

SITUATION

The **DIRECTV®** (4) polarity **SlimLine®** dish with **SL5** LNB to receiver distance exceeds 100 feet. (Reference **SlimLine®** installation manual)

SOLUTION

Model **4SATPL-T** powers a **DIRECTV® SlimLine®** dish with strong DC levels and polarity locks the four dish outputs relieving the receivers from powering the LNB.

RELATED CONSIDERATIONS

Power from the **PS242000A** included with the **4SATPL-T** may be looped to power a model **LA144R** amplifier. Color coded jumpers are suggested to be sure the polarities are maintained to the switch.

FEATURES

- **DBS Compatibility** 4 Polarity **DIRECTV® SlimLine®**
- **2 Amp Power Supply** powers LNBs & line amplifiers
- **Locks LNBs** one polarity on each of (4) coax
- **Blocks 22 kHz** from multiple switches
- **Indoor / Outdoor case** Die cast Aluminum

APPLICATION NOTES

DIRECTV® recommends that the distance between receiver and dish be less than 150 feet of solid copper RG-6. At distances greater than 150 feet they recommend a DC voltage booster and a line amplifier.

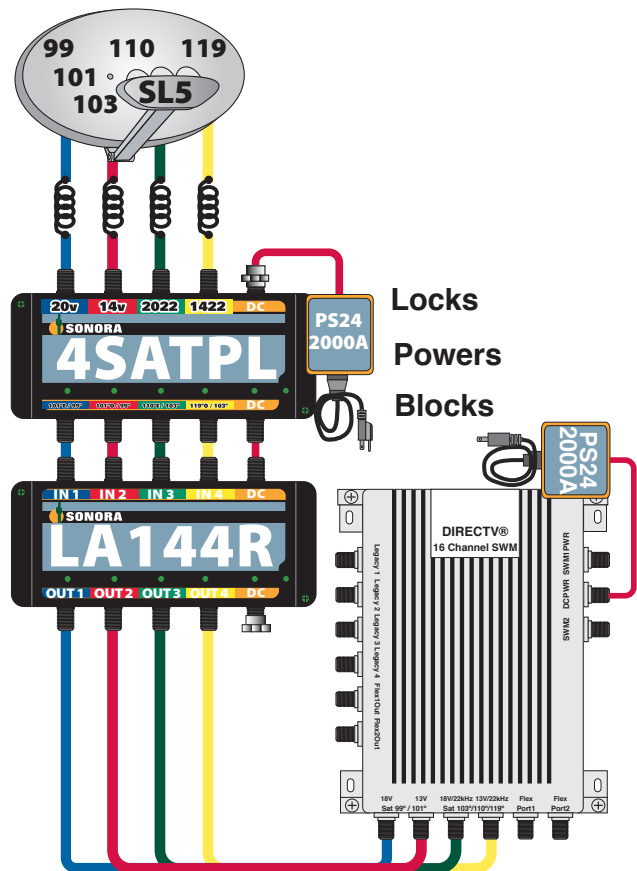
Model **4SATPL-T** provides LNB powering and strong control signal to lock the dish. Without the locker, the **SWM16** which must power the LNB.

Model **LA144R** amplifiers may be powered by the polarity locker for installations with long switch to dish or receiver to switch installations.



DESCRIPTION

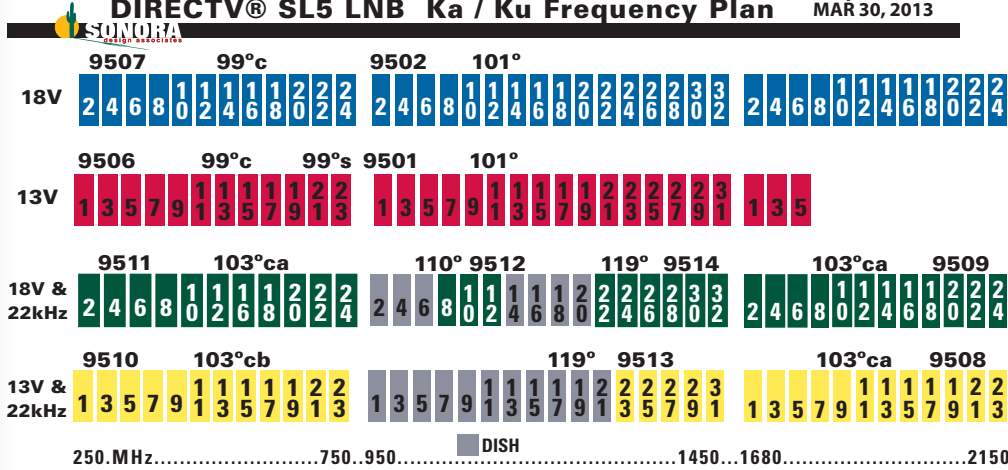
DIRECTV® 4 polarity **SlimLine®** Ku/Ka polarity locker and power booster.



