

**DUAL UHF MODULATOR**

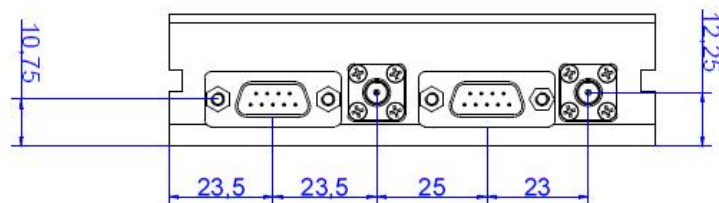
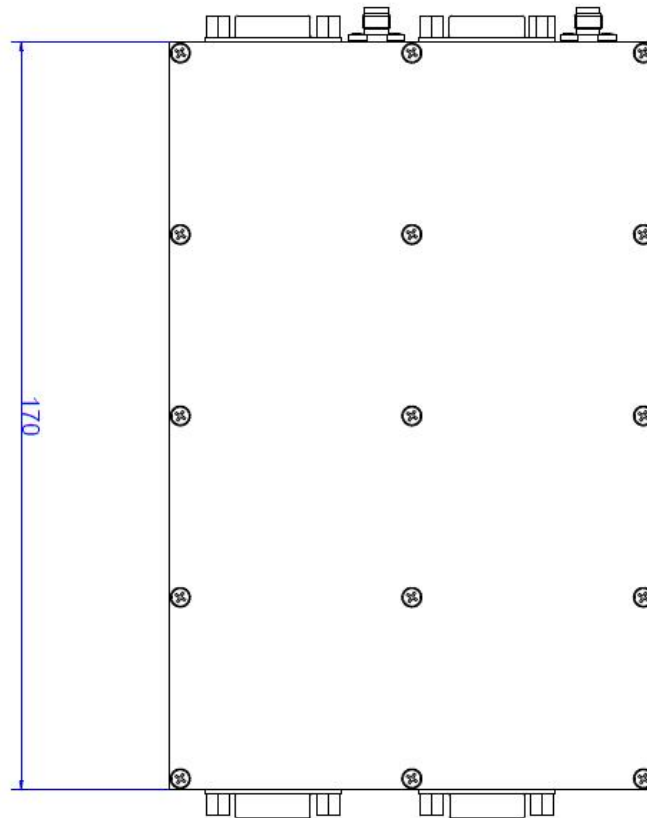
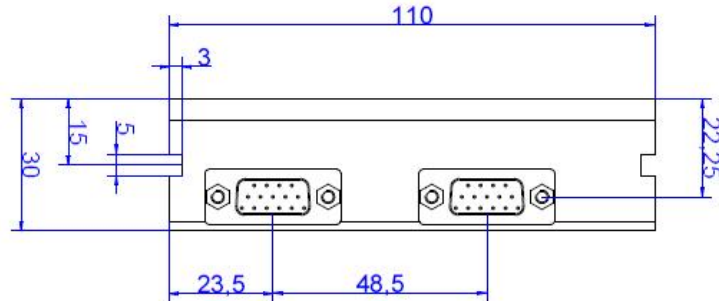
- **COMPACT SIZE**
- **MANY DIFFERENT KIND OF MODULATION**
- **LOW PHASE NOISE**
- **DUAL INDEPENDENT CHANNEL FOR HIGH RELIABILITY**

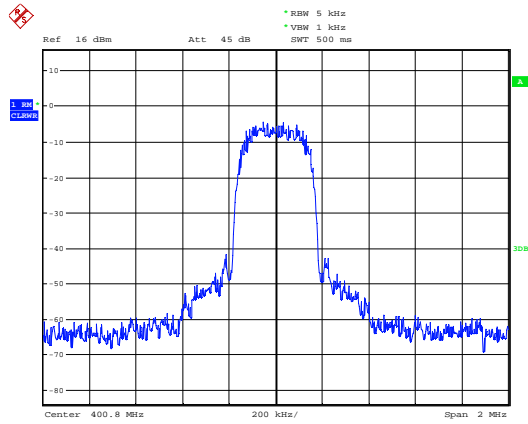
This high quality, high reliability UHF modulator is intended for use in space and airborne applications. It is a compact, reliable unit with state of the art electrical specifications.

