AMETEK® PROGRAMMABLE POWER | VTI Instruments

WWW.POWERANDTEST.COM

RX0424

24-CHANNEL IEPE / VOLTAGE INSTRUMENT WITH INTEGRATED TACHOMETER INPUTS

FEATURES

- 24-Channel IEPE Accelerometer / Voltage Inputs
- 24-bit ADC per Channel
- 204.8 ksamples/second/channel Sample Rate
- Built-in Current Excitation
- 2-Channel Synchronized Tachometer
- 1 MHz Tachometer Frequency Range
- ±25V, ±250 V Tachometer Input Ranges
- TEDS Support
- BNC Input Connectors
- Built in Self-calibration (BIT)
- LXI Ethernet Interface
- IEEE 1588 Synchronization with Data Time Stamping
- Full-featured Embedded Web Interface

Overview

AMETEK's family of rugged instrumentation is designed and built to operate in some of the most extreme environmental conditions imaginable, without compromising measurement accuracy or performance.

An ideal solution for measuring acceleration forces, such as sensing static and dynamic movement or vibrations, the RX0424 delivers repeatable laboratory grade measurements to the field. Fully integrated IEPE current excitation and tachometer input channels further enhance the instruments utility and functionality.

Accuracy

Independent 24-bit analog-to-digital converters, combined with meticulous signal path design, result in exceptional accuracy at programmable data acquisition rates up to 204.8 kSa per second. Multiple input ranges are combined with the independent ADC's to deliver repeatable, high resolution measurements ensuring that all vibration events, large or small, can be accurately captured.

Precision IEPE current excitation sources can be programmed to generate either 4.5 mA or 10 mA drive current and tailored to meet specific application demands. Built-in selftest diagnostics improve test confidence with access to internal temperatures, memory and closed loop end-to-end self-calibration.

Scalability

Multiple instruments are easily distributed around the test article, thus reducing long analog cable lengths and minimizing errors induced by noisy environments. Setup and maintenance times are also reduced thanks to shorter, more manageable transducer cable runs.

Data correlation is achieved utilizing industry standard IEEE-1588 synchronization and timestamp methodology. This applies to individual channels within a single instrument, as well as to multiple instruments distributed around a test article.

Environmental

IP66 rated to protect against dust, spills, humidity, and water jets from every direction, the RX0424 can be used virtually anywhere, especially when combined with rugged Mil-Grade connectors. Extended operating temperatures of -20°C to +60°C are delivered in a compact, light-weight design leveraging thermal conduction cooling techniques to dissipate heat without the use of a fan.

Software

Open Source, industry standard, drivers and programming interfaces provide the flexibility and freedom of choice to select the application programming environment best suited for the application and specific development requirements. Turn-key software, including EXLab and APEX DS is also available.

EXLab is an easy to use solution featuring intelligent configuration capabilities, automatic device discovery, extensive time and frequency domain data visualization, and post-acquisition display and analysis tools. SDRL X-Modal III, experimental modal analysis software, features intuitive task-oriented user interfaces, extensive modal parameter estimation algorithms, parallel display capabilities, flexible data management, and unparalleled channel expandability.

Digitizer

Channels	24
Input Connector	BNC
ADC	24-bit delta-sigma
Input Coupling	DC or AC
Input Type	IEPE (psuedo-differential)
	Voltage (psuedo-differential or differential)
Sample Rate	User Programmable
	204.8 kSa/s or 131.072 kSa/s with Decimate by 5 and by 2n
	Lowest Sample Rate: 2 Hz
Bandwidth	92.2 kHz maximum
Spurious Free Dynamic Range	-86 dBfs typical, 10 V range, 1 kHz test frequency
THD	< -85dB typical , 20 Hz - 20 kHz
Noise	40 nV / sqrt (Hz) typical, 100 Hz, 0.1 V Range
Aliased Response	< -90 dB (typical)
Anti-Alias Filter	3-Pole Linear Phase
	-3.0 dB @ 400 kHz
Digital Anti-Aliasing Filter	Fixed
Crosstalk	-98 dBfs typical @ 1 kHz
DC Offset	< 1 mV DC coupling, < 5 mV AC coupling
AC Coupling 3 dB Corner Freq	0.37 Hz Typical (Ranges: 0.1 V, 0.2 V, 0.5 V)
	0.25 Hz Typical (Ranges: 1 V, 2 V, 5 V, 10 V)
Input Ranges (V pk)	±10Vpk, ±5Vpk, ±2Vpk, ±1Vpk, ±0.5Vpk, ±0.2Vpk, ±0.1Vpk
	Over-range capability: +10%
Input Impedance	Single Ended: 2 MΩ
	Differential: 4 MΩ
	Either side to chassis: 2 MΩ, 35 pF nominal

VTI Instruments
9250 Brown Deer Road
San Diego, CA 92121
+1 850 450 0085
sales.ppd@ametek.com
www.powerandtest.com

Digitizer (cont.)

