

## STEREO GENERATOR AND AUDIO PROCESSOR COM LIM 60+

The **COM LIM 60+** is an all-in-one equipment (5 bands audio processor with MPX generator, MPX decoder, RDS encoder, loudness control (EBU R 128 and ITU-R BS.1770-4) and changeover/silence detector) for FM applications (15KHz processing) and DAB, HD radio, Sirius XM, Web (20KHz processing).

The **COM LIM 60+** sounds great, allowing giving personality to your station by choosing, from the many presets, the one that better suits the style of your radio.

Fully customizable top class audio processing tools with 5 bands compression control, adjustable drive and threshold, dual AGC, 3 bands equalization (low, mid and high frequency), stereo enhancer, voice detector and brightness control.

The RDS "dynamic" features allow managing many kinds of services: PS, RT, RT+, PTY, PTYN. Connecting the **COM LIM 60+** with the radio automation software, it can manage much additional information such as song title, song artist, on-air program, speaker's name, etc.

The MPX encoder and the dynamic RDS are both integrated in the DSP structure providing

an almost ideal MPX signal, easy to integrate with the customer infrastructure thanks to the digital AES-192 and the two totally independent analog outputs.

The **COM LIM 60+** includes a technologically advanced automatic audio changeover/silence detector able to switch between any available sources: Analog, Digital, MPX, FM, IP, AoIP, etc. in case of missing audio from any external sources.



### GENERAL CHARACTERISTICS

<b>WEIGHT</b>	3Kg approximately
<b>DIMENSIONS</b>	1 standard rack unit of 19", 485x44x240mm
<b>AC RATE</b>	90-260VAC, 47-63Hz, 15W
<b>PROCESSING</b>	Fully digital, based on DSP 24bit/100MHz. Signal processing is performed by phase linear filter
<b>OPERATING TEMPERATURE</b>	0 to +50°C

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## ANALOG AUDIO INPUT

<b>CONNECTORS</b>	Balanced on 2 XLR, EMI Suppression
<b>NOMINAL INPUT LEVEL (SENSITIVITY)</b>	-12 to +13dBu, adjustable via software
<b>LEVEL RANGE</b>	-21 to + 24dBu
<b>INPUT LEVEL MAX.</b>	+24dBu
<b>A/D CONVERSION</b>	CS4272 DAC 24bit 192kHz
<b>CMRR INPUT</b>	>60dB (20Hz to 20kHz)

## DIGITAL AUDIO INPUT

<b>NUMBER OF INPUTS</b>	2
<b>CONNECTORS</b>	Balanced on 1 XLR, EMI Suppression
<b>INPUT IMPEDANCE</b>	110 $\Omega$
<b>FORMAT</b>	AES3/EBU & SPDIF
<b>SAMPLE RATE</b>	32, 44.1, 48, 64, 88.2, 96, 192kHz
<b>NOMINAL INPUT LEVEL (SENSITIVITY)</b>	-0.1 to -25dBfs (0.1dB step)
<b>LEVEL RANGE</b>	0 to -36dBfs
<b>CONVERSION DYNAMIC RANGE</b>	124dB (32kHz), 126dB (44.1kHz), 126dB (48kHz), 122dB (96kHz)
<b>CONVERSION RESOLUTION</b>	24 bits

## DIGITAL MPX INPUT

<b>CONNECTORS</b>	Balanced on 1 XLR, EMI Suppression
<b>INPUT IMPEDANCE</b>	110 $\Omega$
<b>FORMAT</b>	AES3/EBU & SPDIF
<b>SAMPLE RATE</b>	192kHz
<b>NOMINAL INPUT LEVEL (SENSITIVITY)</b>	-0.1 to -25dBfs (0.1dB step)
<b>LEVEL RANGE</b>	0 to -36dBfs
<b>CONVERSION DYNAMIC RANGE</b>	124dB (32kHz), 126dB (44.1kHz), 126dB (48kHz), 122dB (96kHz)
<b>CONVERSION RESOLUTION</b>	24 bits

