

## Master Converter Module

Suitable for S-band up and down conversion with loopback translation

The Master Converter Module is a single unit that houses the S-Band upconverter, S-Band downconverter, and loopback converter all locked to an internal 100 MHz oven controlled reference oscillator. All three converter modules are controlled via an integrated Orbital Data Bus (ODB) controller module which contains the switching power supply, temperature and humidity sensor, and control of the three low phase noise microwave synthesizers. Typically mounted above the High Power Amplifier (HPA) and both the Master Converter Module and HPA use the elevation arm aluminum mass as their heatsink. The Master Converter Module is in a pressurized enclosure designed to provide long term reliability and to withstand severe environmental conditions.

### Features

All internal synthesizers locked to an internal 100 MHz oven controlled reference oscillator (OCXO) with +/-30ppb stability over temperature. The modules are tunable in 10 Hz steps while maintaining very low phase noise. If desired, internal OCXO may be locked to the station 10 MHz reference signal. All converter units are contained in a tightly shielded module with the ODB interface. Interface to the Master Converter Module is a standard 70 MHz input and output for TX and RX. Wide synthesizer loop bandwidths for improved microphonic rejection.

### S-Band Upconverter Module

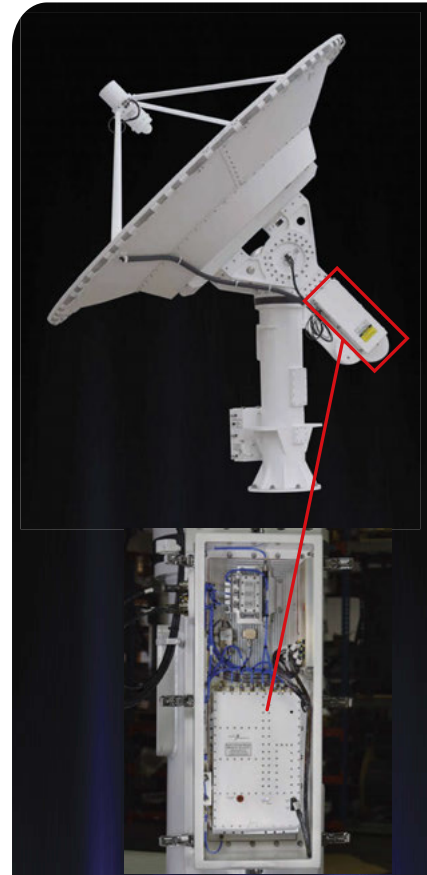
- Converts a standard 70 MHz transmit IF signal to 2025-2120 MHz for driving the HPA assembly
- Tunable in 10 Hz steps
- Low phase noise (-105dBc/Hz at 10kHz typ)
- Dual conversion for excellent image rejection of the upconverted signal
- Internal 0-31.75dB step attenuator remotely settable to adjust HPA drive signal
- No spectral inversion
- Internal power monitor for the S-Band drive output signal
- Typical converted bandwidth 20 MHz
- -20dBm 70 MHz IF minimum to drive HPA to full power output

### S-Band Downconverter Module

- Converts 2200-2300 MHz S-Band receive signal down to a standard 70 MHz IF signal
- Tunable in 10 Hz steps
- Low phase noise (-105dBc/Hz at 10kHz typ)
- Dual conversion with excellent image rejection
- No spectral inversion
- Typical converted bandwidth 20 MHz
- Overall system downconversion gain 60dB typical

