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connection to the Branch (use of power strips).
- G. Top Cover** - There are no serviceable parts inside the product so, the Top Cover should not be removed. If the Top Cover is removed the ground strap and associated screw **MUST BE REINSTALLED** prior to Top Cover screw replacement. **FAILURE TO DO** this may cause **INGRESS** and/or **EGRESS** emission problems.

2.0 Installation

2.1 Mechanical

The 2116-288T190 consists of one RF PCB housed in a 1 RU (1 3/4 inch high) by 14 inch deep chassis. A switching, ± 12 , +24, +5 VDC power supply provides power for the assemblies. The 2116-288T190 can be secured to a rack using the 4 holes on the front panel. Figure 2.0 shows how the 2116-288T190 is assembled.

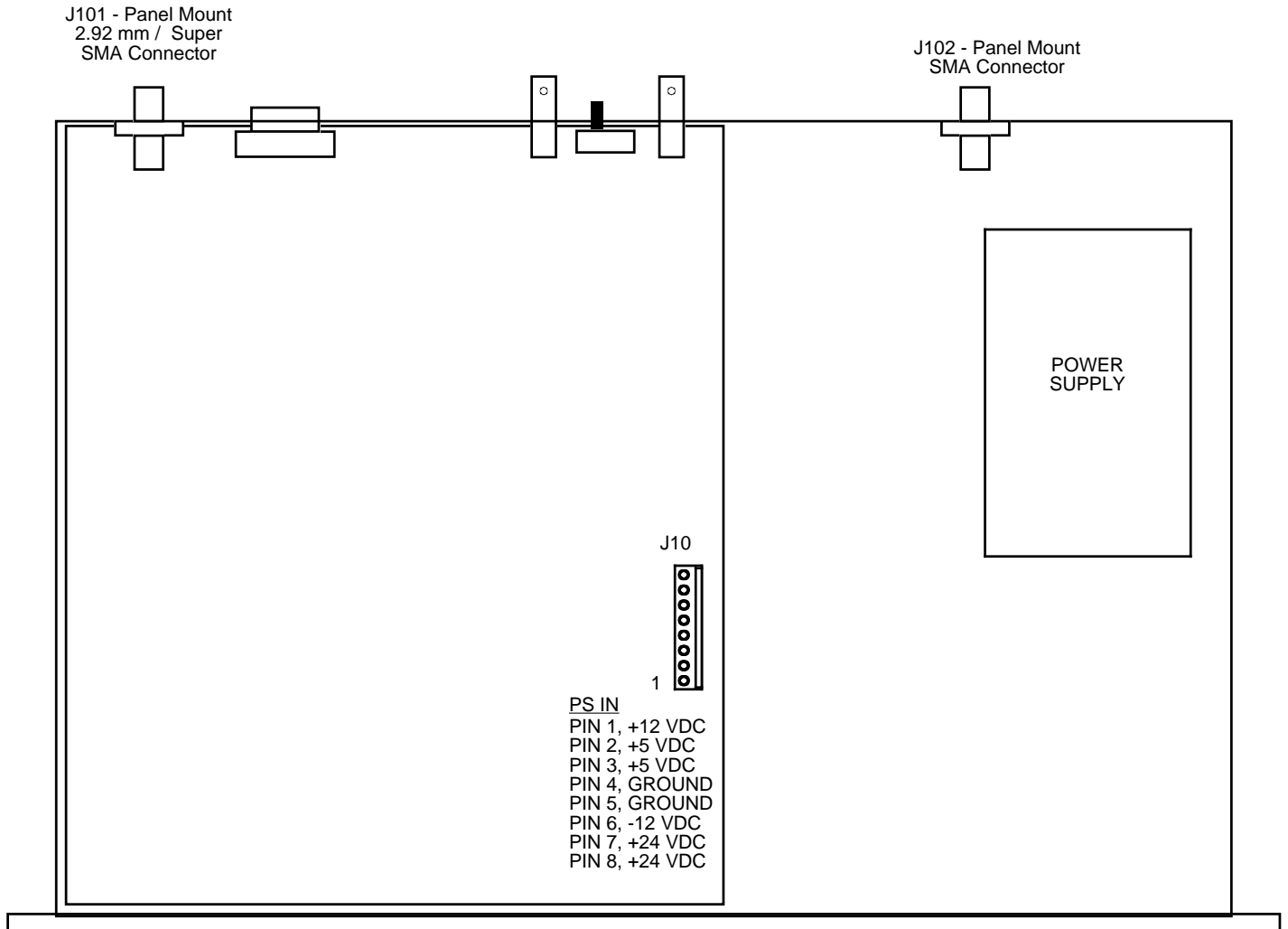


FIGURE 2.0 2116-288T190 Mechanical Assembly

2.2 Rear Panel Input/Output Signals

Figure 2.1 shows the input and output connectors on the rear panel.

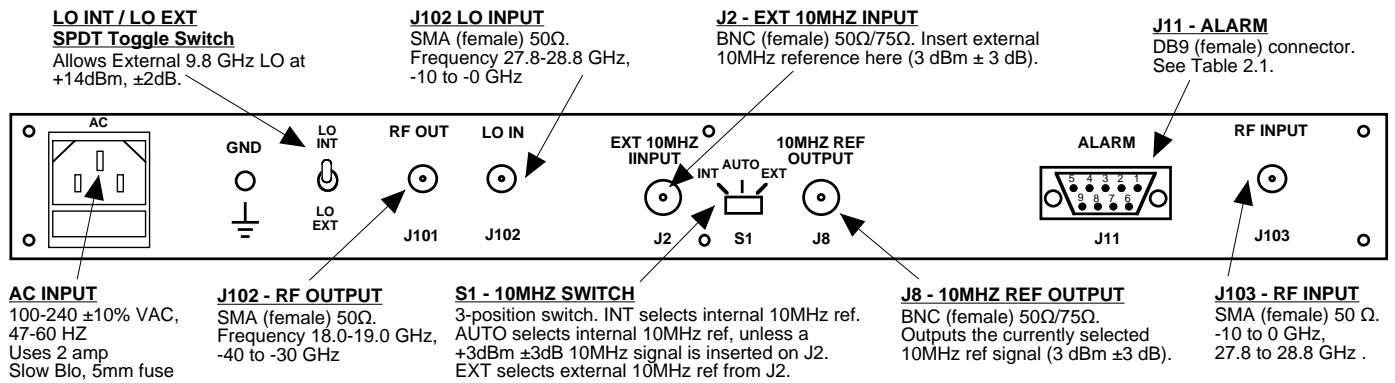


FIGURE 2.1 2116-288T190 Rear Panel I/O's

Pin	Function
1	Not Used
2	Not Used
3	Not Used
4	Not Used
5	GND
6	Alarm Relay: Common
7	Alarm Relay: Normally Open
8	Not Used
9	Alarm Relay: Normally Closed

2.3 Front Panel Indicators

Figure 2.2 shows the front panel indicators.