## MPX INPUT

<b>CONNECTORS</b>	Unbalanced on 2 BNC, EMI Suppression
<b>INPUT IMPEDANCE</b>	50 $\Omega$
<b>NOMINAL INPUT LEVEL (SENSITIVITY)</b>	-6 to +13dBfs, adjustable
<b>CONVERSION DYNAMIC RANGE</b>	PCM4220 24bit 216kHz
<b>LEVEL RANGE</b>	-21 to +24dBu

## ANALOG AUDIO OUTPUT

<b>CONNECTORS</b>	Balanced on 2 XLR, EMI Suppression
<b>OUTPUT IMPEDANCE</b>	47 $\Omega$
<b>OUTPUT LEVEL</b>	-6 to +18dBu, adjustable software
<b>LEVEL RANGE</b>	-20 to +24dBu

<b>OUTPUT LEVEL MAX.</b>	24dBu
<b>CMRR OUTPUT</b>	>60dB (20Hz to 20kHz)
<b>D/A CONVERSION</b>	CS4272 DAC 24bit 192kHz

## DIGITAL AUDIO OUTPUT

<b>OUTPUT NUMBERS</b>	2
<b>CONNECTORS</b>	Balanced on 1 XLR, EMI Suppression
<b>INPUT IMPEDANCE</b>	110Ω
<b>FORMAT</b>	AES3/EBU
<b>SAMPLE RATE</b>	32, 44.1, 48, 64, 88.2, 96kHz, 192kHz
<b>OUTPUT LEVEL ADJUSTMENT</b>	0 to -30dBfs (0.1dB steps)
<b>LEVEL RANGE</b>	0 to -36dBfs
<b>FREQUENCY RANGE</b>	20Hz to 20kHz (+/- 0.025dB when processing is disabled)

## MPX OUTPUT

<b>CONNECTORS</b>	Unbalanced on 2 BNC, EMI Suppression
<b>OUTPUT IMPEDANCE</b>	10Ω
<b>LOAD IMPEDANCE</b>	600Ω or higher
<b>A/D CONVERSION</b>	Texas PCM1796
<b>NOMINAL INPUT LEVEL (SENSITIVITY)</b>	-9 to +15dBfs

## BACK-UP PLAYER

<b>PHYSICAL SUPPORT</b>	USB Flash Drive, micro SD card (max. 64GB)
<b>AUDIO FILE FORMAT</b>	MP3, WAV
<b>SAMPLE RATE</b>	32, 44.1, 48, 64, 96kHz

## MPX & RDS SIGNAL

<b>PILOT FREQUENCY</b>	19kHz, ±1Hz
<b>PILOT INJECTION</b>	-25 to 15.5dB (steps of 0.1), 6-18% total deviation
<b>PILOT STABILITY</b>	±10ppm (-10 to +55°C)
<b>PILOT DISTORTION</b>	0.05% (typical)
<b>DISTORTION AND PILOT NOISE</b>	0.068 % (on 100kHz band)
<b>EXTERNAL COMPOSITE THD</b>	0.005 % (typical on the whole band)
<b>STEREO SEPARATION</b>	>70dB (typical on the whole band)
<b>LINEAR CROSSTALK</b>	≤ -80dB (for 100% modulation)
<b>MAIN&gt;SUB &amp; SUB&gt;MAIN CROSSTALK</b>	>65dB (at least)
<b>FILTERING/DIGITAL BAND</b>	30Hz to 15kHz (-0.1dB), 17kHz (-70dB), 19kHz (-100dB)
<b>PROTECT. 57kHz SUBCARRIER (RDS/RBDS)</b>	Better than 51dB
<b>PRE-EMPHASIS</b>	Off, 50μS, 75μS (±0.1dB)
<b>FREQUENCY RESPONSE</b>	±0.3dB (30Hz to 15kHz)
<b>OPERATING MODE</b>	Mono/Stereo

