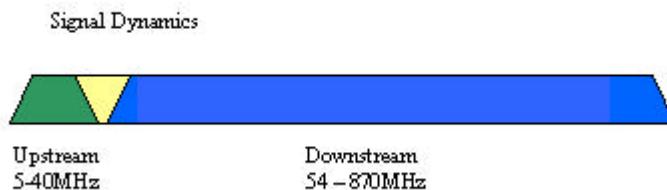


## Signal Dynamics Access Monitoring System



### An Overview :

- Signal Dynamics leverages the unused stop band between CATV upstream and downstream spectrums to insert a non-interfering, "Point of Presence" video and audio channel into the CATV drop.
- No CATV distributable frequencies are used and there is no affect on any CATV product or service.
- As these frequencies are not tunable by existing televisions or cable converters, a unique converter is installed at the television to convert the signal to either baseband or EIA channel 3 or 4.

In the United States, upstream frequencies are typically, 5 MHz to 40 MHz or 42 MHz, with downstream frequencies beginning at 52 MHz or 54 MHz and spanning the entire upper pass-band of the distribution active and passive devices (750 MHz to 1 GHz at this time). Thus there exists a guard band which is a minimum of 12 MHz wide.

The use of diplex filters, in conjunction with two-way amplifiers, allows the cable service provider to offer interactive services across a single coaxial line, while continuing to pass through several amplifiers. The unintended result however, is that there is a 12 MHz band of frequencies, which will not pass through even a single distribution amplifier in either direction, and are therefore unusable to the cable operator.

Figure 1 – Cable subscriber with Converter

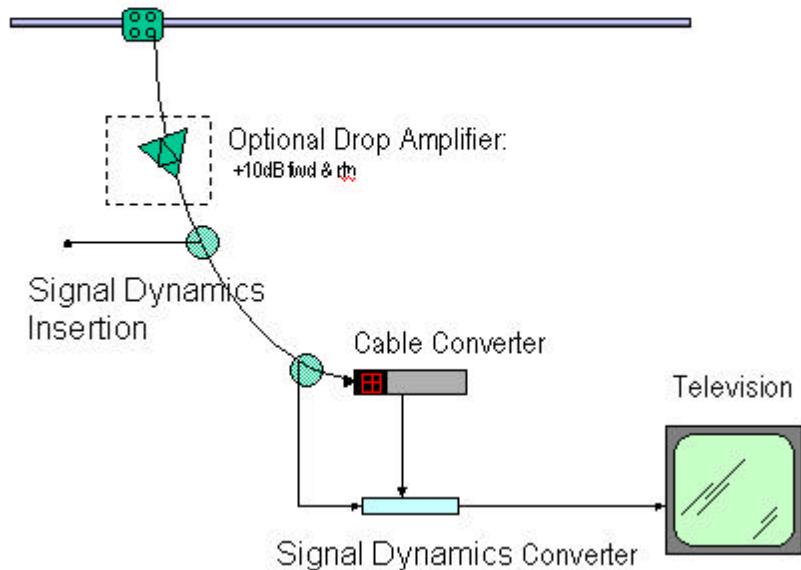
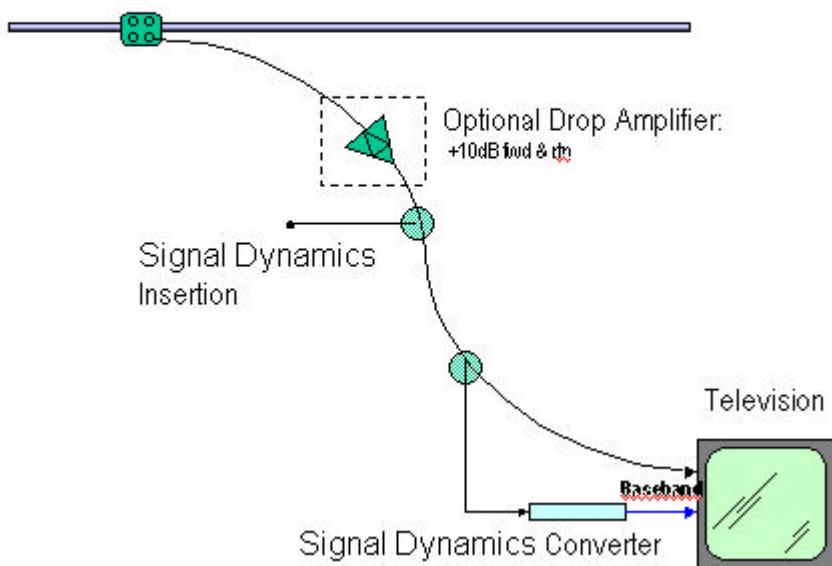


