

# Telecom FSS-BSS Frequency Converters / Receivers

RUAG Space Frequency Converters and Receivers for FSS/BSS payloads meet the highest performance and reliability requirements. Application of new technology enables small, low mass converters and efficient manufacturing.



## HERITAGE

RUAG Space has been supplying high performance and highly reliable microwave communication equipment for telecom satellites for more than 35 years. Delivery record for telecom payloads:

- > 1000 FSS/BSS Units delivered
- > 700 Ka-band Channels delivered
- > 10 000 years acc. op. time in orbit

### Converters and Receivers for telecom payloads

Converters and receivers for all the common combinations of uplink and downlink frequencies are available:

- C-band to C-band
- C-band to Ku-band
- Ku-band to C-band
- Ku-band to Ku-band
- K-band to Ku-band

- RF input:
  - SMA (converter and C-band Receiver)
  - Waveguide (WR75/WR62) (Ku / K Receiver)
- RF output: SMA
- DC & TM/TC: MDM-25

### Design features

- Modular design, adaptable to different requirements on frequency plan, TM/TC-interfaces, bus voltages etc.
- Internal high-stability local oscillator utilizing advanced temperature stabilization.
- Internal DC/DC-converter.
- Small size and low mass.
- Low power consumption.
- Receiver version with integrated LNA and LNA output port as option.

### Modularity

Our modular design allows the equipment to be configured for different frequency plans (including cross links between C- and Ku-band) as well as for a variety of DC-power- and TM/TC interfaces.

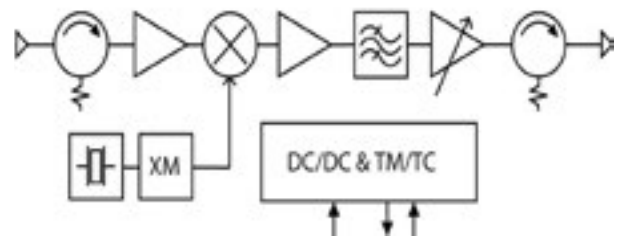
### Compacts design

Modern technologies such as MMIC and RF multilayer hybrids are employed to give smaller dimensions and lower mass. The higher level of integration also means better reproducibility and shorter lead times.

### Production

- Well-known technologies and established processes
- Extensive clean-room facilities
- Highly automated testing and data collection
- Inhouse facilities for environmental testing

### Converter block diagram



### Technical data

Parameter	Typical Performance		
<b>Frequency range GHz Input</b>	C-band 5.8-7.0	Ku-band 12.75-14.80	K-band 17.3-18.4
<b>Frequency range GHz Output</b>	C-band 3.4-4.8	Ku-band 10.70-12.75 13.4-13.65	
<b>Gain</b>	20-35 dB (Converter version) 50-62 dB (Receiver version)		
<b>Frequency stability</b>	< 0.1 ppm over full temp range ± 2.5 ppm over full temp range and 15 years life time		
<b>IP3</b>	33 dBm		
<b>Noise figure</b>	14 dB (converters) 1.5 dB (C-band Receivers) 1.8 dB (Ku-band Receivers) 2.1 dB (K-band Receiver)		
<b>Phase noise</b>	-120 dBc/Hz @ 10 kHz (LO = 3.3 GHz)		
<b>Temperature range</b>	-20°C to + 70°C		
<b>Supply voltage</b>	28-100V (regulated or unregulated)		
<b>Power consumption</b>	10W		
<b>Mass</b>	Converter: 0.7 kg		Receiver: 0.78 kg