

# EIM3.1

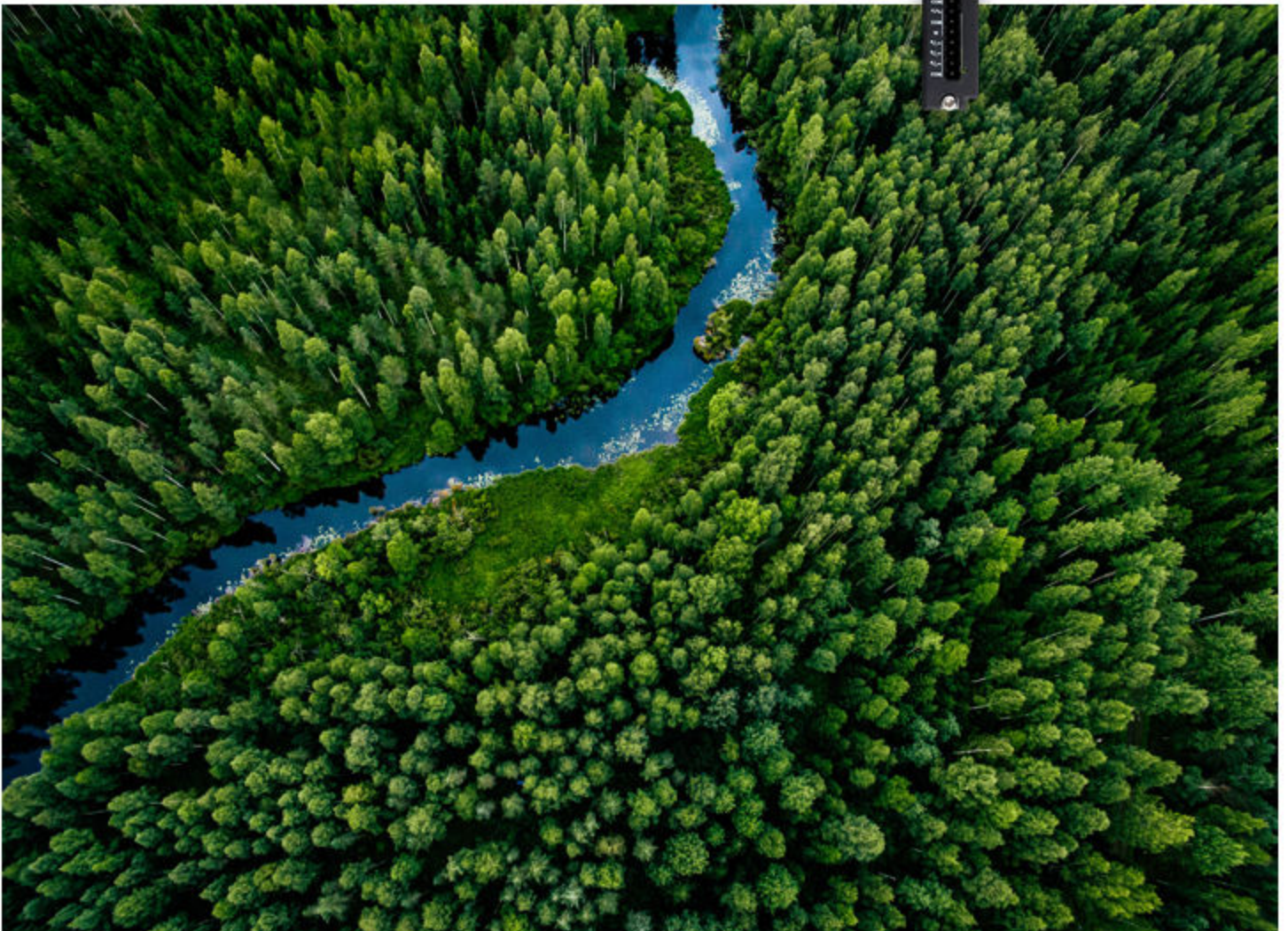
Engine interface module

Data sheet

4921240636-D



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Tomorrow



## **1. Series 300**

1.1 About the hardware modules.....	3
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## **2. Technical specifications**

2.1 Engine interface module EIM3.1.....	4
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## **3. Legal information**

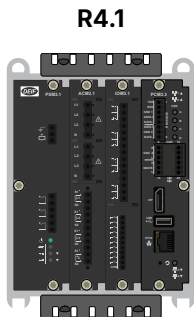
3.1 Disclaimer and copyright.....	7
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# 1. Series 300

## 1.1 About the hardware modules

The hardware modules are printed circuit boards that slot in to either a R7.1 or R4.1 rack. Depending on the type of module, they can provide AC or other measurements, inputs, outputs and give communication indication.

