

XM Monitoring Modules Specifications

Catalog Numbers 1440 Series

The XM® series of intelligent I/O modules process, in real time, the critical parameters that are used to assess the current health and predict the future health of industrial machinery. This real-time processing provides machinery protection and reduces downtime. Use the XM modules in a standalone system, or integrate them with existing automation and control systems.

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Summary of Changes

This manual contains new and updated information. Change bars, as shown to the left of this paragraph, identify changes made to this revision.

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XM DYN Dynamic Measurement Module

The XM dynamic measurement module (catalog number 1440-DYN02-01RJ) is a two-channel, general-purpose monitor that supports measurements of dynamic inputs such as vibration, pressure, and strain. You can use the module to monitor shaft, casing, and pedestal vibration in equipment that rotates. The module is designed specifically for integration with ControlLogix® controllers, that are connected through the 1440-ACNR ControlNet adapter.

Table 1 - XM DYN Dynamic Measurement Module Attribute Descriptions

Attribute	XM DYN (1440-DYN02-01RJ)
Inputs	
Two dynamic channel inputs	<ul style="list-style-type: none"> Eddy current transducer signals Accelerometer signals Voltage signals from any dynamic measurement sensor such as velocity or pressure transducer
Transducer power	<ul style="list-style-type: none"> Constant voltage 24V DC, -24V DC, 60 mA Constant current 4.5 mA +30%/-20% from 24V DC (IEPE) Bias current: monitors self-powered coil-based transducers None
Voltage ranges	<ul style="list-style-type: none"> -20...0V DC -10...10V DC 0...20V DC
Input impedance	> 100 kΩ
Sensitivity	Up to 15% from nom

mV/g	mV/ips	mV/mms	mV/mil	mV/μm	mV/psi	mV/mbar	V/V
10	100	4	100	3.94	20	0.29	1
25	150	6	150	5.91	50	0.73	
50	200	8	200	7.87	100	1.45	
100	500	20	285	11.2			
500	1000	40					
1000							
10000							

Tachometer Input	
One tachometer input	±25V (50V max peak-to-peak)
Input impedance	> 120 kΩ
Range	1...1.2 M rpm/0.0167...20 kHz

Table 1 - XM DYN Dynamic Measurement Module Attribute Descriptions (continued)

Attribute	XM DYN (1440-DYN02-01RJ)
Pulses per revolution	0 (tach off) ... 50,000
Rate of change of speed, max	500 Hz/s
Outputs	
Buffered outputs	<ul style="list-style-type: none"> • One active buffer per dynamic channel • One resistive buffer for tachometer
Indicators	
Status indicators	<ul style="list-style-type: none"> • Module • Network • Channel 0 • Channel 1 • Tachometer • Setpoint multiplier • Virtual relay
Communication	
XM bus	<ul style="list-style-type: none"> • Autobaud 125 Kbps, 250 Kbps, or 500 Kbps • Max distance: 10 m (32.81 ft) • Node number that is mechanically set to simplify installation and commissioning • Customizable poll assembly optimizes space utilization within scanner • Logix Controller integration over the ControlNet network Via 1440-ACNR Adapter
Signal Conditioning	
Sampling mode	<ul style="list-style-type: none"> • Selectable per channel • Asynchronous <ul style="list-style-type: none"> – FMAX: 1 Hz ... 20 kHz • Synchronous <ul style="list-style-type: none"> – FMAX: $10 < \text{Orders} \times \text{Speed (Hz)} < 5000$ – Order range: 4 ... 200 – Min FMAX: 10 Hz – Max FMAX: 5000 Hz
Resolution	<ul style="list-style-type: none"> • A/D conversion: 24 bits • Dynamic range: 80 dBfs (0.01% fs), 90 dBfs, typical
FFT lines	100, 200, 400, 800
Integration	None, single, or double
High pass analog filters	<ul style="list-style-type: none"> • -3 dB corners: 0.2, 1, 5, 10, 40 Hz Roll off: -30 dB/octave for the 0.2 Hz filter, otherwise 24 dB/octave <ul style="list-style-type: none"> • Spike Energy • gSE HPF: 200, 500, 1000, 2000, 5000 Hz Roll off: -12 dB/octave
Low pass filter	<ul style="list-style-type: none"> • Applied to integrated acceleration measurements • -6 dB corner: 2 kHz Roll off: -12 dB/octave
Units	g, ips, mm/s, mils, μm , PSI, mbar, volt
Measurements	
Types	<ul style="list-style-type: none"> • FFT and time waveform • Asynchronous or synchronous

Table 1 - XM DYN Dynamic Measurement Module Attribute Descriptions (continued)

Attribute	XM DYN (1440-DYN02-01RJ)
Real time	Overall <ul style="list-style-type: none"> • RMS • Peak (true or calculated) • Peak-to-peak (true or calculated) • Optional low pass filter <ul style="list-style-type: none"> – -3 dB corner: 200 Hz . . . 20 kHz – Roll off: -24 dB/octave • Gap (or transducer bias voltage) • Speed • SMAX magnitude • SMAX phase
FFT derived	<ul style="list-style-type: none"> • FFT bands <ul style="list-style-type: none"> – Four bands per channel – Defined in frequency or order domain – Overall or max peak in band • Orders <ul style="list-style-type: none"> – Magnitude: 1x, 2x, 3x – Phase: 1x, 2x • Not 1x • Sum harmonics
Alarms	
Number	<ul style="list-style-type: none"> • Six alert and danger pairs • Alarm on any measured value
Operators	<ul style="list-style-type: none"> • Greater than • Less than • Inside range • Outside range
Hysteresis	User-defined
Startup inhibit/setpoint multiplication	<ul style="list-style-type: none"> • Period 0 . . . 1092 min • Inhibit/multiplication function: Multiply by N (0 . . . 10, 0 = Disarm)
Speed inhibit	Speed range can be specified for each alarm. When applied, the alarm is disabled if the speed is outside the defined range
Configuration	
Automatic module configuration	Automatically configured from a configuration that is stored in module memory at power-up, or from a configuration that is held in a Logix5000™ controller.
Relays	
One virtual relay	<ul style="list-style-type: none"> • Logic is provided to drive one virtual relay. • Relay status indicator
Relay function	<ul style="list-style-type: none"> • Normally energized (failsafe) or normally deenergized (non-failsafe) • Latching or non-latching • Time delay: 0 . . . 25.5 s in 100 ms increments • Single or paired AND or OR logic applied to any alarm • Reset by digital command from configuration software, via a command from the XM bus, or from output tag when integrated via ControlNet adapter
Alarm status to activate on	<ul style="list-style-type: none"> • Normal • Alert • Danger • Gap/bias out of range • Module fault • Tachometer fault • Disarm
Power	
Type	Requires Class 2 power supply

Table 1 - XM DYN Dynamic Measurement Module Attribute Descriptions (continued)

Attribute	XM DYN (1440-DYN02-01RJ)
Module	24V DC
Consumption	<ul style="list-style-type: none"> • 250 mA, max • 210 mA, typical
Heat production	<ul style="list-style-type: none"> • 4.56 W, max • 3.60 W, typical
North American Temp Code	T4A
IEC Temp Code	T4
Environmental	
Temperature, operating	-20...70 °C (-4...158 °F)
Temperature, storage	-40...85 °C (-40...185 °F)
Relative humidity	5...95% noncondensing
Physical	
Terminal base	1440-TBS-J
Dimensions (H x W x D), approx	97 x 94 x 94 mm (3.8 x 3.7 x 3.7 in.)
Weight, approx	0.172 kg (0.38 lb)
Certifications⁽¹⁾	
cULus	UL Listed for US and Canada. See File E234338 UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, which are certified for U.S. and Canada. See UL File E194810
CE	European Union 2004/108/EC EMC Directive, compliant with: <ul style="list-style-type: none"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B)
C-Tick	Australian Radiocommunications Act, compliant with: <ul style="list-style-type: none"> • AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-11; Explosive Atmospheres, Protection "i" • EN 60079-0; General Requirements • Ex nA IIC T4 X Gc
KCC	Korean Registration of Broadcasting and Communications Equipment, compliant with: <ul style="list-style-type: none"> • Article 58-2 of Radio Waves Act, Clause 3

(1) When product or packaging is marked. See the Product Certification link at <http://www.rockwellautomation.com> for Declarations of Conformity, Certificates, and other certification details.

XM-124 Standard Dynamic Measurement Module

The XM-124 module (catalog number 1440-SDM02-01RA) is a two-channel, general-purpose monitor that supports dynamic measurements such as vibration, pressure, strain, and spike energy (gSE). The module also supports static (DC) thrust and eccentricity measurements.

The XM-124 consolidates and improves on most of the functionality that is provided by the earlier XM-120, XM-120E, XM-121, XM-122 and XM-123 modules. It also provides the same basic, single-channel, thrust measurement as the XM-320 module. The XM-124 is suitable for monitoring almost any rotating machine, including steam turbines, aeroderivative and industrial gas turbines, hydro turbines, motors, pumps, fans, compressors, and gearboxes.

Table 2 - XM-124 Standard Dynamic Measurement Module Attribute Descriptions

Attribute	XM-124 (1440-SDM02-01RA)
Inputs	
Two dynamic channel inputs	<ul style="list-style-type: none"> Eddy current transducer signals Accelerometer signals Voltage signals from any dynamic measurement device, such as a velocity or pressure transducer
Transducer power	<ul style="list-style-type: none"> Constant voltage: 24V DC, -24V DC, 40 mA Constant current 4.5 mA \pm 30% / -20% from 24V DC (IEPE) None (voltage input) Tachometer can be powered, constant voltage, or configured as voltage input
Voltage range	<ul style="list-style-type: none"> -20...0V DC -10...10V DC 0...20V DC
Input impedance	> 100 k Ω
Sensitivity	Up to 15% from nom

mV/g	mV/ips	mV/mms	mV/mil	mV/ μ m	mV/psi	mV/mbar	V/V
10	100	4	100	3.94	20	0.29	1
25	150	6	150	5.91	50	0.73	
50	200	8	200	7.87	100	1.45	
100	500	20	285	11.2			
500	1000	40					
1000							
10000							

Tachometer Input	
One tachometer input	<ul style="list-style-type: none"> \pm25V (50V max peak-to-peak) 1...50,000 events/revolution
Input impedance	> 120 k Ω
Range	<ul style="list-style-type: none"> 1...1,200,000 rpm 0.0167...20,000 Hz
Pulses per revolution	0 (tach off)...50,000
Rate of change of speed, max	500 Hz/s
Outputs	
4...20 mA	<ul style="list-style-type: none"> Each output is independently programmed to represent any measured parameter, from either channel Two isolated outputs 300 Ω max load

Table 2 - XM-124 Standard Dynamic Measurement Module Attribute Descriptions (continued)

