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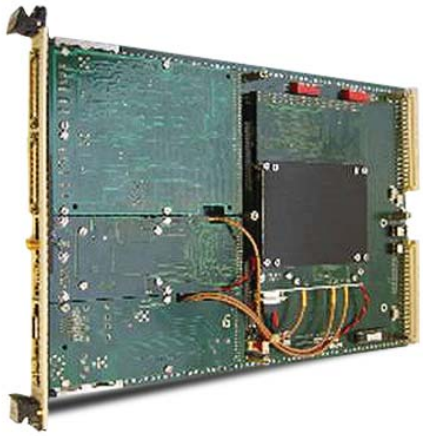
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Racal Instruments™ 3352A SERIES

VXI Rubidium/GPS Frequency Standard

The Racal Instruments™ 3352A Rubidium frequency standard module and the 3352A-GPS, its GPS-disciplined companion, set a new standard for high density functionality in a single width VXI module. Using ANSI Standard M-Module building blocks, the 3352A series integrates the functions of a Rubidium oscillator and clock distribution together with an optional trigger distribution module and an optional digital I/O (DIO) module.

Key Features

- **Single width VXI module for highest possible system density**
- **Eight channels of ground-isolated clock distribution are included**
- **Standard and GPS-locked versions available**
- **External power input keeps rubidium oscillator powered during system shutoff**
- **Low-jitter, low-noise and high isolation clock distribution**
- **Optional trigger distribution and digital I/O**

Product Information

GPS Disciplining Option

The 3352A-GPS uses the 1PPS output from a Motorola architecture GPS receiver to discipline the Rubidium oscillator. This technique results in improved long-term stability.

External DC Power Supported

If the VXI test station goes down, power may still be applied to the Rubidium oscillator and GPS receiver via a front panel external DC power input. This keeps the Rubidium oscillator very stable over time and eliminates the effects of retrace. For the 3352A-GPS, it also keeps GPS location information stable, saving the time it takes for the receiver to do an auto-locate.

Rubidium Oscillator Control

Control of the Rubidium oscillator is available to enable or disable outputs or to query it for information such as serial number, operating hours, operating temperature, event history, self-test and other performance indicators.

Holdover

For the GPS-disciplined 3352A-GPS, when GPS satellites are not available, the system performance reverts to that of a stand-alone Rubidium (this period is called the holdover period). Under worst case temperature conditions, the system will accumulate a maximum of 1.76 µs of error after 1 day and 3.46 µs after two days.

High Isolation Clock Distribution

The clock distribution amplifier section of the 3352A models provide over 47 dB of isolation between channels. TTL channel skew is less than 500 ps, and jitter is less than 50 ps RMS.

Software Driver Support

Software drivers are included which allow remote operation and control of the 3352A or 3352A-GPS from almost any software environment including Microsoft Visual C®, Visual C++®, and Visual Basic® development tools, as well as LabWindows™/CVI, and LabVIEW™.

Optional DIO

The DIO option provides 128 TTL channels in 16 groups of eight bits each. Internal or external trigger state control is available on a per byte basis. Each channel is configurable as an input or an output. A 256 kB dual port buffer is used for input or output operations. In synchronous mode, the system data rate is programmable up to 10 MHz.

ASTRONICS TEST SYSTEMS

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Specifications

Note: The Astronics Test Systems policy is one of continuous development and improvement. Consequently, the equipment may vary in detail from the description and specifications in this publication.

Output Characteristics

Output Frequency
- 10 MHz

Output Channels
- Sinewave Channels: 5
- TTL Channels: 3

Amplitude
- Sine Wave: Adjustable, 0 - 15 dBm
- Adjustment Resolution: 0.5 dB steps
- TTL: 3 V minimum into 50 Ω

Isolation (between outputs)
- >47 dB @ 10 MHz, +15 dBm output

TTL Parameters (TTL outputs)
- Amplitude: 3 V_{pk}, 5 V max
- Rise and Fall Times: <3 ns
- Skew (channel-channel): <500 ps
- Jitter: <50 ps RMS

