

MAIN FEATURES

- ❖ Indoor upconverter for X-band
- ❖ Tuneable in 1kHz steps
- ❖ ALC for precise output level control
- ❖ Excellent phase noise parameters
- ❖ Low intermodulation distortion
- ❖ Low unwanted spurious level
- ❖ High stability internal reference
- ❖ Local/remote control



DESCRIPTION

This high performance upconverter is intended for use in professional applications in X-band such as satellite earth stations. This device includes a double conversion upconverter modul with low phase noise local oscillators, a microprocessor based monitor and control circuitry, a front panel with control keys and status display and internal AC / DC power supply. The equipment can be controlled from the front panel (local control) and via TCP/IP over Ethernet, RS232 and RS422 (remote control). ALC circuit for precise output level control.

SPECIFICATIONS

GENERAL	
RF output frequency [MHz]	8025-8500MHz
IF input frequency	70MHz
Type	Double conversion without inversion
No. of Channels	1
Local source	Internal LO source
RF OUTPUT CHARACTERISTICS	
RF output frequency	8025-8500MHz
Output VSWR	≤1.5
Nominal output impedance	50Ω
Output P1dB	≥ +13dBm, +15dBm typ. @ maximum gain
Output power control	An ALC circuit ensures that output power is user selectable in the -60...+10dBm range in 0.5dB steps independently of the IF input level. The only requirement on IF input level that it should be in the -20...0dBm range to have proper ALC operation. A manual gain control mode is also available.
Output power range	-60...+10dBm in 0.5dB steps
Output power accuracy	better than ±1dB, target: ±0.5dB
In-band spurious	≤ -60dBc
Out-of-band spurious	≤ -80dBc
LO leakage	≤ -75dBm
Harmonics	≤ -60dBc at P _{out} ≤ 0dBm
RF output monitor level	-20dBc ± 2dB with reference to RF output

IF INPUT CHARACTERISTICS	
IF input frequency	70MHz
IF bandwidth	±4MHz useful signal bandwidth ±20MHz typical 3dB bandwidth
Noise figure	≤10dB, 6dB typ. @ maximum gain (30dB)
Input VSWR	≤1.4
Nominal input impedance	50Ω
Input operational signal level	-20dBm to 0dBm
Max. input power level (nondestructive)	> +5dBm
LO leakage on IF input	≤-70dBm
TRANSFER CHARACTERISTICS	
Conversion gain	-60...+30dB (determined by ALC circuit, depends on input power level and desired RF output power)
Attenuation range	90dB (determined by ALC circuit, depends on input power level and desired RF output power)
RF output power range	-60...+10dBm in 0.5dB steps
Output power accuracy	better than ±1dB, target: ±0.5dB
Gain ripple within RF band	≤±1dB
Gain ripple in any 20MHz RF band	≤±0.5dB
Gain slope	≤±0.1dB/MHz
Gain ripple within IF band (±4MHz)	≤±0.3dB
Gain stability	<±0.25dB/day @ constant temperature
Image rejection	>70dB, 80dB typ.
Carrier mute	>90dB rejection
Group delay variation vs. frequency within IF band (±4MHz)	≤2ns peak-peak
Group delay stability vs. temperature	≤2ns peak-peak over full operating temperature range
INPUT FREQUENCY REFERENCE	
Frequency	The equipment shall lock on 5MHz, 10MHz and 100MHz
Connector	BNC female
Level	0dBm±6dB
VSWR	≤1.5/50Ω
LOCAL OSCILLATOR CHARACTERISTICS	
Step size	1kHz
Frequency accuracy	0Hz considering a perfect external frequency reference
Frequency stability	±0.005ppm within temperature range on internal reference
Frequency drift per day	±0.001ppm per day on internal reference
Frequency aging	±0.05ppm/year
Local oscillators monitor level	> -10dBm
Local oscillator monitor ports VSWR	≤1.5/50Ω

LOCAL OSCILLATOR CHARACTERISTICS	
	@100Hz ≤ -77
	@1kHz ≤ -90
	@10kHz ≤ -100
	@100kHz ≤ -100
	@1MHz ≤ -115
NON-LINEAR BEHAVIOUR	
3 rd order intermodulation	≤ -50dBc with two carriers ($\Delta f = 2\text{MHz}$) at 0dBm at RF output at maximum gain
AM/PM conversion	≤ 0.1°/dB at 0dBm RF output power
CONTROL & MONITORING	
Control and monitoring interface	Keypad and LCD display for local M&C TCP/IP over Ethernet, RS232 and RS422 for remote M&C
Controls	ON/OFF switch, output frequency, output power, mute, ALC mode
Monitoring	output frequency, output power, input power, mute, reference source, PLL status, local/remote status
Warnings	local oscillator fault, reference frequency fault, digital fault, general alarm, dry contact summary alarm on RS422 control connector
MECHANICAL CHARACTERISTICS	
Dimensions	1U 19" rack (364mm depth)
Front and rear panel finishing	Light grey (RAL7035) powder coating
Weight	4.75kg
RF output connector	N female (rear panel)
IF input connector	N female (rear panel)
RF output monitor connector	N female (rear panel)
Reference input connector	BNC female (rear panel)
LO monitor connectors	SMA female (front panel)
AC mains input connector	IEC C14 inlet
Control connector	RJ45 for Ethernet, DSUB-9 for RS232 and RS422
POWER SUPPLY	
Voltage	90-264VAC
Frequency	47-63 Hz
Power consumption	≤ 100VA
Fuse value	T4A (4A, Slow blow)
ENVIRONMENT	
Operating temperature range	0°C ... +50°C
Storage temperature range	-30°C ... +70°C
Humidity	95% (not condensing)
Ingress protection level	IP50
Vibration	according to MIL-STD-810G Method 514.6-Cat 4
Shock	½ sinus 30g, 11msec on 3 axis
MTBF	minimum 50000 hours