Attribute	XM-124 (1440-SDM02-01RA)
Buffered outputs	<ul style="list-style-type: none"> • One active buffer per dynamic channel • One resistive buffer for tachometer
Indicators	
Status indicators	<ul style="list-style-type: none"> • Module • Network • Channel 1 • Channel 2 • Tachometer • Setpoint multiplier • Virtual relay
Communication	
DeviceNet network	<ul style="list-style-type: none"> • Standard DeviceNet protocol for all functions (not power—module power is provided independently) • Available EDS file provides support for most DeviceNet compliant systems • Communication rate that is automatically set by bus master to 125, 250, or 500 Kbps • Configurable I/O Poll Response message helps optimize space utilization within scanner input tables: <ul style="list-style-type: none"> – Selectable poll response assembly – Selectable poll response size (bytes)
Serial	<ul style="list-style-type: none"> • RS-232 via mini-connector or terminal base unit • Communication rate that is fixed at 19.2 Kbps • Local configuration via the Serial Configuration Utility
Signal Conditioning	
Sampling mode	<ul style="list-style-type: none"> • Selectable per channel • Dynamic Measurements <ul style="list-style-type: none"> – Asynchronous <ul style="list-style-type: none"> FMAX: 1 Hz . . . 20 kHz – Synchronous • Order range: 4 . . . 200 <ul style="list-style-type: none"> – Min FMAX: 10 Hz – Max FMAX: 5000 Hz, Measured: Orders x Speed (Hz) • Spike Energy • Static Measurements <ul style="list-style-type: none"> – Eccentricity <ul style="list-style-type: none"> Peak-to-Peak Eccentricity • Thrust <ul style="list-style-type: none"> Normal mode (single channel measurement)
Resolution	<ul style="list-style-type: none"> • A/D conversion: 24 bits • Dynamic range: 80 dBfs (0.01% fs), 90 dBfs, typical
FFT lines	100, 200, 400, 800, 1600
Integration	None, single, or double
High pass analog filters	<ul style="list-style-type: none"> • -3 dB corners: 0.2, 1, 5, 10, 40 Hz Roll off: -30 dB/octave for the 0.2 Hz filter, otherwise 24 dB/octave
Low pass analog filter	<ul style="list-style-type: none"> • Applied to integrated acceleration measurements • -3 dB corner: 5kHz Roll off: -18 dB/octave
Low pass digital filter	Independently configured per channel <ul style="list-style-type: none"> • Optional Overall LP Filter • 100 . . . 20000 Hz • Spike Energy • Spectra FMAX: 10 . . . 5000 Hz • Roll Off: -24 dB/octave

Table 2 - XM-124 Standard Dynamic Measurement Module Attribute Descriptions (continued)

Attribute	XM-124 (1440-SDM02-01RA)
Tracking digital filter	Independently configured per channel <ul style="list-style-type: none"> • Tracked speed multiple: 0.1 . . . 20.0 times the measured (tachometer) rpm • Constant Q: 1 . . . 200 • Constant bandwidth: 0.1 . . . 25 Hz • Roll off: -36 dB/octave, typical
Band pass digital filter	Independently configured per channel <ul style="list-style-type: none"> • Frequency, min 25 . . . 1000 Hz • Frequency, max 100 . . . 5500 Hz • Roll off: -60 dB/octave
Units	g, ips, mm/s, mils, μ m, PSI, mbar, volt

Table 2 - XM-124 Standard Dynamic Measurement Module Attribute Descriptions (continued)

Attribute	XM-124 (1440-SDM02-01RA)
Data⁽¹⁾	
Complex data	<ul style="list-style-type: none"> • Spectra (synchronous or asynchronous) • Waveform (synchronous or asynchronous) • Simultaneous waveforms (synchronous) • gSE Spectra
Accuracy, min	<ul style="list-style-type: none"> • ±1% of full scale range for the channel • ±1% of alarm setpoint for speed
Measurements⁽²⁾	
Types	<ul style="list-style-type: none"> • FFT and time waveform • Asynchronous or synchronous
Real time	<ul style="list-style-type: none"> • Overall • RMS • Peak (true or calculated) • Peak-to-peak (true or calculated) • gSE⁽⁵⁾ • Optional low pass filter <ul style="list-style-type: none"> – -3 dB corner: 200 Hz . . . 20 kHz – Roll off: -24 dB/octave • Gap (or transducer bias voltage) • Speed • SMAX magnitude • SMAX phase • Band pass filter value • Tracking filter magnitude • Tracking filter phase • Thrust position • Eccentricity
FFT derived	<ul style="list-style-type: none"> • FFT bands <ul style="list-style-type: none"> – Four bands per channel – Defined in frequency or order domain – Overall or max peak in band • Orders <ul style="list-style-type: none"> – Magnitude: 1x, 2x, 3x – Phase: 1x, 2x • Not 1x • Sum harmonics
Data Buffers	
Delta time buffer	<ul style="list-style-type: none"> • Number of records: 2048 • Delta time interval: 1 . . . 3600 s • Trigger mode: Relay is activated or trigger event (such as DeviceNet command from a controller or host)
Delta rpm buffer	<ul style="list-style-type: none"> • Number of records: 512 • Delta speed interval: 1 . . . 3600 rpm • Trigger mode: Startup collects data in increasing rpm direction only; coast-down collects data in both increasing and decreasing directions • The data that is collected in the buffer is user configurable and can contain up to 16 of the measurements
Spectra or waveform	Saved upon same trigger as delta time buffer
Alarms	
Number	16 alarm and danger pairs
Alarm parameters	Any measured parameter
Operators	<ul style="list-style-type: none"> • Greater than • Less than • Inside range • Outside range

Table 2 - XM-124 Standard Dynamic Measurement Module Attribute Descriptions (continued)

Attribute	XM-124 (1440-SDM02-01RA)
Hysteresis	User configurable in software
Startup inhibit/setpoint multiplication	<ul style="list-style-type: none"> • Period: 0 . . . 1092 min, adjustable in 0.1 min increments • Inhibit/multiplication function: Multiply by N (0 . . . 10, 0 = Disarm)
Speed inhibit	A speed range can be specified for each alarm. When applied, the alarm is disabled when speed is outside of the defined range.
Relays	
Number	<ul style="list-style-type: none"> • Single on-board relay, Single Pole Single Throw (SPST), 1 Form A • Four additional DPDT relays when interconnected to an XM-441 expansion relay module, or • Four virtual relays whose status can be used by remote control systems or the XM-440 master relay module, also 4 DPDT relays
Rating (resistive)	<ul style="list-style-type: none"> • Capacity, nominal: 1.5 A @ 24V DC • Capacity, min 100 µA @ 100 mV DC • Power, max 41.4 W • Voltage, max 27.6V DC • Current, max 1.5 A
Expected life (min operations)	<ul style="list-style-type: none"> • Mechanical: 2×10^7 • Electrical @ 20 cpm – 1.5A, 24VDC: 10^5
Failsafe	<ul style="list-style-type: none"> • Normally energized (failsafe) or • Normally de-energized (non-fail-safe)
Latching	<ul style="list-style-type: none"> • Latching • Non-latching
Time delay	0 . . . 25.5 s, adjustable in 100 ms increments
Logic	Single or paired AND or OR logic applied to any alarm
Reset	<ul style="list-style-type: none"> • Local reset switch on top of module • Remote reset switch wired to terminal base • Digital reset command via serial or DeviceNet interface
Activation on	<ul style="list-style-type: none"> • Alarm status <ul style="list-style-type: none"> – Normal – Alert – Danger – Disarm – Transducer fault – Module fault – Tacho fault
Peak speed capture	The XM-124 retains the value of the highest speed observed since module power was cycled or the peak speed value was manually reset
Configuration	
Nonvolatile configuration	<ul style="list-style-type: none"> • A copy of the module configuration is retained in nonvolatile memory from which the configuration is loaded upon powerup • The configuration that is stored in nonvolatile memory can be deleted only by a module-reset command sent via a serial interface, using the Serial Configuration Utility or via a DeviceNet interface from any compliant software application
Module	
Power supply	<ul style="list-style-type: none"> • 24V DC • 350 mA • Requires Class 2/SELV/PELV power supply
Power dissipation	8.7 W, max

Table 2 - XM-124 Standard Dynamic Measurement Module Attribute Descriptions (continued)

Attribute	XM-124 (1440-SDM02-01RA)
Isolation voltage	<ul style="list-style-type: none"> • 50V (continuous), basic insulation type between uninsulated live parts and the enclosure with the relay contacts open and closed • Type tested at 707V DC for 60 s between uninsulated live parts and the enclosure with the relay contacts open and closed • Type tested at 707V DC for 60 s between supply and output terminals
Wiring category ⁽³⁾	<ul style="list-style-type: none"> • 2 - on signal ports • 1 - on power and relay ports • 2 - on DeviceNet ports • 3 - on serial ports
North American temp code	T5
IEC temp code	T4
Environmental	
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	-20...65 °C (-4...149 °F)
Temperature, surrounding air max	65 °C (149 °F)
Temperature, storage IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	5 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	15 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Emissions CISPR11 (IEC 61000-6-4)	Class A
ESD immunity IEC 61000-4-2	<ul style="list-style-type: none"> • 6 kV contact discharges • 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	<ul style="list-style-type: none"> • 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz • 10V/m with 200 Hz 50% pulse 100% AM at 900 MHz • 10V/m with 200 Hz 50% pulse 100% AM at 1890 MHz • 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	<ul style="list-style-type: none"> • ±3 kV at 5 kHz on power ports • ±3 kV at 5 kHz on signal ports • ±3 kV at 5 kHz on DeviceNet ports
Surge transient immunity IEC 61000-4-5	<ul style="list-style-type: none"> • ±1 kV line-line (DM) and ±2 kV line-earth (CM) on power and relay ports • ±2 kV line-earth (CM) on shielded signal ports • ±2 kV line-earth (CM) on DeviceNet ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Enclosure type rating	None (open-style)
Physical	
Terminal base	1440-TB-A (XM-940) Series C
Dimensions (H x W x D), approx	97 x 94 x 94 mm, (3.8 x 3.7 x 3.7 in.)
Weight	<ul style="list-style-type: none"> • Module: 0.172 kg (0.38 lb) • Terminal base: 0.172 kg (0.38 lb)

Table 2 - XM-124 Standard Dynamic Measurement Module Attribute Descriptions (continued)

Attribute	XM-124 (1440-SDM02-01RA)
Certifications⁽⁴⁾	
c-UL-us	UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/EC EMC Directive, compliant with: <ul style="list-style-type: none"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B)
RCM	Australian Radiocommunications Act, compliant with: <ul style="list-style-type: none"> • AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-11; Explosive Atmospheres, Protection "i" • EN 60079-0; General Requirements • II 3 G Ex nAC • [ic] IIC T4 Gc X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: <ul style="list-style-type: none"> • Article 58-2 of Radio Waves Act, Clause 3

- (1) Complex data is available when the channel is configured for dynamic measurements.
- (2) Measurement availability is dependent on channel configuration.
- (3) Use this Conductor Category information for planning conductor routing. Refer to Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).
- (4) When product or packaging is marked. See the Product Certification link at <http://www.rockwellautomation.com> for Declarations of Conformity, Certificates, and other certification details.
- (5) gSE Measurements can be configured to update continuously, or to alternate with standard acceleration or velocity measurements. The gSE Overall will update in "Real Time" only when configured for continuous update.

