

ORBIT 60 SERIES

Dynamic Input Modules

Datasheet

Bently Nevada Machinery Condition Monitoring

137M0698 Rev. A



Description

The primary purpose of the Dynamic Input module is to digitize the sensor signal at a rate that completely encompasses the signal content and provides transducer power for various sensors. The Orbit 60 Series Dynamic Input module is a 4-channel input module available in both negative and positive dynamic input options. The inputs are also used for speed or Keyphasor signals.

Negative Transducer Input Module

These cards work with negative-voltage external sensors offering four variants:

- **PAV** Negative Dynamic Sampler (Prox, Accel, Velom)
- **PAS** Negative Dynamic Sampler (Prox, Accel, Seismic) *
- **PAA** Negative Dynamic Sampler (Prox, Accel, Aero)
- **PAD** Negative Dynamic Sampler (Prox, Accel, DC LVDT) *

Positive Transducer Input Module


The Positive Voltage (PVT) input module interfaces with industry-standard third-party ICP sensors, as well as sensors that use a 3-wire (power, common, signal) or a custom 2-wire (A/+ and B/-) positive-voltage interface.

- **PVT** Positive Dynamic Sampler (Prox, Accel, Velom) *

* Modules not available in initial release.



Dynamic Input Modules

Dynamic Input Modules	
PAV	(-) (Prox, Accel, Velom)
PAS	(-) (Prox, Accel, Seismic) *
PAA	(-) (Prox, Accel, Aero)
PAD	(-) (Prox, Accel, DC LVDT) *
PVT	(+) (Prox, Accel, Velom) *
Dynamic Inputs	
Analog Input	See Input Module Sensors and Measurements on the next page.
Channels Supported	4 Dynamic Inputs
Sampling Rate	Software configurable 6.4 kHz to 102.4kHz
Outputs	
Analog Buffered Transducer (BTO)	Short circuit protected output signal available through BTO connector on public and utility side.
BTO Connector	
Channel Status LED	1 per input channel indicates when the connected sensor is in an OK condition
Module OK LED	Indicates when the module is functioning properly
System Communication LED	indicates when the module is communicating to the rest of the system

Dynamic Input Modules



This is a true analog signal from the input, not digital to analog reconstitution of the input signal.

* Not available for first release.

Input Module Sensors and Measurements

Sensor Type Supported	Measurement Type	Dynamic Input Module Type (4 channels)						External Barriers	Galvanic Isolators
		PAV	PAS	PAA	PAD	PVT	KPH		
Proximitor (3-wire)	Displacement	X	X	X	X	X	X	175502	103M7134
Accelerometer (3-wire)	Acceleration ¹	X	X	X	X		X	175502	103M7134
HTVAS High-Temp Velocity Accel	Acceleration ^{1, 2} Velocity ^{1, 2}			X				175502	103M7134
86517 and 86497 Interface Modules	Acceleration ¹ , Velocity ¹ , Dynamic Pressure			X				175502	103M7134
350500 Charge Amplifier	Dynamic Pressure	X	X	X	X			175502	103M7134
350501 Charge Amplifier	Acceleration ¹	X	X	X	X			175502	103M7134
Velomitor (2-wire)	Velocity ^{1, 2}	X				X		177241	103M7134
Seismoprobe (2-wire)	Velocity ^{1, 2}		X					N/A	N/A
Proximitor Keyphasor (3-wire)	Speed, Gap	X	X	X	X		X	175502	103M7134
IEPE Positive Constant Current (370300) (2-wire)	Acceleration ^{1, 2} Velocity ^{1, 2} , Dynamic Pressure					X		176394	103M7134
Negative Biased Constant Current (2-wire)	Acceleration ^{1, 2} , Velocity ^{1, 2} , Dynamic Pressure	X						177241	103M7134
DC LVDT	Position				X			283615	N/A
AC LVDT	Position							N/A	N/A
Magnetic Speed Pickups	Speed	X	X	X	X		X	N/A	N/A

¹ Designates the ability to integrate these measurements to provide additional measurement types.

² These sensors can be configured using a Custom transducer configuration.

Compliance and Certifications

FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

EMC

European Community Directive:

EMC Directive 2014/30/EU

Standards:

EN 61000-6-2; Immunity for Industrial Environments
EN 61000-6-4; Emissions for Industrial Environments

Electrical Safety

European Community Directive:

LV Directive 2014/35/EU

Standards:

EN 61010-1;
EN 61010-2-201;

RoHS

European Community Directive:

RoHS Directive 2011/65/EU

Cyber Security

Designed to meet IEC 62443

Maritime*

ABS Rules for Condition of Classification, Part 1

- Steel Vessels Rules
- Offshore Units and Structures

Functional Safety*

SIL 2

* Approvals pending

Hazardous Area Approvals



For the detailed listing of country and product specific approvals, refer to the *Approvals Quick Reference Guide* (108M1756) available from Bently.com.

CSA/NRTL/C

Class I, Zone 2: AEx/Ex ec nC IIC T4 Gc;
Class I, Zone 2: AEx/Ex nA nC IIC T4 Gc;
Class I, Division 2, Groups A, B, C, D T4;
Class I, Division 2, Groups A, B, C, D T4 (N.I.);

T4 @ Ta= -30°C to +65°C (-22°F to +149°F)

ATEX/IECEx



II 3 G
Ex ec nC IIC T4 Gc
Ex nA nC IIC T4 Gc

T4 @ Ta= -30°C to +65°C (-22°F to +149°F)

Ordering Information



For the detailed listing of country and product specific approvals, refer to the *Approvals Quick Reference Guide* (108M1756) available from Bently.com.

