

AS-7000 Datasheet

Advanced API-670 Machinery Protection +Analysis



The AS-7000 combines Alta Solutions' renowned signal analysis capabilities and machinery protection experience into a modern API-670 compliant solution. Designed around our commitment to reliability, flexibility and efficiency, the system can accommodate any sensor type into any channel and allows a facility to only stock two card types for a 7000 vibration monitoring and protection system.

With two separate analog-to-digital signal paths, machine protection and analysis data acquisition functions are provided and within the Alta 7000 system. To view and record diagnostic data during a start-up or shut-down, you no longer need to connect special data acquisition equipment to the machinery protection system.

Just connect one Ethernet cable to your laptop or PC, running Alta analysis software, to view or record real time gapless data for subsequent playback and

analysis. Fully independent A to D signal paths allows access to real time dynamic signals without affecting the machinery protection system functions.

Installation and maintenance has been simplified. Using a more traditional front-monitor and rear-wiring form factor, modules can be hot swapped without having to remove and reconnect wiring. Upgrading from existing systems is simplified since modules can be spaced to align with the existing systems' terminal blocks. R&R existing MPS systems quickly and easily or reconfigure for future expansion.

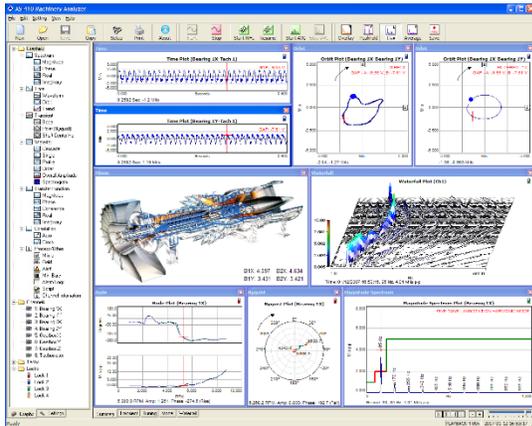


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ADVANCED VIBRATION PROTECTION

The AS-7000 is designed to meet or exceed MPS guidelines within 5TH Edition API 670. Each MP module provides four channels of protection circuitry utilizes 24-bit A-to-D converters, a high-performance DSP, and distributed relay outputs to provide a fully redundant and fault tolerant protection system, when required. The AS-7000 MPS design is suitable for protecting critical machines or multiple BOP machines using a common system chassis.



BUILT-IN ADVANCED ANALYSIS CAPABILITIES

Each 4 channel MP or CP module contains independent parallel circuits for each of four channels to provide advanced monitoring and analysis. By utilizing independent 24-bit A to D converters, each sensor input is processed to simultaneously provide machinery protection and analysis. With the AS-7000 there is no phase lag, amplitude loss, or signal degradation between the sensor input and the machinery diagnostics data.



STATE OF THE ART HARDWARE

The AS-7000 design methodology uses the latest chip technology while optimizing system reliability, efficiency, and product lifespan.

MAXIMUM REDUNDANCY

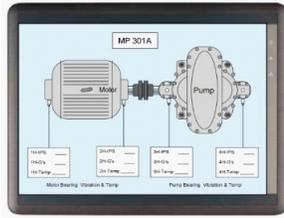
The AS-7000 rack accommodates up to 18 modules. Each 19" rack provides one or two independent systems, meeting the need for high channel density or for two fully redundant systems. The AS-7000 modules are especially-designed for redundant applications as each system can support two 7030SM and sixteen 7050MP modules.

FLEXIBLE MODULAR SYSTEM

With the ability to stagger, offset and arrange any dynamic signal or temperature module in any position; and with multiple backplane sizes, you can install up to two fully independent and segregated systems into one physical rack or provide plenty of room for wiring between modules.

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Advanced API-670 Machinery Protection +Analysis



LEVERAGE OFF-THE-SHELF CONNECTIVITY

The AS-7000 utilizes Ethernet connectivity to connect to computers using standard Ethernet cables and protocols. No proprietary interface cards, no unusual or special cables to support. The system interfaces with a wide range third-party HMIs and remote displays which increases your display choices while reducing cost.



LEVERAGE OFF-THE-SHELF POWER SUPPLIES

The AS-7000 operates on +24Vdc which allows the use of off-the-shelf power supplies, existing control system power, which reduce the overall system and long-term maintenance costs. The system has two independent power input connectors, internally connected, to provide redundant power, without using external switching modules.



DESIGNED TO SUPPORT CURRENT AND FUTURE INTERFACES

The AS-7000 communications are designed around the latest programmable network processors to support today's control and historian interfaces including Modbus TCP and OSI soft PI, but provide an upgradable path for the future to expand other interfaces and historians natively.



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front, you can measure your buffered signals without special and easy to forget or lose adapters.

TRANSDUCER POWER

With the ability to provide +24v or -24v transducer power or Integrated Electronic Piezoelectric (IEPE) transducer biasing, no additional hardware is needed to support whatever you want/need to install.



SENSOR SUPPORT

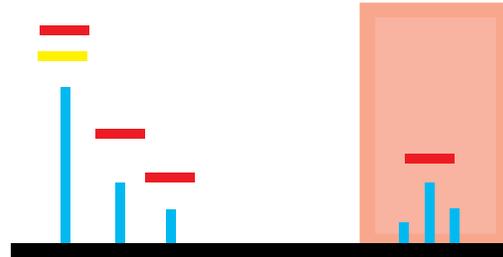
The AS-7000 is designed to support all machinery protection type sensors from any manufacturer that produces a voltage signal between -24 and +24 volts.



LATEST ACQUISITION TECHNOLOGY

The AS-7000 utilizes 24-bit analog-to-digital converters typically found in high-end analysis

equipment and the rack was designed to support the high-bandwidth analysis of simultaneously capturing up to 64 dynamic signals.



