600 Series : 672u Model

20-Channel Dynamic Signal Analyzer (DSA)

NEW

iOtech
iotech.com

Features

- USB interface
- 20 analog inputs, ±40V input range (±60V max without damage)
- 4 mA IEPE current source per channel (22V compliance)
- 0.1 Hz high-pass filter
- Dedicated 24-bit, 105.4 kS/s delta sigma ADC per analog input
- Spurious-free dynamic range of 108 dB (typical)
- AC/DC coupling, software selectable per channel
- TEDS support for accelerometers
- Pseudo-differential input
- Total harmonic distortion of -100 dB (typical)
- Channel-to-channel phase matching of <0.12 degrees at 1 kHz
- 8-bit digital I/O port
- Support for DASYLab®
- Supported Operating Systems: Windows 2000®, Windows Vista® x86 (32-bit), and Windows XP®

The 20-channel 672u Dynamic Signal Analyzer is ideal for large channel count applications including machine condition monitoring, modal analysis, rotating machine analysis, predictive maintenance and more. The USB-based module is compatible with eZ-Series software for real-time vibration analysis. Each of the 20 analog inputs features a dedicated 24-bit delta sigma ADC for superior resolution and accuracy.

RoHS

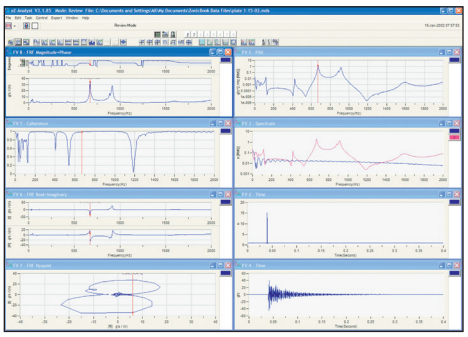
The 672u offers 20 input channels for accelerometers, proximity probes, tachometers, microphones or voltage

Hardware Overview

The IOtech 600 Series are 24-bit dynamic signal analyzers with USB or Ethernet interfaces to transfer acquired data to the PC in real time. This means that every data sample can reside on a PC's hard drive, which makes effective waveform recreation and post acquisition analysis.

Measurement

The spurious-free dynamic range of the 600 Series analog input is 108 dB. The 24-bit delta sigma ADC provides high resolution and excellent AC and DC accuracy. All channels are sampled synchronously and provide better than 0.12˚ of channel-to-channel phase matching at 1 kHz. The extremely low noise floor and extremely low distortion provide the user with high quality test data.