PAV (Prox/Accel/Vel) Module

Ordering Option	Description
60R/INP01-AAA-BB	
AAA – Hazardous Area Certifications	
00	No Hazardous Area
01	CSA/NRTL/C (Class I, Div 2)
02	Multi (CSA, ATEX, IECEx)
XXX	Country Specific Approvals
BB – SIL Level	
00	No SIL
02	SIL 2

PAA (Prox/Accel/Aero) Module

Ordering Option	Description
60R/INP02-AAA-BB	
AAA – Hazardous Area Certifications	
00	No Hazardous Area
01	CSA/NRTL/C (Class I, Div 2)
02	Multi (CSA, ATEX, IECEx)
XXX	Country Specific Approvals
BB – SIL Level	
00	No SIL
02	SIL 2

Accessories

Part Number	Description
60X/BTC01	Buffered Transducer Connector
175502	3-pin Transducer Barrier
177241	2-pin Velomitor Barrier
175990	Thermocouple Barrier
129M0190	RTD Barrier

External Barriers

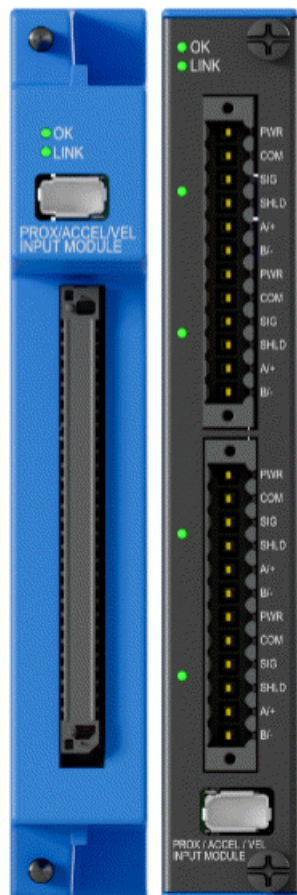
175502	3-pin Transducer Barrier
177241	2-pin Velomitor Barrier

External Galvanic Isolators

103M7134	3-pin Transducer Isolator
103M7134	2-pin Transducer Isolator
154M1361	TC Type J, K, E, T Isolator
103M7138	RTD Isolator

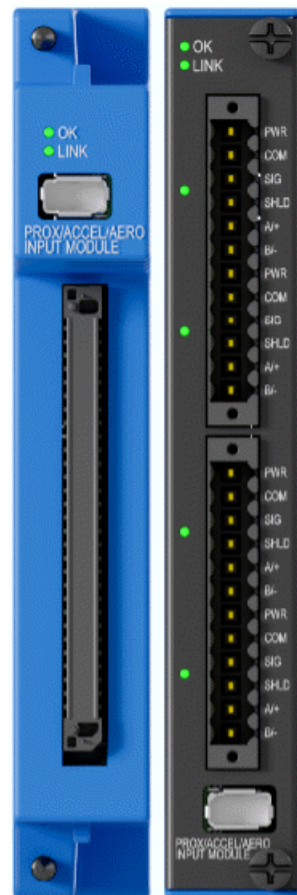
Dynamic Input Module Layout

PAV



Public Side - Utility Side

PAA



Public Side - Utility Side

Negative Dynamic Sensor Interfaces

These module accepts one to four sensor inputs.

Accelerometers*	
155023-01	High Freq 200g Accel I/F Module
23733-03	Accel I/F Module
24145-02	High-Freq Accel I/F Module
330400	100 mV/g Accelerometer
330425	25 mV/g Accelerometer
330450	High Temp Accelerometer
350501	Acceleration Charge Amplifier
49578-01	Accel I/F Module
200350	GP Accel
200355	GP Accel
	Custom Input

Velocity Sensors	
9200	Seismoprobe
74712	Hi Temp Seismoprobe
330500 ¹	Velomitor
330525 ¹	Velomitor XA
190501 ¹	Velomitor CT
330750 ¹	High Temp Velomitor
330752 ¹	High Temp Velomitor
330505 ¹	Low Freq Velocity Sensor
330530 ¹	Radiation Resistant Velomitor
	Custom Input

¹ These sensors can be configured using a Custom transducer configuration.

Proximity Sensors*	
	3300 XL 5 mm Proximitor
3301XX	3300 XL 8 mm Proximitor
3307XX	3300 XL 11 mm Proximitor
3309XX	3300 XL NSV Proximitor
3309XX	3300 RAM and NSV Proximitor
	3300 5 & 8 mm
	16 mm High Temperature Prox System
	7200 5, 8, 11, 14 mm
	Custom Input

Dynamic Pressure*	
350500	3-Wire (Com/Sig/-24VDC) Dynamic Pressure Charge Amplifier PCB 102M206
86517	Pressure Mod
	Custom Input

Custom Transducers	
Custom transducers are software configurable within the following ranges:	
Scale factor	1mv/Eng Unit to 2000 mv/Eng Unit
Input voltage range	+0V to -23 Volts
OK checking voltage range	+0V to -23 Volts
Engineering units	Selection from standard units table or custom unit entry

* Module employs 10 kΩ input impedance.

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1631 Bently Parkway South, Minden, Nevada USA 89423
Phone: 1.775.782.3611 (US) or [Bentley.com/support](https://www.bentley.com/support)
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