INTELLIGENT ALARMING AND SHUTDOWN

Flexible and easy logic configuration and a shared relay bus are available to any of the four relays on every dynamic signal card allow for an unprecedented level of speed, reliability and redundancy not previously available without costly additional hardware.

INHIBIT AND TRIP MULTIPLY

Effectively perform temporary alarming modifications through traditional hardware contacts, with the ability to disable these actions on a channel-by-channel basis for more granular control without additional wiring. This can also be performed over Modbus for a lower-wire-count installation.

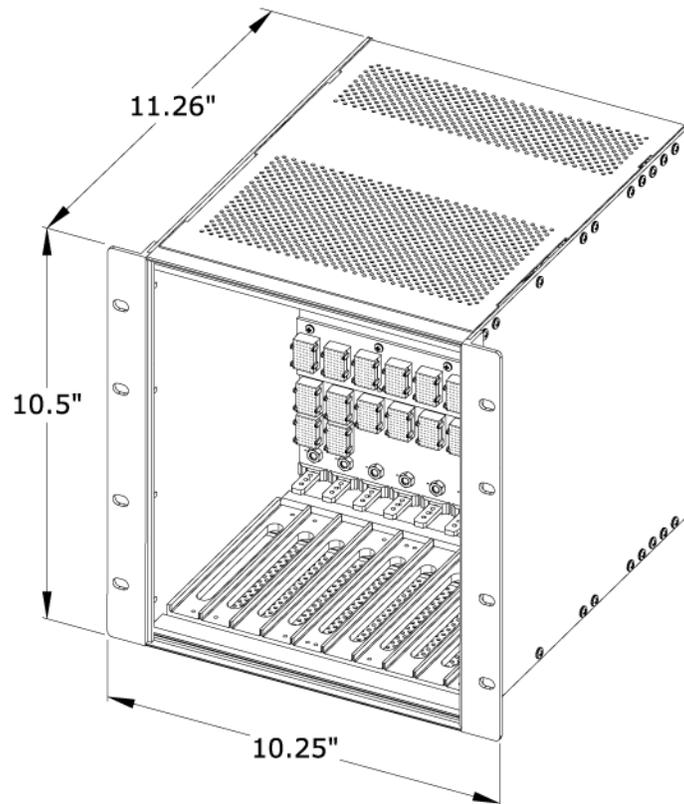
DIAGNOSES BLOCKS (VOTING LOGIC)

Ease of configuration is increased by making diagnosis blocks available to more effectively and easily reuse common arrays in complex voting logic.

CHASSIS SPECIFICATIONS

7015S10 CHASSIS

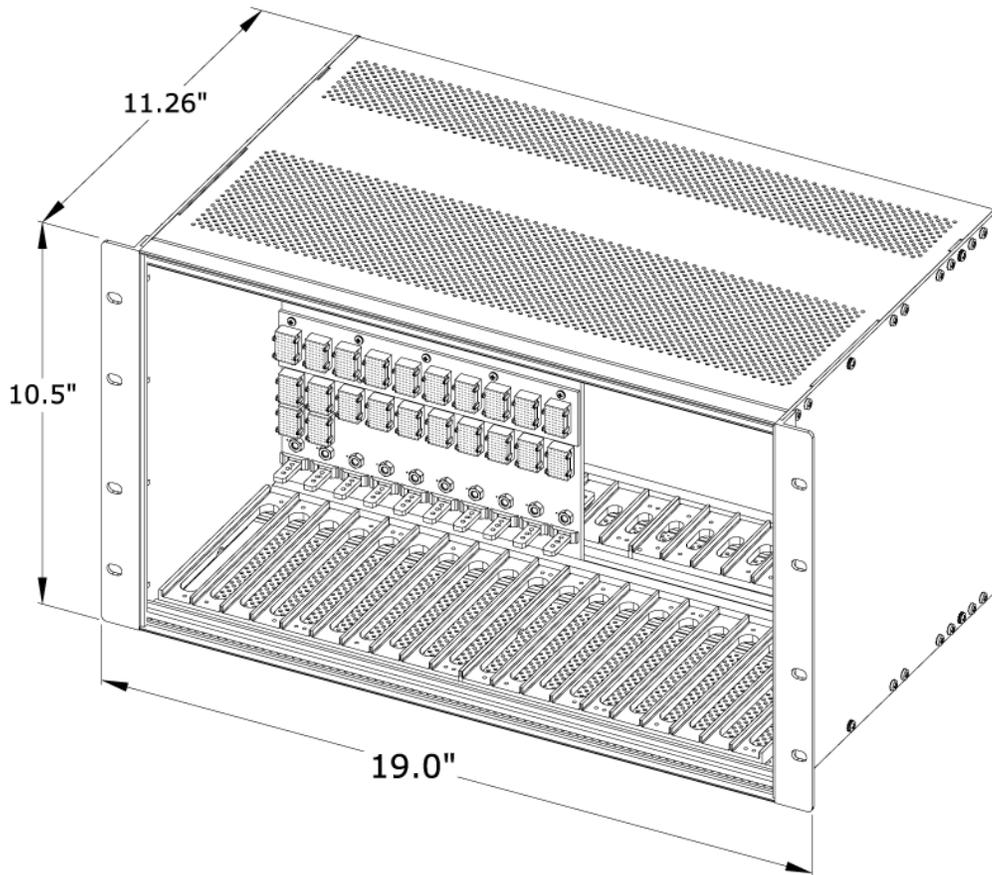
Type	Half Rack
Backplane	10 Slots
SM Modules Supported	1 or 2
MP Modules Supported	1 to 8
Dimensions	10.25"x10.5"x11.26"



