brandywine communications

Frequency Reference Unit (FRU-SAASM)

Features:

- Ultra-stable GPS Disciplined Frequency Reference
- 10 Independent 10MHz outputs
- 1U chassis
- Meets MIL-STD-188-164A stability requirements
- Frequency accuracy to 1 x 10^{-12}
- Dual Port NTP Server

The FRU is a state of the art, high-precision frequency standard capable of outputting ten isolated precision 10MHz frequency reference outputs. The FRU uses an internal GPS receiver to control a precision oscillator with accuracy up to 1 x 10^{-12} and excellent short term stability

The FRU meets the frequency stability requirements of MIL-STD- 188-164A for SHF terminals.

A particular feature of the FRU is the ultra-high isolation (>100dB) between the 10MHz outputs, eliminating interaction between 10MHz outputs when they are loaded/unloaded.

The FRU incorporates a high-sensitivity 12 channel .

Dual Ethernet ports are used for both monitoring/control of the FRU using Simple Network Monitoring Protocol (SNMP) as well as providing Network Time Protocol (NTP) to clients.

A Brandywine supplied user application may also be used to provide a Graphical User Interface to the FRU.

The FRU is available is a number of configurations to support specific applications. A Mobile Application version features a special vibration isolated oscillator that provides isolation of the reference source from portable generator induced phase noise. The High Performance version uses a rubidium oscillator.

A SAASM GPS receiver is available for military applications.

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FRU Technical Specifications

Input:

GPS Antenna Input	
Connector	BNC
1PPS input	
Connector	DB-15
Level	0-10V_{pk}
Impedance	50 Ω
HAVEQUICK Input	DB-15
Level	0-5V_{pk}
Impedance	2 kΩ

Outputs:

10MHz outputs

No of Outputs	10	
Frequency	10MHz	
Accuracy	$1X10^{-12}$ (24hr avg.)	
Amplitude	+13dBm	
Harmonics	<40dBc	
Non Harmonic	<90dBc	
Isolation	<-100dBc when adjacent channel is opened or shorted	
Phase Noise	(dBc/√Hz)	
	Static	Vibration*
10Hz	-120	-120
100Hz	-140	-90
1kHz	-150	-130
10kHz	-150	-150
100kHz	-155	-155

Phase perturbation <5mdeg. in 0.2sec

1PPS Output

Accuracy	±50ns
Connector	DB-15
Level	0-10V_{pk}
Impedance	50 Ω
HAVEQUICK Output	DB-15
Level	0-5V_{pk}

Power: 90 VAC to 260 VAC
<15 Watts.
Dual Redundant Power (opt)

Control and Status:

Type	10/100BaseT Ethernet
No of Ports	2 independent
Protocol	IPV4, IPV6
	SNMPv1, V3 (opt)
	NTPV3, V4 (opt)
Graphical Interface	BWC Application

GPS Receiver

Receiver Type	GB-GRAM
Frequency	L1, L2 Dual Frequency
Satellite Code	C/A, P(Y)
Receiver Type	Parallel 12 Channel
Pos. Accuracy	16m SEP
Warm start	<120 seconds with Almanac, CV loaded

Reliability: MTBF >70,000 hours

Physical

Size 1U 19”x1.72x14” depth

Environmental

Humidity:	95% non-condensing.
Temperature:	0 to +50ºC operating
	-40 to +85ºC non-operating.
Temp. Shock	-20 to +70 ºC 3 ºC/min
Vibration*	1.5g peak. 50-2000Hz
Shock*	MIL-STD-188-164A para. 5.1.2.16.c

* Mobile Application Version only

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