

Cortex RTR-L - Radio Telemetry Receiver



IN-SNEC® **CORTEX Series**

With more than 40 years of experience in telemetry, ZDS is introducing its new Cortex Receiver : the RTR – L, the new generation of the worldwide acclaimed Cortex RTR-XL, the most advanced digital telemetry receiver on the market.

Since 2002, it is more than 600 Cortex RTR-XL which have been selected by the most demanding flight test customers from Governmental Test ranges, Aircraft manufacturers and space Agencies.

Thanks to its new modular architecture, the 4U chassis-based Cortex RTR-L can support up to four channels in IF, P, L, S and C bands, allowing multiple carrier reception and combination as well as low / high gain antenna selection.

Its powerful front end features an IRIG 106-07 Tier II compliant phase noise, an outstanding 110dB-dynamic linear AGC and an unmatched adjacent channel rejection with 8 SAW filters.

The redesigned MMI gives the operator a state of the art and very intuitive approach in receiver set-up and monitoring (contextual menus, one touch mission loading, visual block diagram representation, Eye Diagrams & Spectrum Viewer displays for multiple channels,...)

Alike the Cortex RTR-XL, not only the FPGA-based architecture offers a versatile and reliable digital processing but it empowers the user with a long-term provision for supporting higher bit rates, new demodulation and much more just through simple user-made on-site software upgrades.

Complementary with the existing Cortex RTR-XL, the Cortex RTR-L will satisfy any customers from aircraft manufacturer to test ranges where reduced hardware is required without compromising the performances.

**REDESIGNED
MMI**

**The new generation of
cost-effective and high
performance COTS solution**

Main Features

- Single, dual & quad channels IF/P/L/S/C band (fully independent)
- Excellent phase noise compatible with Tier II modulations
- Optimum ratio Pre-D combiner (available in frequency & polarisation diversity) with automatic switching to Best Source Selector mode
- Multi-mode demodulator Tier 0,1,2 (PCM-FM, SOQPSK, Multi-h CPM)
- Unprecedented multi-h CPM BER & acquisition time
- AM demodulation for antenna tracking
- PC-based with Windows XP OS environment
- 2 types of chassis :
 - ◆ standard (screen and built-in keyboard)
 - ◆ blind (no screen, no keyboard, extractible hard disk, front panel ON/OFF button)
- Embedded 20Mbps bit and frame synchronizers with telemetry over IP (compatible with Eurilogic MAGALI decommutation software)
- Decoders : FEC (Viterbi, ...), Reed Solomon, ...
- Built – in S-band test generator and BER Tester
- Simultaneous spectrum viewer & eye diagram
- 100% in-house designed product

Main Benefits

- User-friendly and intuitive MMI
- High integration with drastically reduced hardware for increased availability
- Enhanced performances, upgradeability and flexibility due to extensive use of Digital Signal Processing techniques
- No tuning, no preventive maintenance
- RF design performances better than IRIG106
- Quad-band (P, L, S & C) receiver without changing RF modules
- Fast diagnostic & assistance

ZODIAC DATA SYSTEMS

AEROSAFETY & TECHNOLOGY
Telemetry & Telecommunications

**ZODIAC
AEROSPACE** 

Technical specifications

Radio

Frequency range (and / or)	
C-band (EU & US)	4400 – 5250 MHz
S-band	2180 – 2485 MHz
Upper L-band	1710 – 1850 MHz
Lower L-band	1429 – 1545MHz
P-band	200 – 500 MHz
IF	70 MHz
RF inputs	up to 4 (N-type 50 Ω)
IF inputs / outputs	up to 4 / 6 (from/to IF recorder RSR)
Dynamic range	-10 dBm to noise threshold
Non destructive level	+ 10dBm
Noise figure	< 12 dB (8 dB typ.)
Spurious signal rejection	> 60 dBc
VSWR	2 : 1
Phase noise	IRIG 106-07 Tier II compliant
IF analog filters	8 pre-selection SAW (500kHz to 36MHz)