Figure 2 – Cable-Ready subscriber



Refer to figures 1 and 2 above. Employing frequencies only within the unused stop-band between CATV Upstream and Downstream spectrums, (40-52 MHz), Signal Dynamics inserts a 'Point of Presence' video channel into the residential or MDU drop, without insertion loss to cable television signals in either direction. As these frequencies are not tunable by existing televisions or cable converters, intelligence is required at the television to convert the signal to either video or Standard channel 3 or 4 RF (61.25 MHz or 67.25 MHz video carrier, respectively). This is achieved with a simple and inexpensive converter.

Using the Signal Dynamics converter, the user can watch cable television as normal. When the apartment door bell rings indicating a visitor, the user may push the button on the supplied RF remote, and the converter will switch the television feed to an NTSC channel 3 or 4 modulated camera feed from the lobby video camera. Another push of the button and the converter switches the user back to his television show. Alternately if the resident has a video monitor with a baseband video input, he will not use the signal dynamics remote. In this scenario the Signal Dynamics converter will continually deliver a baseband video feed of the lobby video directly to a video input on the monitor. A simple push of the video button on the TV remote will provide the user with a view of the lobby feed. In this case the converter's channel 3 / 4 modulator is turned off.

The converter is much smaller than traditional cable television converters, and is remote-controlled from a single button using a hand-held Part 15C compliant, coded-RF transmitter. These features allow the unit to be installed discretely behind a television or entertainment center.

