PRODUCT DATA

Generator, Input/Output Module LAN-XI 51.2 kHz Type 3160

A combination of inputs and generator outputs make a complete stand-alone analyzer test system. Type 3056 is ideal for applications where system excitation is required – such as audio and electroacoustic test applications.

Type 3160 comes in two basic variants, offering the choice between 2 inputs/2 outputs and 4 inputs/2 outputs. All input and output channels have a frequency range of DC to 51.2 kHz.

Type 3160 works equally well as a single-module test system, or as one part of a large LAN-XI measurement system. The combination of inputs and output channels makes it one of the most versatile data acquisition modules available, while interchangeable front-panels give the flexibility to use a wide range of transducers.

Uses and Features

Uses

- General sound and vibration measurements
- Generator output channels for system excitation for sound and vibration measurements
- Ideal for audio and electroacoustic measurements
- Measurement front-end module for PULSE™ measurement and analysis software
- Front-end for PC-based Data Recorder Type 7708
- Single-module measurements
- Multi-module measurements/distributed system
- Stand-alone recording (no PC) using LAN-XI Notar™ software

Features

- 2 or 4 input channels
- 2 generator output channels
- DC to 51.2 kHz input range
- 131 ksamples/s sampling rate
- Power for 200 V microphones
- Dyn-X technology
- REq-X technology
- Supports TEDS transducers
- Interchangeable front panels

Input Channels

Independent Channels

The input channels on a module can be set up independently. You can set up the high-pass filters and input gain separately and attach different types of transducer to different channels.

IEEE 1451.4 Transducers

All input modules support TEDS transducers. This allows automatic front-end and analyzer setup based on TEDS information stored in the transducer, for example, sensitivity, serial number, manufacturer and calibration date. The individual frequency response of a transducer can be corrected for using PULSE's Transducer Response Equalisation, REq-X, to achieve higher accuracy over extended frequency ranges.

Overload

Constant Current Line Drive (CCLD) conditioning monitors the supply voltage used by CCLD-compatible transducers. Available CCLD transducers include:

- Accelerometers
- Charge amplifiers
- Microphone preamplifiers
- Tacho probes

If conditioning errors, such as a broken cable, are detected, an error is indicated as an overload on the specific channel connector (using a ring-LED around the connector) and in the PC software.

Overload indications for input channels include (see Specifications for details):

- Signal overload with adjustable detection level
- CCLD overload: detection of cable break, short-circuit or CCLD transducer working point fault
- Microphone preamplifier overload: detection of microphone preamplifier current consumption too high or too low
- Common mode voltage overload – relevant when input coupling is floating

Ground-loop Noise Suppression

The module's floating/grounded, differential input design and the fact that all external connections (LAN, power supply) are galvanically isolated in the module provide optimal ground-loop noise suppression.

Output Channels

Features

- Two output channels: full generator functionality from 0 to 51.2 kHz
- Output voltage up to 10 V_{peak} and output current up to 40 mA_{peak} in two output ranges only
- Waveforms determined by software (see below)
- High amplitude and frequency linearity
- Extremely low noise floor
- Selectable floating or grounded outputs
- Capable of heavy complex loading without instability
- Low out-of-band spurious noise
- Overload detection on both channels individually (voltage and current) indicated by alternating red/blue LEDs on front panel
- Generator channel indicated by blue LED on front panel (active or not)
- Automatic shutdown (muting) of both channels simultaneously at power failure
- Full output phase control among LAN-XI modules*

The two output channels on Type 3160 can be used as high-quality signal generators with a frequency range from 0 to 51.2 kHz and can supply the signals necessary for performing system analysis.

Type 3160 is designed around a powerful digital signal processor and a low-noise, 24-bit, D/A converter. Type 3160 has exceptional flexibility, stability and accuracy. Output levels are adjustable in hardware (two ranges) with maximum outputs of 316 mV_{peak} and 10 V_{peak}. High-quality levels from 1 µV to 316 mV or 10 V

* Signal generators are not synchronized between LAN-XI and IDA^e generator modules. This does not affect continuous signals (random, white- or pink-noise) but is not suitable for burst random signals and sine signals requiring phase control between generators.

are obtained. The output signal is provided by a BNC connector and can be referred to ground or floating. It is possible to add a DC offset, but any unwanted DC offset is automatically removed.

When Type 3160 is powered by PoE, only the generator channels and two input channels can be used. If DC or mains power is available, the generator channels and all four input channels can be used.