Output frequency:	400-401.5 MHz
Frequency step:	25 kHz
Output power:	RF OFF/0dBm/+5dBm/+10dBm
Power variation:	-0...+1dB over full frequency range -0...+1dB over full temperature range
Frequency stability:	+/-5ppm over full temperature range
Ageing:	after 3 years must be within +/-5ppm
SSB phase noise:	-30dBc/Hz@10Hz -60dBc/Hz@100Hz -70dBc/Hz@1kHz -80dBc/Hz@10kHz -90dBc/Hz@100kHz and above (The SSB phase noise specification meets the IESS-308 standard)
Residual PM:	2 degrees RMS (10Hz-125kHz, SSB) 2.8 degrees RMS (10Hz-125kHz, DSB)
Spurious:	-70dBc
Mode of modulation:	CW/BPSK/OQPSK/SOQPSK-A
Transmission speed:	64/128/256/512 kbps
Mode of FEC:	None
	Reed-Solomon coding: IESS-308 standard coding (n=126, k=112, depth=4)
	Convolutional coding: Viterbi convolutional encoding (k=7, rate=1/2, G0 code=171 octal, G1 code=133 octal)
	Concatenated coding: convolutional coding applied on Reed-Solomon coded data stream
Harmonics:	-60dBc
RF output VSWR:	2.5:1 in all phases ( $S_{(2,2)} \leq -7.4\text{dB}$ )
Operating temperature range:	-20...+50 °C
Mechanical outline dimensions:	30 x 110 x 170 mm (two units in one housing, without connectors)
Connectors (two modulators)	2x SMA-F connectors for the RF output 2x DB9/M connector for the power supply 2x DE15/M connectors for the control signals
Power Supply	+12V DC +/-4V, 140mA typ. @+12V



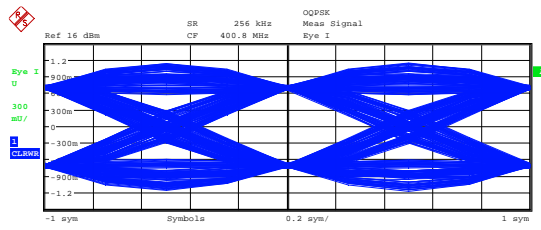
### Outline drawing





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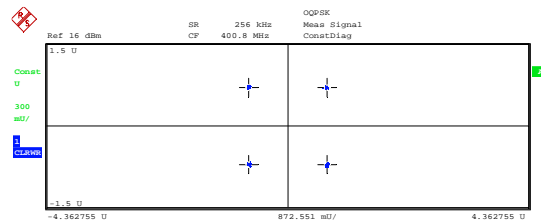
RF output signal with OQPSK modulation, 512 kbps modulation speed



MODULATION ACCURACY				SYMBOL TABLE (Hexadecimal)				
Result	Peak	atSym	Unit	00000	00018	00036	00054	
EVM Offset	2.725	5.361	dB	1 2 3 3 3 0 3 0 3 2 0 3 2 1 0 0 2	0 1 3 2 1 3 0 1 0 2 1 1 2 2 2 3 1	1 3 1 3 0 2 0 3 2 0 0 1 2 3 1 2 2	2 1 0 3 2 3 1 2 3 2 3 1 3 3 3 2 3	
Magnitude Err	1.780	4.240	474	1	00036	00054	00072	00090
Phase Error	1.22	4.40	212	deg	00072	00090	00108	00126
CarrierFreq Err	-219.50			Hz	00144	00162	00180	00198
Amplitude Error	0.00			dB	00216			
Origin Offset	-58.14			dB				
Gain Imbalance	-0.00			dB				
Quadrature Err	-0.04			deg				
SNR	0.999245			dB				
Mean Power	10.52	14.24	485	dBm				
SNR (MER)	31.29			dB				

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Eye pattern diagram



MODULATION ACCURACY				SYMBOL TABLE (Hexadecimal)				
Result	Peak	atSym	Unit	00000	00018	00036	00054	
EVM Offset	2.717	7.465	335	Y	00036	00054	00072	00090
Magnitude Err	1.730	4.176	102	1	00090	00108	00126	00144
Phase Error	1.27	4.24	80	deg	00144	00162	00180	00198
CarrierFreq Err	-219.90			Hz	00216			
Amplitude Error	0.02			dB				
Origin Offset	-68.55			dB				
Gain Imbalance	0.00			dB				
Quadrature Err	-0.01			deg				
SNR	0.999244			dB				
Mean Power	10.53	14.23	287	dBm				
SNR (MER)	31.33			dB				

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Constellation diagram



**BUMT13**

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Picture