<b>MPX/RDS OUTPUT</b>	Adjustable from -10 to 15dB (steps of 0.1dB)
<b>SIGNAL/NOISE RATIO</b>	>90dB (on 100kHz band)
<b>CARRIER SUPPRESSION</b>	>85dB

### RDS FEATURES (OPTIONAL)

<b>SUPPORTED GROUP</b>	All
<b>GROUP SEQUENCE</b>	Configurable
<b>PS</b>	8 DSN x 10 PSN
<b>PI</b>	8 DSN x 10 PSN
<b>PTY</b>	RDS/RBDS
<b>AF METHOD A</b>	25
<b>AF METHOD B</b>	Up to 1024 (64 lists)
<b>RT</b>	Yes, 32 messages
<b>RT RATE ADJUSTMENT</b>	Group sequence
<b>RT+ FOR SONGS &amp; CONTENT TAGGING</b>	Yes
<b>TP</b>	Yes
<b>TA CONTROL</b>	Command, Soft, GPI
<b>PTYN</b>	Yes
<b>EON</b>	10 PSN
<b>CT</b>	Yes
<b>TMC, EWS, IH, TDC</b>	Yes
<b>FREE FORMAT GROUPS (FFG)</b>	Yes
<b>OPEN DATA APPLICATION (ODA)</b>	Yes
<b>PS SCROLLING</b>	Yes
<b>AUTO "PARSES" LONG MESSAGES FOR: BEST TEXT DISPLAY</b>	No
<b>SCROLLING BY CHARACTERS</b>	1 to 8
<b>SCROLLING BY WORD, AUTO CENTERING:</b>	Yes
<b>TRUNCATE LONG WORDS</b>	

### COMMUNICATION

<b>CONNECTION WITH RADIO AUTOMATION: SOFTWARE</b>	Yes
<b>NETWORK CONNECTIVITY</b>	4 TCP ports, 4 UDP, 1 SNMP
<b>CONFIGURATION SOFTWARE</b>	Web Server, FTP
<b>PASSWORD PROTECTION</b>	Yes
<b>ASCII PROTOCOL</b>	Configuration messages
<b>UDP, TCP, HTTP, SNTP</b>	Yes
<b>ALERT NOTIFICATIONS ON USER-DEFINED: EVENTS VIA SNMP TRAPS OR EMAILS</b>	Yes
<b>EMBEDDED SNMP AGENT PERMITTING: ACTIVE MANAGEMENT TASKS</b>	Yes
<b>SUPPORTED NETWORK PROTOCOLS</b>	HTTP, SNTP, UDP, TCP, NTP, FTP
<b>UECP PROTOCOL</b>	EBU SPB490 Ver.7.05

**GENERAL**

<b>GPIO INPUTS/OUTPUTS</b>	6 GPI, 4 GPO
<b>COMMUNICATION PORTS</b>	2xRS232, 3xUSB, 1xLAN
<b>SYNCHRONIZATION</b>	Ext (Pilot MPX), Int, Auto
<b>SYNCHRONIZATION MONITORING</b>	Yes
<b>RDS LEVEL ADJUSTMENT</b>	Digitally controlled
<b>PHASE ADJUSTMENT</b>	0° to 359.9°
<b>SEPARATE OUT RDS+MPX/RDS ONLY</b>	Yes
<b>COMMAND TO ACTIVATE RDS SCA</b>	Yes
<b>OPERATING MODES</b>	Side chain, Loop through, Bypass
<b>RDS SUBCARRIER</b>	100% digitally generated shape
<b>CENELEC - EN50067 COMPLIANT</b>	Yes
<b>CLOCK TIME (CT)</b>	Accurate clock time sync with Internet connection
<b>REMOTE TA TRAFFIC ANNOUNCEMENTS</b>	Yes
<b>AUTOMATIC RTC SYNCHRONIZATION</b>	Autosync with optional USB external GPS receiver

*\* The images and/or technical specifications are subject to change without previous notice.*

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