### Loopback Translator Module

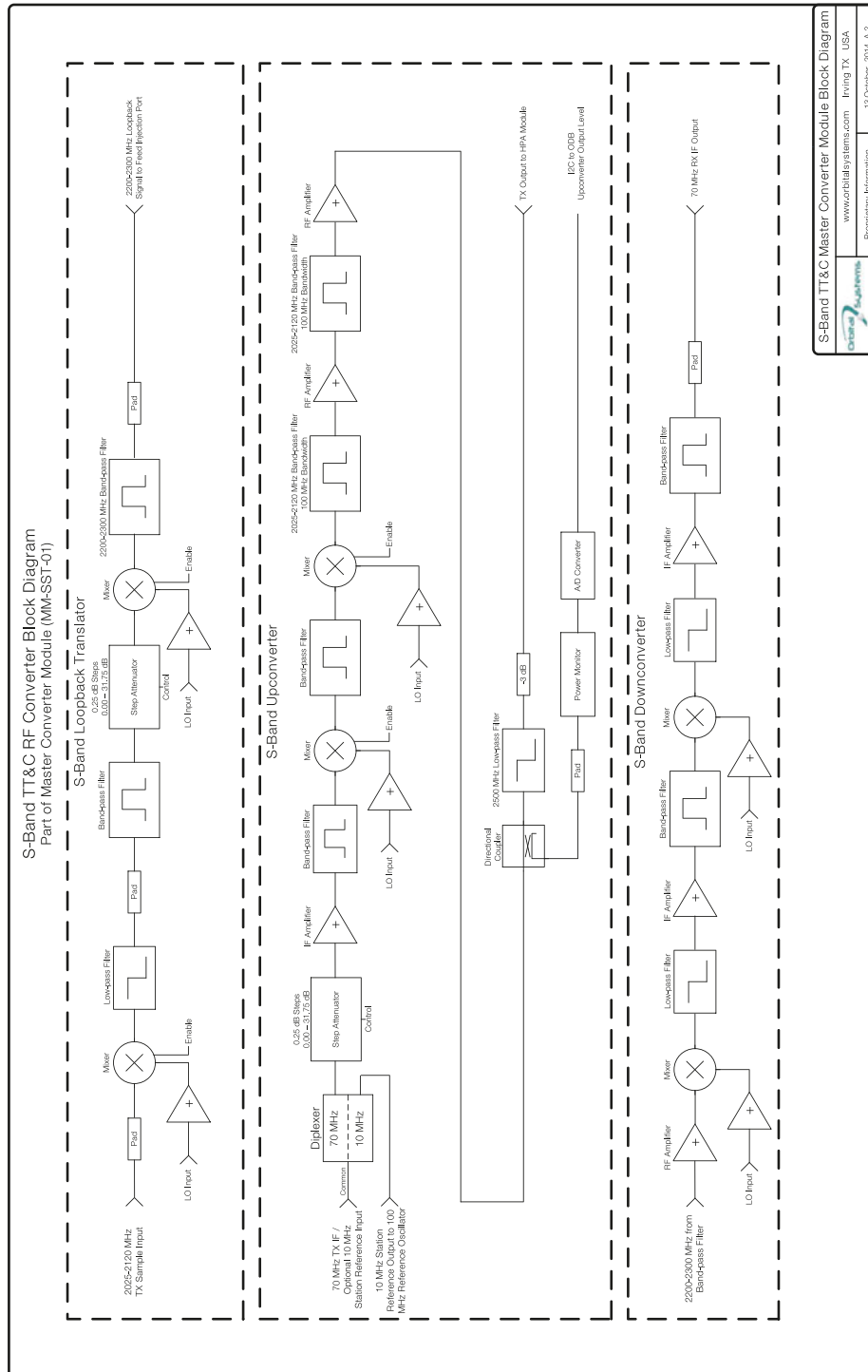
- A sample of the S-Band transmit signal can be converted to the S-Band receive frequency to allow long loopback testing
- Sample signal from transmit path is taken after the HPA
- Loopback testing is available at full power on the HPA via an internal 100 watt termination in the HPA cabinet for off-line testing
- Signal is inserted ahead of S-Band receive LNA to verify complete transmit and receive signal system path
- Internal 0-31.75dB step attenuator remotely settable to adjust desired loopback signal level
- Dual conversion architecture for low spurious output
- No spectrum inversion



### Applications:

The Master Converter Module is used in the following TT&C applications:

S-Band upconversion  
S-Band downconversion  
Loopback translation



S-Band TT&C Master Converter Module Block Diagram  
 www.orbitalsystems.com Irving TX, USA  
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