Common Mode Rejection Ratio	-80 dB Typical @ 1 kHz
Amplitude Accuracy	±0.03 dB @ 1 kHz
Amplitude Match	0.01 dB Typical
Amplitude Flatness	+0.01 dB to 46 kHz
Channel-to-Channel Phase Match	±0.01 @ 1 kHz
Phase Linearity	±0.05 up to 90 kHz + 0.01 dB (full scale signal)
Phase Accuracy (Relative to Tachometer)	<0.1 @ 1 kHz
Over-Voltage Protection	±30 V pk
IEPE Excitation Current	Programmable: 4.5 mA or 10 mA nominal
IEPE Compliance	IEPE compliance voltage > 21 V
Open / Short IEPE Transducer Detection	Green / Red LED located on front panel
TEDS	IEEE 1451.4
Trigger Modes	Level / Edge, External, LXI, software, Timer, Source, RPM

Tachometer

Inputs	2
Frequency Range	1 MHz
Voltage Range	±25 V, ±250 V
Input Type	Differential
Input Coupling	DC, AC 0.6 Hz
Minimum Pulse Width	600 ns
Threshold	Programmable ±95% of Range
Hysteresis	Programmable ±1% of Range

VTI Instruments
9250 Brown Deer Road
San Diego, CA 92121
+1 850 450 0085
sales.ppd@ametek.com
www.powerandtest.com

IEEE 1588 Clock / Timing

Clock Oscillator Accuracy	±20 ppm
Synchronization Accuracy	< ±100 ns of the Master Clock (synchronized)
Timestamp Accuracy	Master clock down to 50 ns
Resolution	25 ns
Alarm Trigger Time Accuracy	Master clock down to 50 ns
Alarm Time to Trigger Delay	50 ns
LAN Event Trigger Time Accuracy	Master clock down to 50 ns
LAN Event Time to Trigger Delay	50 ns
Future Timestamp	50 ns Typical
Past / Zero Timestamp	1 ms Maximum

Hardware Trigger Timing

DIO Trigger Delay	75 ns Typical

Health Monitoring

Embedded Health Monitoring	Internal temperature, Open/Short IEPE Transducer Detection
Built-In Self-Test (BIST)	Yes
Embedded Self-Calibration	Yes
Embedded NIST Traceable Calibration	Yes
Automatic ADC Over Range / Flow Detection	Yes

Power

Input Voltage	+18 V to 30 V DC, must be isolated to 1500 Vrms
Power (AUX)	36 W typical, 40 W max.

VTI Instruments
9250 Brown Deer Road
San Diego, CA 92121
+1 850 450 0085
sales.ppd@ametek.com
www.powerandtest.com

Environmental

Environmental Rating	IP66 Rated
Temperature	Operating Temperature: -20°C to +60°C
	Storage Temperature: -55°C to +80°C
Humidity	95%
Internal Pressure	< 4 PSIA
Vibration & Shock	MIL-PRF-28800F Class 1
Resistance to Corrosive Fluids	Per RR EIR2553: Fuel, Engine Oil, Hydraulic Fluid
CE Compliance	Yes
EMC Directive	EMC EN 61326 Class A, Criteria A, Annex A

Physical

Onboard Memory	128 Mb
Dimensions	15.9" x 12.3" x 4.3"
Weight	9.5 Kg (21lb.)

Ordering

Model	Part Number	Description
RX0424	70-0679-000R	24-Channel IEPE Instrument with 2-Channel Tachometer
N/A	70-0629-000	24 VD AC-DC Desktop Power Supply
N/A	70-0628-000	Power cable including MIL-26482 14-15 plug

VTI Instruments
9250 Brown Deer Road
San Diego, CA 92121
+1 850 450 0085
sales.ppd@ametek.com
www.powerandtest.com