CHASSIS SPECIFICATIONS

7010S10 CHASSIS

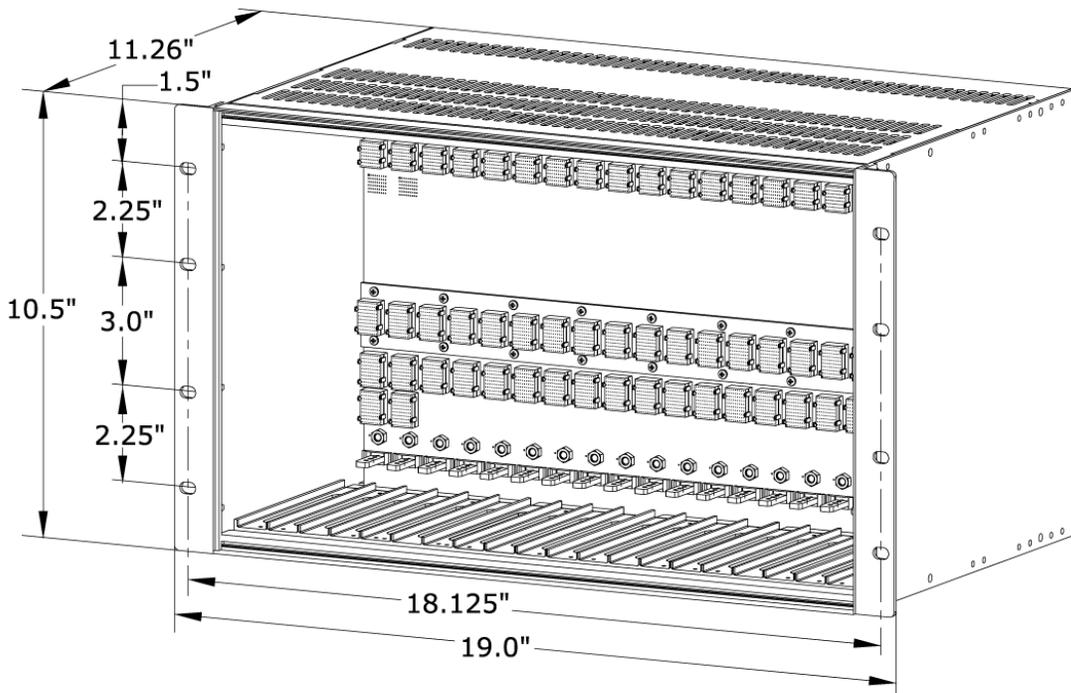
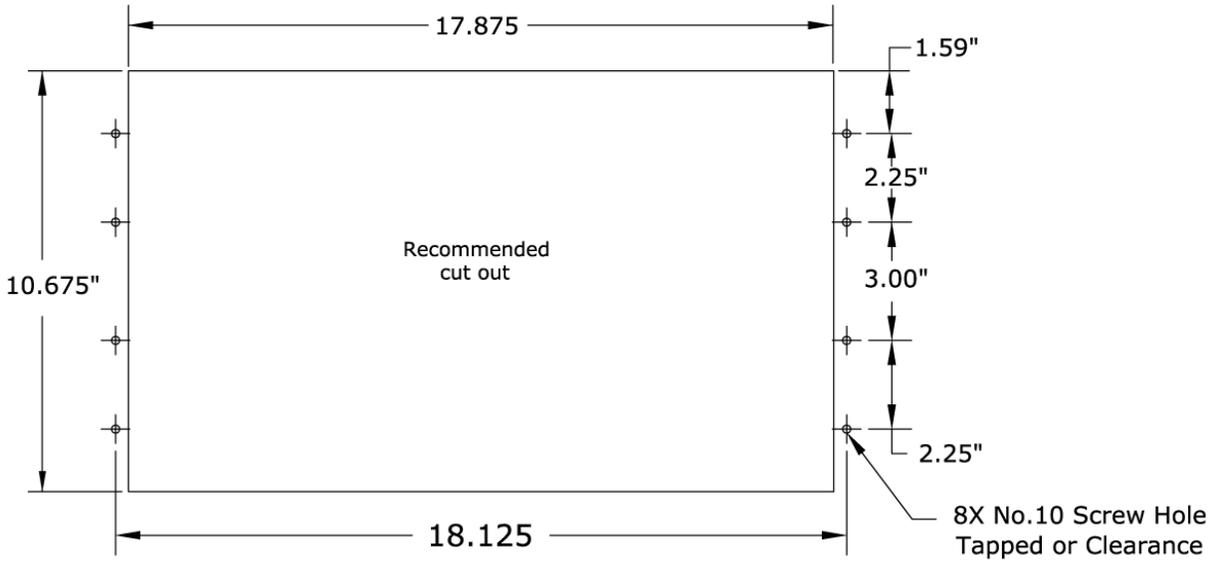
Type	Full Rack
Backplane	10 Slots
SM Modules Supported	1 or 2
MP Modules Supported	1 to 8
Dimensions	19"x10.5"x11.26"



