

# POWER SUPPLIES

SDPI6S POLARITY LOCKER

## SITUATION

The signals from a **DIRECTV®** (4) polarity **SLSP-F SlimLine®** dish with **SL5 LNB**, **DTV66E 95°** dish and a possible 6th polarity are required for multiple switches.

## SOLUTION

Model **SDPI6S** powers a **DIRECTV® SL5 LNB**, polarity locks the four dish outputs and provides 20 V FLEX1 and 13 V on FLEX2 inputs to power the 95° LNB on the **DTV66E** dish or other LNBs..

## RELATED CONSIDERATIONS

Amplifiers may be powered by the power inserter loop output port. A total of 2 amps of DC is available from the short circuit protected **PS242000A** power transformer.

## FEATURES

- *DBS Compatibility . . . . . DIRECTV®SL5, & Flex 1 & 2*
- *2 Amp Power Supply . . . . . powers LNBs & line amplifiers*
- *Power LEDs per polarity . . . . . green if NO short circuits*
- *Locks SL5 LNBs . . . . . one polarity on each of (6) coax*
- *Die cast Aluminum case . . . . Indoor / Outdoor (lock box)*

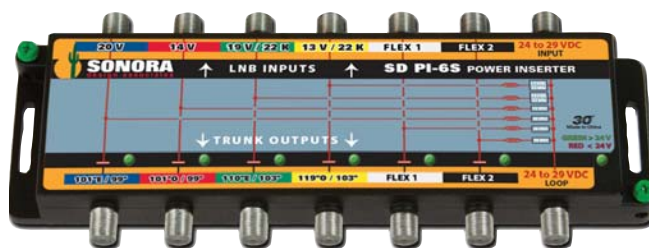
## APPLICATION NOTES

Model **SDPI6S** polarity locker powered by model **PS242000A** provides voltage for the LNBs' and model **TAMP6R03** trunk amplifier.

The **TAMP6R03** has a selectable slope pre-emphasis of either 8 dB or 12 dB. Placing a terminator on the slope port sets the pre-emphasis to 8 dB. The output signal is **-16** at 250 MHz and **-15 dBm** at 2150 MHz.

The **TAMP6R03** has an adjustable automatic gain control window. At maximum output (pot fully clockwise), the output level of the 2150 transponder is -15 dBm.