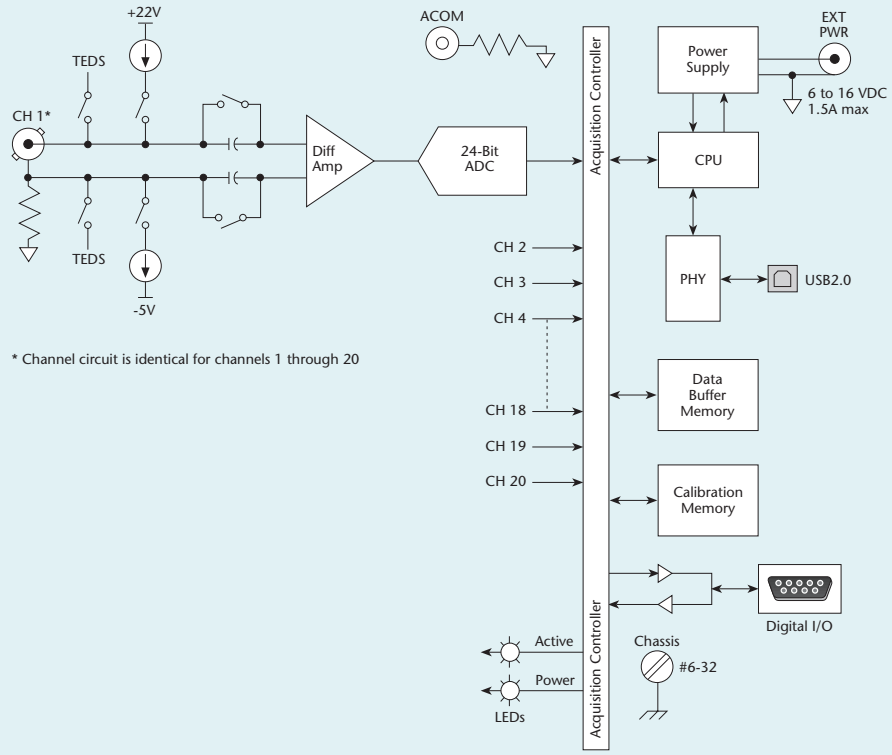


eZ-Analyst software with the 600 Series and your PC makes a real-time, portable vibration and acoustic analysis system

Analog Inputs

The IOtech 600 Series support a variety of analog input types, including Accelerometer, Velometer, Proximity Probe, Microphone, Tachometer, or other voltage input. The 672u model can accept up to to ±40V inputs. All are rated to withstand up to ±60V maximum without damaging the input. These signals may be either AC or DC coupled.

672u Block Diagram



Signal Conditioning

The 672u supports software selectable AC or DC coupling, and automatically connects the 4 mA current source with AC coupling for integrated electronic piezoelectric (IEPE) sensors. The 672u also supplies the current source with a 22V compliance voltage at the input terminals for biasing the IEPE sensors.

All 600 Series models can be programmed to select IEPE sensors and read sensor calibration information using Transducer Electronic Data Sheets (TEDS). The software can automatically connect to the sensors' EEPROM memory, and retrieve their data sheet.

Power

The 672u must use external power, either user supplied, or with the included universal AC/DC power adapter. It may also be powered from a regulated external 10W supply ranging from 6 to 16 VDC.

PC Connection

The 672u connects to the PC through a USB 2.0 port interface. When measuring continuous signals over multiple channels, it is recommended to use a dedicated USB connection between the 600 Series DSA and the PC to ensure the data transfer is not interrupted.

Software Overview

Three end-user software packages are available for the 672u. Each is tailored to a particular type of vibration measurement and analysis application. Select the package that best suits your application, and add additional packages as your requirements evolve. These packages support analysis rates from 20 Hz to 40 kHz.

eZ-Analyst provides throughput data recording and multiple channel vibration analyses. Time Waveform, Spectrum, Waterfall, FRF, Cross, Transfer Function, Coherence, and Octave analyses are provided. Data acquisition and storage can be triggered based on events or scheduled. Direct export to the most accepted Modal Analysis packages.

eZ-TOMAS is a highly sophisticated, yet easy-to-use tool for the monitoring and analysis of single or multiple machines, which allows the user to assess the reliability and operation of his process, and the critical machines pertaining to his process. Notification of faults are displayed locally, but can also be sent via text message or email, allowing the user to be notified of any problem regardless of his location.

eZ-Balance is used to balance rotating machinery with up to seven planes. A Toolkit, which includes Split Weight calculations, supports the balance process. The vibration vectors and correction weights are displayed on polar displays. Time and Spectrum plots show the detailed vibration measurements during the balance process.

Specifications

General Specifications

Environment
- **Operating Temperature:** -40˚ to 50˚C
- **Humidity:** 0˚ to 95% RH, non-condensing
- **Vibration:** IEC 60068-2-64
- **Shock:** IEC 60068-2-27
- **Ingress:** IP 40

Power Supply
- **Maximum Power Draw:** 9W
- **Required Supply Voltage:** 6.0 to 16 VDC
- **Supply Current:** 1.5 amp max
- **Power Jack:** Barrel type; 5.5 mm O.D., 2.5 mm I.D.