Waveforms

The waveform types supported by PULSE are:

- Single fixed sine (continuous or burst)
- Single swept sine
- Dual fixed sine
- Dual swept sine
- Fixed sine plus swept sine
- Stepped sine (with Steady State Response Analyzer)
- Random (continuous or burst)
- Pseudo-random
- Periodic random
- User-defined, arbitrary waveforms can be downloaded

Ranges

The fact that there are only two hardware ranges allows amplitude sweeping over a larger range without the presence of disturbing transients from range-shifting attenuators. To avoid these transients, the range of interest can be locked.

Due to the large dynamic range, it is possible to generate very accurate low-level signals.

Linearity

Frequency linearity is better than ±0.1 dB over the entire frequency range, and amplitude linearity is better than 0.1 dB over at least 100 dB amplitude range referred to full scale.

Overload

Output voltages above 11 V_{peak} or output currents above 40 mA_{peak} are indicated as overloads by the circular LEDs on the output channels.

Security

Automatic shutdown of both outputs is initiated in cases of heavy overload (shorted output) that could affect module functionality by drawing more current than available. The signal ramps up again when the overload is removed.

Compliance with Standards

	CE-mark indicates compliance with: EMC Directive and Low Voltage Directive RCM mark indicates compliance with applicable ACMA technical standards – that is, for telecommunications, radio communications, EMC and EME China RoHS mark indicates compliance with administrative measures on the control of pollution caused by electronic information products according to the Ministry of Information Industries of the People's Republic of China WEEE mark indicates compliance with the EU WEEE Directive
Safety	EN/IEC 61010–1 and ANSI/UL 61010–1: Safety requirements for electrical equipment for measurement, control and laboratory use
EMC Emission	EN/IEC 61000–6–3: Generic emission standard for residential, commercial, and light-industrial environments CISPR 22: Radio disturbance characteristics of information technology equipment. Class B Limits
EMC Immunity	EN/IEC61000–6–1: Generic standards – Immunity for residential, commercial and light industrial environments EN/IEC 61000–6–2: Generic standards – Immunity for industrial environments EN/IEC 61326: Electrical equipment for measurement, control and laboratory use – EMC requirements **Note:** The above is only guaranteed using accessories listed in this Product Data
Temperature	IEC 60068–2–1 & IEC 60068–2–2: Environmental Testing. Cold and Dry Heat Ambient Operating Temperature: –10 to +55°C (14 to 131°F) Storage Temperature: –25 to +70°C (–13 to +158°F)
Humidity	IEC 60068–2–78: Damp Heat: 93% RH (non-condensing at 40°C (104°F))
Mechanical (non-operating)	IEC 60068–2–6: Vibration: 0.3 mm, 2 g, 10 – 500 Hz IEC 60068–2–27: Shock: 100 g IEC 60068–2–29: Bump: 1000 bumps at 25 g
Enclosure	IEC 60529: Protection provided by enclosures: IP 31

EFFECT OF RADIATED AND CONDUCTED RF, MAGNETIC FIELD AND VIBRATION
Radiated RF: 80–2700 MHz, 80% AM 1 kHz, 10 V/m
Conducted RF: 0.15–80 MHz, 80% AM 1 kHz, 10 V
Magnetic Field: 30 A/m, 50 Hz
Vibration: 5–500 Hz, 12.7 mm, 15 m/s^2
Input measured with shorted input. All values are RMS. Conducted RF immunity on all channels is only guaranteed using an external connection from measuring ground to chassis terminal

Input	Radiated RF	Conducted RF	Magnetic Field	Vibration
Direct/CCLD	<250 µV	<300 µV	<4 µV	<80 µV
Preamplifier	<250 µV	<50 µV	<8 µV	<80 µV

Specifications – LAN Interface

CONNECTOR
RJ 45 (10baseT/100baseTX) connector complying with IEEE–802.3 100baseX
Types 3660-C and -D permit the use of a ruggedized RJ45 data connector (Neutrik NE8MC-1) to screw the cable to the frame
Types 3660-C and -D communicate at 1000 Mbits/s: shielded cables of type “CAT 5e” or better should be used
Individual modules communicate at 100 Mbits/s
All LAN connectors support MDIX, which means that cables may be “crossed” or not
For stand-alone modules, PoE is also supported (IEEE 802.3af). PoE requires screened shielded twisted pair (S/STP or S/FTP) CAT6 LAN cables

PROTOCOL
The following standard protocols are used:
- TCP
- DHCP (incl. Auto-IP)
- DNS (on top of UDP)
- IEEE 1588–2002 (on top of UDP)
- IP
- Ethernet