XM-160 Direct (overall) Vibration Module (1440-VDRS06-00RH)

XM-161 Direct (overall) Vibration Module with 4...20 mA Out (1440-VDRS06-06RH)

XM-162 Direct (overall) Vibration Module with Proximity Probe Power (1440-VDRP06-00RH)

The XM-160 series modules monitor direct (overall) vibration levels. Each module measures and reports the overall vibration level between selected high and low pass filters, as well as the gap or bias voltage per channel.

Table 3 - XM-160, 161, and 162 Direct (overall) Vibration Modules Attribute Descriptions

Attribute	XM-160 (1440-VDRS06-00RH), XM-161 (1440-VDRS06-06RH), XM-162 (1440-VDRP06-00RH)
Inputs	
Six channels	<ul style="list-style-type: none"> Eddy current transducer signals IEPE accelerometer signals Voltage signals from any dynamic measurement device, such as a velocity or pressure transducer
Transducer power	<ul style="list-style-type: none"> IEPE constant current 2.69 mA \pm20% from 24V DC None (voltage input) Constant voltage -24V DC (XM-162 only): 20 mA per channel, max
Sensitivity	User configurable in software
Input impedance	> 100 k Ω
Discrete switch (XM-161 and XM-162 only)	<ul style="list-style-type: none"> Relay reset and setpoint multiplier functions Non-isolated switch input: switch to ground (24V COM) Max nom sourced current (circuit limited): 5.1 mA
Buffered Outputs	
Number	One active buffer per vibration input channel
Range configurable in software	All channels negative (-22...3V DC) or positive (0.6...22V DC)
Output impedance	500 Ω
Response	-3 dB @ 16 kHz (down 5% @ 5 kHz)
Outputs	
4...20 mA outputs (XM-161 only)	<ul style="list-style-type: none"> Two isolated banks of three outputs (one per channel) 600 Ω max load (24V loop power) Outputs proportional to overall value Non-powered (external loop voltage required, 7...36V)
Accuracy	<ul style="list-style-type: none"> \pm0.5% of full scale, max \pm0.2% of full scale, typical
Response time (3 tau)	1.5 s
Indicators	
Status indicators	<ul style="list-style-type: none"> Module - red/green Network - red/green Channel 1 - yellow/red Channel 2 - yellow/red Channel 3 - yellow/red Channel 4 - yellow/red Channel 5 - yellow/red Channel 6 - yellow/red
Communication	
DeviceNet network	<ul style="list-style-type: none"> Standard DeviceNet protocol for all functions (not power—module power is provided independently) Available EDS file provides support for most DeviceNet compliant systems Communication rate automatically set by bus master to 125, 250, or 500 Kbps Configurable I/O Poll Response message helps optimize space utilization within scanner input tables: <ul style="list-style-type: none"> Selectable poll response assembly Selectable poll response size (bytes)
Serial	<ul style="list-style-type: none"> RS-232 via mini-connector or terminal base unit Communication rate fixed at 19.2 Kbps Local configuration via the Serial Configuration utility

Table 3 - XM-160, 161, and 162 Direct (overall) Vibration Modules Attribute Descriptions (continued)

Attribute	XM-160 (1440-VDRS06-00RH), XM-161 (1440-VDRS06-06RH), XM-162 (1440-VDRP06-00RH)
Vibration Measurement and Signal Conditioning	
A/D conversion	12 bits
Resolution	0.05% of full scale
Accuracy	<ul style="list-style-type: none"> ±5% of full scale 3 Hz...1 kHz; +5/-10% 1...5 kHz, max ±1% of full scale, typical
Units	volts, g, ips, mm/s, mils, um, PSI, Pa
Range	<ul style="list-style-type: none"> 0...2 ips RMS (integrated 100 mV/g accel @ 1 kHz) 0...20 g RMS (100 mV/g accel) 0...15.6 mils peak (200 mV/mil probe)
Low pass filter	1 kHz or 5 kHz selectable, two-pole 0.1 dB Chebyshev (-0.1 dB @ fo)
High pass filter	3.0 Hz or 10.0 Hz selectable, two-pole 0.1 dB Chebyshev (-0.1 dB @ fo)
Additional overall low pass filter	Single pole, -3 dB @ 10 kHz (down 10% @ 5 kHz)
Integrator	<ul style="list-style-type: none"> Single stage selectable, -0.3 dB @ 3 Hz RMS
Overall level	<ul style="list-style-type: none"> Peak (true or calculated) Peak-to-peak (true or calculated)
DC Bias (gap) Voltage Measurement	
Low pass filter	Single pole, -3 dB @ 335 Hz
Range	-24...24V DC
Accuracy	<ul style="list-style-type: none"> ±5% of full scale (48V DC), max ±1% of full scale, typical
Resolution	4 mV
Trend Buffer	
Number of records	1...12 parameters
Time interval	1...3600 s
Trigger	<ul style="list-style-type: none"> Relay on the expansion relay module is activated or by a trigger event (for example, DeviceNet command from a controller or host) The data collected in the buffer is user configurable in software
Post trigger	Percent of trend that is to be acquired after the trigger
Capacity	17...2048 records
Alarms	
Number	One per channel
Operators	<ul style="list-style-type: none"> Greater than Less than Inside range Outside range
Hysteresis	User configurable in software
Startup inhibit	<ul style="list-style-type: none"> Period: 0...1092 min, adjustable in 0.1 min increments Inhibit/multiplication function: Multiply by N (0...10, 0 = Disarm) Inhibit/multiplication initiated by: <ul style="list-style-type: none"> DeviceNet command Front terminal setpoint multiplier circuit closure (XM-161 and XM-162 only) Inhibit/multiplication terminated by: <ul style="list-style-type: none"> Expired timer DeviceNet command Front terminal setpoint multiplier circuit open (XM-161 and XM-162 only)
Relays	
Number	<ul style="list-style-type: none"> Up to eight relays when interconnected to one or two XM-441 expansion relay modules or Eight virtual relays whose status can be used by remote control systems
Failsafe	<ul style="list-style-type: none"> Normally energized (failsafe) Normally de-energized (non-fail-safe)
Latching	<ul style="list-style-type: none"> Latching Non-latching

Table 3 - XM-160, 161, and 162 Direct (overall) Vibration Modules Attribute Descriptions (continued)

Attribute	XM-160 (1440-VDRS06-00RH), XM-161 (1440-VDRS06-06RH), XM-162 (1440-VDRP06-00RH)
Time delay	0...25.5 s, adjustable in 100 ms increments
Logic	Single or paired AND or OR logic applied to any alarm
Reset	<ul style="list-style-type: none"> Local reset switch on top of module Digital reset command via serial or DeviceNet interface Remote reset switch wired to terminal base (XM-161 and XM-162 only)
Activation On	<ul style="list-style-type: none"> Alarm status <ul style="list-style-type: none"> Normal Alert Danger Disarm Transducer fault Module fault
Configuration	
Nonvolatile configuration	<ul style="list-style-type: none"> A copy of the module configuration is retained in nonvolatile memory from which the configuration is loaded upon powerup The configuration stored in nonvolatile memory can be deleted only by a module-reset command sent via the serial interface, using the Serial Configuration utility or via a DeviceNet interface from any compliant software application
Power	
Module	24V DC Class 2/SELV
XM-160 module XM-162 module	<ul style="list-style-type: none"> Current, max: 190 mA @ 24V DC Class 2/SELV Power dissipation, max: 4.56 W @ 24V DC (4.3 W @ 18V DC, 4.9 W @ 32V DC)
XM-161 module	<ul style="list-style-type: none"> Current, max: 310 mA @ 24V DC Class 2/SELV Power dissipation, max: 7.44 W @ 24V DC (7 W @ 18V DC, 8 W @ 32V DC)
Environmental	
Temperature, storage	-40...85 °C (-40...185 °F)
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	-20...65 °C (-4...149 °F)
Temperature, surrounding air, max	65 °C (149 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	15 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	20 g
Emissions CISPR 11 (IEC 61000-6-4)	Class A
ESD immunity IEC 61000-4-2	8 kV air discharges
Radiated RF immunity IEC 61000-4-3	<ul style="list-style-type: none"> 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz

Table 3 - XM-160, 161, and 162 Direct (overall) Vibration Modules Attribute Descriptions (continued)

Attribute	XM-160 (1440-VDRS06-00RH), XM-161 (1440-VDRS06-06RH), XM-162 (1440-VDRP06-00RH)
EFT/B immunity IEC 61000-4-4	<ul style="list-style-type: none"> • ±2 kV at 5 kHz on shielded power ports • ±2 kV at 5 kHz on shielded signal ports • ±2 kV at 5 kHz on XMbus port
Surge transient immunity IEC 61000-4-5	<ul style="list-style-type: none"> • ±2 kV line-earth(CM) on shielded power ports • ±2kV line-earth(CM) on shielded signal ports • ±2kV line-earth(CM) on XMbus port
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz. . .80 MHz
Enclosure type rating	None (open-style)
Isolation voltage	Not rated
Wiring category ⁽¹⁾	<ul style="list-style-type: none"> • 2 - on shielded power and shielded signal ports • 3 - on Serial ports • 2 - on XMbus ports
Wire type	Power and Signal connections: shielded
North American temp code	T4
IEC temp code	T4
Physical	
Terminal base	1440-TB-H
Dimensions (H x W x D), approx	97 x 94 x 94 mm (3.8 x 3.7 x 3.7 in.)

Table 3 - XM-160, 161, and 162 Direct (overall) Vibration Modules Attribute Descriptions (continued)

Attribute	XM-160 (1440-VDRS06-00RH), XM-161 (1440-VDRS06-06RH), XM-162 (1440-VDRP06-00RH)
Certification⁽²⁾ (when product is marked)	
c-CSA-us	CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for US and Canada. See CSA File 150115.
CE	European Union 2004/108/EC EMC Directive, compliant with: <ul style="list-style-type: none"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B)
C-Tick	Australian Radiocommunications Act, compliant with AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-11; Explosive Atmospheres, Protection "i" • EN 60079-0; General Requirements • II 3 G Ex nAC [ic] IIC T4X Gc • EN 61000-6-2; Industrial Immunity
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with Article 58-2 of Radio Waves Act, Clause 3

(1) Use this Conductor Category information for planning conductor routing. Refer to Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

(2) See the Product Certification link at <http://www.rockwellautomation.com> for Declarations of Conformity, Certificates, and other certification details.

XM-220 Dual Speed Module

The XM-220 module (catalog number 1440-SPD02-01RB) measures speed, rotor acceleration, and peak speed and can detect zero speed, locked rotor, and reverse rotation. The module can also serve as a component of an electronic overspeed detection System (EODS).