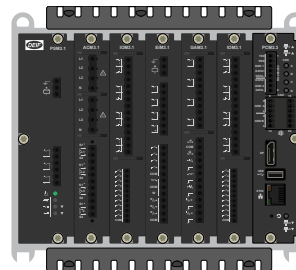
### Controller racks



**R4.1**

Modules

- 1 PSM3.1
- 2 module selection
- 1 PCM3.3

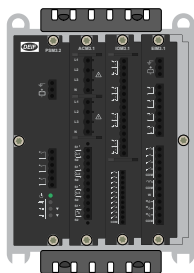


**R7.1**

Modules

- 1 PSM3.1
- 5 module selection
- 1 PCM3.3

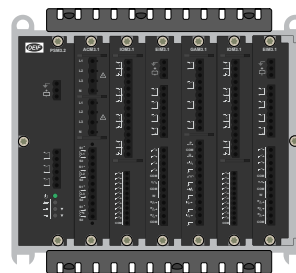
### Extension racks (EtherCAT)



**R4.1**

Modules

- 1 PSM3.2
- 3 module selection
- 1 small blind module



**R7.1**

Modules

- 1 PSM3.2
- 6 module selection
- 1 small blind module

The hardware modules feature:

- Placement flexibility in the rack.
- Add, replace, or remove on-site.
- Automatically recognised.
- Configurable input and output functions (digital and analogue):
  - Digital input functions: Commands from operators or 3rd party equipment, changing configuration, operating information.
  - Digital output functions: Alarm status, commands to 3rd party equipment, operating information.
  - Analogue input functions: External set points, operating information, supervised binary inputs.
  - Analogue output functions: Regulation \*, operating information.

**NOTE** \* Only available on certain types of controller.

All slots must be covered during operation and blind modules can be used to cover unused slots.

## 2. Technical specifications

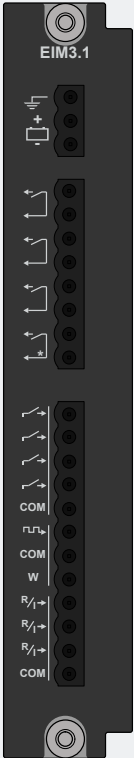






### 2.1 Engine interface module EIM3.1

The engine interface module has its own power supply and a tacho input to measure speed. It also has four relay outputs, four digital inputs, and three analogue inputs. These I/Os are configurable.

The power supply terminals include circuit protection against load dump transients and JEM177 surge transients (rugged design). These terminals also include battery voltage measurement.



EIM3.1 has its own microprocessor. If the rack power supply fails, or connection to the application is lost, the EIM3.1 can continue to operate independent of the application.








#### EIM3.1 terminals

Module	Count	Symbol	Type	Name	
	1		Ground	Frame ground	
	1		12 or 24 V DC	Power supply	
	3		Relay output	Configurable	
	1		Relay output (with wire break detection)	Configurable	
	4		Digital input	Configurable	
	1		MPU input (with wire break detection)*	Magnetic pickup	
	1	w	W input (no wire break detection)*	Generator tacho output or NPN/PNP sensor	
	3	$R_1 \rightarrow$	Analogue current or resistance measurement input (RMI)	Configurable	

**NOTE** \* These inputs cannot both be used at the same time.

#### EIM3.1 technical specifications

Category	Specification
<b>Frame ground</b> 	Voltage withstand: $\pm 36$ V DC to the power supply positive (terminal 1) and negative (terminal 2)
<b>Auxiliary power supply</b> 	<p>Input voltage: 12 or 24 V DC nominal (8 to 36 V DC continuously)            UL/cUL Listed: 10 to 32.5 V DC            0 V DC for 50 ms when coming from at least 8 V DC (cranking dropout)            Consumption: Typical 3 W, maximum 5 W            Internal protection: by 12 A fuse (not replaceable) (fuse size determined by load dump requirements)            Voltage withstand: <math>\pm 36</math> V DC            Load dump protected by TVS diodes</p> <p><b>Start current</b></p>