Revised Nov 13 2013

DIRECTV® SL5 LNB Ka / Ku Frequency Plan

Updated:
MAR 30, 2013



DIRECTV® receivers and the AIM meter are programed to measure the transponders targeted for specific zip codes. The signal meter in the receivers can be used to verify the transponders for your region.

DIRECTV® provides test channels to verify the reception of specific transponder on each polarity. The test channel numbers associated with transponders is provided.

TEST CH	VOLTS	MHz	SAT	XPNDR
9506	13	274	99°	c1
9501	13	974	101°	1
9507	18	274	99°	c2
9502	18	989	101°	1
9510	13 / 22k	274	103°	cb1
9513	13 / 22k	1353	119°	27
9508	13 / 22k	2120	103°	ca23
9511	18 / 22k	274	103°	cb2
9512	18 / 22k	1105	110°	10
9514	18 / 22k	1426	119°	32
9509	18 / 22k	2120	103°	ca24

SPECIFICATIONS

Specifications Typical QC Limit

Inputs / Outputs (4) @ 5 to 2400 MHz
 Insertion Loss..... 0.5 dB..... 1 dB
 Return Loss 54-2400 MHz..... 12 dB.....10 dB

Power Specifications

Input Transformer24 VDC, 2 Amp
 100 to 240 VAC input, switching, short circuit protected

Output Voltages and tones

101°& 99° (Odd) RHCP 14 Vdc
 101° & 99° (Even) LHCP.....20 Vdc
 119° & 103° (Odd) RHCP 22 kHz & 14 Vdc
 110°/119° & 103° (Even) LHCP.....22 kHz & 20 Vdc

Mechanical Specifications

Dimensions 6" L x 3.5" W x 7/8" H
 Weight 1.75 lb (0.8 kg)
 Master Carton (18 units) 20" x 10" x 10"
 Master Carton Weight..... 34 lb. (15.5 kg)

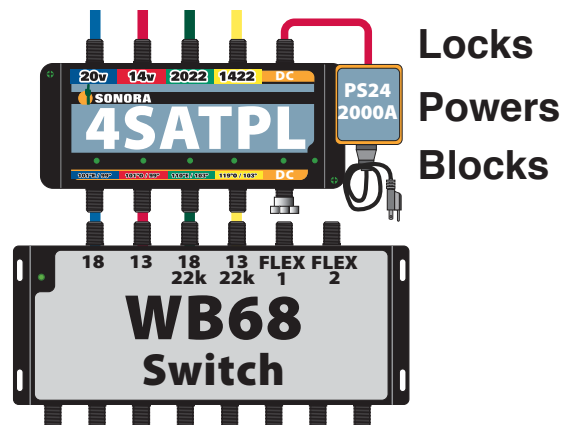
Environmental Specifications

Operating Environment:Indoor/Outdoor Lock box
 Ambient Temperature..... -30° C to +70° C

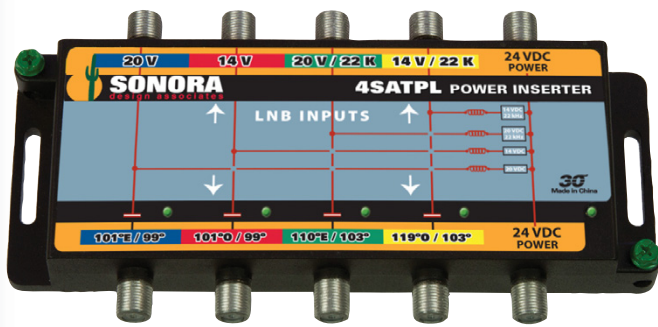
A common problem for installers is maintaining the correct trunk to switch polarity. Use the test channels to verify trunk polarity.

