

Southern California Microwave

SECURE DIGITAL DATA LINK - SDDL

SOQPSK DIGITAL DATA LINK TRANSCEIVER FOR UNMANNED SYSTEMS



The L-3 SCM Secure Digital Data Link (SDDL) is comprised of a highly compact and efficient SOQPSK TDMA Transceiver that provides a robust downlink and uplink for Unmanned Vehicle applications. The SDDL enables optimal utilization of frequency spectrum by use of a single RF channel supporting an IP-based, Bi-Directional TDMA Transport Stream for downlink of Compressed Video and Data information, and uplink of Sensor Command and Control information. The spectrally efficient SOQPSK modulation utilizes an Occupied Bandwidth of only 5 MHz in wide-band mode, and only 2 MHz in narrow-band mode. This provides for up to 4-times the number of available channels for UAV Operations as compared to analog solutions. The SDDL is fully compliant with the Small Unmanned Aerial Vehicles Digital Data Link (SUAS DDL) Waveform Specification.

The SDDL Transceiver supports a standard NTSC/RS-170A Analog Color Video input that is compressed using H.264 (MPEG-4 Part 10/AVC) compliant video compression prior to encoding into the transport stream. The SDDL also supports a single Low-Rate EIA RS-232 Data Channel and an 802.3 Compliant Ethernet connection. An optional, user defined, High-Speed Data Channel can be configured to support a variety of sensor payloads. The aggregate encoded IP-based transport stream is secured by utilization of industry standard AES-128 Encryption.

SDDL Transceiver setup and control is accomplished through an EIA RS-232 Serial Control Interface Channel providing a simple command/response User Interface. The User Interface enables full control of the video compression settings, transceiver configuration/control, and status queries of operational parameters such as Transmitter and Receiver temperatures and Receive Signal Strength Indication (RSSI).

Size, weight and power have been minimized to meet the demanding requirements of SUAS and other mobile UAS platforms. The SDDL occupies only 17 cu. in., weighs less than 12 oz. and consumes less than 15 Watts of total power at full RF transmit power.

KEY FEATURES

- Utilizes a Single, Bi-Directional, TDMA RF Channel
- SOQPSK Modulated Transceiver Design
- L or S-Band Operation
- 2-Watt Nominal RF Output Power
- NTSC/RS-170A Analog Color Video Interface
- 802.3 Compliant Ethernet Interface
- Low-Rate Serial Data Interface
- Optional High-Rate Data Interface
- AES-128 Encryption
- H.264 (MPEG-4 Part 10/AVC) Video Compression
- SUAS DDL Specification Compliant

Excellence You Can Measure



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SDDL SPECIFICATIONS

SOQPSK DIGITAL DATA LINK TRANSCEIVER FOR UNMANNED SYSTEMS

ELECTRICAL

Modem Characteristics

Maximum Aggregate
Data Rate: Narrow-Band: 1.5 Mbps
Wide-Band: 4.5 Mbps

Occupied Channel
Bandwidth: Narrow-Band: 2.0 MHz
Wide-Band: 5.0 MHz

Interfaces:
Video: NTSC/RS-170A
Ethernet: 802.3 Compliant
Low-Rate Data: Serial EIA RS-232; 115.2 kbps,
Maximum
User Control: Serial EIA RS-232; 115.2 kbps
High Speed Data Option: Serial Two-wire; 4 Mbps, Maximum
Video Compression: H.264 (MPEG-4 Part 10/AVC)
Encryption: AES-128

Transceiver Characteristics

Modulation Format: SQPSK
Frequency Ranges: L-Band (1710-1850 MHz,
standard; 1625-1850 MHz,
optional),
S-Band (2200-2500 MHz)
Frequency Selection: Serial User Control Interface: Select
Frequencies in 500 kHz Increments
across Selected Band
Frequency Stability: ± 10 ppm
RF Output Power:1 mW (0 dBm) to 2W (+33 dBm)
in 1 dB Increments
RF Output Impedance: 50 Ω
Receive Sensitivity: -86 dBm, Minimum
VSWR: 2.2:1, Maximum
Image Rejection:60 dB, Minimum
Noise Figure:6 dB, Maximum
Dynamic Range:60 dB, Minimum
Video Input Impedance: 75 Ω

Power Requirements

Input Voltage(Including
ripple and noise): +12 to +18 VDC
Operating Power: 15 Watts, Nominal
Reverse Polarity Protection Up to 18 VDC

SIGNAL INTERFACE

Connectors

RF: SMA female
Video, Low-rate Data, User
Interface, Ethernet, Power: 34-pin Harwin Jackscrew,
M80-5303442

ENVIRONMENTAL

Temperature: Operating: -20°C to +70°C min.,
Baseplate
Overtemp Protection: Transceiver will Shut Down at
75 °C, then Resume Normal
Operation at 72 °C
Altitude: Unlimited
Vibration: 2G Random, 20 Hz – 2000 Hz,
0.4 DA Maximum

ENVIRONMENTAL

Size: 2.85" x 6.0" x 1.0" (7.24 x 15.24 x
2.54 cm)
Weight: 12oz., (340.32 g), Maximum

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