2 and 3 CHANNEL RACK MOUNTED FREQUENCY DOWNCONVERTERS FOR TRACKING APPLICATIONS

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These GeoSync Microwave 2 and 3 Channel Downconverters are designed with shared local oscillators to provide two or three phase and amplitude related channels for tracking applications.
Every effort has been made to simultaneously provide high performance, reliability and value.
Models are available for operation in either S-, C-, X-, Ku and Ka-Band.

The low phase noise and excellent dynamic range of these converters enable them to carry almost any type of analog or digital communications signals.
Multiple remote connections and a robust protocol provide strong M&C support.

STANDARD FEATURES

- Multiple channels with shared Local Oscillators
- RS422, RS485 and 10/100 Base-T Ethernet
- 50 IF impedance
- RF, IF and LO monitor ports
- Automatic switching to external 5/10 MHz reference
- Electronic adjustment of internal reference frequency
- Low intermodulation distortion
- Phase noise IESS-308/309 compliant
- 30 dB level control
- Elapsed time and event log after power turn on
- CE mark

OPTIONS

- Reference clean-up loop and improved frequency stability
- Multiple outputs

MODELS

RF Frequency (GHz)	2 Channel Model Numbers	3 Channel Model Numbers
2.0-2.4	DTR2-200240	DTR3-200240
3.4-4.2	DTR2-340420	DTR3-340420
3.4-4.2, 4.5-4.8	DTR2-340480	DTR3-340480
7.7-8.5	DTR2-770850	DTR3-770850
8.0-8.5	DTR2-800850	DTR3-800850
10.7-12.75	DTR2-107127	DTR3-107127
17.7-18.7	DTR2-177187	DTR3-177187
17.7-20.2	DTR2-177202	DTR3-177202
19.2-21.2	DTR2-192212	DTR3-192212
20.2-21.2	DTR2-202212	DTR3-202212

SPECIFICATIONS (1/2)

Type	Dual conversion
Frequency Step Size	1 kHz (100 Hz option)
Frequency Sense	No inversion

INPUT CHARACTERISTICS

Frequency	Refer to model number table
Impedance	50 ohms
Return Loss	20 dB minimum
Signal Monitor	-20 dBc nominal
Input Level (Non-damage)	15 dBm maximum

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SPECIFICATIONS (2/2)

OUTPUT CHARACTERISTICS

Frequency	70 ±2 MHz
Impedance	50 ohms
Return Loss	20 dB minimum
Signal Monitor	-20 dB nominal
Power Output (1 dB Compression)	16 dBm minimum/17 dBm typical

TRANSFER CHARACTERISTICS

Gain	44 to 48 dB at 23°C
Level Control	30 dB in 0.2 dB steps
Level Stability	±0.25 dB/day maximum at constant temperature
	±0.5 dB typical from 0 to 50°C
Amplitude Response	0.5 dB peak-to-peak/4 MHz maximum
Noise Figure at Minimum Attenuation	11 dB maximum (13 dB maximum Ka band)
Image Rejection	80 dB minimum
Channel to channel isolation	50 dB minimum
Channel to channel gain tracking	±1.0 dB/day maximum at constant temperature
Channel to channel phase tracking	±2°/day maximum at constant temperature
Third Order Intermodulation Distortion	60 dBc minimum(+30 dBm IP3)
(Two tones each at 0 dBm output)-	
AM/PM Conversion	0.1°/dB maximum to 0 dBm output
Spurious Outputs (Inband)-	
Signal Related	60 dBc <1 MHz, 65 dBc maximum up to 0 dBm output
Signal Independent	-80 dBm maximum
LO Leakage at RF	-80 dBm maximum
Frequency Stability	±2 x 10^{-8}, 0 to 50°C
Frequency Aging	5 x 10^{-9}/day, after 24 hours on time
Frequency Accuracy	Same as Frequency Reference

PHASE NOISE

Frequency Offset maximum/typical (dBc/Hz)							
RF BAND	10 Hz	100 Hz	1 kHz	10 kHz	100 kHz	300 kHz	1 MHz
S-BAND	-60/-63	-78/-81	-88/-91	-96/-99	-96/-99	-96/-99	-117/-120
C-BAND	-70/-74	-80/-84	-90/-94	-94/-97	-94/-97	-94/-97	-116/-119
X-BAND	-67/-72	-81/-85	-89/-93	-90/-94	-90/-94	-90/-94	-115/-122
Ku-BAND	-65/-70	-72/-82	-87/-90	-90/-92	-90/-92	-90/-93	-115/-122
Ka-BAND	-59/-64	-67/-76	-80/-82	-84/-86	-84/-86	-89/-93	-109/-115
Required maximum reference							
10 MHz	-120	-145	-160	-160			

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REMOTE CONTROLS

Serial Interface	RS485/RS422
Ethernet Interface	10/100 Base-T Ethernet interface providing: - HTTP-based web server - SNMP1.0 configuration - Alarm reporting via SNMP Trap - Telnet Access - Password protection

INDICATOR and ALARMS

Status Indicator	Red LED (front panel)
Remote Mode Indicator	Green LED (front panel)
Summary Alarm	Contact closure/open for DC voltage and local oscillator

OPTIONS

49-1. Type N female RF connector

49-2. Type TNC female IF connector

49-3 Reference clean-up loop and improved frequency stability

Reference oscillator acts as an analog phase lock with a 0.1 Hz nominal loop bandwidth.
Typical loop suppression of the external reference is as follows:
28 dB at 1 Hz offset, 65 dB at 10 Hz offset and 100 dB at 100 Hz offset
Frequency stability: ±2 x 10 , 0 to 50°C
Frequency aging: 1 x 10^{-9} per day after 24 hours operation preceded by 10 days of operation

49-5 Multiple IF outputs, up to 4

49-6 100 Hz frequency step size

PRIMARY POWER REQUIREMENTS

Voltage	90-250 VAC
Frequency	47-63 Hz
Consumption	40W typical
Fuse	T1.25A

PHYSICAL (1/2)

Weight	16 pounds (4.5 kg) nominal without rack slides 20 pounds (6.4 kg) nominal with rack slides
Chassis Dimensions	19” x 5.25” panel height x 20” maximum

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PHYSICAL (2/2)

Connectors -

RF	SMA female
IF	BNC female
RF Monitor	SMA female
IF Monitor	BNC female
External Reference	BNC female
Summary Alarm	DE-9P
Remote Interface	DE-9S for RS485, RS422
	RJ-45 female for Ethernet
Primary Power	IEC-60320-C13/C14
Redundancy Interface	DE-9P

ENVIRONMENTAL

Operating

Ambient Temperature	0 to 50°C
Relative Humidity	Up to 95% at 30°
Altitude	Up to 10,000 feet

Non-operating

Ambient Temperature	-50 to +70°C
Relative Humidity	Up to 10,000 feet
Altitude	Up to 40,000 feet
Shock and Vibration	Normal handling by commercial carriers

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