Cables from the Polarity locker outputs must match switch input voltages:

- 20V to 18V,
- 14V to 13V,
- 20V/22k to 18V/22k
- 14V/22k to 13V 22k.



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SL5 ODU Power Inserter and Tone Generator Unit

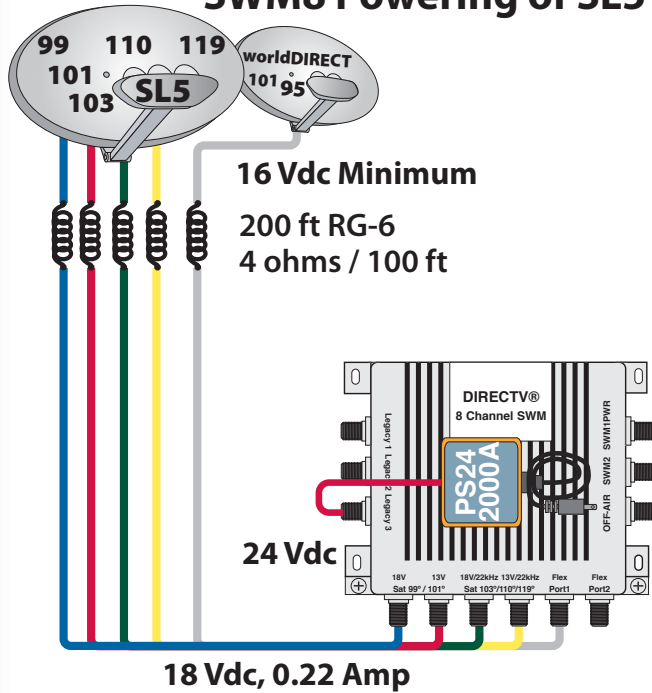
Features: Simplifies MDU installations by providing an integrated module for locking LNB polarizations and satellite selection

4SATPL-T Trunk Power Inserter

- Powers SL5 ODUs
- Regulated DC Voltages
- F-Connector Power Input
- Power LED Indicators

Parameter	UNIT	4SATPL-T
Operating Frequency Range	MHz	250 - 2150
Insertion Loss	dB	1.5 (max.)
Flatness in operating frequency range	dB	± 0.5
Number of Input Ports	Each	(4) F
Number of Output Ports	Each	(4) F
Isolation between ports	dB	> 35 dB
Input / Output Return Loss	dB	> 12 (min)
DC Power provided to inputs	VDC	
Port #1 (20 V 101° & 99°)	VDC	20 ± 0.5
Port #2 (13 V 101° & 99°)	VDC	13.5 ± 0.5
Port #3 (22 kHz & 20 V 119° & 103°)	VDC	20 ± 0.5 (+ 22 kHz)
Port #4 (22 kHz & 13 V 119/110° & 103°)	VDC	13.5 ± 1 (+ 22 kHz)
Number of LEDs	Each	5 (1 per input & 1 for adaptor input)
22 kHz Tone to ODU	kHz	
Frequency	kHz	22.0 ± 0.5
Duty Cycle	%	50
Amplitude	mVpp	800 (min)
DC Power Path	mA	1000 (max.) From DC Input to each Input
DC Power Connector Type	Each	(1) F
Switching Mode Power Supply		24 V, 1.2A (min)
Short Circuit Protection		Yes, Multi fuse
Lightning Surge Protection		32V p-p, max shunt current 200A; 8 msec, 1.5kW max dissipation
Ground Screws	Each	(1) Ground Screw.
Dimensions L x W x H	mm	58 x 188 x 23
Environmental Requirements		Indoor use only
Operating Temperature range	°C	-34 to + 60 Indoor housing
Humidity		Shall survive exposure to 95% relative humidity over operating temperature

SWM8 Powering of SL5



DIRECTV® recommends that the distance between receiver and dish be less than 150 feet of solid copper RG-6. Here is why.