Table 4 - XM-220 Dual Speed Module

Attribute	XM-220 (1440-SPD02-01RB)
Inputs	
Two tachometer inputs	<ul style="list-style-type: none"> • ±25V (50V max peak-to-peak) • Eddy current transducer signals • Magnetic pickups • TTL output devices
Input impedance	120 kΩ min
Speed/frequency range	<ul style="list-style-type: none"> • 1...1,200,000 rpm • 0.0167...20,000 Hz
Speed measurement error	<ul style="list-style-type: none"> • 1...240 rpm: ±0.2 rpm • 241...12,000 rpm: ±2 rpm • 12,001...20,400 rpm: ±5 rpm • 20,401...120,000 rpm: ±20 rpm • 120,001...360,000 rpm: ±50 rpm • 360,001...1,200,000 rpm: ±160 rpm
Outputs	
4...20 mA outputs	<ul style="list-style-type: none"> • Each output is independently programmed to represent speed or acceleration, from either channel • Two isolated outputs • 300 Ω max load • One active buffer per input channel
Buffered outputs	<ul style="list-style-type: none"> • Output range configurable by wiring: <ul style="list-style-type: none"> – -24...9V – -5...24V – -5...9V • Third buffered output available when the module is configured for single redundant channel mode. Outputs a CMOS (0...5V) level square-wave that corresponds to the active input signal
Sensor Fault Detection	
Eddy current transducer	Bias voltage is compared with the fault limits
Magnetic pickups	A current source is available for biasing passive magnetic pickups to detect open or short circuits
Indicators	
Status indicators	<ul style="list-style-type: none"> • Module - red/green • Network - red/green • Channel 1 - yellow/red • Channel 2 - yellow/red • Startup -yellow • Relay - red • AUX - reserved for future use
Communication	
DeviceNet network	<ul style="list-style-type: none"> • Standard DeviceNet protocol for all functions (not power—module power is provided independently) • Available EDS file provides support for most DeviceNet compliant systems • Communication rate automatically set by bus master to 125, 250, or 500 Kbps • Configurable I/O Poll Response message helps optimize space utilization within scanner input tables: <ul style="list-style-type: none"> – Selectable poll response assembly – Selectable poll response size (bytes)

Table 4 - XM-220 Dual Speed Module (continued)

Attribute	XM-220 (1440-SPD02-01RB)
Serial	<ul style="list-style-type: none"> • RS-232 via mini-connector or terminal base unit • Communication rate fixed at 19.2 Kbps • Local configuration via the Serial Configuration utility
Measurements	
Units	<ul style="list-style-type: none"> • rpm • Direction of rotation • Acceleration in rpm/min
Measured parameters	<ul style="list-style-type: none"> • Forward • Reverse • rpm • Direction of rotation • Acceleration in rpm/min
Peak speed capture	The module retains the value of the highest speed observed since module power was cycled or the peak speed value was manually reset
Measurement Modes	
Dual channel	Two sensors are used independently to perform two separate speed, acceleration and peak speed measurements
Single redundant channel	One sensor is used to perform the speed, acceleration and peak speed measurements. If the current sensor fails, the module automatically switches to the second (redundant) sensor
Reverse rotation	Two sensors are used to monitor both speed and direction. The two sensors must be mounted out of phase from each other so that the rotational direction can be determined by monitoring which sensor the shaft keyway passes first
Alarms	
Number	Eight alarms, fixed per channel
Alarm parameters	Alarm and danger pair provided for each of: <ul style="list-style-type: none"> • Speed • Acceleration • Zero speed • Locked rotor
Operators	<ul style="list-style-type: none"> • Greater than • Less than • Inside range • Outside range
Hysteresis	User configurable in software
Relays	
Number	<ul style="list-style-type: none"> • Single on-board relay, two sets of contacts - DPDT (2 Form C) • Four additional relays when interconnected to an XM-441 expansion relay module, or • Four virtual relays whose status can be used by remote control systems or the XM-440 master relay module
On-board relay rating	<ul style="list-style-type: none"> • Voltage, max: 120V DC, 125V AC • Current, max: 3.5 A • Current, min: 0 • Power, max: 60 W, 62.5VA • Max current is up to 40 °C (104 °F), then derates to 2 A at 65 °C (149 °F) • Agency rating <ul style="list-style-type: none"> – 120V AC @ 0.5 A – 110V DC @ 0.3 A – 30V DC @ 1.0 A
Failsafe	<ul style="list-style-type: none"> • Normally energized (failsafe) • Normally de-energized (non-fail-safe)
Latching	<ul style="list-style-type: none"> • Latching • Non-latching

Table 4 - XM-220 Dual Speed Module (continued)

Attribute	XM-220 (1440-SPD02-01RB)
Time delay	0...25.5 s, adjustable in 100 ms increments
Logic	Single or paired AND or OR logic applied to any alarm
Reset	<ul style="list-style-type: none"> • Local reset switch on top of module • Remote reset switch wired to terminal base • Digital reset command via serial or DeviceNet interface
Activation on	Alarm Status <ul style="list-style-type: none"> • Normal • Alert • Danger • Disarm • Transducer fault • Module fault • Tacho fault
Configuration	
Nonvolatile configuration	<ul style="list-style-type: none"> • A copy of the module configuration is retained in nonvolatile memory from which the configuration is loaded upon powerup • The configuration stored in nonvolatile memory can be deleted only by a module-reset command sent via the serial interface, using the Serial Configuration utility or via a DeviceNet interface from any compliant software application
Power	
Module	24V DC
Consumption	<ul style="list-style-type: none"> • 300 mA, max • 225 mA, typical
Heat production	<ul style="list-style-type: none"> • 7 W (24 BTU/hr), max • 4 W (14 BTU/hr), typical
Transducer	Isolated 24V DC, user configurable with wiring
Environmental	
Temperature, storage	-40...85 °C (-40...185 °F)
Conformal coating	All printed circuit boards are conformally coated in accordance with IPC-A-610C
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	-20...65 °C (-4...149 °F)
Temperature, surrounding air, max	65 °C (149 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	15 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	20 g
Emissions CISPR 11 (IEC 61000-6-4)	Class A

Table 4 - XM-220 Dual Speed Module (continued)

Attribute	XM-220 (1440-SPD02-01RB)
ESD immunity IEC 61000-4-2	<ul style="list-style-type: none"> • 6 kV contact discharges • 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	<ul style="list-style-type: none"> • 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz • 10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz • 10V/m with 200 Hz 50% Pulse 100% AM at 1890 MHz • 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	<ul style="list-style-type: none"> • ± 2 kV at 5 kHz on power ports • ± 1 kV at 5 kHz on relay and shielded signal ports • ± 1 kV at 5 kHz on XMbus port
Surge transient immunity IEC 61000-4-5	<ul style="list-style-type: none"> • ± 2 kV line-earth(CM) on relay and shielded signal ports • ± 2 kV line-earth(CM) on XMbus port
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Enclosure type rating	None (open-style)
Voltage and current ratings	Supply: <ul style="list-style-type: none"> • 24V DC, 0.3 A max, Class 2/SELV Relay: <ul style="list-style-type: none"> • 120V AC, 0.5 A • 110V DC, 0.5 A • 30V DC, 1.0 A
Power dissipation	7 W max
Isolation voltage	<ul style="list-style-type: none"> • 250V (continuous), Basic Insulation Type, relay to all other circuits. • Isolation between other circuits is not rated. • Type tested at 1500V AC for 60 s
Wiring category ⁽¹⁾	<ul style="list-style-type: none"> • 2 - on relay and signal ports • 3 - on serial and power ports • 2 - on XMbus ports
Wire type	<ul style="list-style-type: none"> • Signal connections: shielded • Power and relay connections: unshielded
Pilot duty rating	Relay port: Not rated
North American temp code	T4A
IEC temp code	T4
Physical	
Terminal base	1440-TB-B
Dimensions (H x W x D), approx	97 x 94 x 94 mm (3.8 x 3.7 x 3.7 in.)

Table 4 - XM-220 Dual Speed Module (continued)

Attribute	XM-220 (1440-SPD02-01RB)
Certification⁽²⁾ (when product is marked)	
c-CSA-us	CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for US and Canada. See CSA File 150115.
CE	European Union 2004/108/EC EMC Directive, compliant with: <ul style="list-style-type: none"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2006/95/EC LVD, compliant with: <ul style="list-style-type: none"> • EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: <ul style="list-style-type: none"> • AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-11; Explosive Atmospheres, Protection "i" • EN 60079-0; General Requirements • II 3 G Ex nAC [ic] IIC T4X Gc • when used at or below 60V AC or 75V DC
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: <ul style="list-style-type: none"> • Article 58-2 of Radio Waves Act, Clause 3

(1) Use this Conductor Category information for planning conductor routing. Refer to Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

(2) See the Product Certification link at <http://www.rockwellautomation.com> for Declarations of Conformity, Certificates and other certification details.

XM-320 Position Module

The XM-320 module (catalog number 1440-TPS02-01RB) measures turbine supervisory position measurements, including axial position (thrust), valve position, differential expansion, and case expansion.

Table 5 - XM-320 Position Module Attribute Descriptions

Attribute	XM-320 (1440-TPS02-01RB)
Inputs	
Two channels	<ul style="list-style-type: none"> Eddy current transducer signals Linear variable differential transformer Voltage signals from any position measurement sensor
Transducer power	Isolated 24V that can be wired to be either +24V or -24V
Voltage range	Selectable in software between -24...24V
Sensitivity	User configurable in software
Input impedance	> 100 kΩ
Outputs	
4...20mA outputs	<ul style="list-style-type: none"> Two isolated outputs 600 Ω max load
Buffered outputs	Two outputs (one per channel)
Indicators	
Status indicators	<ul style="list-style-type: none"> Module - red/green Network - red/green Channel 1 - yellow/red Channel 2 - yellow/red Setpoint multiplier - yellow Relay - red
Communication	
DeviceNet network	<ul style="list-style-type: none"> Standard DeviceNet protocol for all functions (not power—module power is provided independently) Available EDS file provides support for most DeviceNet compliant systems Communication rate automatically set by bus master to 125, 250, or 500 Kbps Configurable I/O Poll Response message helps optimize space utilization within scanner input tables: <ul style="list-style-type: none"> Selectable poll response assembly Selectable poll response size (bytes)
Serial	<ul style="list-style-type: none"> RS-232 via mini-connector or terminal base unit Communication rate fixed at 19.2 Kbps Local configuration via the Serial Configuration utility
Measurement Modes	
Measurement modes	<ul style="list-style-type: none"> Normal (two independent channels) Head-to-head Radial cancel
Delta Time Buffer	
Number of records	2048
Delta time interval	1...3600 s
Trigger mode	Relay on the module is activated or by a trigger event (for example, DeviceNet command from a controller or host)
Alarms	
Number	Two alarm and danger pairs

Table 5 - XM-320 Position Module Attribute Descriptions (continued)

