1900/65A General Purpose Equipment Monitor

Datasheet

Cordant™

173401 Rev. AC

Description

The 1900/65A General Purpose Equipment Monitor is designed to continuously monitor and protect equipment that is used in a variety of applications and industries. The monitor's low cost makes it an ideal solution for general-purpose machines and processes that can benefit from continuous monitoring and protection.

Inputs

The 1900/65A provides four transducer inputs and four temperature inputs. Software can configure each transducer input to support 2- and 3-wire accelerometers, velocity sensors or proximity sensors. Each temperature input supports Type E, J, K, and T thermocouples, and 2- or 3-wire RTDs.

Outputs

The 1900/65A provides six relay outputs, four 4-20 mA recorder outputs, and a dedicated buffered output. The user can use the 1900 Configuration software to configure the relay contacts to open or close according to the OK, Alert and Danger statuses of any channel or combination of channels, and to provide data from any variable from any channel on any recorder output. The dedicated buffer output can provide the signal for each transducer input.

Baker Hughes

Specifications

Inputs

Transducer Inputs

Users can configure Channels 1 through 4 to accept input from acceleration, velocity or displacement transducers.

Transducer Channel Types

Channel Types define the functionality for processing that will be applied to an input signal and the kind of variables or measurement values that will be derived from this input. Channel Types also define the kind of sensor that must be used. Transducer Channel Types include:

- Acceleration or Reciprocating Acceleration
- Velocity or Reciprocating Velocity
- Radial Vibration (shaft vibration)
- Thrust (shaft axial displacement)
- Position
- Speed

Acceleration and Reciprocating Acceleration Channel Types

The Acceleration Channel Type and Reciprocating Acceleration Channel Type support two- and three-wire acceleration sensors. The Reciprocating Acceleration channel type has timed OK channel defeat disabled.

Acceleration Variables and Reciprocating Acceleration Variables

Acceleration Variables and Reciprocating Acceleration Variables are filtered and processed measurements from raw transducer signals. The Acceleration Channel Type and Reciprocating Acceleration Channel Type continuously processes up to four variables per channel.

Vibration	Up to three bandpass filtered amplitude measurements.
Acceleration Enveloping	Users can apply the acceleration enveloping algorithm to one Acceleration or Reciprocating Acceleration Variable.
Bias Voltage	Users may assign the value of the transducer bias voltage to any of the variables.

Configuration Options

Each variable is independently configured with the following options.

Vibration Variables	• Peak or RMS • Metric or English units • Filter corner frequencies • Full scale range • Acceleration integrated to velocity
Enveloped Variable	• Filter corner frequencies • Standard or Enhanced demodulation

Filters

Vibration Variable	0.5 Hz – 25 kHz configurable 4-pole high-pass, 4-pole low-pass
Enveloping High-Pass	25 Hz to 5 kHz, configurable 4-pole
Enveloping Low-Pass	125 Hz to 25 kHz, configurable 2-pole
Enveloped Variable High-Pass	0.1 Hz min., but greater than Enveloped Variable low-pass 2-pole
Enveloped Variable Low-Pass	Greater than Enveloped Variable high-pass and less than Enveloping high-pass 4-pole
Bias Filter	0.01 Hz 1-pole low-pass
OK Filter	2.4 kHz 1-pole low-pass

Full Scale Range

Vibration	20 to 500 m/s^2 (2 to 50 g) peak and RMS
Enveloped	20 to 500 m/s^2 (2 to 50 g) peak and RMS
Integrated	10 to 100 mm/s (0.4 to 4 in/s) peak and RMS
Bias Voltage	-24 V

Accuracy

Vibration Variables	±1% of full scale range

Input Impedance

3-wire Voltage Mode	10 kΩ

Velocity and Reciprocating Velocity Channel Type

The Velocity Channel Type and Reciprocating Velocity Channel Type support two-wire and three-wire piezo-velocity sensors.

