



WIR VERSTEHEN DIE ZEICHEN DER ZEIT
KEEPING PACE WITH THE SIGNAL OF TIME



ComCat™ Tuner – CCT-NG –

versus

LANReceiver – LR2 –

The MEDAV Tuners in Comparison

Why this Comparison?

When reading through the MEDAV equipment descriptions, brochures and data sheets, it may attract attention that in different projects or solutions different types of tuners are recommended.

The interested reader will probably ask, how it comes that MEDAV offers two tuners and what the advantages and disadvantages of them are.

The answer is, that the two MEDAV tuners are the up-to-date hardware receiving equipment used in current projects and solutions. The difference between them is, that the tuners fulfil different types of requirements, depending on the tasks for which they are intended to be used.

These are briefly described in the next two sections, explaining the special features of the tuners and their intended application areas. Then, the technical data are compared in tables. For more detailed information on the tuners in general, please consult the data sheets of the tuners.

When to use the ComCat Tuner “CCT-NG”?

The **CCT-NG** is the **high-end tuner** with better technical data, especially analogue filters. According to this, it is more expensive (approximately 4-times) than LR2.

It can work with up to **24 MHz instantaneous bandwidth**. It provides a **built-in Fast Fourier Transformation (FFT) processor** and can output not only **digitized IF**, but also **complex FFT data** or **power spectrum density (PSD) data**. **Four built-in hardware digital down converters (DDC)** enables the tuner to output up to 4 independent sub-bands of digitized IF.

CCT is typically used for wideband search & detection or for processing of multi-channel signal.

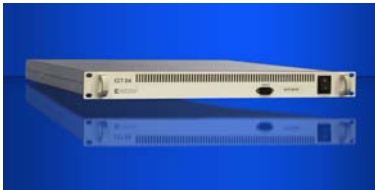

When to use the LANReceiver “LR2”?

The **LANReceiver LR2** is the "little brother" of CCT, also working with a **direct sampling concept**, but with less bandwidth (150 kHz via USB or 500 kHz via LAN) and no built-in FFT or PSD capabilities.

This tuner is typically used as "hand-off" receiver, providing exactly one narrowband channel to enable for monitoring of one radio signal.

Read and compare about the special features and technical data of both tuners on the following pages.

Core Features

Feature	ComCat CCT-NG	LANReceiver LR2
Figure		
HF Frequency range:	100 kHz (9kHz) – 30 MHz	LR2-D2: 100 kHz - 30 MHz
IF, FFT, PSD bandwidth:	15.625 kHz - 24 MHz	8 kHz - 500 kHz (IF)
Tuning resolution	1 Hz	1 Hz
High input sensitivity	yes	yes
High in-band dynamic range	yes	yes
RF sampling	Direct RF sampling of HF and IF sampling of V/UHF signals	Direct RF sampling of HF signals
Digital down converter	Integrated Digital Down Converter	Integrated Digital Down Converter
AGC control	yes	yes Wideband power measurement before A/D conversion allows exact AGC control
Output of digital complex baseband data (CBB)	Up to 16 MHz to LAN	Output of digital complex baseband data (CBB) up to 500 kHz bandwidth
Output of pre-processed complex spectrum (FFT) data to LAN for external use	Up to 16 MHz bandwidth	-
Output of pre-processed power spectrum density (PSD) data to LAN for external use	Up to 24 MHz bandwidth	-
	Synchronisation of multiple tuners	-
	Real-time frequency response calibration of the entire HF path, e.g. for Direction Finding (DF) applications	-
Housing	Compact 19" / 1U size	Deliverable as half 19" table housing Two single tuners can be combined to a standard 19" 1 U size housing using the optional rack mount kit
Robust design	yes	yes
Processing	Embedded ADC and high speed signal processing core Smart processing algorithms for comprehensive signal detection, signal search and classification applications on external PC hardware	Embedded 16 Bit ADC and high speed signal processing core Smart processing algorithms for comprehensive signal detection, signal search and classification applications on external PC hardware
Preselector filters to suppress out-band signals	yes	yes
Remote operation	Fully remote controlled operation using TCP/IP or CORBA software interface	Fully remote controlled operation using TCP/IP or CORBA software interface
Power	60 Watt	Low power consumption less than 25 Watt
Analogue IF output options	-	IF1: BW = 3 MHz at 10.7 MHz IF2: BW = 30 kHz at 455 kHz
Smart software interfaces for fast integration	Graphical user interfaces Virtual Devices (VD)	Graphical user interfaces Virtual Devices (VD)