Attribute	XM-320 (1440-TPS02-01RB)
Operators	<ul style="list-style-type: none"> • Greater than • Less than • Inside range • Outside range
Hysteresis	User configurable in software
Startup inhibit/setpoint multiplication	<ul style="list-style-type: none"> • Period: 0 . . . 1092 min, adjustable in 0.1 min increments • Inhibit/multiplication function: Multiply by N (0 . . . 10, 0 = Disarm)
Relays	
Number	<ul style="list-style-type: none"> • Single on-board relay, two sets of contacts - DPDT (2 Form C) • Four additional relays when interconnected to an XM-441 expansion relay module or • Four virtual relays whose status can be used by remote control systems or the XM-440 master relay module
On-board relay rating	<ul style="list-style-type: none"> • Voltage, max: 125V DC, 125V AC • Current, max: 3.5 A • Current, min: 0 • Power, max: 60 W, 62.5VA • Max current is up to 40 °C (104 °F), then derates to 2 A at 65 °C (149 °F).
Failsafe	<ul style="list-style-type: none"> • Normally energized (failsafe) or • Normally de-energized (non-fail-safe)
Latching	<ul style="list-style-type: none"> • Latching • Non-latching
Time delay	0 . . . 25.5 s, adjustable in 100 ms increments
Logic	Single or paired AND or OR logic applied to any alarm
Reset	<ul style="list-style-type: none"> • Local reset switch on top of module • Remote reset switch wired to terminal base • Digital reset command via serial or DeviceNet interface
Activation on	Alarm status <ul style="list-style-type: none"> • Normal • Alert • Danger • Disarm • Transducer fault • Module fault
Configuration	
Nonvolatile configuration	<ul style="list-style-type: none"> • A copy of the module configuration is retained in nonvolatile memory from which the configuration is loaded upon powerup • The configuration stored in nonvolatile memory can be deleted only by a module-reset command sent via a serial interface, using the Serial Configuration utility or via a DeviceNet interface from any compliant software application
Power	
Module	24V DC
Consumption	<ul style="list-style-type: none"> • 200 mA, max • 165 mA, typical
Heat production	<ul style="list-style-type: none"> • 5.28 W (18 BTU/hr), max • 3.96W (13.5 BTU/hr), typical
Transducer	Isolated 24V DC, user configurable with wiring
Environmental	
Temperature, storage	-40 . . . 85 °C (-40 . . . 185 °F)
Conformal coating	All printed circuit boards are conformally coated in accordance with IPC-A-610C

Table 5 - XM-320 Position Module Attribute Descriptions (continued)

Attribute	XM-320 (1440-TPS02-01RB)
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	-20...65 °C (-4...149 °F)
Temperature, surrounding air, max	65 °C (149 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	15 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	20 g
Emissions CISPR 11 (IEC 61000-6-4)	Class A
ESD immunity IEC 61000-4-2	<ul style="list-style-type: none"> • 8 kV contact discharges • 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	<ul style="list-style-type: none"> • 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz • 10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz • 10V/m with 200 Hz 50% Pulse 100% AM at 1890 MHz • 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	<ul style="list-style-type: none"> • ±2 kV at 5 kHz on power ports • ±1 kV at 5 kHz on relay and shielded signal ports • ±1 kV at 5 kHz on XMbus port
Surge transient immunity IEC 61000-4-5	<ul style="list-style-type: none"> • ±1 kV line-earth(CM) on relay ports • ±2 kV line-earth(CM) on shielded signal ports • ±2 kV line-earth(CM) on XMbus port
Conducted RF immunity	IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Enclosure type rating	None (open-style)
Voltage and current ratings	Supply: <ul style="list-style-type: none"> • 24V DC, 0.2 A max, Class 2/SELV Relay: <ul style="list-style-type: none"> • 120V AC, 50/60Hz, 0.5 A Res • 110V DC, 0.3 A Res • 30V DC, 1.0 A Res
Power dissipation	5.3 W max
Isolation voltage	<ul style="list-style-type: none"> • 250V (continuous), Basic Insulation Type, relay to all other circuits. • Isolation between other circuits is not rated. • Type tested at 1500V AC for 60 s
Wiring category ⁽¹⁾	<ul style="list-style-type: none"> • 2 - on relay and shielded signal ports • 3 - on Serial and power ports • 2 - on XMbus ports

Table 5 - XM-320 Position Module Attribute Descriptions (continued)

Attribute	XM-320 (1440-TPS02-01RB)
Wire type	<ul style="list-style-type: none"> • Signal connections: shielded • Power and relay connections: unshielded
Pilot duty rating	Relay port: Not rated
North American temp code	T4A
IEC temp code	T4
Physical	
Terminal base	1440-TB-B
Dimensions (H x W x D), approx	97 x 94 x 94 mm (3.8 x 3.7 x 3.7 in.)
Certification⁽²⁾ (when product is marked)	
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E234338.
c-CSA-us	CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for US and Canada. See CSA File 150115.
CE	European Union 2004/108/EC EMC Directive, compliant with: <ul style="list-style-type: none"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2006/95/EC LVD, compliant with: <ul style="list-style-type: none"> • EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: <ul style="list-style-type: none"> • AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-11; Explosive Atmospheres, Protection "i" • EN 60079-0; General Requirements • II 3 G Ex nAC [ic] IIC T4X Gc • when used at or below 60V AC or 75V DC
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: <ul style="list-style-type: none"> • Article 58-2 of Radio Waves Act, Clause 3

(1) Use this Conductor Category information for planning conductor routing. Refer to Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

(2) See the Product Certification link at <http://www.rockwellautomation.com> for Declarations of Conformity, Certificates, and other certification details.

XM-360 Process Module

The XM-360 module (catalog number 1440-TPR06-00RE) measures a DC voltage or a loop current and reports the data value, the rate of change for each channel, and the difference between adjacent channels.

Table 6 - XM-360 Process Module

Attribute	XM-360 (1440-TPR06-00RE)
Inputs	
Six channels	1...6 process DC voltage inputs or loop current inputs
Isolation	Up to 250V of isolation for each input
Sensitivity	User configurable in software
Input range	User configurable per channel as: <ul style="list-style-type: none"> • 0...5V • 0...10V • 4...20 mA • -5...5V • 1...5V • 0...20 mA
Input impedance	<ul style="list-style-type: none"> • 50 Ω current input • 1 MΩ voltage input
Outputs	
4...20 mA outputs	<ul style="list-style-type: none"> • Two isolated banks of three outputs (one per channel) • 600 Ω max load
Accuracy	<ul style="list-style-type: none"> • $\pm 1\%$ of full scale, max • $\pm 0.2\%$ of full scale, typical
Indicators	
Status indicators	<ul style="list-style-type: none"> • Module - red/green • Network - red/green • Channel 1 - yellow/red • Channel 2 - yellow/red • Channel 3 - yellow/red • Channel 4 - yellow/red • Channel 5 - yellow/red • Channel 6 - yellow/red
Communication	
DeviceNet network	<ul style="list-style-type: none"> • Standard DeviceNet protocol for all functions (not power—module power is provided independently) • Available EDS file provides support for most DeviceNet compliant systems • Communication rate automatically set by bus master to 125, 250, or 500 Kbps • Configurable I/O Poll Response message helps optimize space utilization within scanner input tables: <ul style="list-style-type: none"> – Selectable poll response assembly – Selectable poll response size (bytes)
Serial	<ul style="list-style-type: none"> • RS-232 via mini-connector or terminal base unit • Communication rate fixed at 19.2 Kbps • Local configuration via the Serial Configuration utility
Signal Conditioning	
Accuracy	<ul style="list-style-type: none"> • 1% of full scale, max • $\pm 0.2\%$ of full scale, typical
Low pass filter	User configurable for the measurement value and rate of change value from each channel
Resolution	0.05% of input range

Table 6 - XM-360 Process Module (continued)

Attribute	XM-360 (1440-TPR06-00RE)
Units	<ul style="list-style-type: none"> • °C • °F • PSI • inHg • CFM • mbar • m/s² • Pa • g • kPa • gSE • mA • rpm • ips • Hz • mm/s • mm • μm • radian • in • revolution • mil • ° • % • unspecified
Measurements	
Rate of change	<ul style="list-style-type: none"> • Per minute • Updated once per second
Delta Time Buffer	
Number of records	2048
Delta time interval	1...3600 s
Trigger mode	Relay on the XM-441 expansion relay module is activated, or by a trigger event (for example, DeviceNet command from a controller or host)
Alarms	
Number	<ul style="list-style-type: none"> • 12 alarm and danger pairs • Measurement value and rate of change value from each channel
Operators	<ul style="list-style-type: none"> • Greater than • Less than • Inside range • Outside range
Hysteresis	User configurable in software
Relays	
Number	<ul style="list-style-type: none"> • Up to eight relays when interconnected to one or two XM-441 expansion relay modules or • Eight virtual relays whose status can be used by remote control systems
Failsafe	<ul style="list-style-type: none"> • Normally energized (failsafe) • Normally de-energized (non-fail-safe)
Latching	<ul style="list-style-type: none"> • Latching • Non-latching
Time delay	0...25.5 s, adjustable in 10 ms increments
Logic	Single or paired AND or OR logic applied to any alarm
Reset	<ul style="list-style-type: none"> • Local reset switch on top of module • Digital reset command via serial or DeviceNet interface

Table 6 - XM-360 Process Module (continued)

Attribute	XM-360 (1440-TPR06-00RE)
Activation on	Alarm status <ul style="list-style-type: none"> • Normal • Alert • Danger • Disarm • Sensor-out-of-range • Module fault
Configuration	
Nonvolatile configuration	<ul style="list-style-type: none"> • A copy of the module configuration is retained in nonvolatile memory from which the configuration is loaded upon powerup • The configuration stored in nonvolatile memory can be deleted only by a module-reset command sent via the serial interface, using the Serial Configuration utility or via a DeviceNet interface from any compliant software application
Power	
Module	24V DC
Consumption	<ul style="list-style-type: none"> • 300 mA, max • 170 mA, typical
Heat production	<ul style="list-style-type: none"> • 7.2 W (24.6 BTU/hr), max • 4 W (14 BTU/hr), typical
Transducer	Isolated 24V DC, user configurable with wiring
Environmental	
Temperature, storage	-40...85 °C (-40...185 °F)
Conformal coating	All printed circuit boards are conformally coated in accordance with IPC-A-610C
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	-20...65 °C (-4...149 °F)
Temperature, surrounding air, max	65 °C (149 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	15 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	20 g
Emissions CISPR 11 (IEC 61000-6-4)	Class A
ESD immunity IEC 61000-4-2	<ul style="list-style-type: none"> • 6 kV contact discharges • 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	<ul style="list-style-type: none"> • 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz • 10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz • 10V/m with 200 Hz 50% Pulse 100% AM at 1890 MHz • 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz

Table 6 - XM-360 Process Module (continued)

Attribute	XM-360 (1440-TPR06-00RE)
EFT/B immunity IEC 61000-4-4	<ul style="list-style-type: none"> ±2 kV at 5 kHz on power ports ±1 kV at 5 kHz on shielded signal ports ±1 kV at 5 kHz on XMBus port
Surge transient immunity IEC 61000-4-5	<ul style="list-style-type: none"> ±2 kV line-earth(CM) on shielded signal ports ±2 kV line-earth(CM) on XMBus port
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz . . . 80 MHz
Enclosure type rating	None (open-style)
Voltage and current ratings	Supply: 24V DC, 0.3 A max, Class 2/SELV
Power dissipation	7.2 W max
Isolation voltage	Not rated
Wiring category ⁽¹⁾	<ul style="list-style-type: none"> 2 - on shielded signal ports 3 - on Serial and power ports 2 - on XMBus ports
Wire type	<ul style="list-style-type: none"> Signal connections: shielded Power connections: unshielded
North American temp code	T4
IEC temp code	T4
Physical	
Terminal base	1440-TB-E
Dimensions (H x W x D), approx	97 x 94 x 94 mm (3.8 x 3.7 x 3.7 in.)
Certification⁽²⁾ (when product is marked)	
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E234338.
c-CSA-us	CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for US and Canada. See CSA File 150115.
CE	European Union 2004/108/EC EMC Directive, compliant with: <ul style="list-style-type: none"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B)
C-Tick	Australian Radiocommunications Act, compliant with: <ul style="list-style-type: none"> AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-11; Explosive Atmospheres, Protection "i" EN 60079-0; General Requirements II 3 G Ex nAC [ic] IIC T4X Gc
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: <ul style="list-style-type: none"> Article 58-2 of Radio Waves Act, Clause 3

(1) Use this Conductor Category information for planning conductor routing. Refer to Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

(2) See the Product Certification link at <http://www.rockwellautomation.com> for Declarations of Conformity, Certificates, and other certification details.

