MB DAQ 8256

8-channel data acquisition frontend

MB DYNAMICS
Sound & Vibration Testing Technology

8-channel data acquisition front-end for high-precision Sound & Vibration measurements

The MB DAQ 8256 is an eight-channel data acquisition front-end for high-precision, multi-channel sound and vibration measurements, Squeak & Rattle testing and in-line acoustic test systems. The universal inputs allow not only the connection of voltage sensors, IEPE accelerometers and microphones, but also the acquisition of additional associated quantities such as temperature, displacement, position or pressure via current sensors with 4-20 mA output. The delta-sigma A/D converter used allows simultaneous sampling at sampling rates of up to 256kS/s per channel. The signal-to-noise ratio of up to 107dB, the low distortion factor and the very low phase deviation between the channels enable noise- and distortion-free recording of the smallest measurement signals even in harsh industrial environments. Four additional digital inputs are available for recording frequency, speed, pulse width and quadrature encoder signals. A powerful signal processor allows pre-processing and analysis of the acquired signals. The integrated Ethernet port supports data streaming for further analysis and display in our BSR SUITE data acquisition software for Sound & Vibration analysis, NVH and Squeak & Rattle testing.

Features & Benefits:

- 8 simultaneously sampled inputs, 24-bit delta-sigma converter.
- Sampling rate 0.5-256kS/s per channel
- Suitable for voltage sensors, IEPE sensors and current transducers
- Voltage ranges: ±1.2V and ±12V
- Current ranges: ±4.8mA and ±32mA
- Isolated analogue section
- Overvoltage protection up to ±42V peak
- 110dB signal to noise ratio
- Extremely low phase errors
- Trigger, angle and tachometer TTL inputs
- USB2.0 device port and 100Base-Tx Ethernet
- 456 MHz floating point DSP with 32Mbyte DRAM
- 9VDC to 36VDC power supply

Typical applications:

- NVH measurements and Squeak & Rattle testing
- Sound & Vibration measurements
- In-line acoustic test systems
- Machine condition monitoring

Options / Accessories:

- BSR SUITE Sound & Vibration Software
- Direct access via Matlab ® Instrument Control Toolbox or LabView
- TCP/IP and USB drivers

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High-precision measurement technology for use in industrial environments

The functional isolation between the analogue and digital sections, the robust design and the use of a simultaneous sampling 24-bit delta-sigma AD converter ensure precise resolution of the finest signal details even in harsh industrial environments. Integrated 250Ω precision shunts for current measurement allow temperature, flow, pressure and other process parameters to be measured using additional 4-20mA output sensors. Overvoltage protection up to ±42V protects the analogue inputs from being destroyed by excessive input voltages.

Figure 1: Status LEDs for each analogue input indicate whether the input is open, the IEPE sensor power supply is activated, or the input channel is overloaded.

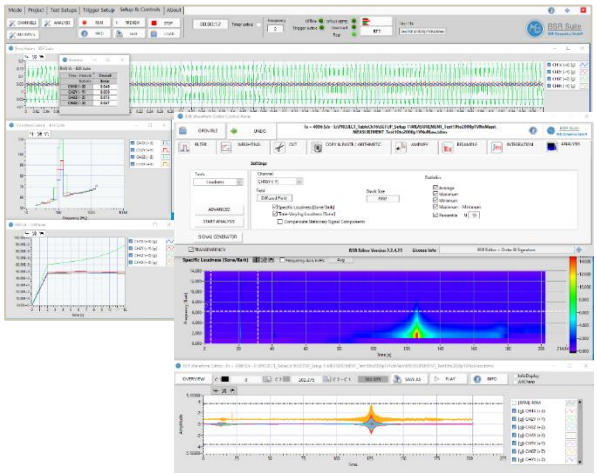

Figure 2: BSR SUITE measurement and analysis software with comprehensive signal processing and analysis capabilities

Mobile Data Acquisition, Acoustic Measurements & Vibration Analysis

Our measurement and analysis software BSR SUITE supports the full range of functions of the MB DAQ 8256: real-time simultaneous sampling of the acquired measurement signals with sampling rates of up to 256 kHz per channel, data processing, analysis and storage of the measurement data are perfectly matched. With its comprehensive signal processing and analysis capabilities, the combination of the MB DAQ 8256 and BSR SUITE is ideal for a wide range of mobile data acquisition, vibration and acoustic measurement, NVH and squeak & rattle testing applications.

Drivers for MATLAB, Python and LabVIEW

Drivers for MATLAB, Python and LabVIEW make it easy to integrate the DAQ 8256 into your own measurement applications. TCP/IP and USB API libraries allow configuration and control of the measurement hardware and transfer of acquired data via standard interfaces. The integrated powerful signal processor allows pre-processing and evaluation of measurement data, enabling the development of stand-alone instruments without the need for an external PC. The integration of analogue inputs, digital inputs and digital outputs allows the development of customised, automated test systems.