Technical Specifications

Feature	ComCat CCT-NG	LANReceiver LR2
Analog to Digital Converter Sampling Rate	120 MS/sec	66.66 MS/sec
External References 10 MHz	50 Ohm, 0dBm to +10 dBm	-
SYNC	CMOS 3.3 V (5V tolerant input) If used for synchronizing the rising SYNC edge related to the rising 10 MHz edge must follow the timing requirement	-
	SYNC before 10 MHz 7.7 ns +- 750ps Raise time SYNC IN <= 1 ns / V	
Digital Postprocessing Digital Down Converter	variable decimation	variable decimation
Complex Baseband (CBB)	variable bandwidth: 15.625 kHz to 24MHz	variable bandwidth: 8 kHz to 500 kHz
Complex FFT (CFFT)	4096- or 1024-point-FFT, polyphase, variable bandwidth: 15.625 kHz to 24MHz	-
	magnitude and logarithm of complex FFT	
Power Density Spectrum (PSD)	variable averaging of PSD by 1,2,4,8,16,32,64,128	-
Averaging	up to 16 MHz CBB and FFT, up to 24 MHz PSD	-
Bandwidth over LAN	up to 16 MHz CBB and FFT, up to 24 MHz PSD	Selectable: 8, 15, 30, 60, 120, 150, 250, 500 kHz
Bandwidth over USB	-	Selectable: 8, 15, 30, 60, 120, 150 kHz
Digital Output via LAN Complex Baseband	16 or 32 bit signed integer, I and Q samples	16 bit signed integer, I and Q samples
Complex FFT	16 bit floating point, complex 32 bit 4 k or 1k FFT	-
Power Density Spectrum	16 bit unsigned integer, logarithmic scaling range 256 dB	-
Maximum Data Rate	approx. 80 MByte / sec	approx. 2.5 MByte / sec
Operating Temperature	0°C to 50°C Rated temperature -10°C to +55°C	0°C to 50°C
Storage Temperature	-40°C to 70°C	-40°C to 70°C
Humidity	Max. 85%, non-condensing	Max. 85%, non-condensing
Power Consumption	85-264 Volt AC, 50-60 Hz, 60 Watt	85-264 Volt AC, 50-60 Hz, 25 Watt
Mechanical Width	19 inch	215 mm (19 / 2 inch)
Height	1 RU (Rack Units)	1 RU (Rack Units)
Depth	560 mm	320 mm
Weight	11 kg	1.6 kg

Technical Specifications

Feature	ComCat CCT-NG	LANReceiver LR2
Mechanical 2 Tuners combined with option LR2-RMK	-	
Width		19 inch
Height		1 RU (Rack Units)
Depth		322 mm
Weight		3.2 kg
Interfaces		
RF Input	N, Female, 50 Ohm (optional 2 for HF)	N, Female, 50 Ohm, HF1 and HF2,
LAN	RJ45, (100/1000 Base-T)	RJ45, (100 Base-T)
Power Supply	IEC 320	IEC 320
Specific Interfaces	<i>10 MHz Reference Input:</i> SMA, Female	<i>IF1 and IF2 Output (optional):</i> SMA, Female
	<i>1 PPS:</i> SMA, Female	<i>USB:</i> USB Socket
	<i>RS 232:</i> D-SUB9. Male	
Standards		
MTBF	> 10.000 hrs (MIL-HDBK)	> 10.000 hrs (MIL-HDBK)
Compliant to	EN 61010-1:2002 / EN 61000-6-2:2002 / EN 61000-6-3:2002	EN 61010-1:2002 / EN 61000-6-2:2002 / EN 61000-6-3:2002
Frequency Range	100 kHz - 30 MHz 9 kHz - 30 MHz (opt.)	100 kHz - 30 MHz
Frequency Accuracy	+/- 1x10 ⁻⁶	
Tuning Resolution	1 Hz	1 Hz
Bandwidth	15.625 kHz to 20 kHz 15.625 kHz to 24 MHz	8 kHz to 500 kHz
Tuning Accuracy	< 0.2 Hz	1 Hz
Reference Frequency	10 MHz internal/external	
RF Gain	25 dB min.	20 dB min.
Flatness	+/- 1 dB	
Max. Attenuation	66 dB	30 dB
Attenuator Stepsize	6 dB / 2 dB	10 dB
Gain Control	AGC (slow,medium,fast) MGC	AGC (Decay Time adjustable) MGC