XM-361 Universal Temperature Module

XM-362 Isolated Thermocouple Temperature Module

The XM-361 (1440-TUN06-00REA) and XM-362 (1440-TTC06-00REA) modules measure temperature from RTDs and thermocouples. The modules report, and can alarm on, the measured temperature, rate of change for each channel, and difference between adjacent channels.

When only thermocouples are monitored, the XM-362 module is the preferred solution.

Table 7 - XM-361 Universal Temperature and XM-362 Isolated Thermocouple Temperature Module Attribute Descriptions

Attribute	XM-361 (1440-TUN06-00RE) and XM-362 (1440-TTC06-00RE)
Inputs	
Channels	<ul style="list-style-type: none"> • 1...6 RTD or thermocouple signals, user configurable • XM-361 accepts RTD and isolated thermocouple inputs • XM-362 accepts isolated or grounded thermocouple inputs
Supported thermocouple types (XM-361 and XM-362)	<ul style="list-style-type: none"> • B 0...1810 °C (32...3290 °F) • C 0...1316 °C (32...2400 °F) • E 5...284 °C (41...543 °F) • J 0...364 °C (32...687 °F) • K -40...484 °C (-40...903 °F) • N -40...620 °C (-40...1148 °F) • R -40...1760 °C (-40...3200 °F) • S -40...1760 °C (-40...3200 °F) • T -40...379 °C (-40...714 °F)
Supported RTD types (XM-361 only)	<ul style="list-style-type: none"> • 100 Ω 2-wire and 3-wire platinum (alpha = 0.00385) -40...660 °C (-40...1220 °F) • 200 Ω 2-wire and 3-wire platinum (alpha = 0.00385) -40...453 °C (-40...847 °F) • 100 Ω 2-wire and 3-wire platinum (alpha = 0.003916) -40...660 °C (-40...1220 °F) • 200 Ω 2-wire and 3-wire platinum (alpha = 0.003916) -40...443 °C (-40...829 °F) • 250 Ω 2-wire and 3-wire platinum (alpha = 0.00392) -40...389 °C (-40...732 °F) • 100 Ω 2-wire and 3-wire nickel (alpha = 0.00618) -40...180 °C (-40...356 °F) • 120 Ω 2-wire and 3-wire nickel (alpha = 0.00672) -40...439 °C (-40...822 °F) • 10 Ω 2-wire and 3-wire copper (alpha = 0.00427) -40...260 °C (-40...500 °F)
RTD current source value	1.004 mA ±1%
Common mode input voltage (XM-361 only)	±3V
Input impedance	<ul style="list-style-type: none"> • XM-361: 1 MΩ voltage input • XM-362: 10 kΩ voltage input
Outputs	
4...20 mA outputs	<ul style="list-style-type: none"> • Two isolated banks of three outputs (one per channel) • 600 Ω max load
Accuracy	<ul style="list-style-type: none"> • ±1% of full scale, max • ±0.2% of full scale, typical
Isolation	250V
Indicators	
Status indicators	<ul style="list-style-type: none"> • Module - red/green • Network - red/green • Channel 1 - yellow/red • Channel 2 - yellow/red • Channel 3 - yellow/red • Channel 4 - yellow/red • Channel 5 - yellow/red • Channel 6 - yellow/red

Table 7 - XM-361 Universal Temperature and XM-363 Isolated Thermocouple Temperature Module Attribute Descriptions (continued)

Attribute	XM-361 (1440-TUN06-00RE) and XM-362 (1440-TTC06-00RE)
Communication	
DeviceNet network	<ul style="list-style-type: none"> • Standard DeviceNet protocol for all functions (not power—module power is provided independently) • Available EDS file provides support for most DeviceNet compliant systems • Communication rate automatically set by bus master to 125, 250, or 500 Kbps • Configurable I/O Poll Response message helps optimize space utilization within scanner input tables: <ul style="list-style-type: none"> – Selectable poll response assembly – Selectable poll response size (bytes)
Serial	<ul style="list-style-type: none"> • RS-232 via mini-connector or terminal base unit • Communication rate fixed at 19.2 Kbps • Local configuration via the Serial Configuration utility
Signal Conditioning	
Accuracy	<ul style="list-style-type: none"> • C thermocouples: $\pm 3^{\circ}\text{C}$ ($\pm 6^{\circ}\text{F}$) or 0.6% of full scale, whichever is greater • E, J, K, N, T thermocouples: $\pm 1^{\circ}\text{C}$ ($\pm 2^{\circ}\text{F}$) or 0.6% of full scale, whichever is greater • B, R, S thermocouples: $\pm 4^{\circ}\text{C}$ ($\pm 7^{\circ}\text{F}$) or 0.6% of full scale, whichever is greater • Platinum and nickel RTDs (3-wire only): $\pm 1^{\circ}\text{C}$ ($\pm 2^{\circ}\text{F}$) or 0.6% of full scale, whichever is greater • Copper RTDs (three-wire only): $\pm 7^{\circ}\text{C}$ ($\pm 13^{\circ}\text{F}$) or 5% of full scale, whichever is greater
Resolution	0.025% of temperature range
Low pass filter	User configurable for the measurement and rate of change value from each channel
Sampling rate	200 Hz
Units	$^{\circ}\text{C}$, $^{\circ}\text{F}$
Measurements	
Measured value	Temperature
Rate of change	<ul style="list-style-type: none"> • Per minute • Updated once per second
Delta Time Buffer	
Number of records	2048
Delta time interval	1...3600 s
Trigger mode	Relay on an XM-441 expansion relay module is activated, or by a trigger event (for example, DeviceNet command from a controller or host)
Alarms	
Number	<ul style="list-style-type: none"> • 18 alarm and danger pairs • Measurement value and rate of change value from each channel
Operators	<ul style="list-style-type: none"> • Greater than • Less than • Inside range • Outside range
Hysteresis	User configurable in software
Relays	
Number	<ul style="list-style-type: none"> • Up to eight relays when interconnected to one or two XM-441 expansion relay modules or • Eight virtual relays whose status can be used by remote control systems
Failsafe	<ul style="list-style-type: none"> • Normally energized (failsafe) • Normally de-energized (non-fail-safe)
Latching	<ul style="list-style-type: none"> • Latching • Non-latching
Time delay	0...25.5 s, adjustable in 100 ms increments
Logic	Single or paired AND or OR logic applied to any alarm

Table 7 - XM-361 Universal Temperature and XM-363 Isolated Thermocouple Temperature Module Attribute Descriptions (continued)

Attribute	XM-361 (1440-TUN06-00RE) and XM-362 (1440-TTC06-00RE)
Reset	<ul style="list-style-type: none"> • Local reset switch on top of module • Digital reset command via serial or DeviceNet interface
Activation on	Alarm status <ul style="list-style-type: none"> • Normal • Alert • Danger • Disarm • Sensor Out of Range • Module fault
Configuration	
Nonvolatile configuration	<ul style="list-style-type: none"> • A copy of the module configuration is retained in nonvolatile memory from which the configuration is loaded upon powerup • The configuration stored in nonvolatile memory can be deleted only by a module-reset command sent via a serial interface, using the Serial Configuration utility or via a DeviceNet interface from any compliant software application
Power	
Module	24V DC Class 2/SELV
Consumption	400 mA, max for XM-361, 300mA for XM-362
Heat production	<ul style="list-style-type: none"> • 7.2 W (24.6 BTU/hr), max • 4 W (14 BTU/hr), typical
Environmental	
Temperature, operating	-20...65 °C (-4...149 °F)
Conformal Coating	All printed circuit boards are conformally coated in accordance with IPC-A-610C
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	-20...65 °C (-4...149 °F)
Temperature, surrounding air, max	65 °C (149 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	15 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	20 g
Emissions CISPR 11 (IEC 61000-6-4)	Class A
ESD immunity IEC 61000-4-2	<ul style="list-style-type: none"> • 6 kV contact discharges • 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	<ul style="list-style-type: none"> • 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz • 10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz • 10V/m with 200 Hz 50% Pulse 100% AM at 1890 MHz • 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz

Table 7 - XM-361 Universal Temperature and XM-363 Isolated Thermocouple Temperature Module Attribute Descriptions (continued)

Attribute	XM-361 (1440-TUN06-00RE) and XM-362 (1440-TTC06-00RE)
EFT/B immunity IEC 61000-4-4	<ul style="list-style-type: none"> ±2 kV at 5 kHz on power ports ±1 kV at 5 kHz on shielded signal ports ±1 kV at 5 kHz on XMBus port
Surge transient immunity IEC 61000-4-5	<ul style="list-style-type: none"> ±2 kV line-earth(CM) on shielded signal ports ±2 kV line-earth(CM) on XMBus port
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz . . . 80 MHz
Enclosure type rating	None (open-style)
Voltage and current ratings	<ul style="list-style-type: none"> XM-362 Supply: 24V DC, 0.3 A max, Class 2/SELV XM-361 Supply: 24V DC, 0.4 A max, Class 2/SELV
Power dissipation	7.2 W max
Isolation voltage	Not rated
Wiring category ⁽¹⁾	<ul style="list-style-type: none"> 2 - on shielded signal ports 3 - on Serial and power ports 2 - on XMBus ports
Wire type	<ul style="list-style-type: none"> Signal connections: shielded Power connections: unshielded
North American temp code	T4
IEC temp code	T4
Physical	
Terminal base	1440-TB-E
Dimensions (H x W x D), approx	97 x 94 x 94 mm (3.8 x 3.7 x 3.7 in.)
Certification⁽²⁾ (when product is marked)	
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E234338.
c-CSA-us	CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for US and Canada. See CSA File 150115.
CE	European Union 2004/108/EC EMC Directive, compliant with: <ul style="list-style-type: none"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B)
C-Tick	Australian Radiocommunications Act, compliant with: <ul style="list-style-type: none"> AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-11; Explosive Atmospheres, Protection "I" EN 60079-0; General Requirements II 3 G Ex nAC [ic] IIC T4X Gc
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: <ul style="list-style-type: none"> Article 58-2 of Radio Waves Act, Clause 3

(1) Use this Conductor Category information for planning conductor routing. Refer to Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

(2) See the Product Certification link at <http://www.rockwellautomation.com> for Declarations of Conformity, Certificates, and other certification details.

XM-440 Master Relay Module

The XM-440 master relay (catalog number 1440-RMA00-04RC) combines four relay outputs with XM bus master capabilities to provide remote, shared, and voted relay operation for distributed XM measurement modules. The relay supports linking of one or two XM-441 expansion relays to provide a capacity of up to 12 relays.