ACQUISITION PERFORMANCE
Each LAN-XI module generates data at almost 14 Mbit/s when measuring four channels at 51.2 kHz bandwidth. The modules are capable of handling their own maximum traffic while the built-in switch in the frame’s backplane has more than sufficient capacity. This means that bottlenecks can only occur outside these, for example in:
- External switches
- PC

For convenience, it is possible to daisy-chain LAN-XI frames. However, it is not recommended to daisy-chain more than two frames. For larger configurations, a star configuration with a central switch is recommended. This must have a switch capacity well beyond $N \times 20$ Mbit/s, where N is the total number of modules

PTP PERFORMANCE
PTP Synchronisation (with 1 Gigabit LAN Switch):
Typical sample synchronisation better that 200 ns
(approx. ±0.07° @ 1 kHz, ±2° @ 25.6 kHz)
Tested with:
- Cisco® SG300-10MP, 10-port 10/100/1000 Managed Gigabit Switch with Maximum PoE (8 ports)
- Netgear® 5-port Gigabit Switch GS105

Better performance can be expected with a dedicated PTP switch:
- UL-0265: 10-port Gigabit Managed Switch with PTPv2 and PoE (8 ports).
  This is a dedicated PTP switch, preconfigured for optimal use with LAN-XI

Specifications – Generator, Input/Output Module LAN-XI 51.2 kHz Type 3160

POWER REQUIREMENTS
DC Input: 10–32 V DC
Connector: LEMO coax., FFA.00.113, ground on shield
Power Consumption:
DC Input: <15 W
Supply via PoE: According to IEEE 802.3af, Max. cable length 50 m
Temperature Protection:
Temperature sensor limits module's internal temperature to 80ºC (176ºF). If temperature exceeds limit, system will automatically enable fan in LAN-XI frame or shut down module outside frame

DIMENSIONS AND WEIGHT
Height: 132.6 mm (5.22″)
Width: 27.5 mm (1.08″)
Depth: 250 mm (9.84″)
Weight: 750 g (1.65 lb)

INPUT CHANNELS

Frequency Range		DC to 51.2 kHz Lower frequency range can be set in PULSE software			
Sampling Rate		131 ksamples/s			
A/D Conversion		2×24 bit			
Data Transfer		24 bit			
Input Voltage Range		$10\ V_{peak}$ Extended range: $31.6\ V_{peak}$			
Input Signal Coupling	**Differential**	Signal ground is “floating” (1 MΩ re: chassis)			
	Single-Ended	Signal ground is connected to chassis (“Grounded”)			
Input Impedance		Direct, Microphone: 1 MΩ || <300 pF			
		CCLD: >100 kΩ || <300 pF			
Absolute Maximum Input		$\pm 60\ V_{peak}$ without damage			

High-pass Filters

* Defined as the lower frequency, f_L, for guaranteed fulfilment of −0.1 dB accuracy in $10\ V_{peak}$ range

****** Defined as the nominal −10%/3 dB filter frequency

	– 0.1 dB *	**–10% @ ****	**–3 dB @ ****	**Slope**
0.1 Hz −10% analog high-pass filter 0.7 Hz −0.1 dB digital high-pass filter	0.5 Hz 0.7 Hz	0.1 Hz 0.15 Hz	0.05 Hz 0.073 Hz	−20 dB/dec.
1 Hz −10% digital high-pass filter 7 Hz −0.1 dB digital high-pass filter	5 Hz 7 Hz	1.0 Hz 1.45 Hz	0.5 Hz 0.707 Hz	−20 dB/dec.
22.4 Hz −0.1 dB analog high-pass filter	22.4 Hz	15.8 Hz	12.5Hz	−60 dB/dec.
Intensity filter (analog)	115Hz	23.00 Hz	11.5 Hz	−20 dB/dec.

