

Overview

The MB Dynamics Model 405-X dual channel signal conditioner is designed for use with MB's Win475 automated vibration transducer calibration system. It provides multiple sources of excitation voltage and/or current, programmable gains, and circuitry to work with virtually all types of vibration transducers over a very broad frequency range. It is supplied "standard" as a bench-top; or, optionally, in a rack-mounted enclosure. The MB Model 405-X signal conditioner can be tailored to connect to virtually any input transducer type and connector, via the use of either MB or user-supplied "Personality Modules." Personality Modules adapt the device under test (DUT) to the unit's D-sub front panel input connector. They are powered from standard electrical outlets and auto-select to virtually all worldwide voltage standards via the rear panel AC input connector. The Model 405-X signal conditioning unit provides all required filtering functions, programmable gain, and very low noise circuitry, as necessary to ensure quality measurements with required low Expanded System Uncertainty (ESU).



Model 405-X Dual Channel Signal Conditioner

Parameters	Specifications
Supported transducer types	Single-ended piezoelectric charge; 4-pin voltage; bridge (including strain gage); piezoresistive; IEPE (ICP); variable capacitance; servo; velocity; displacement
Gain adjustment	Automatic gain selection for both REF and DUT channels under Win475 program control to optimize signal-to-noise ratio; gains from 0.5 to 1000 are achievable in 1/2/5 increments (when using the MB Model 405-X, combined with a Win475 data acquisition board/module)
Hardware filtering	All inputs high-pass filtered at 0.01 Hz (-3 dB, 2-pole Butterworth filter) for dynamic measurements
Calibration frequency range	0.1 Hz minimum, 20 kHz maximum, 50 kHz maximum for mounted resonant frequency search
Program communications	Via high-density shielded data cable to National Instruments data acquisition board/module; USB to host PC required; internal PC backplane plug-in board standard; optional external USB data acquisition module

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MB-WIN475-405X-1018

Parameters	Specifications
Measured transducer electrical parameters (via connection to data acquisition hardware)	Bridge/piezoresistive devices: sensor input and output resistance; Zero Measurand Output (ZMO); excitation voltage; shunt calibration values including user software selection of which of four (4) legs to shunt; IEPE (ICP) devices: bias voltage
Excitation sources	5 VDC, ± 12 VDC, and software adjusted bridge excitation from 2 VDC to 15 VDC, IEPE (ICP) at 24 VDC and nominal 4 mA
Bridge completion	User configures at "Personality Module" input connector
Channel gain match	<0.1% from 5 Hz to 10 kHz, 0.5% at 0.5 Hz and 20 kHz
Channel phase match	<1° from 5 Hz to 10 kHz; 2° at 0.5 Hz and 20 kHz, corrected to within 1° over full 0.1 to 20 kHz by software "self-calibration" feature
Noise	<100uVRMS on any channel
Input impedance	Charge: >100 M voltage and IEPE (ICP): >100K; bridge: >100K
Output impedance	<50 Ω on all monitor outputs, DAC output, and all ADC inputs
Input sensor range	Voltage mode, IEPE (ICP), variable capacitance, servo, bridge, and velocity: minimum 1 mV, maximum 10V, customer to adjust test level within these ranges; charge: minimum 0.1 pC, maximum 250 pC, customer to adjust test level within these ranges
Integration	Unit can be used to measure outputs from accelerometers, velocity transducers, or displacement transducers as the DUT; software performs single integration of REF accelerometer to calculate velocity; software double integrates REF acceleration to calculate displacement at driven frequency
User interface	Front panel LED's for channel type and gain
Connectors – front panel	BNC input for IEPE (ICP), Volt REF transducer; DB-9 port provides +12 VDC excitation for Volt REF; BNC input for charge, IEPE (ICP) DUT transducer; DB-15HD input for all other DUT transducer types via MB or user-supplied "Personality Module" connection
Connectors – rear panel	AC line input; REF and DUT channel monitor BNC's; DAC output BNC (to drive system power amplifier); DIO to MB peripherals
TEDS compatibility	Reads TEDS devices as DUT; reads other types of electronic ID (user to specify at time of order)
Ambient temperature & humidity	Temperature and humidity parameters automatically measured and recorded during tests via built-in sensor
Power	90-264 VAC, 47-63 Hz, 65 W max.

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