Telion-Series Software Defined Radio Transceiver Characteristics (incl. ARDS-compliant waveform)

Last Updated: 12/2010

General characteristics		
Frequency band of operation	1350…1390 MHz	
RF channel throughput	Defined by the loaded software. • 1.28634 Mb/s for ARDS waveform; • from 100 kb/s to 1.3 Mb/s otherwise.	
Signal OC-BW	Depends on the type of modulation chosen and RF bit rate selected. From 12.5 kHz to 2.6 MHz. In ARDS-compliant mode: -3 dB 800 kHz; -20 dB 1.8 MHz; -40 dB 5.8 MHz; -60 dB 10 MHz.	
Modulation types supported	Various. Currently supported SOQPSK (ARDS-compliant), MSK, GMSK, FSK.	
Error correction	In ARDS-compliant mode: Convolutional code, r = ½, G1 = G1-1011011; G2-1111001. On Rx – Viterbi, hard decision, k = 7.	
Error detection	Transceiver can support user-defined CRC protocol. Several standard protocols are supported: CRC16 (by default), CRC24 (ARDS-compliant, MIL-STD 188-184), CRC32	

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Interleaving/De-interleaving	In ARDS-compliant mode: 36x47 matrix Interleaver/De-interleaver.	
Network topologies supported	TDMA (ARDS-compliant), Push-to-Talk, Point-to-Point, Point-to-Multipoint, proprietary TDMA (including Masterless TDMA).	
RF Network security	The following parameters are user selectable, providing required network security: • Hop Rate as fast as 100,000 times per second; • Fast frequency hopping option; • Number of data bytes within each RF packet; • Deviation/modulation index for the RF channel transmissions; • Hop table up to 128 frequency channels long. Each frequency channel is user selectable.	
	Available cryptography (AES, DES, and 3DES algorithms).	
Methods available to user to overcome in-band interference	User has ability to: • Select fast frequency hopping vs. slow frequency hopping; • Select frequency channels for their network, which will be overlapping the in-band interfering signal the least; • Select different hopping rate (including single channel operation); • Select different number of data bytes per each RF packet.	
Transmitter		
Frequency band	1350…1390 MHz.	
Output power	Programmable with 1 dB steps, up to 1 Watt.	

Maximum duty cycle	In ARDS-compliant mode < 20%. Otherwise, up to 100% (either CW or modulated).	
Current in transmit mode at maximum output power	• 1.8A @ 4 VDC; • 1 A @ 6 VDC; • 500 mA @ 12 VDC.	
Receiver		
Frequency band	1350…1390 MHz, 25 kHz channel spacing.	
Sensitivity	In ARDS mode: -97 dBm @10^-4 (no FEC); -102 dBm @10^-4 (with FEC) In Proprietary modes: -110 dBm @ 10^-4 (no FEC, 130 kbps) -97 dBm @10^-4 (no FEC, 1.3 Mbps)	
Frequency Stability	1.5 ppm	
Demodulation techniques	In ARDS-compliant mode: Coherent In Proprietary modes: Depends on the type of the signal used for the communications.	
Maximum input signal level	At least 0 dBm (sinusoidal signal of this amplitude within the frequency band of transceiver's operation will not result in permanent damage of the transceiver's hardware).	

RF selectivity	-3 dB 40 MHz -20 dB 72 MHz -60 dB 120 MHz	
Current in full receive mode	• 350 mA @ 4.5 VDC; • 250 mA @ 6 VDC; • 125 mA @ 12 VDC.	
1st IF Selectivity	-3 dB 2.6 MHz -20 dB 4.5 MHz -60 dB 12 MHz	
2nd IF Selectivity	In ARDS mode: -3 dB 900 kHz -20 dB 1.98 MHz -40 dB 5.4 MHz -60 dB <6.5 MHz In Proprietary mode: Reconfigurable and determined by the characteristics of the digital filters.	
Image rejection	80 dB	
Spurious rejection	60 dB	
Electrical and Mechanical characteristics		
Input voltage range	3.6…36 VDC.	

<table>
<tr><td>Operating temperature range</td><td>-40 … + 80 deg C.</td><td></td></tr>
<tr><td>Humidity</td><td>Up to 95%, non-condensing (-30 … +60 deg C).</td><td></td></tr>
<tr><td>RF connector</td><td>MCX.</td><td></td></tr>
<tr><td>Data connectors</td><td>Board-level transceiver provides 30-pin high density data connector. For signals assignment see TBD by Lexycom.</td><td></td></tr>
<tr><td>Data interfaces</td><td>Serial Ports

Port1
<table>
<tr><th>ARDS-compliant mode</th><th>PTT mode</th><th>Otherwise</th></tr>
<tr><td>CDU operation, Menu driven, asynch. NRZL, 2-line operation, 19200-8-N-1 fixed settings.

Can be used for software updates.</td><td>Diagnostics port, asynch. NRZL, 2-line operation, command driven, SMNP-like command set. 57600-8-N-1 fixed settings.</td><td>Secondary data port or Diagnostics port. Transparent or Command-based operation. Up to 921.6 kb/s, various Parity, number of DataBits, and number of Stop bits.</td></tr>
</table>
Port2
<table>
<tr><th>ARDS-compliant mode</th><th>PTT mode</th><th>Otherwise</th></tr>
<tr><td>Data port, SDLC/RS232 switchable (non-dynamic, defined at power-up).

In SLDC mode operates</td><td>Diagnostics port, asynch. NRZL, 2-line operation, command driven, SMNP-like command set. 57600-8-N-1 fixed settings.</td><td>Secondary data port or Diagnostics port. Transparent or Command-based operation. Up to 921.6 kb/s, various Parity,</td></tr>
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with Internal or External clock. In External clock mode a 806.4 kbps clock is supplied by the transceiver onto the TxC line.		number of DataBits, and number of Stop bits.	

JTAG Port
Complies with IEEE 1149.1 standard. Includes TMS, TCK, TRST, TDI, and TDO signals.

Ethernet Port (optional)
10/100Base-T, full/half duplex, MDI/MDI-X auto crossover.

USB (optional)
2.0 compliant.

General Purpose IO lines
Up to 12 (**TBR**) general purpose digital IO lines are available. 3.3V CMOS level. Not-fused, not-isolated.

In the ARDS-compliant mode some of the IO lines are used as follows:
(*) TransmitBlinking Pulse;
(*) Select SLDC/RS232;
(*) TimeSlot Pulse.

In PTT and masterless-TDMA modes one of the IO lines is used for 1PPS input.

	SPI (otional) (**TBR**)	
Programming the transceiver	Via CDU/Dignostics port using SNMP-like protocol. Configuration software is included. OR Via JTAG interface.	
Dimensions (board level)	3.18'' x 2.89'' x 0.47''. Fits PC/104 8/16-bit carrier boards.	