CHASSIS SPECIFICATIONS

The 18 Slot Chassis

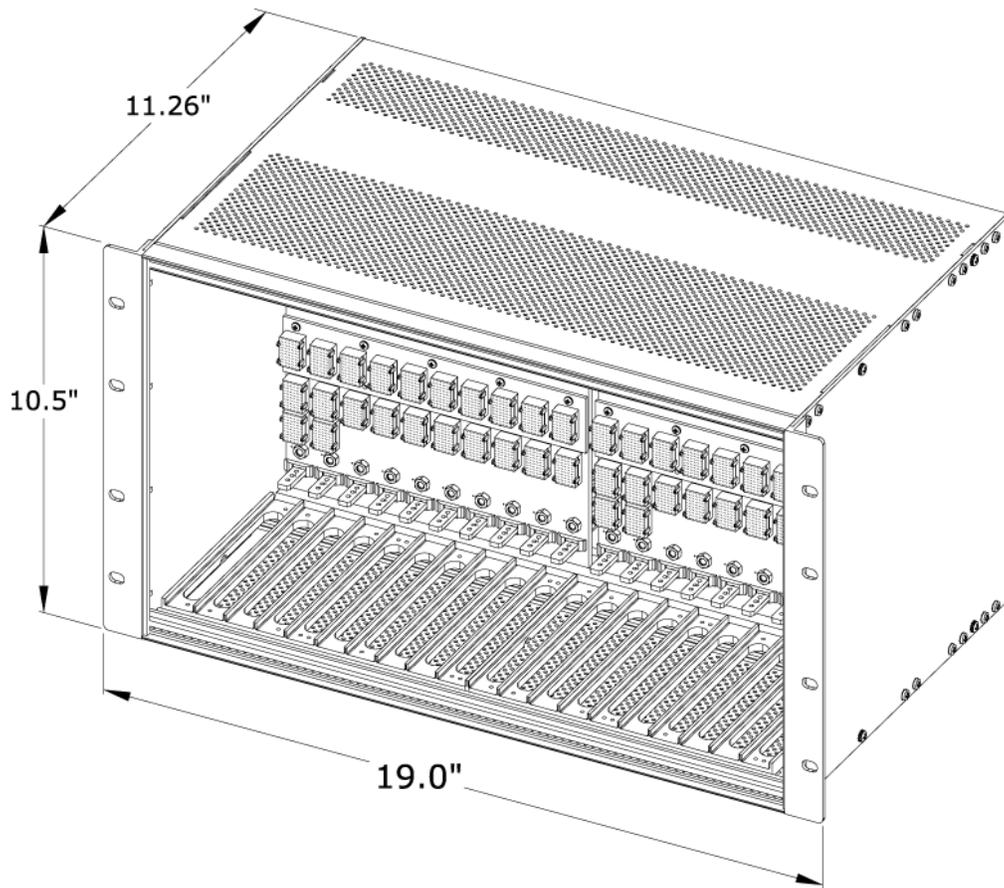
The 18 slot chassis allows for installation in a standard 19" rack foot-print, matching current standard dimensions.



CHASSIS SPECIFICATIONS

7010D10 CHASSIS

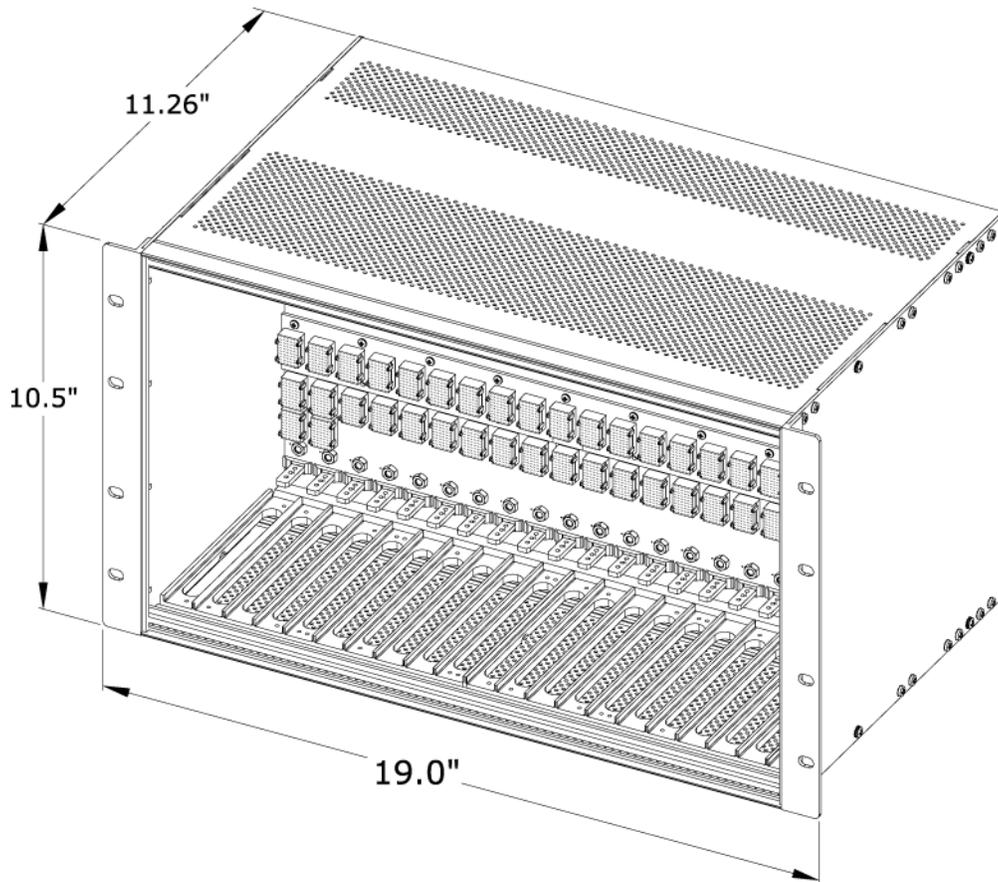
Type	Full Rack
Backplane	Dual 10 Slots
SM Modules Supported	1 or 2 (Primary), 1 or 2 (Secondary)
MP Modules Supported	1 to 8 (Primary), 1 to 8 (Secondary)
Dimensions	19"x10.5"x11.26"