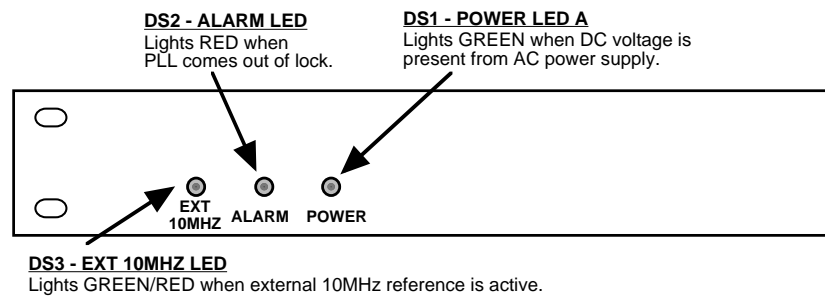


FIGURE 2.2 2116-288T190 Front Panel Controls and Indicators

2.4 Installation / Operation

2.4.1 Installing and Operating the 2116-288T190 Block Translator

1. Connect a -10 dBm to 0 dBm signal to RF INPUT (J103) (Figure 2.1).
2. Connect RF OUT (J101) to the external equipment.
3. Connect a 100-240 \pm 10% VAC, 47 - 63 Hz to AC connector on the back panel.
4. Be sure DS1 (green, DC Power) is on and DS2 (red, Alarm) is off (Figure 2.2).
5. Select either INT, AUTO or EXT Reference using the rear panel 3-way switch, S1 (Figure 2.1). In INT the unit uses the internal 100MHz OCXO reference. In AUTO (unit uses internal 100MHz reference or locked to external 10MHz input with valid 10MHz signal (+/- 1PPM @ +3 dBm on J2). If EXT is selected or AUTO is selected and there is a 10MHz, +3 dBm signal at J2, check that DS3 (green, Ext. 10MHZ) is on (Figure 2.2). IF DS3 is red in External either the External signal input is below the specification or the frequency is not within +/- 1PPM. In AUTO, the unit will turn off the LED if the level drops below specification or if it cannot lock within seven seconds because of frequency error on the input 10MHz signal.
6. If EXT is selected or AUTO is selected and there is a 10MHz, 3 dBm signal at J2, check that DS3 (yellow, Ext. 10MHZ) is on (Figure 2.2).
7. Check that a 10MHz, 3 dBm \pm 3 dB signal is present at the 10MHZ REF OUTPUT (J8) (Figure 2.1).
8. **AC Fuse** - The fuse is a 5 mm X 20 mm, 2 amp slow blow (Type T) and is inserted in the far slot in the drawer below the AC input as shown in Figure 2.3. There is a spare fuse in the near slot. If a fuse continues to open, the power supply is most likely defective.

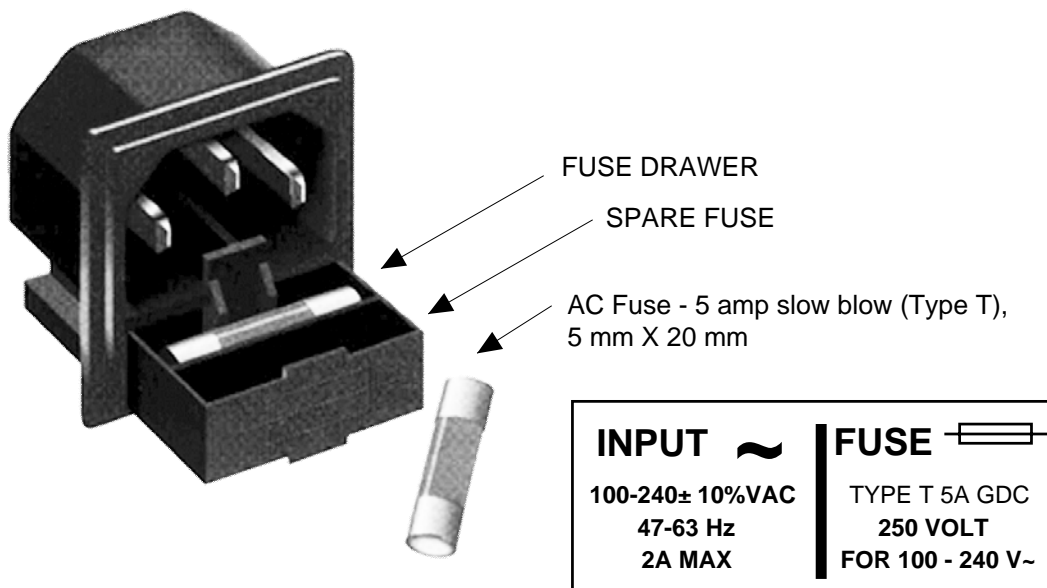


FIGURE 2.3 Fuse Location and Spare Fuse



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