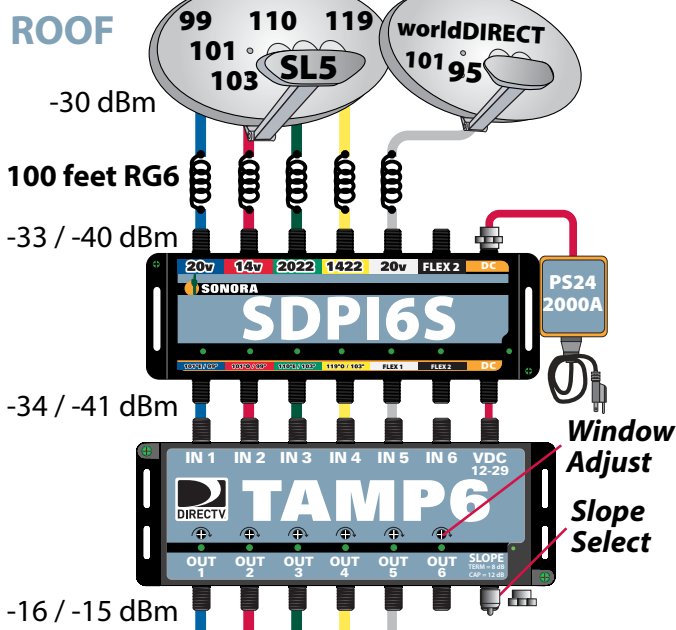
## SDPI6S



**DIRECTV® APPROVED**  
**Model PS242000A**

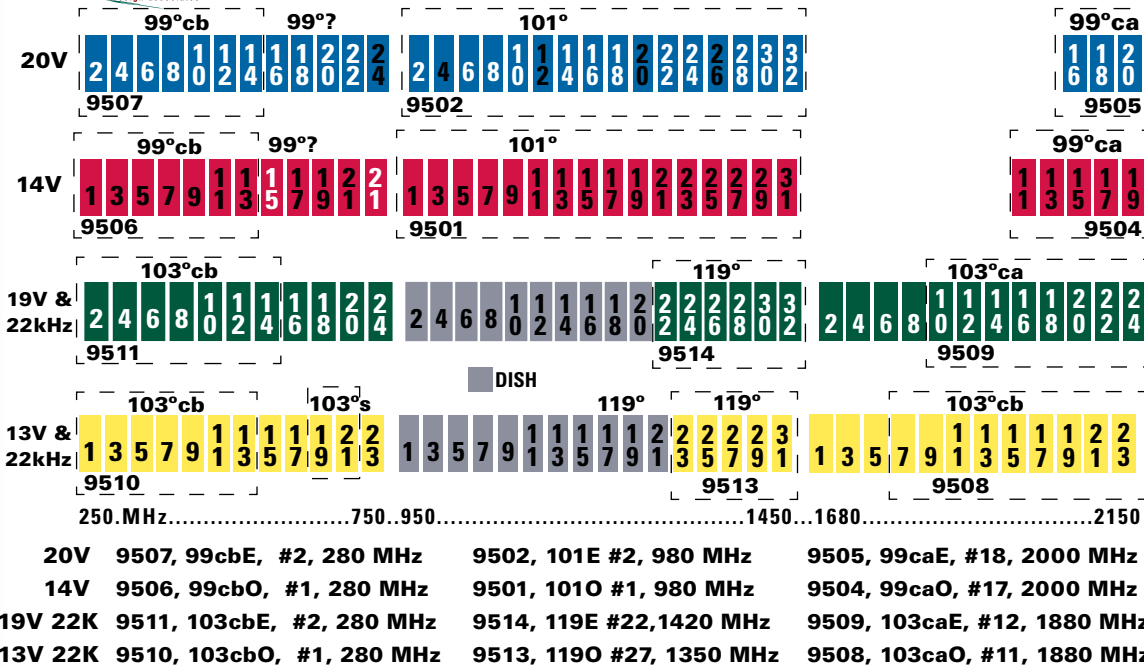
## DESCRIPTION

**DIRECTV® APPROVED SlimLine® SL5, 95° Ku/Ka** and FLEX2 polarity locker and power inserter.



Revised Mar 31 2016

## DIRECTV® SL5 LNB Ka / Ku Frequency Plan Updated: July 16, 2015



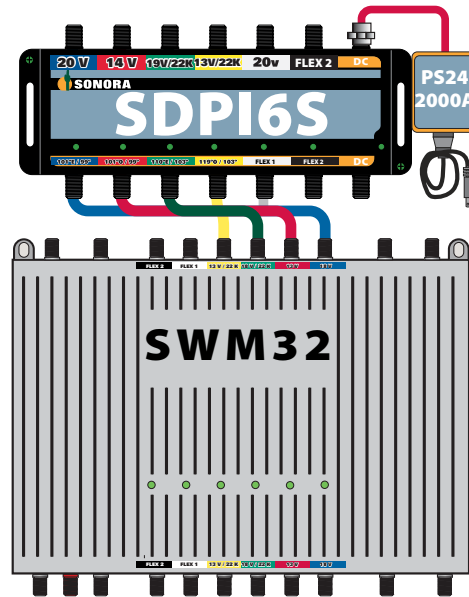
Receivers and AIM meters measure transponders by zip code. The signal meter in the receivers can be used to verify the transponders for your region.

Test channels verify the reception of specific transponders on each polarity. The test channel numbers associated with transponders is provided.

## SPECIFICATIONS

<b>Specifications</b> .....	<b>Typical</b> .....	<b>QC Limit</b>
Inputs / Outputs .....	(6) @ 5 to 2400 MHz	
Insertion Loss.....	0.5 dB.....	1 dB
Return Loss 54-2400 MHz.....	12 dB.....	10 dB
<b>Isolation Cross Polarization</b>		
Any input to adjacent Output .....	> 40 dB.....	> 35 dB
<b>Power Specifications</b>		
Input Voltage .....	23 to 29 VDC	
Power Transformer <b>SDPI6S-T</b> .....	24 VDC, 2 Amp	
	100 to 240 VAC input, switching, short circuit protected	
<b>Output Voltages and tones</b>		
101° & 99° (Even) LHCP .....	20.0 Vdc	
101° & 99° (Odd) RHCP .....	14.0 Vdc	
119° & 103° (Odd) RHCP .....	22 kHz & 13.0 Vdc	
110°/119° & 103° (Even) LHCP .....	22 kHz & 19.0 Vdc	
FLEX1 .....	20.0 Vdc	
FLEX 2 .....	20.0 Vdc	
<b>Mechanical Specifications</b>		
Dimensions .....	3.5" L x 8.75" W x 0.9" H	
Weight .....	1.5 lb (0.7 kg)	
Master Carton <b>SDPI6S</b> (24 units).....	10" x 11.5" x 15"	
Master Carton Weight <b>SDPI6S</b> .....	31 lb. (14 kg)	
Master Carton <b>SDPI6S-T</b> (12 units).....	10" x 13" x 19"	