Category	Specification
	<ul style="list-style-type: none"> <li>Power supply current limiter <ul style="list-style-type: none"> <li>24 V: 0.6 A minimum</li> <li>12 V: 1.2 A minimum</li> </ul> </li> <li>Battery: No limit</li> </ul>
<b>Relay outputs</b> 	Relay type: Electromechanical Electrical rating and UL/cUL Listed: 30 V DC and 6 A, resistive Voltage withstand: $\pm 36$ V DC
<b>Relay output with wire break detection</b> 	Relay type: Electromechanical Electrical rating and UL/cUL Listed: 30 V DC and 6 A, resistive Includes wire break detection Voltage withstand: $\pm 36$ V DC
<b>Magnetic pickup</b> 	Voltage: 3 to 70 V AC peak Frequency: 2 to 20,000 Hz Accuracy: 2 to 99 Hz: 0.5 Hz; 100 to 20,000 Hz: $\pm 0.5$ % of measurement Cable supervision: Resistance maximum 100 k $\Omega$ Includes wire break detection Voltage withstand: 70 V AC
<b>Generator tachometer (W)</b> 	Voltage: 8 to 36 V DC Frequency: 2 to 20,000 Hz Accuracy: 2 to 99 Hz: 0.5 Hz; 100 to 20,000 Hz: $\pm 0.5$ % of measurement No wire break detection Voltage withstand: $\pm 36$ V DC
<b>NPN/PNP</b> 	Voltage: 8 to 36 V DC Frequency: 2 to 20,000 Hz Accuracy: 2 to 99 Hz: 0.5 Hz; 100 to 20,000 Hz: $\pm 0.5$ % of measurement No wire break detection Voltage withstand: $\pm 36$ V DC
<b>Digital inputs</b> 	Bipolar inputs <ul style="list-style-type: none"> <li>ON: -36 to -8 V DC, and 8 to 36 V DC</li> <li>OFF: -2 to 2 V DC</li> </ul> Minimum pulse length: 50 ms Impedance: 4.7 k $\Omega$ Voltage withstand: $\pm 36$ V DC
<b>Analogue multi-functional inputs</b> 	<b>Current input</b> <ul style="list-style-type: none"> <li>From active transmitter: 0 to 20 mA, 4 to 20 mA, or any custom range between 0 and 25 mA</li> <li>Accuracy: 1 % of selected range</li> </ul> <b>Pt100/1000</b> <ul style="list-style-type: none"> <li>-40 to 250 °C (-40 to 482 °F)</li> <li>Accuracy: 1 % of full scale (to IEC/EN60751)</li> <li>Maximum sensor self-heating: 0.5 °C/mW (1 °F/mW)</li> </ul> <b>Resistance measurement</b> <ul style="list-style-type: none"> <li>Any custom range between 0 and 2.5 k<math>\Omega</math></li> <li>Accuracy: 1 % over ranges: 0 to 200 <math>\Omega</math>, 0 to 300 <math>\Omega</math>, 0 to 500 <math>\Omega</math>, 0 to 1000 <math>\Omega</math>, and 0 to 2500 <math>\Omega</math></li> </ul> <b>Digital input</b> <ul style="list-style-type: none"> <li>Dry contact with cable supervision</li> <li>Maximum circuit resistance: 330 <math>\Omega</math></li> <li>Minimum current rating for the connected relay: 2.5 mA</li> </ul> Voltage withstand: $\pm 36$ V DC All analogue multi-functional inputs for EIM3.1 have a common ground

Category	Specification
<b>Terminal connections</b>	<p><b>Frame ground and power supply</b></p> <ul style="list-style-type: none"> <li>• Terminals: Standard 45° plug, 2.5 mm<sup>2</sup></li> <li>• Wiring: 1.5 to 2.5 mm<sup>2</sup> (16 to 12 AWG), multi-stranded</li> </ul> <p><b>Other connections</b></p> <ul style="list-style-type: none"> <li>• Terminals: Standard 45° plug, 2.5 mm<sup>2</sup></li> <li>• Wiring: 0.5 to 2.5 mm<sup>2</sup> (22 to 12 AWG), multi-stranded</li> </ul>
<b>Torques and terminals</b>	<p>Module faceplate screws: 0.5 N·m (4.4 lb-in)</p> <p>Connection of wiring to terminals: 0.5 N·m (4.4 lb-in)</p> <p>UL/cUL Listed: Wiring must be minimum 90 °C (194 °F) copper conductors only</p>
<b>Galvanic isolation</b>	<p>Between relay groups and other I/Os: 600 V, 50 Hz for 60 s</p> <p>Between digital input groups and other I/Os: 600 V, 50 Hz for 60 s</p> <p>Between MPU and W inputs and other I/Os: 600 V, 50 Hz for 60 s</p> <p>Between analogue inputs and other I/Os: 600 V, 50 Hz for 60 s</p>
<b>Ingress protection</b>	<p>Unmounted: No protection rating</p> <p>Mounted in rack: IP20 according to IEC/EN 60529</p>
<b>Dimensions</b>	L×H×D: 28 × 162 × 150 mm (1.1 × 6.4 × 5.9 in)
<b>Weight</b>	250 g (0.5 lb)

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