PC Communication: USB 2.0
Dimensions: 276.9 mm W x 169.8 mm D x 57.2 mm H (10.9" x 6.7" x 2.25")
Weight: 1.68 kg (3.7 lbs)
Warm-Up: 10 minutes to rated specifications

Analog Specifications

Analog Measurements

ADC Converter Resolution: 24 bits
ADC Converter Type: Delta-Sigma per channel
Sample Rates: Up to 105,468 samples per second
Sample Rate Accuracy: ±50 ppm
Channels: 20 input channels
Input Connector: 1 BNC per channel
Input Impedance
- **High to Ground:** 800k Ohm || 120 pF
- **Low to Ground:** 1k Ohm
- **High to Low:** 801k Oh

Input Coupling: DC, AC, or AC + IEPE; software programmable per channel basis
High-Pass Filter (Cutoff): 0.1 Hz
Input Ranges: ±40V peak
Input Protection
- **BNC Shell to BNC Center:** ±60V max without damage
- **BNC Shell to Earth Ground:** ±8V max without damage

Over-Range Indication: Software
Low-Pass Filter: Software programmable per channel
Type: Anti-aliasing hardware 3-pole 360 kHz, software selectable FIR filter. Any unwanted signals above 27 MHz are lost in the noise floor of 64k FFT.

Amplitude Accuracy

- **AC at 1 kHz:** ±0.1 dB typ ±0.15 dB max
- **DC:** ±(0.2% of reading + 15 mV)

Amplitude -3 dB: 0.49 x sample rate
Amplitude Flatness: ±0.05 dB typ ±0.10 dB max DC to 20 kHz
Total Harmonic Distortion: -100 dB typ 1 kHz, -97 dB typ 10 kHz
SFDR Including Harmonics: 108 dB typ DC to 50 kHz
SFDR (@ -60 dB): 128 dB typ DC to 50 kHz
Channel-to-Channel Crosstalk: <-100 dB at 1 kHz
Channel-to-Channel Phase Matching: <0.06˚/kHz + 0.1˚
Common Mode Rejection Ratio: -56 dB typ -41 dB max at 1 kHz
Wideband Noise

Analysis Frequency (Hz)	Typical Noise (µV rms) [1]
20	11
50	15
100	20
200	26
500	37
1000	48
2000	62
5000	89
10000	116
20000	151
40000	197

1. Maximum noise @ ≤50˚C = 1.4x (where x is the typical value given in the above table)

IEPE Bias Source
Current: 4.0 mA, 22V compliance (on/off software programmable per channel)
Impedance: >255k Ohm
IEPE Fault Detection Thresholds: <1V (short), >20V (open)
IEPE Fault Indication: Software indicator, per channel

Calibration Note: Factory calibration of 672u is conducted with the unit in its standard operating upright horizontal position, with the chassis cover clear of other devices and objects.

Tachometer Inputs

Any analog input channel may be used as a tachometer input

Digital I/O Lines

Channels: 8 digital I/O, programmable as inputs or outputs on a line by line basis
Ports: 1 x 8-bit; each bit is programmable as input or output
Power-Up Mode: Inputs pulled low
Connector: DB9 female
Input Modes: 2 programmable input modes: asynchronous, under program control at any time relative to analog scanning; synchronous with analog scanning
Input Protection: -0.6 and +5.6V
Input Levels
Low: 0 to +0.8V
High: +2.0V to +5.0V
Input Pull-Down Resistor: 10k Ohm
Synchronous Sampling: 105,468 Hz max
Output Voltage Range: 0 to +3.3V, may be pulled up to +5V
Output Resistance: 100 Ohm
Output Levels
Low: <0.8V
High: >3.0V with no load
Output Timing: Outputs are always written asynchronously

Ordering Information

Description	Part No.
20-channel, USB-based dynamic signal analyzer	672u

Accessories & Cables

Handle for 672u	HA-210-5-BK
High-speed USB cable, 1 m.	CA-179-1
External power supply, 90 to 264 VAC; requires additional cable	TR-2U
USA version	CA-1
European version	CA-216

Software (DASYLab drivers included)

Real-time vibration and acoustic analysis software	eZ-Analyst
Rotating machine monitoring and analysis software	eZ-TOMAS
Remote access and control client for eZ-TOMAS	eZ-TOMAS Remote
Machine balancing software	eZ-Balance
Lite version, includes all drivers; comes without analysis, limited module count, and one Layout Window	DASYLab LITE
Basic version, includes all drivers; comes with all standard modules (except Signal Analysis and Actions), and one Layout Window	DASYLab BASIC
Full version, includes all drivers; comes with all standard modules, 200 Layout Windows, and Control Sequencer	DASYLab FULL
Pro version, includes all drivers; includes Full version plus all add-on modules (without third-party modules)	DASYLab PRO
Run-time license for DASYLab	DASYLab RUNTIME