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



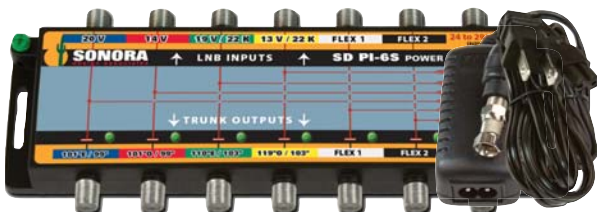
Master Carton Weight <b>SDPI6S-T</b> .....	26 lb. (11.8 kg)
<b>Environmental Specifications</b>	
Operating Environment: .....	Indoor/Lockbox
Ambient Temperature.....	-30° C to +60° C



SWiM SL5 & Worldview 95° ODU Power supply and polarity locker. Operates from 24 to 29 VDC. An Input voltage level detector signals a Green LED when a 24 V minimum voltage is present.

### SDPI6S Trunk Power Inserter

- Powers SL5, FLEX1 & FLEX2 ODUs
- Regulated DC Voltages
- Dual 10 AWG Ground Lugs
- 24 to 29 VDC Input Range
- Input Range LED indicator

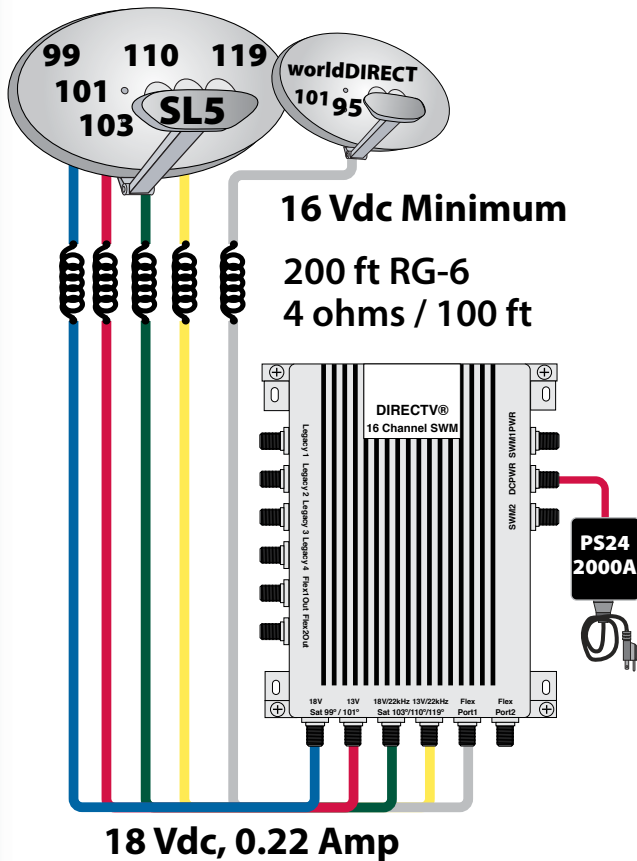


### SDPI6S-T with DC Power Supply

- UL Approved
- 24 Volt 2 Amp
- Interchangeable AC Cord
- F-Connector for DC Input
- Overload Protection



