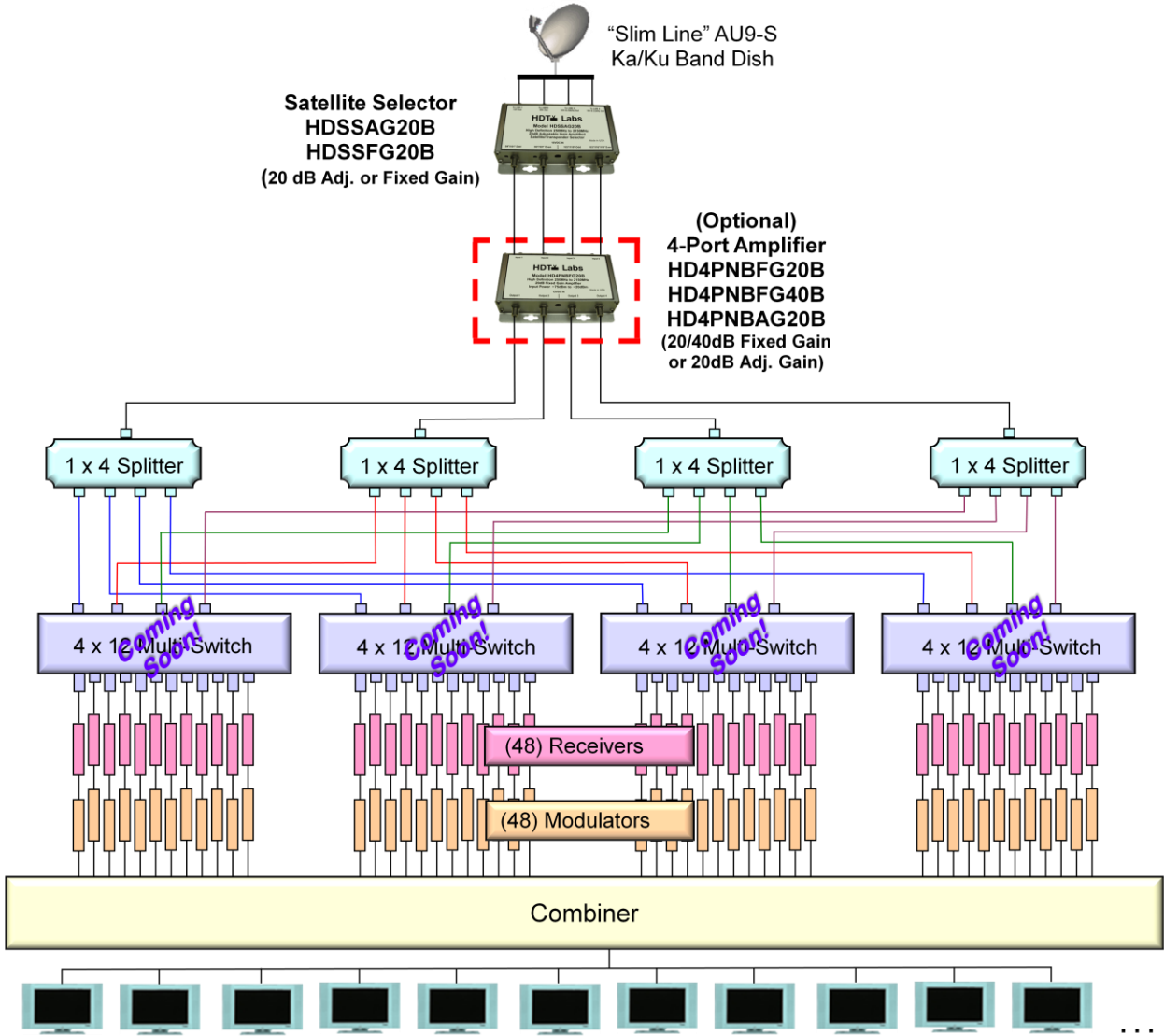


Typical HDTV 48-Channel SMATV System Diagram for DIRECTV



Typical HDTV 48-Channel SMATV System Description for DIRECTV

DISH ANTENNA

Most typical SMATV (Satellite Master Antenna Television) HDTV desired systems will usually use the "Slim Line" AU9-S Ka/Ku band dish (99°/101°/103°/110°/119°) for signal reception. The RF output signal level of the dish will vary between -19dBm and -28dBm, depending upon the model of LNB used. Recommended RG-6 coaxial cable will have a loss of about 10dB per 100' at 2150MHz, when the connectors and ground blocks used are rated to 2GHz.