Absolute Amplitude Precision, 1 kHz, 1 V_{input}		±0.05 dB, typ. ±0.01 dB
Amplitude Linearity (linearity in one range)	0 to 80 dB below full scale	±0.05 dB, typ. ±0.01 dB
	80 to 100 dB below full scale	±0.2 dB, typ. ±0.02 dB
	100 to 120 dB below full scale	typ. ±0.02 dB
	120 to 140 dB below full scale	typ. ±0.02 dB
	140 to 160 dB below full scale	typ. ±1 dB
Overall Frequency Response re 1 kHz, from lower limit f_L to upper limit f_U f_L is defined as the lower frequency for guaranteed fulfilment of −0.1 dB accuracy in $10\ V_{peak}$ range (see under High-pass Filters) f_u is defined as the chosen frequency span. DC (f_L = 0)		±0.1 dB ±0.3 dB in 31.6 V range

Noise

* Measured lin. 10 Hz to 25.6 kHz or lin. 10 Hz to 51.2 kHz:

(Input terminated by 50 Ω or less)

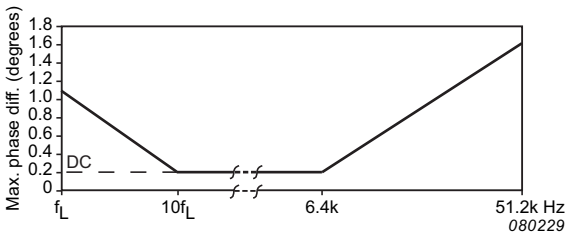
	Input Range	**Guaranteed**		**Typical**	
		Lin*	**1 kHz**	**Lin***	**1 kHz**
Signal level <316 mV_{peak} 10 Hz to 25.6 kHz 10 Hz to 51.2 kHz	$10\ V_{peak}$	<4 μV_{rms} <13 μV_{rms}	<25 $nV_{rms}/\sqrt{Hz}$	<3 μV_{rms} <10 μV_{rms}	<19 $nV_{rms}/\sqrt{Hz}$
Signal level >316 mV_{peak} 10 Hz to 25.6 kHz 10 Hz to 51.2 kHz	$10\ V_{peak}$	<60 μV_{rms} <350 μV_{rms}	<375 $nV_{rms}/\sqrt{Hz}$	<50 μV_{rms} <250 μV_{rms}	<313 $nV_{rms}/\sqrt{Hz}$
Signal level <1 V_{peak} 10 Hz to 25.6 kHz 10 Hz to 51.2 kHz	$31.6\ V_{peak}$	<20 μV_{rms} <45 μV_{rms}	<125 $nV_{rms}/\sqrt{Hz}$	<15 μV_{rms} <35 μV_{rms}	<95 $nV_{rms}/\sqrt{Hz}$
Signal level >1V_{peak} 10 Hz to 25.6 kHz 10 Hz to 51.2 kHz	$31.6\ V_{peak}$	<200 μV_{rms} <1200 μV_{rms}	<1250 $nV_{rms}/\sqrt{Hz}$	<150 μV_{rms} <800 μV_{rms}	<950 $nV_{rms}/\sqrt{Hz}$

Spurious-free Dynamic Range re Full-scale Input (Input terminated by 50 Ω or less) Spurious-free Dynamic Range is defined as the ratio of the rms full-scale amplitude to the rms value of the largest spurious spectral component (non-harmonic)	**Input Range**	**Typical**
	$10\ V_{peak}$	160 dB
	$31.6\ V_{peak}$	140 dB

	Guaranteed	**Typical**
DC Offset re Full Scale Measured after automatic DC compensation at current temperature when changing from AC to DC coupling or changing input range when DC coupled	<−90 dB	−100 dB
Harmonic Distortion (all harmonics)	**Guaranteed**	**Typical**
	−80 dB (−60 dB in 31.6 V range)	−100 dB @ 1 kHz (−80 dB @ 1 kHz in 31.6 V range)

Crosstalk: Between any two channels of a module or between any two channels in different modules	**Frequency Range**	**Guaranteed**	**Typical**
	0−51.2 kHz	−100 dB	−140 dB

INPUT CHANNELS (CONTINUED)

Channel-to-Channel Match		**Guaranteed**	**Typical**
(10 V_{peak} input range)	Maximum Gain Difference f_L is defined as the −0.1 dB frequency of the high-pass filter	0.2 dB from lower frequency limit, f_L, to 51.2 kHz (0.4 dB at −10% filter frequency)	±0.05 dB
	Maximum Phase Difference (within one frame) f_L is defined as the −0.1 dB frequency of the high-pass filter		
	Additional PTP sync. error (phase difference) between modules/frames (using a single standard gigabit switch)	**Typical:** <200 ns (approx. ±0.07° @ 1 kHz, ±2° @ 25.6 kHz)	
Channel-to-Channel Match (31.6 V_{peak} input range)	Maximum Gain Difference	0.6 dB from lower frequency limit, f_L, to 51.2 kHz (1 dB at −10% filter frequency)	
	Maximum Phase Difference (within one frame)	4° from lower frequency limit, f_L, to 51.2 kHz	

