

Product Data

6-Ch. A&V Recording Module — Type 3030

Part of Intelligent Data Acquisition System Type 3561

USES:

- Input module for multichannel acoustic and vibration measurements
- In multichannel applications such as STSF, modal analysis, ODS, etc.

FEATURES:

- Input via 37-pole D-sub connector designed for use with up to:
 - 6 × Microphone Type 4196
 - 6 × Preamplifier Type 2669 with prepolarized $\frac{1}{2}$ " microphone
 - 6 × DeltaTron® Accelerometer (CCLD) or any combination

- Supports transducers with remote ID via µLAN interface
- Charge Injection Calibration facility
- Cable fault detection via downloaded software
- Overload detection for out-of-band frequencies
- DC, 0.7 Hz and 22.4 Hz high-pass filters, independently set for each channel
- Independent input ranges for each channel, with autorange
- Long, real-time, time records: 512 k or 2048 k samples total for the enabled number of channels
- Powerful built-in digital signal processor (prepared for DSP expansion board)
- Automatic DC-offset compensation

6-Ch. A&V Recording Module Type 3030 is an acoustic and vibration input module which meets the requirements for multichannel measurements with Intelligent Data Acquisition System (IDA) Type 3561.

The input module uses a single, 37-pin D-sub connector for connecting six transducers at a time. This allows simple cabling for large systems comprising many transducers, as used, for example, for the measurement of spatial transformation of sound fields, modal analysis or operational deflection shapes. A tri-colour LED indicates the status of the module (overload, recording, downloaded DSP code).

Downloaded DSP software defines the functions available with the module, for example, decimation and zoom for recording time histories.

Transducers

A cable which branches to six 3-pole LEMO connectors allows you to connect an array of six microphones Type 4196 to the input. A piston-phone adaptor is also available, allowing simultaneous calibration of the six channels. Other prepolarized

microphones, including those employing DeltaTron® Preamplifier Type 2671, can also be used, as can DeltaTron® Accelerometers. These, however, require special cabling and/or adaptors.

Cable Fault Detection

Type 3030 employs two methods of detecting cable breaks.

For microphones, the supply current to the microphones is monitored on-line and in real time. If the current exceeds the upper or lower limit of the allowed band, an error event is generated.

For DeltaTron® accelerometers or microphones using DeltaTron® preamplifiers, the supply voltage can be monitored off-line. If the acceptable limits are exceeded, an error event is generated and you can stop the measurement and measure the working voltage to help determine the cause of the error.

Independent Channels

The channels of the input module can be set up independently. This means that you can set up the high-pass filters and input gain separately and,



if required, attach different types of transducer to different channels.

Remote ID

Type 3030 is prepared for use with transducers with remote ID – serial number, sensitivity, etc.

Specifications 3030

UPPER FREQUENCY:

12.8 kHz at $f_s = 32.768$ kHz
25.6 kHz at $f_s = 65.536$ kHz

SAMPLING:

32768 Hz (inputs and CIC output) & 65536 Hz (inputs only)

A/D Conversion: 16 bit

Input Coupling:

22.4 Hz high-pass filter @ -0.1 dB, slope -18 dB/oct ($f_L = 22.4$ Hz)
0.7 Hz high-pass filter @ -0.1 dB, slope -6 dB/oct ($f_L = 0.7$ Hz)
DC-Direct ($f_L = 0$ Hz)

Analog Special Functions:

CCLD on/off

Charge Injection Calibration:

Max. V_{out} : $5 V_{rms}$

Frequency Range: DC to 12.8 kHz

Analog Self-test (prepared)

Digital DC-offset Adjustment

Cable Fault Detection:

+15 V transducer supply current monitoring

Fault Detection Current Adjustment:

Dual current detector

0 to 10 mA, 8-bit resolution

Remote ID between Transducer and Front-end:

Communication via μ LAN interface

Automatic Input Type Select: Prepared

Working Voltage Meas. for CCLD:

$35 V_{peak}$, ± 0.5 V

INPUT VOLTAGE:

7 ranges from $7.071 mV_{peak}$ to $7.07 V_{peak}$ in 10 dB steps

INPUT IMPEDANCE:

Direct, microphone: $1 M\Omega \parallel <200$ pF

CCLD: $> 100 k\Omega \parallel <200$ pF

MAXIMUM INPUT VOLTAGE:

50 V, $35 V_{rms}$

MAXIMUM INDUCED COMMON MODE VOLTAGE:

$1 V_{peak}$

SUPPLY FOR CCLD ACCELEROMETERS:

4 mA at +28 V source

COMMON-MODE REJECTION:

DC: 50 dB

0 to 1 kHz: 40 dB

1 kHz to 12.8 kHz: 30 dB

CROSSTALK (SOURCE: 50 Ω):

Between any two channels of module or between any two channels in different modules:

0 to 2 kHz: -100 dB

2 kHz to 12.8 kHz: -85 dB

ATTENUATOR LINEARITY:

± 0.1 dB

ANTI_ALIASING FILTER ($f_s = 32768$ Hz & $f_s = 65536$ Hz):

Provides at least 80 dB attenuation of those inputs frequencies which can cause aliasing

Passband: DC to 25.6 kHz @ -0.1 dB, slope -18 dB/oct

OVERLOAD DETECTION:

Applied before filters

TOTAL HARMONIC DISTORTION:

At least 80 dB below max. input ($\approx 0.01\%$)

NOISE (Linear 10 to 25.6 kHz):

Input Range	Equivalent Input Noise
7.071 mV	$3 \mu V_{rms}$
22.36 mV	$3 \mu V_{rms}$
70.71 mV	$5 \mu V_{rms}$
223.6 mV	$10 \mu V_{rms}$
707.1 mV	$31 \mu V_{rms}$
2.236 V	$100 \mu V_{rms}$
7.071 V	$316 \mu V_{rms}$

OVERALL FREQUENCY RESPONSE:

f_L to f_U : ± 0.1 dB

AMPLITUDE LINEARITY:

0 to 40 dB below full scale: ± 0.1 dB

40 to 60 dB below full scale: ± 0.4 dB

60 to 80 dB below full scale: ± 2.0 dB

ABSOLUTE AMPLITUDE PRECISION:

± 0.1 dB, 2.236 V input range (1.024 kHz)

CHANNEL-TO-CHANNEL MATCH (any input range):

Maximum Gain Difference: 0.2 dB from lower frequency limit, f_L , to upper frequency limit, f_U

Maximum Phase Difference (within one frame):

$1.1^\circ - 0.1^\circ \times (f/f_L)$ from f_L to $10 \times f_L$;

0.1° from $10 \times f_L$ to 640 Hz;

$1.0^\circ \times (f/640)$ from 640 Hz to 6.4 kHz

CHANNEL-TO-CHANNEL MATCH (same input range):

Maximum Gain Difference:

0.2 dB from lower frequency limit, f_L , to upper frequency limit, f_U

Maximum Phase Difference (within one frame):

$1.1^\circ - 0.1^\circ \times (f/f_L)$ from f_L to $10 \times f_L$;

0.1° from $10 \times f_L$ to 1280 Hz;

$1.0^\circ \times (f/1280)$ from 1280 Hz to 12.8 kHz

Digital Signal Processing:

The functionality of Type 3030 is dependent on the DSP software downloaded from the application software used

PROCESSOR:

Motorola DSP56002 @ 60 MHz

Power Supply:

Power Supply Module Type 2823

POWER CONSUMPTION:

Approx. 13 W (max. value)

Voltage (V)	Typical (mA)	Max. (mA)
-15	110	220
+ 5	450	
+ 8	150	160
+15	110	220
+28	30	

Dimensions:

Type 3561 module dimensions

Height: 134.0 mm (5.28 in)

Length: 42.5 mm (1.67 in)

Width: 230 mm (9.06 in)

Weight: 1.1 kg (2.4 lb.)

Compliance with Standards:

	When incorporated into Intelligent Data Acquisition System Type 3561, Type 3030 complies with the system standards stated in the Product Data for Type 3561 (BP 1447)
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Ordering Information

Optional Accessories

Type 4196: Prepolarized Microphone
AO 0432: 10 m 37-pole D-sub to 6 $\times$ 3-pole LEMO cable for use with Microphone Type 4196
AO 0432/x: As AO 0432 but x m long

Brüel & Kjær reserves the right to change specifications and accessories without notice

Brüel & Kjær



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