CHASSIS SPECIFICATIONS

7010S18 CHASSIS

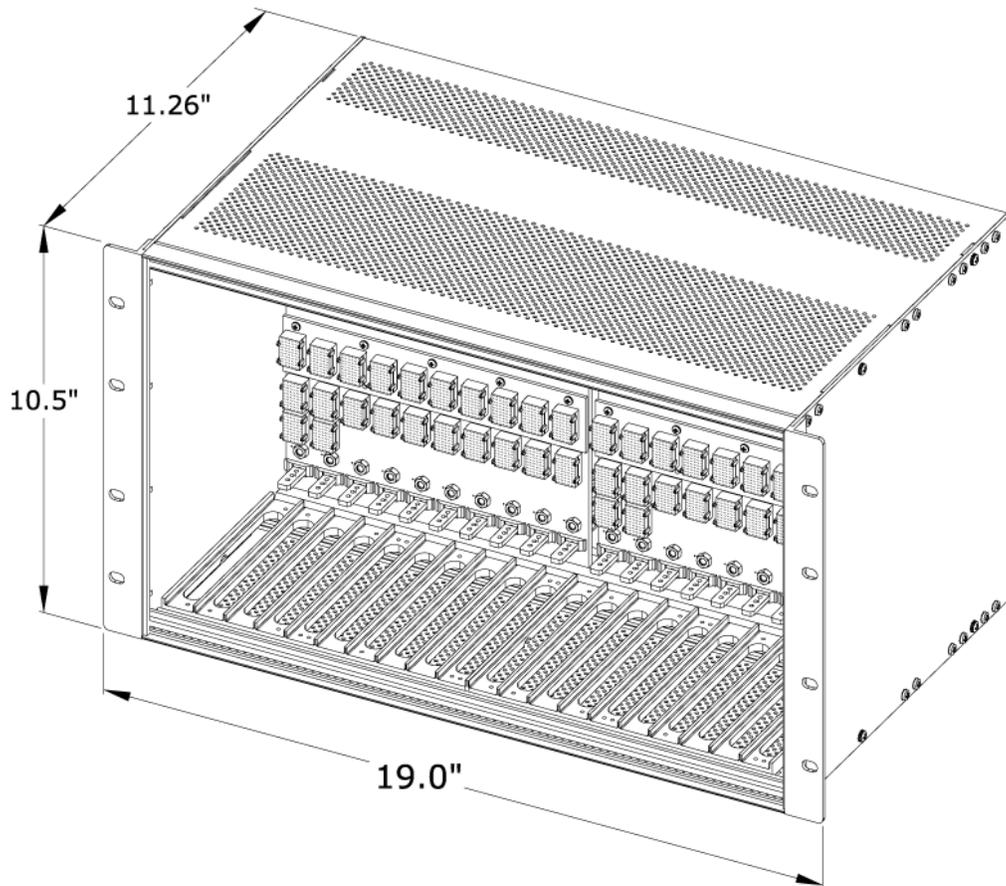
Type	Full Rack
Backplane	18 Slots
SM Modules Supported	1 or 2
MP Modules Supported	1 to 16
Dimensions	19"x10.5"x11.26"



CHASSIS SPECIFICATIONS

7010D10 CHASSIS

Type	Full Rack
Backplane	Dual 10 Slots
SM Modules Supported	1 or 2 (Primary), 1 or 2 (Secondary)
MP Modules Supported	1 to 8 (Primary), 1 to 8 (Secondary)
Dimensions	19"x10.5"x11.26"