Specifications are subject to change without notice.

OUTLINE DRAWING (mm)

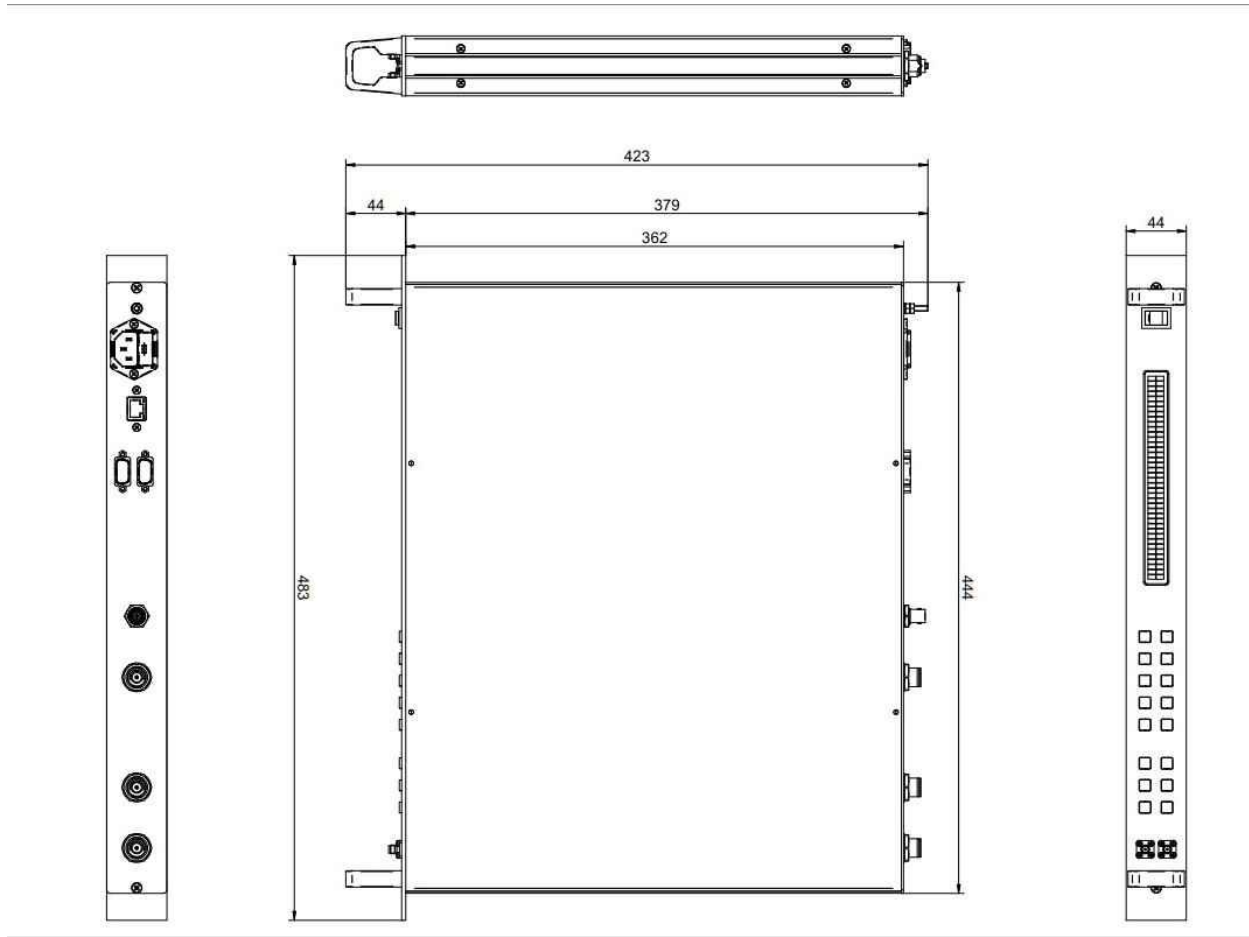


Figure 1. Outline drawing



BMCU48
X-band upconverter 70MHz to 8025-8500MHz

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
BMCU48K11304	BMCU48 X-band upconverter 70MHz to 8025-8500MHz

DOCUMENT REVISION

DOCUMENT NAME	REVISION	DATE
BMCU48-LM-K11304	V01	2023/09/13