Sound Intensity Phase Match (only for using intensity filter and in 10 V_{peak} input range) All channels matched	**Frequency Range**	**Guaranteed Phase Match**	**Typical Phase Match**
	50–250 Hz	±0.017°	±0.005°
	250 Hz–2.5 kHz	0.017° × (f/250)	±0.005°
	2.5–6.4 kHz	±0.17°	±0.08°

Common Mode Rejection in 10 V_{peak} input range Values for 31.6 V_{peak} range are 10 dB lower.		**Guaranteed**	**Typical**
	0–120 Hz	70 dB	80 dB
	120 Hz–1 kHz	55 dB	60 dB
	1–51.2 kHz	30 dB	40 dB

Absolute Max. Common Mode Voltage	±5 V_{peak} without damage	
	±4 V_{peak} without clipping)	
	If common mode voltage exceeds the max. value, care must be taken to limit the signal ground current in order to prevent damage. Max. is 100 mA. The instrument will limit the voltage to the stated max. “without damage” common mode value	

Anti-aliasing Filter At least 90 dB attenuation of those frequencies which can cause aliasing	Filter Type	3rd order Butterworth
	−0.1 dB @	51.2 kHz
	−3 dB @	128 kHz
	Slope	–18 dB/octave
Supply for Microphone Preamplifiers		±14.0 V, max. 100 mA per channel (max. 100 mA total/module)
Supply for Microphone Polarization		200 V ±1 V, or 0 V (set per channel)
Supply for CCLD		4 to 5 mA from 24 V source, option to DC-couple CCLD power supply
Tacho Supply		CCLD for Type 2981 (Power supply for legacy types MM-0012 and MM-0024 not available)

Analog Special Functions	**Microphone Charge Injection Calibration:** All modules with 7-pin LEMO support CIC via dedicated application software and OLE interface **Transducers:** Supports IEEE 1451.4-capable transducers with standardised TEDS (up to 100 m cable length)
Overload Detection	**Signal Overload:** Adjustable detection level ±1 V_{peak} to ±10 V_{peak}. Default level ±10 V_{peak} (CCLD mode ±7 V_{peak}) (31.6 V range: ±31.6 V) can be set in PULSE Transducer Database **CCLD Overload:** Detection of cable break or short-circuit + detection of CCLD transducer working point fault. Detection level: +2 V/20 V **Microphone Preamplifier Overload:** Detection of microphone preamplifier current consumption too high or too low. Detection level default 10 mA/1 mA Adjustable detection level 1 to 20 mA or 100 mA if disabled **Common Mode Voltage Overload:** Detection level: ±3.0 V
Protection	If signal input level exceeds the measuring range significantly, the input will go into protection mode until the signal goes below the detection level again for at least 0.5 s. While in protection mode, the input is partly switched off and the input impedance is greatly increased. (The measured value will be strongly attenuated but still detectable) In DC mode −10 V_{peak} range, the detection limit is ±12 V. In all other measuring modes (except CCLD) the limit is ±50 V_{peak} including DC component or ±12 V_{peak} AC (In CCLD mode the limit is +50/−2 V_{peak} including DC component or ±12 V_{peak} AC) In the 31.6 V range, the limit is ±50 V_{peak}