7030SM – SYSTEM MONITOR MODULE

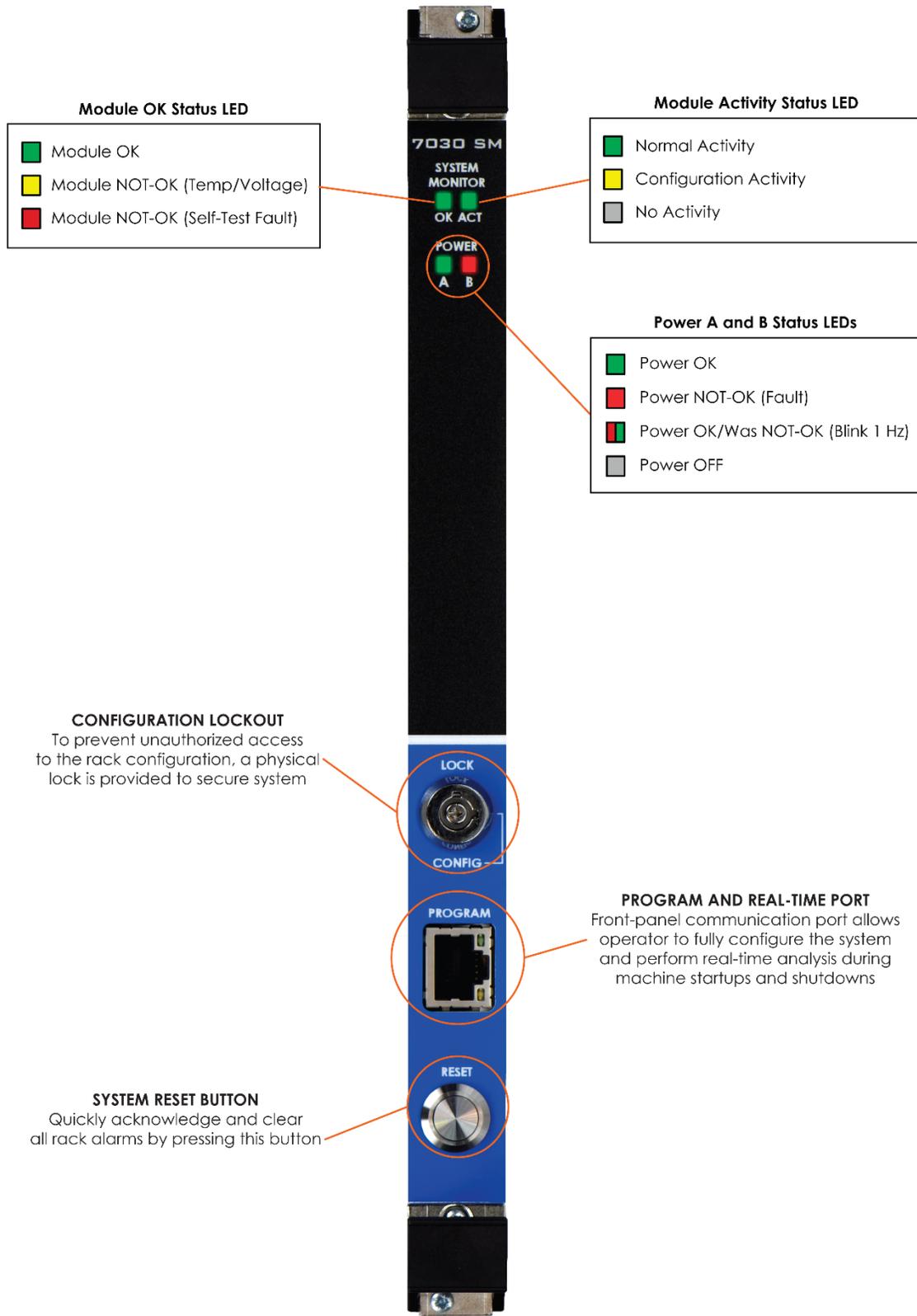


The 7030SM seamlessly integrates critical functions including programming, health status monitoring, dynamic data streaming, and communications. This multifunction module simplifies the system configuration while reducing costs via a minimized spares inventory.

The 7030SM System Monitor provides the following features:

- Module and system health monitoring
- LED indicators for both module health and system power status
- System fault logging with output relay
- System configuration security key-lock
- Ethernet based system programming and real-time analysis ports
- System reset push-button
- Ethernet TCP/IP based communication ports for HMI's or Historians

7030SM – SYSTEM MONITOR MODULE



7030SM – SYSTEM MONITOR MODULE

FRONT PANEL

LED Indicators	Module OK, Module Activity, Power Status. 3-Color LED (Green / Yellow / Red) for Easy At-A-Glance Status Indication.	
Module OK Status LED	MODULE OK	Internal Voltage < 5% error Internal Temperature > -20C(-4F) AND < 65C(149F)
	MODULE NOT OK	Internal Voltage > 5% ERROR Internal Temperature < -20C(-4F) OR > 65C(149F)
	MODULE NOT OK	Self-Test Fault
Module Activity Status LED	NORMAL ACTIVITY	Module is communicating with software
	CONFIG ACTIVITY	Module is receiving configuration from software
	NO ACTIVITY	Module is not communicating
Power Status LED	POWER OK	Input Voltage > +15Vdc AND < +30Vdc
	POWER NOT OK	Input Voltage < +15Vdc OR > +30Vdc
	POWER OK	Power has recovered from fault condition
	blink	
	POWER NOT OK	
Configuration Lockout	Two position barrel keylock receptacle limits configuration programming access to authorized personnel only	
	LOCK	Configuration access from software disabled
	CONFIG	Configuration access from software enabled via password
Program Port	100Mbit Ethernet port operating Alta Solutions proprietary protocol for: System Programming and Monitoring Streaming real-time data for analysis	
	LINK	Network PHY carrier detected
	ACT	Network communication is valid
	Shielded RJ45 receptacle for use with CAT5E or better cable	
System Reset	Local reset/acknowledge of system alarm condition(s) and relay latching Spring loaded return momentary pushbutton	
	PUSH	50msec de-bounced transition initiates system reset
	RELEASE	No response

SYSTEM FAULT RELAY (located on 7035I card)

Relay Control	Energized: Rack-Wide Normal Condition De-Energized: Rack-Wide Abnormal Condition, Loss of Power
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7030SM – SYSTEM MONITOR MODULE

EXTENDED CONNECTIVITY (located on 7035I card)

Communication Interface	Three separate serial interfaces with 7035I operating three Ethernet ports Two ports operating with 100Mbit TCP/IP Ethernet protocol for: Intelligent communications with Control Systems, Historians, or HMIs One port operating with 100Mbit Alta proprietary Ethernet protocol for: Streaming real-time data for analysis	
	LINK	Network PHY carrier detected
	ACT	Network communication is valid
	Shielded RJ45 receptacle for use with CAT5E or better cable	

