



*Telemetry Data Link System
Transmitter/Receiver Data Sheet
S-Band downlink/UHF uplink*

Microwave Innovations has introduced a full duplex Telemetry Data link for use in the high dynamic environments typical of weaponry telemetry. This product marries an S-Band downlink transmitter with a UHF uplink receiver in the airborne package while incorporating the latest advances yielded from high shock testing in excess of 50,000g's. Low voltage operation, high overall efficiency, and small size make this duplex data link ideal for use on High Dynamic Environment Ballistic and Missile platforms which desire to uplink command information to the airborne platform.



Product Specifications: Full duplex data link system

S-Band downlink operating characteristics:

Frequency of Operation: 2200.5 - 2299.5, or 2300.5 - 2399.5 MHz (1.0 MHz steps)
Frequency Stability: +/-0.002%
Output Power: Up to 1 Watt minimum
Output Z: 50 Ohms nominal
VSWR: 2.0:1 nominal
Spurious Outputs: As per IRIG-106
Load protection: Protected against open/short

Downlink modulation characteristics:

Modulation Type: True FM
Modulation Frequency Response: 100 Hz to 10 MHz
Modulation Sense: Positive
Modulation Input Z: 75 Ohms/ Hi-Z optional
Optional Filtering: CCIR-405; or up to a 6-pole Bessel pre-modulation filter
Sensitivity: Factory set per user requirements
Distortion: < 2.0%
IFM: 10 kHz peak maximum
IAM: < 2%

Power requirements:

Voltage Range: 8 to 16 Vdc
Current Consumption: 200 mAmp (16 dBm TX power out, higher power transmitters available)
Reverse Polarity Protection: Provided

Command uplink characteristics:

Frequency of Operation: VHF/UHF Bands; 433 to 868 MHz
Frequency Stability: +/-0.002%
Sensitivity: -90 dBm for 20 db S+N/N
Data Rate: < 80 Kbit/sec
Output voltage: 3 Vpp
Output Z: 600 Ohms nominal
VSWR: Input 2.0:1 nominal
Image Rejection: -50dB typical
Max RF input level: 0 dBm

Environmental specifications:

Temperature Range: -20 to +70°C Standard, -40 to +85°C Optional
Humidity: Non-Condensing
Acceleration: 15,000 g's
Shock: 100g's, 1/2 sine, 11 msec
Vibration: 20g's sine, 10 Hz to 2 kHz
0.1g²/Hz Random, 10 Hz to 2 kHz

Mechanical/Connector characteristics:

RF Output: SMA Female
DC Input: 10 Pin Header
RF Input: SMA Female
Mounting/Outline Dimensions: See outline.

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Product Specifications: Full duplex data link system

Technical discussion:

This data sheet provides overall detail on a complete full duplex telemetry uplink and downlink system as used in support of high dynamic airborne platforms.

The airborne assembly is built in accordance with stringent manufacturing standards, incorporating a command receiver into a typical airborne telemetry package. Thus the telemetry user is now afforded the ability to uplink command information to the airborne platform while in flight.

The basestation assembly integrates conjugate hardware to that of the airborne platform providing for the UHF RF uplink transmission of commands while simultaneously allowing for reception of the S-Band telemetry downlink from the vehicle. The package also includes power supply filtering, all in a rugged aluminum enclosure approximately 10 x 10 x 4 inches. A small "user area" is available to allow for placement of custom circuitry (such as decoding, encoding, formatting of data). 110 Vdc operation is possible using a simple power converter which can be supplied with the system.

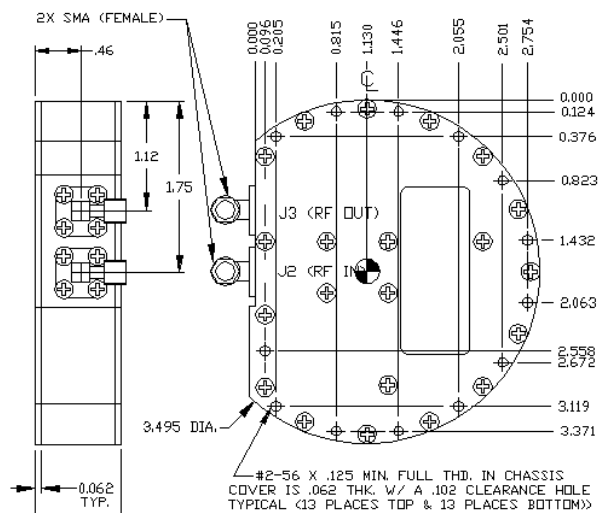
Previous efforts have yielded complete end to end systems, as depicted below, including airborne wrap around antennas.

Mechanical configuration (system photo):



Shown above is hardware as previously provided in support of a ballistic interceptor test program. The small airborne package (lower right in the photo) operated in accordance with the specifications detailed on the front of this data sheet while the basestation integrates the ground support RF hardware consisting of an S-Band receiver colocated with the UHF command uplink transmitter. The RF connections to the ground support antennas are on the backside of the package and not visible in this photo. The connections front side are for data in (uplink) and out (telemetry downlink), as well as power and interface to the user circuitry. The antenna shown is a dual band unit and is program specific. Variants of these designs may be appropriate for your program. Call to discuss your specific requirements.

Mechanical detail (airborne package):



J1 CONNECTOR (FARSIDE)			
USER INTERFACE-SAMTEC P/N SDL-105-T-11			
PIN	FUNCTION	PIN	FUNCTION
A	DC INPUT VOLTAGE	F	DATA IN GND
B	N/A	G	ENABLE/DISABLE (TX)
C	DATA OUT(+)	H	DATA OUT GND
D	N/A	I	SIGNAL STRENGTH OUTPUT
E	DATA IN(+)	J	DC RETURN/GROUND