Analog Signal Processing

C8U

Commander™ 8 Dual Upconverter

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The Commander™ 8 Upconverter (C8U) is a next generation headend Upconverter which builds on the award winning success of the Commander 6® Upconverter. The C8U has industry leading performance and features and is an ideal solution for both analog and digital headend and hub locations. Two frequency agile models, the C8U-L (50 to 600 MHz) and the C8U-H (550 to 1000 MHz), cover all current and future broadband frequency requirements up to 1 GHz, with a convenient 50 MHz frequency overlap between models.

The C8U consists of dual independent Upconverters in a reliable single rack unit (1RU) package, avoiding thermal and mating problems while providing space efficiency. A bright, wide two-line vacuum fluorescent display (VFD) provides access to all upconverter controls and is accessed via a convenient menu system. Front panel access to independent RF and IF test points is provided. Easy rear panel fuse access is also provided.

Each independent upconverter in the C8U incorporates three switchable IF inputs for redundancy, emergency alert or programming purposes, facilitating operational flexibility. These IF sources may be switched automatically or manually. The C8U is network management ready and is compatible with SNMP Network Management Systems via the LIFEnet™ proxy. It is also compatible with Motorola's Headend Control Software (HCS).

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In a digital system, the C8U can accept any digital IF signal between 41.0 and 47.0 MHz. The C8U continues the C6U legacy of handling many types of digital signals including 64 QAM, 256 QAM, 8-VSB and QPSK signals. In an analog system, the C8U supports addressable channels. An encoded composite IF signal is received from a scrambler, such as Motorola's model MVP-II, and is Upconverted to the proper RF channel for transmission.

BENEFITS INCLUDE:

- Superior phase noise performance
- Dual independent upconverters in 1RU
- 1 GHz bandwidth in two models
- Frequency selection in 12.5 kHz steps or by HRC, IRC, EIA channel maps
- User friendly display and interface
- Network management ready
- Internal sensors for IF and RF signals
- DC power capable
- Downloadable firmware

SPECIFICATIONS

RF	
Channels	Tunable by HRC, IRC, or EIA frequency plans; Frequency tunable in 12.5 kHz steps
Frequency Range	50 to 600 MHz (C8U-L); 550 to 1000 MHz (C8U-H)
Output Level	+60 dBmV Minimum
Recommended Operating Range	+57 to +61 dBmV
Spurious	<-63 dBc for intermodulation products (49 to 1000 MHz) <-72 dBc for fixed frequency products (49 to 1000 MHz) (Measured relative to analog picture carrier @ +60 dBmV RF output and sound carrier @ -15 dBc)
Output Return Loss	14 dB Minimum within channel
C/N Ratio (normalized to 4 MHz)	
In-band	73.0 dB Minimum, 74.0 dB Typical
Adjacent channels	73.0 dB Minimum, 75.0 dB Typical
Semi-adjacent channels	75.0 dB Minimum, 77.0 dB Typical
Wideband channels	77.0 dB Minimum, 79.0 dB Typical
RF Carrier Phase Noise	
@1 kHz offset	-71 dBc/Hz Minimum
@10 kHz offset	-99 dBc/Hz Minimum
@20 kHz offset	-105 dBc/Hz Minimum
RF Test Point	-20 dB ±1 dB
Group Delay	25 ns p-p Maximum within a channel
Passband flatness	1.0 dB p-p Maximum within a channel
Converter to Converter Isolation	65 dB Minimum
Power line related modulation	-30 dBc Minimum
Phase-lock Input (6.000 or 6.0003 MHz)	
Return Loss	18 dB Minimum
Input Level	0 to +30 dBmv
IF	
Input Frequency	41.0 to 47.0 MHz
IF Input Levels	+25 dBmV to +35 dBmV
IF Input Return Loss	20 dB Minimum, 40.0 to 48.0 MHz
IF Isolation	70 dBc Minimum, A and B IF inputs @ +30 dBmV
IF Test Point Level	-20 dB Nominal ± 1.0 dB
IF Test Point Return Loss	16 dB Minimum
IF AGC Range	±5 dB Minimum (RF output: ±0.5 dB)
CW IF Output Frequency	45.75 MHz (analog mode); 44.0 MHz (digital mode)
CW IF Output Level	+53 dBmV ±3 dB
CW IF Phase Noise @ 1 kHz offset	-86 dBc/Hz Minimum
General	
AC Voltage Requirements	100 to 240 Vrms, 47 to 63 Hz
Power Requirements	45 Watts Maximum
Operating Temperature	0° to 50° C
Weight	14.5 lbs (6.6 kgs) Maximum
Dimensions	19" W x 1.75" H x 18" D (48.2 cm x 4.4 cm x 45.7 cm)

C8U OPTIONAL ACCESSORY

DC Power Option (DC). (Order C8U with DC option as C8U-*-D).

The DC power option (DC) for the Commander™ line of headend products allows powering from a DC source instead of an AC line source.

Input Voltage	-20 Vdc to -60 Vdc (-48 Vdc recommended)
Input Power	45 Watts Maximum

Model Number	Description
C8U-L-X	NTSC Dual Upconverter, 50-600MHz
C8U-L-D	NTSC Dual Upconverter, 50-600MHz, DC Power
C8U-H-X	NTSC Dual Upconverter, 550-1000MHz
C8U-H-D	NTSC Dual Upconverter, 550-1000MHz, DC Power
C8U-LH-X	NTSC Dual Upconverter, 1 Low Channel & 1 High Channel
C8U-LH-D	NTSC Dual Upconverter, 1 Low Channel & 1 High Channel, DC Power

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