For Satellite Communications

INMARSAT Pilot Receiver

Model RCV-INMST

This receiver makes use of digital signal processing techniques to track a CW pilot signal. A phase continuous, 1 Hz step size, frequency synthesizer generates an error correction signal which is used in conjunction with MITEQ's INMARSAT AFC capable frequency converters to provide Automatic Frequency Control for both maritime and aeronautical (Enhanced AFC) applications.

Features

- **Enhanced AFC operation**
- **Low noise/low spurious output**
- **Tunable input (5 kHz step size)**
- **Extensive remote capability (RS485)**
- **Large graphic display**
- **Simple setup**

Options

- **Higher output level**
- **50 ohm IF impedance**
- **10 MHz reference frequency**
- **Remote RS422, RS232, or IEEE-488 interface**

Specifications

Input characteristics	
Frequency	50–90 MHz tunable in 5 kHz steps
Level	-50 to 0 dBm
Return loss	20 dB nominal
Impedance	75 ohms (50 ohms optional)
Output characteristics	
Frequency	5 MHz
Level	0 ±3 dBm (+10 dBm optional)
Return loss	20 dB nominal
Impedance	50 ohms
Tracking ratio	-1:1 (other ratios optional)
Frequency correction	INMARSAT Aero
Frequency step size	1 Hz minimum, 10 Hz maximum
Frequency rate of change	15 Hz/second maximum
Phase during frequency step	Phase continuous
Spurious	-70 dBc, 10 Hz to 10 kHz, -65 dBc, 10 kHz at 1 MHz
Phase noise	-80 dBc/Hz at 10 Hz, -90 dBc/Hz at 100 Hz, -100 dBc/Hz at 3 kHz
Residual noise from the input	No residual noise from the input
Monitor port	-20 dBc nominal
Acquisition/tracking characteristics	
Pilot type	CW
Frequency range	±50 kHz
Frequency rate of change	±1 kHz/minute
Carrier-to-noise ratio	40 dB (38 dB typical) for acquisition, 40 dB (30 dB typical) for tracking
Acquisition time	15 seconds typical
Adjacent channel rejection	Modulated carriers may be +10 dBc
Pilot loss/hold time	A lost pilot is indicated on the front panel, After 1 hour of continuously lost pilot, a mute command is issued via a rear panel contact closure, A lost pilot does not interrupt the output signal, Pilot reacquisition occurs during the hold time
Loop bandwidth	Not applicable – see Technical Note 25T021
Reference characteristics	
Frequency	5 MHz (10 MHz optional)
Level	0 ±3 dBm
Impedance	50 ohms

Options

11. Increased output power: +10 dBm.

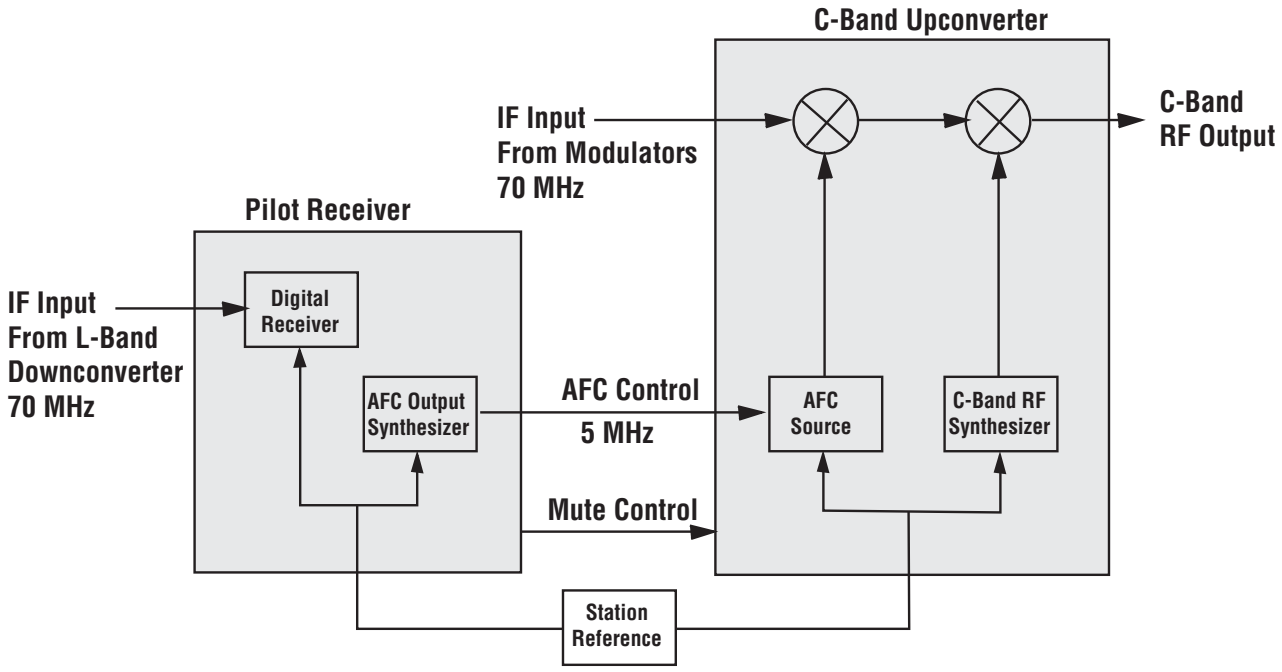
15. 50 ohm IF impedance.