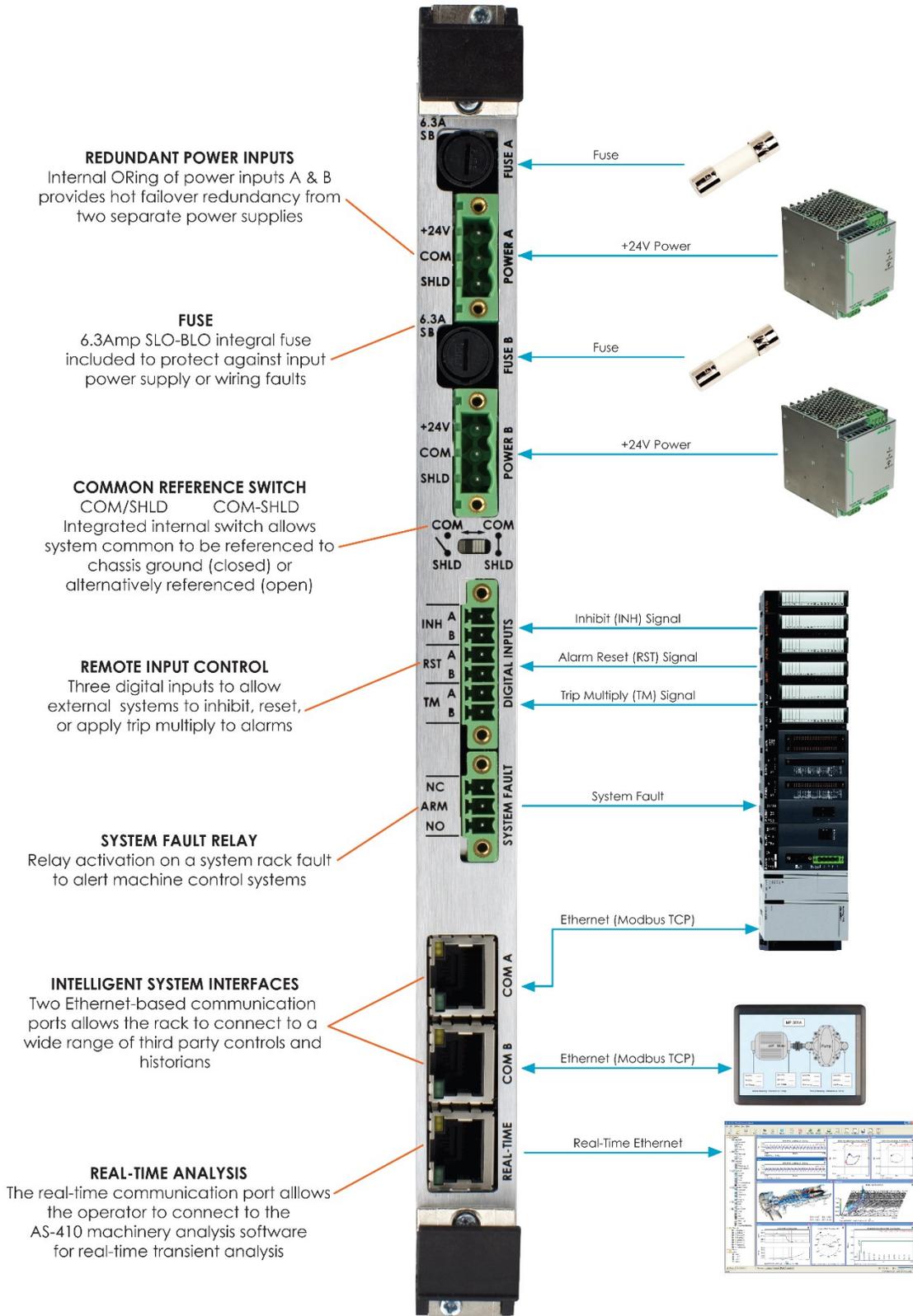
7035I – SYSTEM I/O INTERFACE

The 7035I connects all rack modules to plant control systems supporting both isolated discrete digital I/O and serial communication.

The 7035I Interface card provides the following features:

- Dual DC power inlets with redundant backup fail over capability
- Isolated digital inputs for Inhibit, Reset, and Trip Multiply
- System Fault Relay (SPDT)
- Dual TCP/IP Ethernet ports for connecting HMI's or Historians
- Real-time analysis output port for connecting laptops/PCs running Alta Solutions machinery analysis or on-line condition monitoring software.





7035I – SYSTEM I/O INTERFACE

POWER INPUT(S)

Voltage Range	+15Vdc to +30Vdc (Nominal: +24Vdc)
Power	24Vdc @ 300W Max (Dependent Rack configuration) * Typical 16-Channel Protection System Approx. 2 A @ +24Vdc (48W) Max Load.
Connectors	Two 3-tap removable terminal blocks** Power A Power B Electrical +24Vdc: Power Supply Positive Input COM: Power Supply Input Return SHLD: Earth Ground Connection Mechanical Maximum Gauge: 10AWG Stranded Plug pin Pitch: 7.62mm Connection Type: Screw Clamp
	*Power consumption varies based on modules installed and voltage supplied. **Inputs are OR'd internally to provide fault tolerant redundancy

DIGITAL INPUTS

Function	Remote systems interface for discrete digital control Inhibit: Alarm inhibit during programming changes Reset: Latched alarm reset Trip Multiply: Alarm trip level multiply for startup and shutdown
Connector	One 6-tap removable terminal block Electrical All input pairs are isolated and biased internally Inhibit: Contact Closure Sensing Reset Alarm Latch: Contact Closure Sensing Trip Multiple: Contact Closure Sensing Mechanical Maximum Gauge: 16AWG Stranded Plug pin Pitch: 3.81mm Connection Type: Screw Clamp
Activation	<1kOhm (shorted)
De-activation	>10kOhm (open)
Isolation	Common mode (2500Vpeak)

7035I – SYSTEM I/O INTERFACE

SYSTEM FAULT RELAY (Controlled by 7030SM)

Function	Rack-Wide System Fault
Connector	<p>One 3-tap removable terminal block</p> <p>Electrical NO: De-Energized Relay Open Contacts COM: Relay Common Pole NC: De-Energized Relay Closed Contacts</p> <p>Mechanical Maximum Gauge: 10AWG Stranded Plug pin Pitch: 7.62mm Connection Type: Screw Clamp</p>
Trigger On / Energized	Rack-Wide Normal Condition
Trigger Off / De-Energized	Rack-Wide Abnormal Condition, Loss of Power
Relay Type	1 Form C, SPDT
Contact Rating	6A @ 28Vdc or 300Vac
Max Switched Power	180 W or 1800 VA
Max Switched Current	5A
Max Switched Voltage	150Vdc or 300 Vac

COMMUNICATION (Controlled by 7030SM)