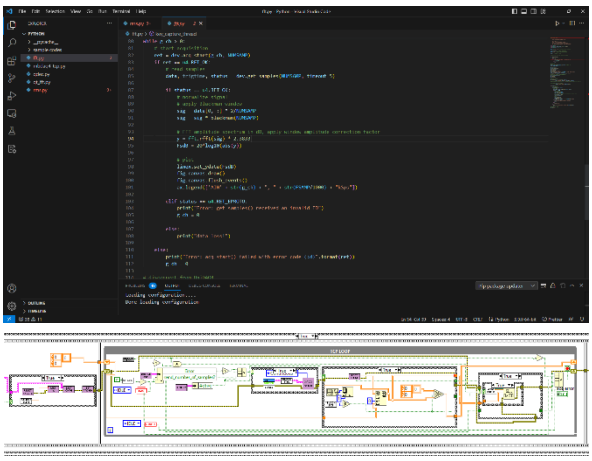

Figure 3: Drivers and interface libraries for developing custom measurement applications in MATLAB, Python and LabVIEW

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Technical data MB DAQ 8256

Analogue inputs	8
Coupling	DC, AC @ 1Hz, AC @ 150Hz, single-ended or differential
Suitable sensor types	Voltage sensors, IEPE sensors and current transformers
IEPE supply	4mA ±5%, 22V compliance, open and short-circuit input detection
Input voltage ranges	±1.2V and ±12V
Input current ranges	±4.8mA and ±32mA
Input impedance	1.8MΩ, 30pF differential / 50pF single-ended
Input leakage current	< ±50nA
Overvoltage protection	±42V
A/D converter	24-bit resolution, simultaneously sampling Delta-Sigma converter
Sampling rate	0.5 to 256 kS/s
Alias suppression	> 110dB
Crosstalk	< 130dB at 10kHz
THD*	12V range: differential < 127dB @ 1kHz, single-ended < 112dB @ 1kHz 1.2V range: differential < 115dB @ 1kHz, single-ended < 108dB @ 1kHz
SFDR**	12V range: 138dB @ 102.4kS/s 1.2V range: 137dB @ 102.4kS/s
SNR***	12V range: 107dB @ 102.4kS/s 1.2V range: 106dB @ 102.4kS/s
Phase shift between channels	1° @ 35kHz, 0.1° @ 5kHz with AC coupling at 1Hz; 1° @ 7Hz, 0.1° @ 70Hz
Gain Error	< ±0.05% of measurement range 80 to +50°C)
Digital inputs	4, TTL (GPIO, frequency, pulse width, quadrature encoder)
Digital outputs	2, TTL (GPIO, PWM)
Communication ports	100Base-Tx Ethernet, USB 2.0 high-speed (for configuration only)
Processor	TMS320C6746 DP, 456MHz, 32Mbyte DRAM
Power supply	9-36VDC
Power consumption	6.5W typical (IEPE activated on all channels), 12.5W max. peak
Size (W*D*H)	212mm*187mm*78mm
Weight	1530gr.
Environmental conditions	Ambient temperature 0-50°C, air humidity max. 95%.

* Input signal = -1dBFS (21.4Vpp in 12V range, 2.14Vpp in 1.2V range)
** Input signal = 1kHz sine, -1dBFS, measurement FFT with 65536 points, without harmonics
*** Measured with 1kHz -60dBFS input signal, SNR = 20*log (RMS Fullscale Sine Input / RMS Noise)

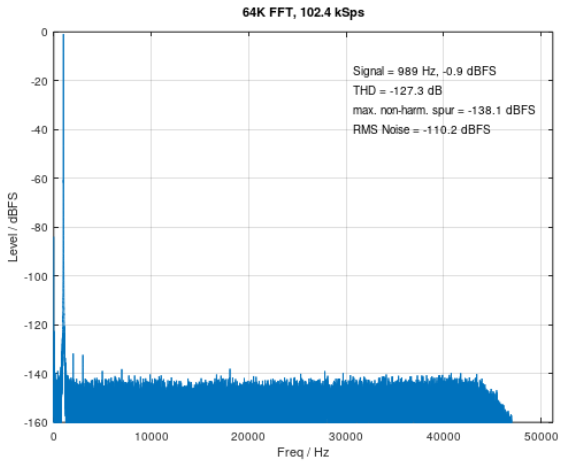

Figure 1: Differential input, 12Volt range

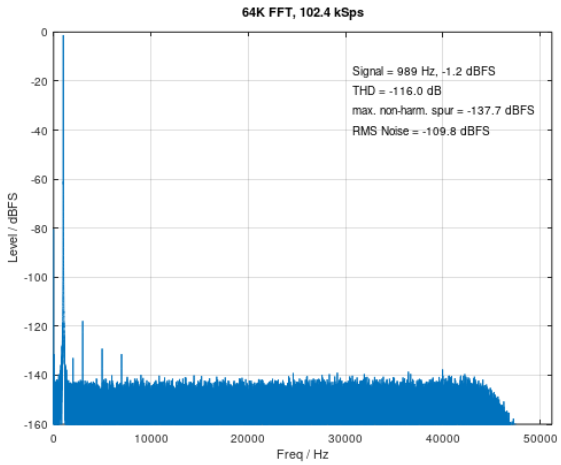

Figure 2: Differential input, 1.2Volt range