### Theory of Operation:

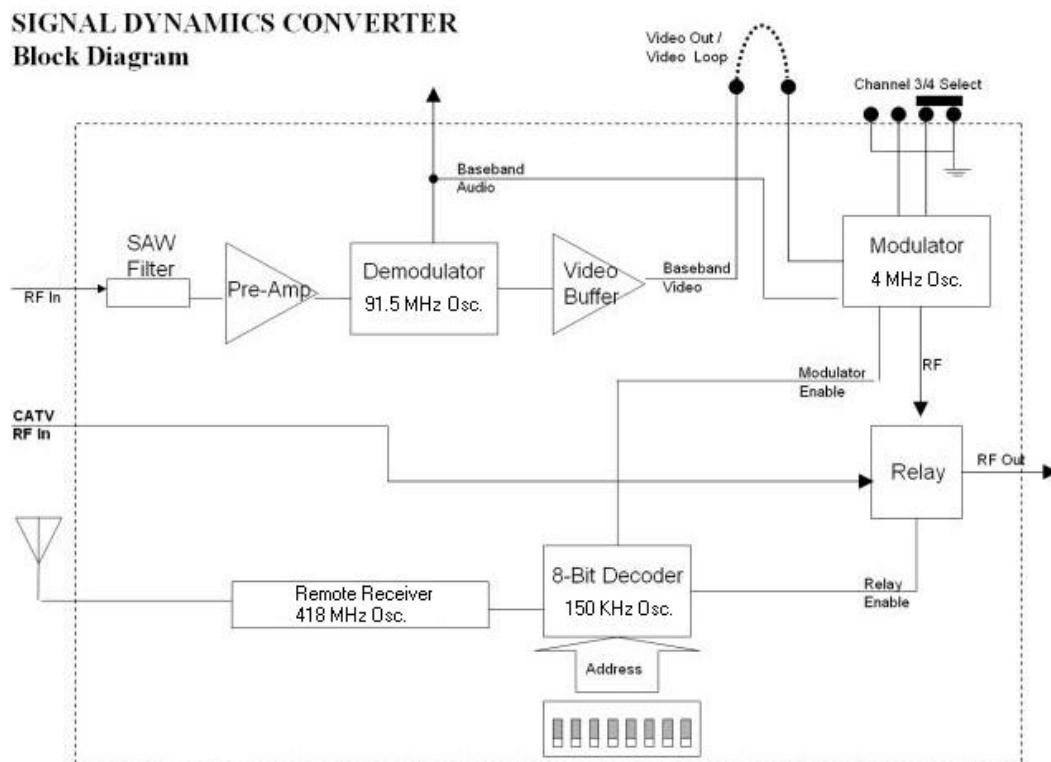
#### **The Converter:**

Again referring to Figures 1 or 2 above, an RF signal is inserted into the subscriber cable drop for each CATV subscriber at a frequency of 45.75 MHz. This stop-band signal will now be available at the subscriber's residence for demodulation and display on the subscriber's video monitor or television set. Referring to the block diagram below (Figure 3), the signal is bandwidth limited by a standard NTSC IF SAW filter before being amplified. This signal is then demodulated to provide color baseband video and sound, which can be fed directly into a video monitor for viewing when desired. The demodulator contains a PLL oscillator that operates at a fundamental of 91.5 MHz.

Alternately these same baseband signals can be re-modulated onto NTSC channel 3 or 4 (switch selectable) by an on-board video modulator. The modulator RF carriers are derived from a reference oscillator centered at 4 MHz.

The RF modulator is turned on only by a call for lobby video via the supplied RF remote control.

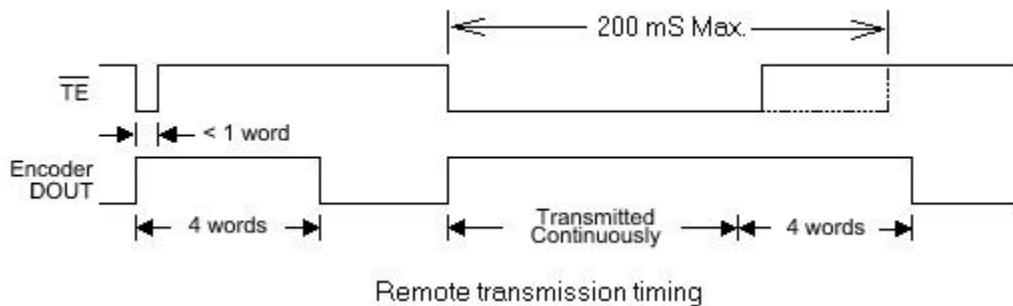
The remote receiver circuit converts the RF signal received from the handheld remote control directly to a baseband data signal. The radio receiver contains an oscillator that operates at 418 MHz. The demodulated baseband data is fed to a 8-bit decoder for remote control address decoding. A given converter responds only to a remote control operating with the same 8-bit address. The data decoder operates and samples its data at a frequency of 150 KHz.



**Figure 3.**

**The Remote:**

The handheld one-button remote is comprised of an RF transmitter operating on a center frequency of 418 MHz +/-200 KHz. The signal is Amplitude Shift Key (ASK) modulated by a 3 KHz data stream. The data stream is generated by an 8-bit data encoder using the following transmission timing:



A 4-word transmission cycle commences upon receipt of a button press. The cycle will repeat for a maximum of 200 mS, regardless of how long the button is held. The transmission characteristics and RF levels of the remote meets the rules defined in the FCC Part 15C rules.

Document end.