17. Remote control.

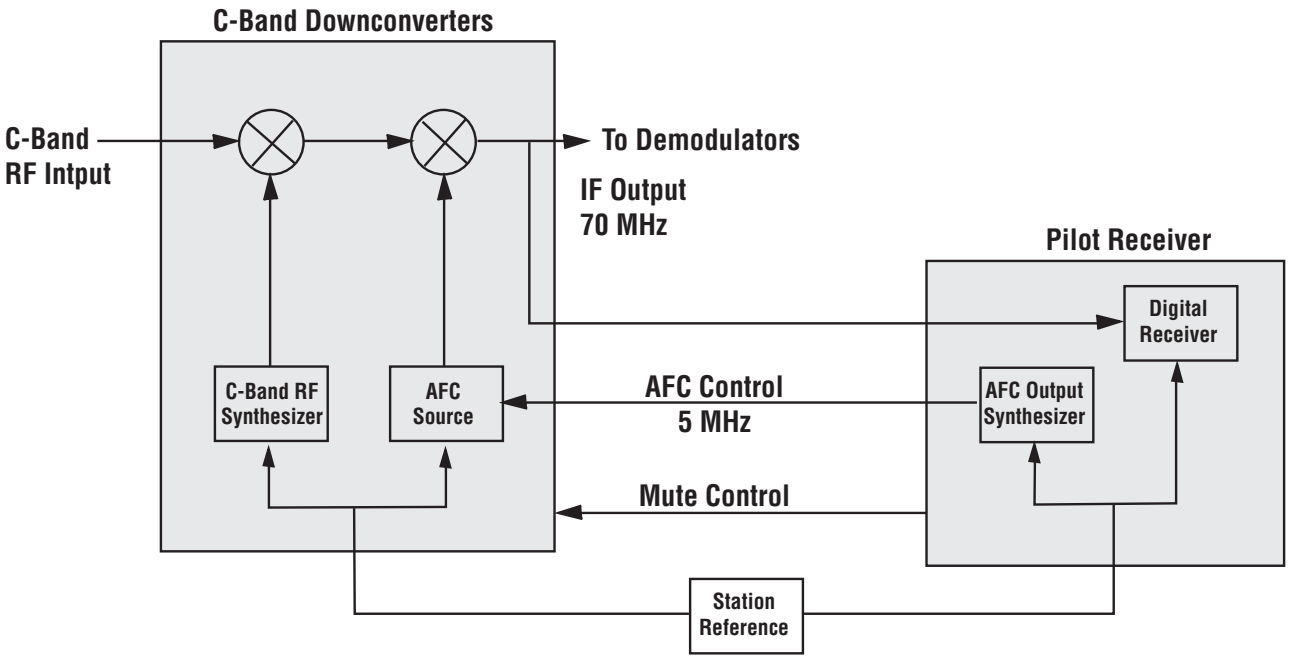
- **A.** RS422.
- **B.** RS485 (supplied as standard).
- **C.** RS232.
- **F.** IEEE-488.

24. 10 MHz reference frequency.

INMARSAT C-Band AFC Upconverter Subsystem, Simplified Block Diagram



INMARSAT C-Band AFC Downconverter Subsystem, Simplified Block Diagram



General Specifications

Primary Power

Voltage	100, 120, 220, 230/240 VAC +10%, -13% (rear selectable), 250 VAC maximum
Frequency	47–63 Hz
Power consumption	75 W typical

Summary Alarm

Contact closure/open for DC voltage and/or component alarm

Converter Mute Control

Contact closure/open for mute/unmute of RF converters

Physical

Weight	25 (9.07 kg) pounds nominal
Overall dimensions	19" [482.6mm] x 5.25" [133.35mm] panel height x 22" [558mm] maximum (chassis depth 20" [508mm])
Rear panel connectors	
IF input	BNC female
AFC output	BNC female
AFC output monitor	SMA female
Reference input	BNC female
Remote interface	DEM-9S for RS485 and RS422, DB-25P for RS232, IEEE-488 receptacle for GPIB
Summary alarm	DE-9P
Redundancy alarm	DE-9P
Mute control output	DEM-9S

Environmental

Operating	
Ambient temperature	0 to 50°C
Relative humidity	Up to 95% at 30°C
Atmosphere pressure	Up to 10,000 feet
Nonoperating	
Ambient temperature	-50 to +70°C
Relative humidity	Up to 95% at 40°C
Atmospheric pressure	Up to 40,000 feet
Shock and vibration	Normal handling by commercial carriers

Technical Notes

25T020 Enhanced Automatic Frequency Control for INMARSAT Earth Stations
25T021 Phase-Locked Vs Digital Pilot Receivers: Pilot Receiver Loop Bandwidth
25T023 Local/Remote Control Description of INMARSAT Receiver

100 Davids Drive, Hauppauge, NY 11788
TEL.: +1-631-436-7400 • FAX: +1-631-436-7431
www.miteq.com