Voltage Isolation (from ground)
- 400 V

Spectral Purity (sine outputs)
- Harmonics: <-40 dBc
- Spurious: <-57 dBc

Monitoring
- All outputs monitored

Timebase Characteristics

Initial Accuracy (@ 25° C)
- 5 x 10^{-11}

Stability
- Frequency Drift: 5 x 10^{-11}/month
- Frequency Retrace: ±2 x 10^{-11}
- Allan Variance (1 s): 3 x 10^{-11}
- Allan Variance (10 s): 1 x 10^{-11}
- Allan Variance (100 s): 3 x 10^{-12}

Phase Noise/Spurious
- 10 Hz offset: -90 dBc/Hz / -90 dBc
- 100 Hz offset: -128 dBc/Hz / -105 dBc
- 1 kHz offset: -140 dBc/Hz / -115 dBc
- 10 kHz offset: -147 dBc/Hz / -130 dBc

Warm Up (@ 25° C)
- <4 minutes to lock
- <7.5 minutes to reach 1 x 10^{-9}

Receiver Characteristics

Receiver Architecture
- 12 parallel channels

Tracking Capability
- 12 simultaneous satellites

Operating Frequency
- L1 (1575.42 MHz)

Acquisition Time (Time to First Fix, TTFF)
- Hot: <25 s, typical
- Warm: <50 s, typical
- Cold: <200 s, typical
- Internal Reacquisition: <1 s, typical

Options

Opt. TD2: Trigger Distribution (Type 2)
- Routes two simultaneous trigger paths.

DIO Characteristics

Number of Channels
- 128

Data Rate
- Static to 10 MHz (Synchronous or Asynchronous)

Operating Modes
- Asynchronous
- Synchronous
- Mixed (Synchronous and Asynchronous)

Input/Output
- TTL or CMOS

Configuration
- I/O lines selected as either input or output on an 8-bit byte basis

Memory
- 256 k x 8 dual-ported

Connectors
- Four 68-pin VHDCI

CE The CE Mark indicates that the product has completed and passed rigorous testing in the area of RF Emissions and Immunity to Electromagnetic Disturbances, and complies with European electrical safety standards.

Interface

(Single slot, Register-based, VXIbus 1.4 Compliant)

Peak Current & Power Consumption
- Total Power: 55 W

	I_{PM} (A)	I_{DM} (A)
+12 V	1.7	0.6
+5 V	5.2	0.8
-12 V	0.05	0.05

Front Panel I/O

Outputs
- Sine (5): 10 MHz, 1 V_{rms}, nom. 50 Ω (MCX)
- TTL (3): 10 MHz, 3 V nom. into 50 Ω (MCX)
- 1 or 100 pps from GPS: TTL, MMCX
- pps active: TTL, DE-9 (GPS option)

Inputs
- Sine: 10 MHz, 0 dBm nom
- TTL: 10 MHz
- External Rubidium Power: 10 to 25 V (DE-9)
- GPS Antenna:(SMA) 50 Ω

Status Lights
- Red: Sysfail
- Red: Module ID Signal Applied
- Green (6): M-Module Accessed
- Green: PPS Active (3352-GPS only)
- Green: Rubidium Locked (internal)

Software

Drivers
- LabVIEW™, LabWindows™/CVI, VXI*plug&play* support for frameworks based on Microsoft Win32® application programming interface

Environmental

Temperature
- Operating: 0° C to 50° C
- Storage: -40° C to 70° C

Humidity (non-condensing)
- 5 to 95%

MTBF (ground benign)
- Rubidium: 600,000 hrs

Calibration Interval
- 15 yrs

Mechanical

Weight
- 2.2 lb (1 kg)

Cooling (10° C Rise)
- 3.0 l/s @ 0.5 mm H_2O

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Ordering Information

408630 : Racal Instruments™ 3352A-GPS
Rubidium Oscillator with GPS and Clock Distribution

408630-001 : Racal Instruments™ 3352A
Rubidium Oscillator with Clock Distribution

408630-003 : Racal Instruments™ 3352A-DIO
Rubidium Oscillator with Digital I/O

408630-004 : Racal Instruments™ 3352A-GPS-TD2
Rubidium Oscillator with GPS, Clock and Trigger Distribution Type 2

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