OUTPUT CHANNELS

Output Connector		2 × BNC	
Output Coupling		DC	
Signal Ground Coupling		Floating or grounded to chassis	
D/A Conversion		24 bit	
DC Offset (DC Value set to 0 V)		≤1 mV auto-adjusted by loopback (<–80 dB re full scale)	
Output Voltage Range (DC)		0 to ±10 V ±0.5% of requested value	
Output Voltage Range (AC)		1 μV_{RMS} – 10 V_{peak} in two ranges	
Output Impedance		50 Ω	
Output Load		Max. 40 mA_{peak}	
Frequency Range		0 – 51.2 kHz	
Frequency Response re 1 kHz		±0.1 dB, 1 mHz to 51.2 kHz	
Frequency Accuracy		0.00025%	
Frequency Resolution		1 mHz (defined in PULSE software)	
Phase Resolution		100 mdegrees (defined in PULSE software)	
Phase Deviation Between Channels		<20 mdegrees for frequencies below 1 kHz*	
Waveform		Software determined arbitrary waveforms up to 2 Msamples Waveforms available in PULSE: Single fixed sine (continuous or burst), single swept sine, dual fixed sine, dual swept sine, fixed sine plus swept sine, stepped sine (with SSR Analyzer), random (continuous or burst), pseudo-random, periodic random User-defined, arbitrary waveforms can be downloaded	
Amplitude Linearity @ 1 kHz		**Guaranteed**	**Typical**
	±0.1 dB	0 – 100 dB below 7 V_{rms}	0 – 110 dB below 7 V_{rms}
Noise μV_{rms} (nV/√Hz) in 50 kHz bandwidth	**Range**	**Guaranteed**	**Typical**
	316 mV_{peak}	1 μV_{rms} (4.4 nV/√Hz)	0.5 μV_{rms} (2.2 nV/√Hz)
	10 V_{peak}	10 μV_{rms} (44nV/√Hz)	5 μV_{rms} (22 nV/√Hz)
Harmonic Distortion Products	0 – 51.2 kHz	<–80 dB re full range output	
Spurious In Band (non-harmonic)	0 – 51.2 kHz	<– 100 dB re full range output or 1 μV, whichever is greater	
Spurious Out of Band (non-harmonic)	Up to 1 MHz	<– 80 dB re full range output	
Absolute Amplitude Precision		**Guaranteed**	
	@ 23°C, 1 kHz, 1 V_{rms}	±0.05 dB	
Crosstalk Between output channels and between any output channel and any input channel terminated by less than 50 Ω (unloaded generator output)		**Guaranteed**	**Typical**
	0 – 51.2 kHz	–120 dB	–130 dB
Common Mode Rejection		**Guaranteed**	
	1 Hz – 1 kHz	60 dB	
Maximum Common Mode Voltage		5 V_{peak}, DC – 80 MHz If common mode voltage exceeds the max. value, care must be taken to limit the signal ground current in order to prevent damage. Max. is 100 mA. The instrument will limit the voltage to the stated max. "without damage" common mode value	
Reconstruction Filter		Sixth order Butterworth (–3 dB frequency = 120 kHz typically)	
Attenuation of Mirror Frequencies		>80 dB	
Overload Detection		Reported to PULSE and indicated by light rings on output connectors for output voltage above 11 V_{peak} and output current above 40 mA_{peak}	

* Signal generators are not synchronized between LAN-XI and IDA^e generator modules. This does not affect continuous signals (random, white- or pink-noise) but is not suitable for burst random signals and sine signals requiring phase control between generators

Ordering Information

Type 3160-A-042 Generator, 4/2-ch. Input/Output Module LAN-XI 51.2 kHz (Mic, CCLD, V)
includes the following accessories:
- UA-2100-060: LAN-XI Detachable front panel with 6 BNC input connectors
- ZG-0426: Mains Adaptor (100 – 240 V)
- AO-1450: Shielded CAT 6 LAN Cable with RJ 45 (2 m)

Type 3160-A-022 Generator, 2/2-ch. Input/Output Module LAN-XI 51.2 kHz (Mic, CCLD, V)
includes the following accessories:
- UA-2100-022: LAN-XI Detachable front panel with 4 BNC input/output connectors
- ZG-0426: Mains Adaptor (100 – 240 V)
- AO-1450: Shielded CAT 6 LAN Cable with RJ 45 (2 m)

OPTIONAL ACCESSORIES

AO-0090	7-pin LEMO to BNC male (1.2 m) for floating ground
AO-0091	7-pin LEMO to BNC female (1.2 m) for floating ground
AO-0526	4-pin Microtech to 3 × BNC Cable
AO-0546	DC Power Cable, Car Utility Socket to 1 module
AO-0548	DC Power Cable, Source to 4 modules
AO-1450	Shielded CAT 6 LAN Cable with RJ45 (2 m)
JJ-0081	BNC Adaptor, female to female
JJ-0152	BNC T-connector
JP-0145	BNC to 10–32 UNF Plug Adaptor
UA-1713	10 × 2 mm Hex Wrench (QX-1315) for front panel exchange
UL-0265	10-port Gigabit Managed Switch with PTP and PoE (8 ports)
WB-1497	20 dB Attenuator

SOFTWARE
Please refer to the System Data for PULSE Software (BU 0229)

Service Products

3160-CAI	Type 3160 Initial Accredited Calibration
3160-CAF	Type 3160 Accredited Calibration
3160-CTF	Type 3160 Traceable Calibration
3160-TCF	Type 3160 LAN-XI Conformance Test with Certificate

A wide range of Brüel & Kjær Accelerometers, Microphones, Preamplifiers and Sound Intensity Probes is available for use with a LAN-XI system. The system supports IEEE 1451.4-capable transducers with standardised TEDS

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