The Protection Processing Module (PPM) serves as the computational engine for the Orbit 60 monitoring system. It extracts all machinery measurements for the protection system and performs alarm determinations. The PPM analyzes signals from transducers, generates measurements/statuses and publishes them to other modules for data collection and external communication. Each PPM occupies a single slot within the system.

Each PPM provides capacity for a large number of sensors and can support typical monitored machine trains. The PPM capacity is a function of the type of processing required on each input. If the system requires more processing than a single PPM can provide additional PPMs can be added to the system for complex monitoring deployments. For protection systems, redundant PPMs are recommended.

The Orbit Studio Configuration Software provides a System Utilization Calculator to evaluate the remaining capacity of the PPMs in your system. If your processing capacity reaches 90%, a warning indicator displays and we recommend adding another PPM, or 2 PPMs if the system is redundant.
# Protection Processor Module

## Protection Processor Module (PPM)

### Channel Types

- Radial Vibration
- Acceleration
- Velocity
- Thrust
- Speed
- Dynamic Pressure
- Temperature

### Measurements and Signal Processing

<table>
<thead>
<tr>
<th>Direct</th>
<th>Set based on the bandwidth of the selected transducer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bandpass</td>
<td>Adjustable lowpass and highpass corners based on the frequency range of the transducer. Number of poles selectable from 1, 2, 4, 6 or 8.</td>
</tr>
<tr>
<td>1X/2X/nX Amplitude and Phase</td>
<td>Supported for machine speed ranges from 50 to 120,000 rpm.</td>
</tr>
<tr>
<td>Gap</td>
<td>Applicable to Proximitor sensor inputs</td>
</tr>
<tr>
<td>Bias</td>
<td>Applicable to Acceleration and Velocity sensor inputs</td>
</tr>
<tr>
<td>SMAX</td>
<td>Supported for ranges down to 50 rpm.</td>
</tr>
<tr>
<td>Speed</td>
<td>1 rpm to 120,000 rpm</td>
</tr>
<tr>
<td>Reverse Speed</td>
<td>Valid when the machine is spinning backwards. This measurement behaves like a typical speed measurement.</td>
</tr>
<tr>
<td>Reverse Peak Speed</td>
<td>Valid when the machine is spinning backwards and has exceeded the reverse speed setpoint, storing the highest achieved reverse speed.</td>
</tr>
</tbody>
</table>

### Protection States

- Up to 32 Protection States that can be controlled by Discrete contacts or configurable measurement ranges. Alarm setpoints are adjustable for different Protection States.

### Number of Reverse Rotation

Valid when the machine is spinning backwards and has exceeded the reverse speed setpoint, counting revolutions.

### Rotor Acceleration

Rotor acceleration is a ramp rate of a rotor (in rpm/ min) as its speed increases from zero rpm to the machine’s running speed value.

### Integration/RMS

Available for Velocity and Acceleration channels to be applied to Direct, Bandpass, 1X, 2X, nX and SMAX measurements.

### Alarming

<table>
<thead>
<tr>
<th>Alarm Time Delays</th>
<th>100 ms to 60 sec for vibration and position measurements. 1 sec to 60 sec for speed measurements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setpoints</td>
<td>Four setpoint levels available at each measurement.</td>
</tr>
</tbody>
</table>

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**Bently Nevada**

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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

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
Ex d d 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


Protection Processor Module

<table>
<thead>
<tr>
<th>Ordering Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60R/PPM01–AAA–BB • Protection Processor Module</td>
<td></td>
</tr>
<tr>
<td>AAA – Hazardous Area Certifications</td>
<td></td>
</tr>
<tr>
<td>00</td>
<td>No Hazardous Area</td>
</tr>
<tr>
<td>01</td>
<td>CSA/NRTL/C (Class I, Div 2)</td>
</tr>
<tr>
<td>02</td>
<td>Multi (CSA, ATEX, IECEx)</td>
</tr>
<tr>
<td>XXX</td>
<td>Country Specific Approvals</td>
</tr>
<tr>
<td>BB – SIL Level</td>
<td></td>
</tr>
<tr>
<td>00</td>
<td>No SIL</td>
</tr>
<tr>
<td>02</td>
<td>SIL 2</td>
</tr>
</tbody>
</table>
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