Velocity Variables and Reciprocating Velocity Variables

Velocity Variables and Reciprocating Velocity Variables are filtered and processed measurements from raw transducer signals. The Velocity Channel Type and Reciprocating Velocity Channel Type support up to four continuously calculated variables per channel.

Vibration	Up to three bandpass filtered amplitude measurements.
Bias Voltage	Users may assign the value of the transducer bias voltage to any of the variables.

Configurable Options

Each variable is independently configured with the following options.

Vibration Variables	• Peak or RMS • Metric or English units • Filter corner frequencies • Full-scale range • Velocity integrated to displacement

Filters

Vibration Variables	0.5 Hz to 5.5 kHz, configurable 8-pole high-pass, 4-pole low-pass
Bias Filter	0.09 Hz 1-pole low-pass
OK Filter:	2.4 kHz 1-pole low-pass

Full Scale Range

Vibration	10 to 50 mm/s (0.5 to 2 in/s) peak and RMS
Integrated	100 to 500 µm (5 to 20 mils) peak to peak
Bias Voltage	-24 V

Accuracy

Vibration Variables	±1% of full scale range

Input Impedance

3-Wire Voltage Mode	10 kΩ

Radial Vibration Channel Type

The Radial Vibration Channel Type measures radial shaft motion using proximity sensors.

Radial Vibration Variables

Radial Vibration Variables are filtered and processed measurements from raw transducer sensors. The Radial Vibration Channel Type supports up to four continuously calculated variables per channel.

Direct	Up to three bandpass filtered amplitude measurements
Gap	Gap voltage
Vibration	Up to three bandpass filtered amplitude measurements

Configurable Options

Each variable is independently configured with the following options.

Vibration Variables	• Metric or English units • Filter corner frequencies • Number of filter poles • Full-scale range

Filters

Direct Filter 1	4 to 4000 Hz (240 to 240,000 RPM)
Direct Filter 2	1 to 600 Hz (60 to 36,000 RPM)
Direct Filter Characteristics	High-pass set by attack and decay, 1-pole low-pass
Gap Filter	0.09 Hz 1-pole low-pass
Vibration Variables	0.5 Hz to 4 kHz, configurable 1-, 2-, or 4-pole high-pass and low-pass, configurable
OK Filter	2.4 kHz 1-pole low-pass

Full Scale Range

Direct	100 to 500 µm (3 to 20 mils) peak-to-peak

Gap	-24 V

Accuracy

Vibration Variables	±1% of full-scale range

Input Impedance

Non-configurable	10 kΩ

Thrust Channel Type

The Thrust Channel Type measures axial shaft motion using proximity sensors.

Thrust Variables

Thrust Variables are filtered and processed measurements from raw transducer signals.

Position	Axial position of shaft
Gap	Gap, voltage or position

Configurable Options

Each variable is independently configured with the following options.

Position Variables	Metric or English units Full-scale range

Filters

Direct Filter:	1.2 Hz 1-pole low-pass
Gap Filter	0.41 Hz 1-pole low-pass
OK Filter:	2.4 kHz 1-pole low-pass

Full Scale Range

Position	1 to 4 mm (50 to 150 mils) span with adjustable zero position
Gap	-24 V

Accuracy

Position Variables	±1% of full-scale range

Input Impedance

Non-configurable	10 kΩ

Position Channel Type

The Position Channel Type measures mechanical motion using proximity sensors.

Position Variables

Position Variables are filtered and processed measurements from raw transducer signals.

Position	Mechanical position
Gap	Gap, voltage or position

Configurable Options

Each variable is independently configured with the following options.

Position Variables	Metric or English units Full- scale range

Filters

Direct Filter	1.2 Hz 1-pole low-pass
Gap Filter	0.41 Hz 1-pole low-pass
OK Filter	2.4 kHz 1-pole low-pass

Full Scale Range

Position	1 to 28 mm (50 to 1100 mils) span with adjustable zero position.
Gap	-24 V

Accuracy

Position Variables	±1% of full scale range

Input Impedance

Non-configurable	10 kΩ

Speed Channel Type

The Speed Channel Type measures speed using proximity sensors.