Table 8 - XM-440 Master Relay Module

Attribute	XM-440 (1440-RMA00-04RC)
Indicators	
Status indicators	<ul style="list-style-type: none"> Module - red/green Network - red/green Relay 1 - red Relay 2 - red Relay 3 - red Relay 4 - red
Communication	
DeviceNet network	<ul style="list-style-type: none"> Standard DeviceNet protocol for all functions (not power—module power is provided independently) Available EDS file provides support for most DeviceNet compliant systems Communication rate automatically set by bus master to 125, 250, or 500 Kbps Configurable I/O Poll Response message helps optimize space utilization within scanner input tables: <ul style="list-style-type: none"> Selectable poll response assembly Selectable poll response size (bytes)
Serial	<ul style="list-style-type: none"> RS-232 via mini-connector or terminal base unit Communication rate fixed at 19.2 Kbps Local configuration via the Serial Configuration utility
Relays	
Number	<ul style="list-style-type: none"> Four relays, two sets of contacts each - DPDT (2 Form C) Four or eight additional relays when connected to one or two XM-441 expansion relay modules
Contacts	250V AC, 50/60 Hz @ 3 A resistive
Failsafe	<ul style="list-style-type: none"> Normally energized (failsafe) Normally de-energized (non-fail-safe)
Latching	<ul style="list-style-type: none"> Latching Non-latching
Time delay	0...25.5 s, adjustable in 100 ms increments
Logic	Per relay, defined as A out of B where B is up to 16 alarms or relays from any XM module on the bus and A is from 1 to B
Reset	<ul style="list-style-type: none"> Local reset switch on top of module Remote reset switch wired to terminal base Digital reset command via serial or DeviceNet interface
Power	
Module	24V DC Class 2/SELV
Consumption	200 mA, max
Heat production	3.4 W (11.6 BTU/hr), max
Environmental	
Temperature, storage	-40...85 °C (-40...185 °F)
Conformal coating	All printed circuit boards are conformally coated in accordance with IPC-A-610C
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	-20...65 °C (-4...149 °F)

Table 8 - XM-440 Master Relay Module (continued)

Attribute	XM-440 (1440-RMA00-04RC)
Temperature, surrounding air, max	65 °C (149 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	15 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	20 g
Emissions CISPR 11 (IEC 61000-6-4)	Class A
ESD immunity IEC 61000-4-2	<ul style="list-style-type: none"> • 4 kV contact discharges • 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	<ul style="list-style-type: none"> • 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz • 10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz • 10V/m with 200 Hz 50% Pulse 100% AM at 1890 MHz • 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	<ul style="list-style-type: none"> • ±2 kV at 5 kHz on power ports • ±1 kV at 5 kHz on relay and shielded signal ports • ±1 kV at 5 kHz on XMbus port
Surge Transient immunity IEC 61000-4-5	<ul style="list-style-type: none"> • ±1 kV line-earth(CM) on relay ports • ±2 kV line-earth(CM) on shielded signal ports • ±2 kV line-earth(CM) on XMbus port
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Enclosure type rating	None (open-style)
Voltage and current ratings	Supply: <ul style="list-style-type: none"> • 24V DC, 0.2A max, Class 2/SELV Relay: <ul style="list-style-type: none"> • 250V AC, 50/60 Hz, 3 A Res
Power dissipation	3.4 W max
Isolation voltage	<ul style="list-style-type: none"> • 250V (continuous), Basic Insulation Type, relay to relay and to all other circuits. • Type tested at 1500V AC for 60 s
Wiring category ⁽¹⁾	<ul style="list-style-type: none"> • 2 - on relay and shielded signal ports • 3 - on Serial and power ports • 2 - on XMbus ports
Wire type	<ul style="list-style-type: none"> • Signal connections: shielded • Power and relay connections: unshielded
Pilot duty rating	Relay ports: Not rated
North American temp code	T4A
IEC temp code	T4

Table 8 - XM-440 Master Relay Module (continued)

Attribute	XM-440 (1440-RMA00-04RC)
Physical	
Terminal base	1440-TB-C
Dimensions (H x W x D), approx	97 x 94 x 94 mm (3.8 x 3.7 x 3.7 in.)
Certification⁽²⁾ (when product is marked)	
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E234338.
c-CSA-us	CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for US and Canada. See CSA File 150115.
CE	European Union 2004/108/EC EMC Directive, compliant with: <ul style="list-style-type: none"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2006/95/EC LVD, compliant with: <ul style="list-style-type: none"> EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: <ul style="list-style-type: none"> AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-11; Explosive Atmospheres, Protection "i" EN 60079-0; General Requirements II 3 G Ex nAC [ic] IIC T4X Gc when used at or below 60V AC or 75V DC
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: <ul style="list-style-type: none"> Article 58-2 of Radio Waves Act, Clause 3

(1) Use this Conductor Category information for planning conductor routing. Refer to Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

(2) See the Product Certification link at <http://www.rockwellautomation.com> for Declarations of Conformity, Certificates, and other certification details.

XM-441 Expansion Relay Module

The XM-441 expansion relay (catalog number 1440-REX00-04RD) adds four relays to any XM measurement module or to the XM-440 master relay.

Table 9 - XM-441 Expansion Relay Module Attribute Descriptions

Attribute	XM-441 (1440-REX00-04RD)
Indicators	
Status indicators	<ul style="list-style-type: none"> Module power - green Relay 1 - red Relay 2 - red Relay 3 - red Relay 4 - red
Communication	
Host communication	The XM-441 module communicates to a host module via the side connector of the terminal base. If the host is an XM-440 master relay module, then you can place two XM-441 modules immediately to the right of the XM-440 module. All XM measurement modules support just one expansion module, which must be connected directly to and on the right of the host module
Relays	
Number	Four relays, two sets of contacts each - DPDT (2 Form C)
Contacts	250V AC, 50/60 Hz @ 3 A resistive

Table 9 - XM-441 Expansion Relay Module Attribute Descriptions (continued)

Attribute	XM-441 (1440-REX00-04RD)
Failsafe	<ul style="list-style-type: none"> • Normally energized (failsafe) • Normally de-energized (non-failsafe)
Other features	<p>These features are managed by the host XM module:</p> <ul style="list-style-type: none"> • Latching • Time delay • Logic • Reset • Activation
Environmental	
Temperature, storage	-40...85 °C (-40...185 °F)
Conformal coating	All printed circuit boards are conformally coated in accordance with IPC-A-610C
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	-20...65 °C (-4...149 °F)
Temperature, surrounding air, max.	65 °C (149 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	15 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	20 g
Emissions CISPR 11 (IEC 61000-6-4)	Class A
ESD immunity IEC 61000-4-2	<ul style="list-style-type: none"> • 4 kV contact discharges • 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	<ul style="list-style-type: none"> • 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz • 10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz • 10V/m with 200 Hz 50% Pulse 100% AM at 1890 MHz • 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4:	<ul style="list-style-type: none"> • ±2 kV at 5 kHz on power ports • ±1 kV at 5 kHz on relay and signal ports • ±1 kV at 5 kHz on XMbus port
Surge transient immunity IEC 61000-4-5	<ul style="list-style-type: none"> • ±1 kV line-earth(CM) on relay ports • ±1 kV line-earth(CM) on signal ports • ±1 kV line-earth(CM) on XMbus port
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Enclosure type rating	None (open-style)

Table 9 - XM-441 Expansion Relay Module Attribute Descriptions (continued)

Attribute	XM-441 (1440-REX00-04RD)
Voltage and current ratings	Supply <ul style="list-style-type: none"> • 24V DC, 0.2 A max, Class 2/SELV Relay <ul style="list-style-type: none"> • 250V AC, 50/60 Hz, 3 A Res
Power dissipation	2.9 W (9.9 BTU/hr) max
Wiring category ⁽¹⁾	<ul style="list-style-type: none"> • 2 - on relay, power, and signal ports • 3 - on serial ports • 2 - on XMBus ports
Physical	
Terminal base	1440-TB-D
Dimensions (H x W x D), approx	97 x 94 x 94 mm (3.8 x 3.7 x 3.7 in.)
Certification⁽²⁾ (when product is marked)	Description
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E234338.
c-CSA-us	CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for US and Canada. See CSA File 150115.
CE	European Union 2004/108/EC EMC Directive, compliant with: <ul style="list-style-type: none"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2006/95/EC LVD, compliant with: <ul style="list-style-type: none"> • EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: <ul style="list-style-type: none"> • AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-11; Explosive Atmospheres, Protection "i" • EN 60079-0; General Requirements • II 3 G Ex nAC [ic] IIC T4X Gc • when used at or below 60V AC or 75V DC
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: <ul style="list-style-type: none"> • Article 58-2 of Radio Waves Act, Clause 3
Wire Type	<ul style="list-style-type: none"> • Signal connections: shielded • Power and Relay connections: unshielded
Pilot Duty Rating	Relay ports: Not rated
North American Temp Code	T4A
IEC Temp Code	T4

(1) Use this Conductor Category information for planning conductor routing. Refer to Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

(2) See the Product Certification link at <http://www.rockwellautomation.com> for Declarations of Conformity, Certificates and other certification details.

XM-442 Voted EODS Relay Module

The XM-442 module (catalog number 1440-REX03-04RG) combines with three XM-220 modules to provide an API-compliant, triple-redundant electronic overspeed detection system (EODS).

Table 10 - XM-442 Voted EODS Relay Module

Attribute	XM-442 (1440-REX03-04RG)
Indicators	
Status indicators	<ul style="list-style-type: none"> • Module power - red/green • Shutdown relay - red • Alarm relay - red
Communication	
Host communication	The XM-442 module communicates to the speed modules connected to it only via the three digital inputs on the front of the terminal base. Power and communication pass through the side connector of the terminal base but are not used by the XM-442 module
Relays	
Number	Four relays, two sets of contacts each - DPDT (2 Form C)
Contacts	<ul style="list-style-type: none"> • 250V AC, 50/60 Hz @ 3 A resistive • 150V DC, 1.6 A Resistive
Failsafe	Normally energized
Latching	The shutdown and alarm relays latch when the conditions that activate them are met
Logic	<ul style="list-style-type: none"> • Two-out-of-three • One-out-of-three
Activation	Low logic level (< 0.8V) on the overspeed/circuit fault inputs
Reset	<ul style="list-style-type: none"> • Local reset switch on top of module • Remote reset switch wired to terminal base
Power	
Voltage and current ratings	Supply: <ul style="list-style-type: none"> • 24V DC, 0.2 A max, Class 2/SELV Relay: <ul style="list-style-type: none"> • 250V AC, 50/60 Hz, 3 A Res • 150V DC, 1.6 A Res
Heat production	2.9 W (9.9 BTU/hr), max
Environmental	
Temperature, storage	-40...85 °C (-40...185 °F)
Conformal coating	All printed circuit boards are conformally coated in accordance with IPC-A-610C
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	-20...65 °C (-4...149 °F)
Temperature, surrounding air, max	65 °C (149 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing

Table 10 - XM-442 Voted EODS Relay Module (continued)