SATELLITE SELECTOR

Since most SMATV installations will have signal losses due to the number of devices and the number of cable runs required, a Satellite Selector should be used to optimize system performance. The **20dB Adjustable Gain Satellite Selector (HDSSAG20B)** is a combination of polarity locker, 20dB adjustable gain amplifier, and independent power supply that ensures strong and consistent control signals to the dish LNBs and adds signal strength to the system.

Use the Adjustable Gain Satellite Selector to more accurately tune each of the four system channels and maximize the multi-switch output levels to the highest C/N ratio possible. The Adjustable Gain Satellite Selector allows you to build more reliable systems, use fewer parts, and produce a cleaner C/N output on all channels.

4-PORT AMPLIFIERS

If the amplification from the Satellite Selector still does not allow you to hit the desired input windows of the multi-switches and receivers, optional 4-Port Amplifiers can be used. The 20dB Fixed Gain Amplifier (HD4PNBFG20B) when paired with the adjustable gain of the Satellite Selector would be a preferred solution for relatively small system losses. If very large system losses exist, the 40dB Fixed Gain Amplifier (HD4PNBFG40B) should be considered. An alternative to the fixed-gain amplifiers would be to pair a **20dB Adjustable Gain Amplifier (HD4PNBAG20B)** with a **20dB Fixed-Gain Satellite Selector (HDSSFG20B)** to again have precise gain control into the next device. Care should be taken in this case to not over-drive the Adjustable Gain Amplifier.

Input power levels to all three amplifiers can be as low as -75dBm. Since the amplifiers can detect these very weak signals, longer cable runs may be used before amplification is required. All three amplifier types have gain/slope networks built into each of their four channels. As system channel frequencies increase, so does the loss associated with that channel. The gain/slope circuitry essentially keeps the

output signal at a consistent level across all frequencies by applying more gain at the higher frequency channels and less gain at the lower frequency channels.

SPLITTERS

The common 2-way, 4-way, and 8-way splitters may be used in any combination and number in order to produce the desired number of channels, our sample diagram showing 48 channels. Each splitter, however, does introduce loss into the system and reduces signal strength accordingly. Care should be taken when wiring splitter outputs to multi-switch inputs in that each multi-switch input must be from a different satellite, as the color coded lines in the diagram indicate.

MULTI-SWITCH

The **HDTV Labs HDMS4X12P** is a rack-mountable, 1U high (1.75") multi-switch with 4 input and 12 output ports that provide satellite TV signals from all five of DIRECTV's primary satellites to the inputs of 12 receiver channels. When the input signal levels at the receivers are -45dBm or less, you could experience pixilation or 771 searching for satellite every time cloud cover impairs your dish. Hitting the multi-switch at the top of the input window will allow you to have the greatest output signal from the multi-switch. Use your satellite meter to make sure your C/N is greater than 11, typically being 16 to 17 on satellite 101° and 13 to 16 on satellite 119°. Add multi-switches as needed for the desired number of system channels.

RECEIVERS, MODULATORS, COMBINER

The SMATV system can contain any number of channels for distribution. A dedicated commercial satellite receiver is needed for each channel in the system and sends the signal for that particular channel to a modulator. Modulators take baseband audio and video signals from the satellite receivers and modulate these signals onto the desired output channels. The headend combiner then takes the multiple modulator inputs and produces one common output through amplifiers if necessary to the desired number of television sets.

TV's and DVR's

Since individual channel receivers are built into the SMATV system, set top boxes are not required for signal reception. The built-in television tuners are used instead.