Speed Variables

Speed Variables are filtered and processed measurements from raw transducer signals.

Speed	Up to 4 speed measurements
Gap	Gap, voltage

Configurable Options

Each variable is independently configured with the following options:

Gap Filter	0.09 Hz 1-pole low-pass
OK Filter	2.4 kHz 1-pole low-pass

Full Scale Range

Speed	100 - 100,000 rpm

Events Per Revolution

EPR	0.001 to 1000

Accuracy

Speed Variables:	± 0.5 RPM + 0.015% of reading

Input Impedance

Non-configurable	10 kΩ

Temperature Inputs (Ch. 5 – 8)

Channels 5 through 8 support Type E, J, K, and T thermocouples, and 2- and 3-wire RTDs.

Temperature Variable

Temperature variables are processed measurements from raw transducer signals. The temperature channel type processes one temperature variable per channel.

Configurable Options

Each Variable is independently configured with the following options.

Units	°C or °F

Filters

Analog Filter	50 Hz 1-pole, low-pass
Digital Filter	Notch filter will attenuate the first 5 orders of 50 Hz and 60 Hz (49 Hz to 61 Hz) by a minimum of 100 dB.

Full Scale Range

Type E	-200 to 1000 °C (-328 to 1832 °F)
Type J	-210 to 1200 °C (-346 to 2192 °F
Type K	-200 to 1370 °C (-328 to 2498 °F)

Type T	-200 to 400 °C (-328 to 752 °F)
10 Ω Cu α=0.00427	-200 to 260 °C (-328 to 500 °F)
120 Ω Ni α=0.00672	-80 to 260 °C (-112 to 500 °F)
100 Ω Pt α=0.00385:	-200 to 850 °C (-328 to 1562 °F)
100 Ω Pt α=0.00392:	-200 to 700 °C (-328 to 1292 °F)

Accuracy

All Thermocouple Types	±1 °C (±1.8 °F) typical @ 25 °C (77 °F) ±2.5 °C (±4.5 °F) maximum for thermocouple measurements over –100 °C (148 °F) ±5 °C (±9 °F) maximum for thermocouple measurements below –100 °C (-148 °F)
3-Wire RTD (except 10 Ω Cu)	±1.5 °C (±2.7 °F) + 0.5 % full scale
3-Wire RTD 10 Ω Cu	±3 °C (±5.4 °F) + 0.5 % full scale
2-wire RTD Types	2-wire RTDs have additional errors due to field wire resistance and variations in the field wire resistance due to changes in ambient temperature.

Input Impedance

Thermocouple Inputs	>1 MΩ

Alarm Status Time Delays

Position/ Vibration Inputs

Minimum	0.1 second
Maximum	60 seconds
Adjustment Resolution	0.1 second

Accessories

Part Number	Description
167699-02	1900/65A Display Module
173400	*1900/65A User Guide*
172250	*1900/65 Modbus Gateway Users Guide*
173089	*1900/65A Field Wiring Diagrams*
02200794	Power supply, 110/220 Vac to 24 Vdc 2.5 A DIN rail mount
02200121	DIN rail end bracket
168374	35mm DIN rail mounting clip for 1900/65A Monitor Module
168495	Bulkhead mounting plate
168547-0010-01-01	3 m (10 ft) PVC cable, assembled
168547-0010-01-02	3 m (10 ft) PVC cable, unassembled
168547-0010-02-01	3 m (10 ft) TEF cable, assembled
168547-0010-02-02	3 m (10 ft) TEF cable, unassembled
168628	Stainless steel NEMA 4X weatherproof door for panel-mount display assembly
168629	Painted steel NEMA 4 weatherproof door for panel-mount display assembly
168944	Fiberglass NEMA 4X/IP66 weatherproof housing with window in door
284785	MTL 7728(-) barrier
175502	MTL 7796(-) barrier
172555	Modbus/TCP (Ethernet) to Modbus/RTU (Serial) Converter
169825-01	Training CD