Attribute	XM-442 (1440-REX03-04RG)
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	15 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	20 g
Emissions CISPR 11 (IEC 61000-6-4)	Class A
ESD immunity IEC 61000-4-2	<ul style="list-style-type: none"> • 4 kV contact discharges • 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	<ul style="list-style-type: none"> • 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz • 10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz • 10V/m with 200 Hz 50% Pulse 100% AM at 1890 MHz • 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	<ul style="list-style-type: none"> • ±2 kV at 5 kHz on power ports • ±1 kV at 5 kHz on relay and signal ports • ±1 kV at 5 kHz on XMbus port
Surge transient immunity IEC 61000-4-5	<ul style="list-style-type: none"> • ±1 kV line-earth(CM) on relay ports • ±1 kV line-earth(CM) on signal ports • ±1 kV line-earth(CM) on XMbus port
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Enclosure type rating	None (open-style)
Power dissipation	2.9 W max
Wiring category ⁽¹⁾	<ul style="list-style-type: none"> • 2 - on relay, power, and signal ports • 3 - on serial ports • 2 - on XMbus ports
Wire type	<ul style="list-style-type: none"> • Signal connections: shielded • Power and relay connections: unshielded
Pilot duty rating	Relay ports: Not rated
North American temp code	T4A
IEC temp code	T4
Physical	
Terminal base	1440-TB-G
Dimensions (H x W x D), approx	97 x 94 x 94 mm (3.8 x 3.7 x 3.7 in.)
Certification⁽²⁾ (when product is marked)	
c-CSA-us	CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for US and Canada. See CSA File 150115.
CE	<p>European Union 2004/108/EC EMC Directive, compliant with:</p> <ul style="list-style-type: none"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) <p>European Union 2006/95/EC LVD, compliant with:</p> <ul style="list-style-type: none"> • EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	<p>Australian Radiocommunications Act, compliant with:</p> <ul style="list-style-type: none"> • AS/NZS CISPR 11; Industrial Emissions

Table 10 - XM-442 Voted EODS Relay Module (continued)

Attribute	XM-442 (1440-REX03-04RG)
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-11; Explosive Atmospheres, Protection "i" • EN 60079-0; General Requirements • II 3 G Ex nAC [ic] IIC T4X Gc when used at or below 60V AC or 75V DC
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: <ul style="list-style-type: none"> • Article 58-2 of Radio Waves Act, Clause 3

(1) Use this Conductor Category information for planning conductor routing. Refer to Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

(2) See the Product Certification link at <http://www.rockwellautomation.com> for Declarations of Conformity, Certificates, and other certification details.

Accessories

Terminal Bases

Table 11 - Terminal Bases Specifications

NA Temp Code	T4A	T4A	T4A	T4A	T4	T4A	T4	T4A	T4
Attribute	XM-940 (1440-TB-A)	XM-941 (1440-TB-B)	XM-942 (1440-TB-C)	XM-943 (1440-TB-D)	XM-944 (1440-TB-E)	XM-946 (1440-TB-G)	XM-947 (1440-TB-H)	XM-DYN (1440-TB5-J)	XM-124 (1440-TB-A/C)
Supported XM Modules	XM-12x	XM-220, XM-320	XM-440	XM-441	XM-36x	XM-442	XM-16x	XM DYN	XM-124
Environmental									
Temperature, operating	-20...65 °C (-4...149 °F)							-20...70 °C (-4...158 °F)	-20...65 °C (-4...149 °F)
Temperature, storage	-40...85 °C (-40...185 °F)							-40...85 °C (-40...185 °F)	
Relative humidity	95% noncondensing							5...95% noncondensing	
Physical									
Dimensions (H x W x D)	97 x 94 x 94 mm (3.8 x 3.7 x 3.7 in.)								
Side connector	Interconnect to adjacent modules passes primary power (3 A max), DeviceNet protocol and power (300 mA max), and the circuits necessary to support expansion modules.								
Terminal screw torque	0.8 N·m (7 lb·in)								
Certifications⁽¹⁾									
CE	European Union 2004/108/EC EMC Directive, compliant with: <ul style="list-style-type: none"> EN 61326-1; Meas./Control/Lab Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 								
C-Tick	Australian Radiocommunications Act, compliant with: <ul style="list-style-type: none"> AS/NZS CISPR 11; Industrial Emissions 								
Ex	<ul style="list-style-type: none"> European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-11; Explosive Atmospheres, Protection "i" EN 60079-0; General Requirements II 3 G Ex nAC [ic] IIC T4X Gc when used at or below 60V AC or 75V DC 								
c-CSA-us	CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for US and Canada. See CSA File 150115.								
c-UL-us	UL Listed, certified for U.S. and Canada. See UL File E234338 UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.								

(1) When product or packaging is marked. See the Product Certification link at <http://www.rockwellautomation.com> for Declarations of Conformity, Certificates, and other certification details.

Serial Configuration Utility

Use the XM Serial Configuration utility to commission and configure XM modules. The utility ships with each XM module and can be downloaded from <http://www.rockwellautomation.com/support/>.

From the support website, choose Downloads>Firmware Updates>Condition Monitoring.

Attribute	Serial Configuration Utility
Operating systems	Microsoft Windows: NT, 2000, XP
Computer requirements	<ul style="list-style-type: none"> • Computer with an available RS-232 serial port Recommended: 400 MHz CPU, 128+ MB RAM, 10 MB free disk space • Almost any up-to-date computer will suffice for configuring modules. The recommended configuration is suggested for systems that will be heavily used or that will be used to view live data
Security	Password facility that precludes unauthorized use.
DeviceNet address management	0 . . 63
Additional features	<ul style="list-style-type: none"> • Auto save configuration • Alarm and relay management • Module firmware update • Store highest tachometer speed with reset
Supported XM modules	<ul style="list-style-type: none"> • XM-120 standard vibration • XM-120E eccentricity • XM-121 low frequency vibration • XM-121A absolute shaft vibration • XM-122 gSE vibration • XM-123 aeroderivative • XM-124 standard dynamic • XM-160 direct vibration • XM-161 direct vibration with 4 . . 20 mA output • XM-162 direct vibration with eddy current probe power • XM-220 dual speed • XM-320 position • XM-360 process • XM-361 universal temperature • XM-362 thermocouple temperature • XM-440 master relay
Plots	<ul style="list-style-type: none"> • Spectra • Time waveform • Trend • Level • Alarm and relay status <p>The available plots depend on the module providing the data</p>

Fuse Kit

The fuse kit limits the available current from listed safety extra low voltage (SELV) or protected extra low voltage (PELV) sources. The kit lets you use SELV or PELV supplies as an alternative to a listed Class 2 power source for an XM monitoring system.

Attribute	Fuse Kit (1440-SAFUSEKIT)
Fuse	Bussmann model MDA-5-R
Wire	(0.2...6 mm ² (30...10 AWG) solid or stranded
Tightening torque	0.5...0.6 N·m (4.5...5.3 lb·in)
Stripping length	10 mm (0.4 in.)

Serial Communication Cable

The serial communication cable connects a computer to an XM module for configuration by using the XM Serial Configuration utility.

Attribute	Communication Cable (1440-SCDB9FXM2)
Length	2 m (6.56 ft)
Connectors	9-pin female serial to micro-USB

ControlNet Adapter

The ControlNet adapter (cat. no. 1440-ACNR) bridges an XM bus network and a ControlNet network. Use only with 1...10 XM dynamic measurement modules (cat. no. DYN02-01RJ).

Table 12 - ControlNet Adapter Attribute Descriptions

Attribute	ControlNet Adapter (1440-ACNR)
I/O Capacity	
XM modules, max	10 XM dynamic measurement modules (cat.no. 1440-DYN02-01RJ)
ControlNet communication rate	5 M (fixed value)
XM bus communication rate	500 Kbps (fixed value)
Technical	
Status indicators	<ul style="list-style-type: none"> • Module • Backplane (XM bus) • ControlNet A • ControlNet B
Power consumption, max	2.4 W
Power dissipation, max	2.4 W
Thermal dissipation	8.194 BTU/hr
Input over voltage protection	Reverse polarity protected

Table 12 - ControlNet Adapter Attribute Descriptions (continued)

Attribute	ControlNet Adapter (1440-ACNR)
Isolation voltage	Tested @ 900V AC for 60 s between XM bus-to-ControlNet network and ControlNet network-to-user power
Field power	Class 2 power supply <ul style="list-style-type: none"> • Voltage: 24V DC • Current: 120 mA
Wiring	
Power conductor wire size	22...14 AWG (0.34...2.1 mm ²) solid or stranded copper wire rated at 75 °C (167 °F) or greater 1.2 mm (3/64 in.) insulation max
Wiring category ⁽¹⁾	<ul style="list-style-type: none"> • 1 - on power ports • 2 - on communication ports
Screw torque	0.8 N-m (7 lb-in)
Physical	
Dimensions (H x W x D), approx	86.4 x 94 x 68.6 mm (3.4 x 3.7 x 2.7 in.)
Weight, approx	0.2 kg (0.44 lb)
Environmental	
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	-20...70 °C (-4...158 °F)
Temperature, surrounding air, max.	70 °C (158 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	15 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	20 g
Vibration IEC 60068-2-6 (Test Fc, Operating)	5 g @ 10...500 Hz
Emissions CISPR 11 (IEC 61000-6-4)	Class A
ESD Immunity IEC 61000-4-2	<ul style="list-style-type: none"> • 6 kV contact discharges • 8 kV air discharges
Radiated RF Immunity IEC 61000-4-3	<ul style="list-style-type: none"> • 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz • 10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz • 10V/m with 200 Hz 50% Pulse 100% AM at 1890 MHz • 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
Conducted RF Immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Enclosure Type Rating	None (open-style)
Isolation Voltage	<ul style="list-style-type: none"> • 50V (continuous), Basic Insulation Type, between ControlNet to system and ControlNet to power. • Type tested at 900V AC for 60 s

Table 12 - ControlNet Adapter Attribute Descriptions (continued)

Attribute	ControlNet Adapter (1440-ACNR)
Wire Size	Power connections <ul style="list-style-type: none"> • 0.34... 2.1 mm² (22... 14 AWG) • Solid or stranded copper wire rated at 75 °C (167 °F) or greater 1.2 mm (3/64 in.) insulation max.
North American Temp Code	T4A
IEC Temp Code	T4
Certifications⁽²⁾	
CE	European Union 2004/108/EC EMC Directive, compliant with: <ul style="list-style-type: none"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B)
C-Tick	Australian Radiocommunications Act, compliant with: <ul style="list-style-type: none"> • AS/NZS CISPR 11; Industrial Emissions • AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-11; Explosive Atmospheres, Protection "i" • EN 60079-0; General Requirements • II 3 G Ex nA nL IIC T4X Gc when used at or below 60V AC or 75V DC
KCC	Korean Registration of Broadcasting and Communications Equipment, compliant with: <ul style="list-style-type: none"> • Article 58-2 of Radio Waves Act, Clause 3
c-UL-us	UL Listed, certified for U.S. and Canada. See UL File E234338 UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.

(1) Use this Conductor Category information for planning conductor routing. Refer to Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

(2) When product or packaging is marked. See the Product Certification link at <http://www.rockwellautomation.com> for Declarations of Conformity, Certificates, and other certification details.

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, http://www.ab.com	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at <http://www.rockwellautomation.com/literature/>. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

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