Technical Specifications

Feature	ComCat CCT-NG	LANReceiver LR2
Input Sensitivity @ S/N = 10 dB		
HF @ BW = 500 Hz	-128 dBm	
HF @ BW = 3 kHz	-120 dBm	
HF @ BW = 25 kHz	-111 dBm	
AM, 6 kHz BW, Mi=0.5, Fm=1.0 kHz for 10 dB /SNR		-108 dBm
SSB, 2.7 kHz BW, for 10 dB /SNR		-116 dBm
FM, 15 kHz BW, 5 kHz Deviation, Fm=0.4 kHz for 20 dB /SNR		-103 dBm
Oscillator Phase Noise		
HF @ 1 kHz offset	-130 dBc/Hz typical	-120 dBc/Hz typ. -110 dBc/Hz max
HF @ 10 kHz offset	-140 dBc/Hz typical	-130 dBc/Hz typ. -110 dBc/Hz max
Maximum Input Power	+20 dBm typical (+30 dBm with input attenuator active)	
Input IP3	+40 dBm typ.	> 35 dBm 40 dBm typ.
Noise Figure	9 dB typ.	9 dB typ.
Image Frequency Rejection	Not applicable	Not applicable
IF Rejection	Due to direct HF sampling technique not applicable	Due to direct HF sampling technique not applicable
Preselector	12-Band	11-Band
Sweep Time	< 3ms	
Scan Rate	max. 4 GHz / s	
SFDR (referred to full scale of A/D converter)	90 dB typical	> 85 dB
Oscillator Reradiation at antenna input	< -110 dBm	< -110 dBm
Spurious Response	< -125 dBm	< -110 dBm (1 – 30 MHz)

Preselector Specifications

HF 12 (13) Band Preselector	ComCat Tuner CCT-NG Bands overlap by 500 kHz		HF 11 Band Preselect or	LAN Receiver LR2	
Band 0	Preselector bypass		Band 0	Preselector bypass	
Band 1 (option)	9 kHz	500 kHz	Band 1	0.1 MHz	0.5 MHz
Band 2	0.1 MHz	1.0 MHz	Band 2	0.1 MHz	1.5 MHz
Band 3	0.5 MHz	2.0 MHz	Band 3	1.5 MHz	2.0 MHz
Band 4	1.5 MHz	3.5 MHz	Band 4	2.0 MHz	3.0 MHz
Band 5	3.0 MHz	5.5 MHz	Band 5	3.0 MHz	5.0 MHz
Band 6	5.0 MHz	7.0 MHz	Band 6	5.0 MHz	7.0 MHz
Band 7	6.5 MHz	8.5 MHz	Band 7	7.0 MHz	10.0 MHz
Band 8	8.0 MHz	11.0 MHz	Band 8	10.0 MHz	13.0 MHz
Band 9	10.5 MHz	13.5 MHz	Band 9	13.0 MHz	17.0 MHz
Band 10	13.0 MHz	16.5 MHz	Band 10	17.0 MHz	22.0 MHz
Band 11	16.0 MHz	19.5 MHz	Band 11	22.0 MHz	30.0 MHz
Band 12	19.0 MHz	23.5 MHz			
Band 13	23.0 MHz	30.0 MHz			



Our Goals

Technology

... in the development and in the company management is state-of-the-art and represents a high level.

Quality

... in all divisions of our company is considered as the pre-requisite for a risk-free and successful cooperation with our customers and business partners.

Position in the market

... is affected by the experience made in the signal and information processing. We are ready to face up to the competition

Service Offering

... is comprehensive, complete and tailored to suit the needs. As a systems vendor, we offer standard devices, systems and services

Employees

... form the roots of the company and render the services necessary for maintaining and expanding the technical basis and a trustful cooperation

Growth

... on a stable technical and economical basis within the country and outside is our aim

Trust

... vis-à-vis our business partners and within the own company is the basis of our business



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