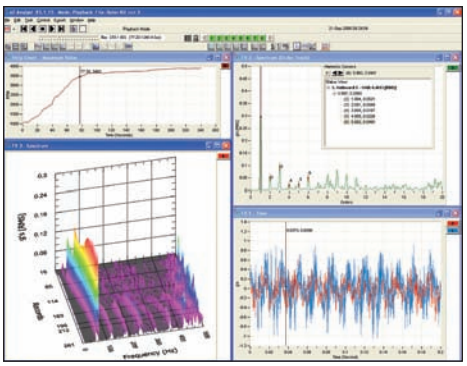
BUY NOW!

For complete product specifications, pricing, and accessory information, call 1-888-714-3272 (U.S. only) or visit **iotech.com/600series**.

eZ-Series Software

eZ-Analyst, eZ-TOMAS, eZ-Balance

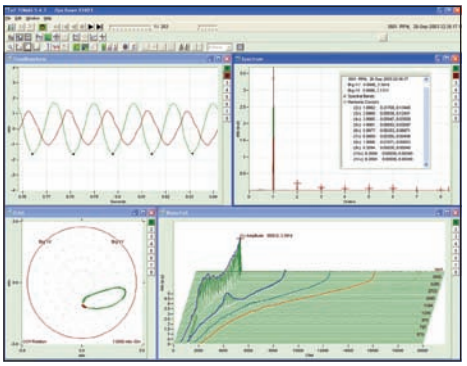
iotech.com



eZ-Analyst

Real-Time Vibration and Acoustic Analysis Software

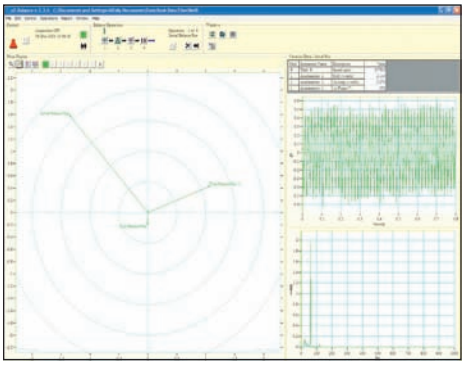
Mechanical engineers and reliability engineers often are responsible for deciding when to repair and refurbish industrial equipment such as mixers, grinders, and pulverizers. Refurbishing too often is not cost effective, but waiting too long for repairs can cause the catastrophic loss of this expensive equipment. eZ-Analyst software working with 600 Series data acquisition hardware allows continuous monitoring of the vibration and acoustic characteristics of industrial equipment. By tracking these parameters over time, the engineer can detect imminent problems and make sound decisions regarding repair schedules.



eZ-TOMAS & eZ-TOMAS Remote

Rotating Machine Monitoring and Analysis Software

Industrial equipment consists of rotating machinery such as motors, gearboxes, and transmissions. These components are subject to wear over time and require periodic maintenance and repair. Instead of overhauling the complete set of machinery, it is often cost-effective to determine the components that are near the failure point and replace or repair only these. eZ-TOMAS is designed specifically for monitoring rotating machinery and detecting problems with it. For example, it is possible to compare the magnitude and frequency of the vibration in a gearbox to the motor speed and determine if there is a problem in the gearbox. eZ-TOMAS provides an economical solution for monitoring and analyzing rotating machinery, and troubleshooting problems.



eZ-Balance

Machine Balancing Software

One of the ways to reduce vibration in rotating machinery is to attach known weights to appropriate locations on the machinery. This technique is similar to placing balance weights on your automotive wheels to eliminate vibration at certain speeds. The challenge is to figure out what weights to use and where to place them. When used in combination with 600 Series data acquisition hardware, eZ-Balance software provides that information.