Parameter	UNIT	SDPI6S
Operating Frequency Range	MHz	250 - 2150
Insertion Loss	dB	1.5 (max.)
Flatness in operating frequency	dB	± 0.5
Number of Input Ports	Each	(6) SCTE Indoor F
Number of Output Ports	Each	(6) SCTE Indoor F
Isolation between ports	dB	> 35 dB
Input / Output Return Loss	dB	> 10 (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	19 ± 0.5 (+ 22 kHz)
Port 4 (22 kHz & 13 V 119° & 103°)	VDC	13.0 ± 0.5 (+ 22 kHz)
Port 5 (Flex Port 1)	VDC	20 ± 0.5
Port 6 (Flex Port 2) I	VDC	20 ± 0.5
Number of LEDs	Each	7 (1 per input & 1 for adaptor input)
LED Color Adaptor Input	VDC	> 23.8 : Green < 23.8 and > 0 : RED
LED Color Input Ports:		Green
22 kHz Tone to ODU	kHz	Square wave form
Frequency	kHz	22.0, 18 MIN, 26 MAX
Rise / Fall Time	uS	3 MIN
Amplitude	mVpp	800, 400 MIN, 900 MAX
DC Power Path	mA	1000 (max.) From DC Input to each Input
DC Power Connector Type	Each	(1) SCTE Indoor F
Switching Mode Power Supply	V	24 MIN, 29 MAX
Short Circuit Protection		Yes, 1 A Multi fuse
Lightning Surge Protection		32 V p-p, max shunt 200 A; 8 msec, 1.5 kW max dissipation
Ground Screws	Each	2 Green Screw Ground pt.
Dimensions L x W x H	Inch	3.5 x 8.75 x 0.9
Environmental Requirements		Indoor use only
Operating Temperature range	°C	-34 to + 60 Indoor housing
Humidity		Shall survive 95% relative humidity over operating temperature



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

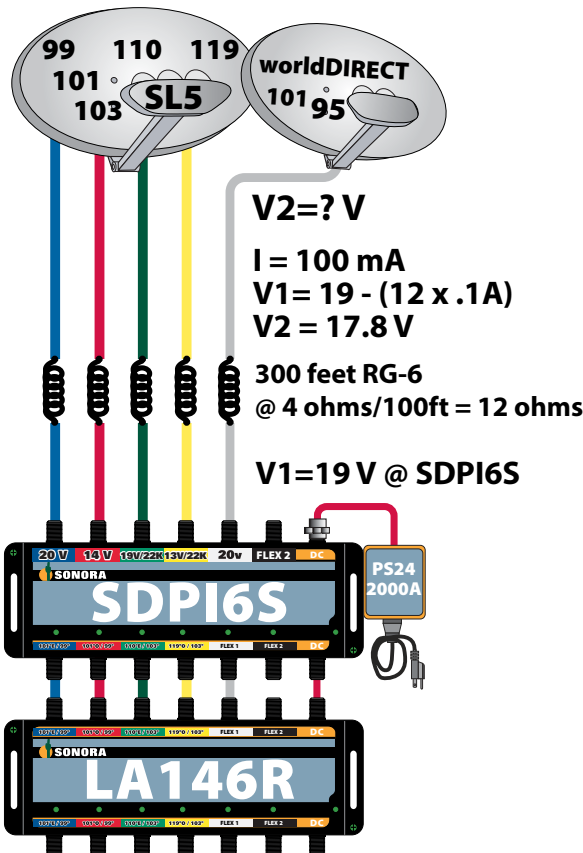
The 18 volts originating at the SWM16 must arrive at the SL5 above 16 volts for the SL5 to operate correctly. Up to (2) volts can be lost in the coax.

Model SL5 LNBs employ current management to minimize the current carried per coax. (400 mA total) Rev3 SL5 LNBs splits the 400 mA current equally at 100 mA per coax.

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

Solid copper RG-6 has a typical loop resistance of 4 ohms per 100 feet. At 200 feet the resistance is 8 ohms.  $0.1 \text{ Amp} \times 8 \text{ ohms} = 0.8 \text{ volts loss}$

$$18 \text{ V} - 0.8 \text{ V} = 17.2 \text{ volts to the SL5}$$



Model SDPI6S-T starts with **19 Volts** to provided extended dish to Main Point of Entry distances.

The extra voltage provides an additional 150 feet RG-6 distance. Model LA146R offsets the signal loss of 150 feet of RG-6.

The LA146R located at the polarity locker does not affect the current loss in the cable to the dish. What is the voltage loss in the 19V/22k coax? Assume 100 mA per coax.

At **300** feet the resistance is 12 ohms.

$$0.1 \text{ Amp} \times 12 \text{ ohms} = 1.2 \text{ volts loss}$$

$$19 \text{ V} - 1.2 \text{ V} = 17.8 \text{ volts to the SL5}$$