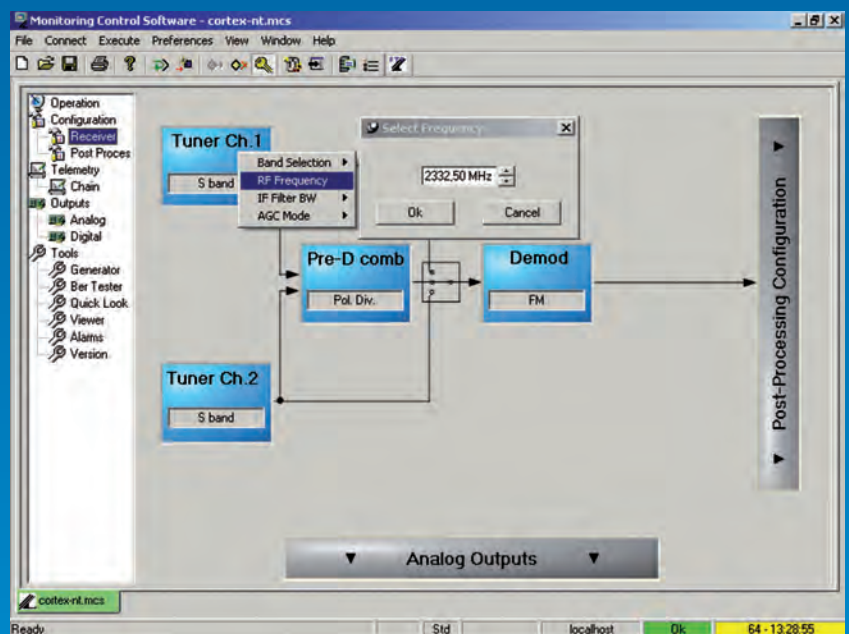
Signal processing

IF filters	30 FIR digital filters (3kHz to 36MHz)
AGC modes	Automatic / Manual / Freeze
AGC time constants	5 (0.1 to 1000 ms)
AM response	from AGC cut-off to 50 kHz
Diversity combiner	Polarisation (or space) & Frequency
Combiner balance control	Equalizes CH1/CH2 noise floors
Combiner modes	Pre-D dual channels with optimal ratio and automatic best source selection (CH1/CH2 fade level of 5 dB)
Pre-D gain	> 2.5 dB for two identical SNR
Pre-D tape recording & playback	5kHz to 10MHz
Demodulation	FM, PM, AM (auto-tracking), BPSK, QPSK, OQPSK, SOQPSK, Multi-h CPM
Video filtering	17 digital filters (12.5 kHz to 20 MHz)
De-emphasis (TV)	CCIR 405-1 (525 or 625 lines)
Bit synchronizer	single channel with RS422 and/or TTL outputs
PCM codes	NRZ-L/M/S, BP-L/M/S, DM-M/S, differential, RNRZ-L...
Bit rates (max)	PCM/FM 30 Mbps QPSK 20 Mbps SOQPSK 40 Mbps Multi-h CPM 24 Mbps
Decoders (CCSDS)	Viterbi (7,1/2) Reed Solomon (223,255)

Miscellaneous

M&C	local or distant PC (via TCP-IP)
Rackable chassis	19-inch, 4 U, D=550mm standard or blind version
Operating temperature	+10°C to +40°C
Storage temperature	-40°C to +70°C
Power supply	100-240 VAC, 50-60 Hz

Cortex RTR-L



NEW DEVELOPMENTS

- ▶ Branch source selector on the digital PCM stream (after the bit synchronizer)
- ▶ Turbo product decoder embedded for improved transmission
- ▶ Dynamic equalizer solution against multipaths
- ▶ Number of independant demodulators (increase up to 6)
- ▶ True real-time ZDS Advantys decommutation system in the RTR

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