Model SL5 LNBs employ current management to minimize the current carried per coax. (540 mA total) 18 V = 220 mA, 18V 22kHz = 220 mA, 13V = 50 mA, 13V 22kHz = 50 mA.

The 18 volts originating at the SWM8 must arrive at the SL5 above 16 volts for the SL5 to operate correctly. Up to (2) volts can be lost in the coax.

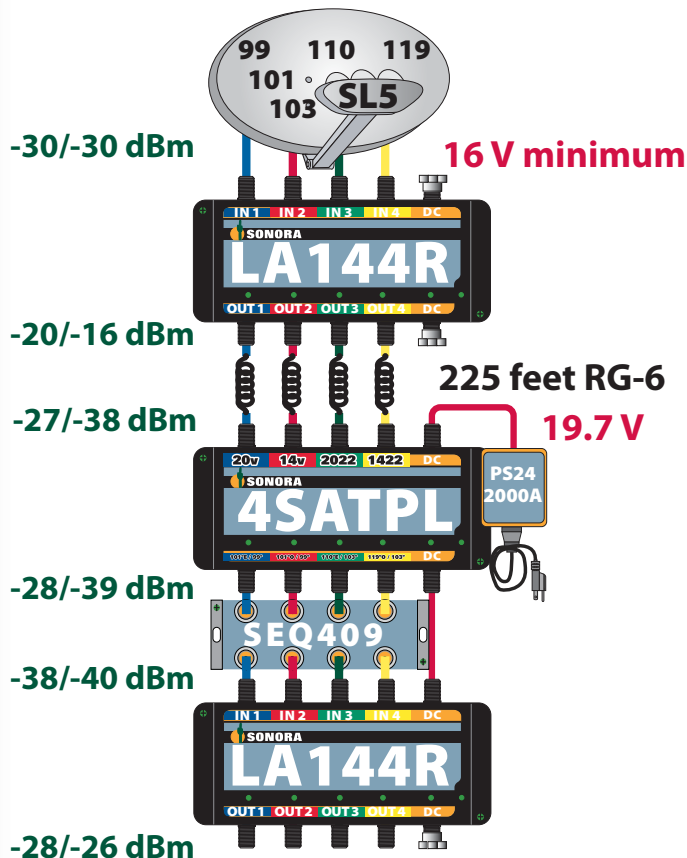
$$\text{Resistance} = \text{Voltage loss} / \text{Current}$$

$$18 \text{ V} - 16 \text{ V} = 2 \text{ volts} / 0.22\text{A} = 9 \text{ ohms}$$

Solid copper cable has a DC loop resistance of 4 ohms per 100 feet. Copper covered steel has a DC loop resistance of 8 ohms.

$$\text{Copper Covered steel} = 9 \text{ ohm} / 8 = 112 \text{ feet}$$

$$\text{Solid Copper} = 9 \text{ ohm} / 4 \text{ ohm} = 225 \text{ feet}$$



Model 4SATPL-T starts with 19.7 Volts to provided extended dish to home distances.

The extra 1.7 volts buys extra RG-6 distance. The extra coax distance increases the signal loss which model LA144R offsets.

Amplifiers near the dish increase the current draw and increase the voltage loss to the dish. Model LA144R draws 3.2 Watts. (200 mA @ 16V). The total current on the 19.7 volt coax is (220 mA for the LNB + 200 mA for the LA144R) = 400 mA

What is the maximum distance that a 19.7 Volt supply can power an SL5 LNB + LA144R with RG-6 cable?

$$(19.7 \text{ V} - 16 \text{ V}) / 0.4 \text{ AMP} = 9 \text{ OHMS}$$

$$\text{Copper Covered steel} = 8 \text{ ohm} / 8 = 112 \text{ feet}$$

$$\text{Solid Copper} = 8 \text{ ohm} / 4 \text{ ohm} = 225 \text{ feet}$$

If the dish is greater than 225 feet (RG-6), model LA144R cannot be placed at the dish.