FUNCTIONS	<p>Serial Connectivity to external intelligent systems</p> <p>Streaming real-time data for analysis</p>
INTERFACE	<p>Three Ethernet ports</p> <p>COM A*</p> <p>COM B</p> <p>REAL-TIME</p> <p>Electrical Ethernet TX/RX LED indicators for LINK (GREEN SOLID) and ACTIVITY (YELLOW BLINK)</p> <p>Mechanical RJ45/Shielded CAT5E or better cable</p>
PERFORMANCE	<p>100Mbit</p> <p>COM A: TCP/IP protocol for Modbus and Alta Solutions AltaView**</p> <p>COM B: TCP/IP protocol for Modbus and Alta Solutions AltaView**</p> <p>REAL-TIME: Alta Solutions proprietary</p> <p style="text-align: right;">*RS-232 Serial option planned **Additional protocols planned</p>



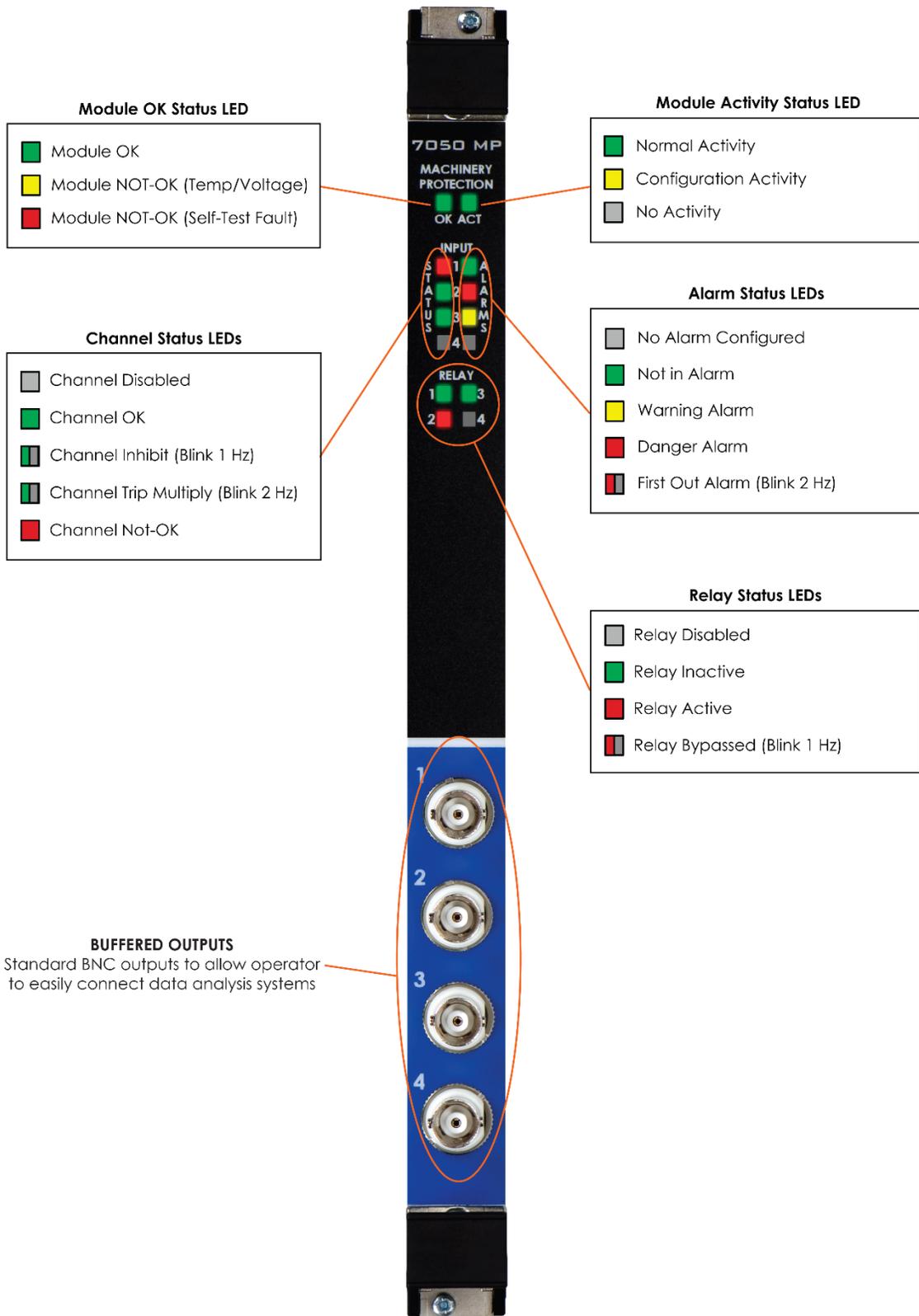
The 7050MP Machinery Protection module combines the features found in a traditional protection cards with the advanced analysis of portable systems.

By utilizing 21st century processing power, the 7050MP can support a wide range of channel configurations (including many forms of vibration, axial position, differential expansion, speed) typically requiring specialized separate modules. This approach reduces the overall system cost in both material and logistics by limiting the system spares requirement.

The 7050MP implements the following features:

- Real-time protection of four dynamic inputs
- Separate Real-time analysis circuitry capable of simultaneously sampling up to 64 dynamic channels.
- Support for a wide range of measurements
- Advanced Boolean logic (for relay control) with 4 relays at each MP card
- Four 4-20mA outputs to connect to existing control systems or HMIs
- Buffered BNC outputs don't require any special or proprietary adapters

7050MP – MACHINERY PROTECTION MODULE



7050MP – MACHINERY PROTECTION MODULE

FRONT PANEL

LED Indicators	Module OK, Module Activity, Channel Status, Alarm Status, Relay Status. 3-Color LED (Green / Yellow / Red) for Easy At-A-Glance Status Indication.
Channel Status	Indicates Channel Condition Including Channel OK / Was Not-OK /Not-OK, Trip Multiply, Alarm Inhibit, etc.
Alarm Status	Shows Highest Alarm Currently Active, Indicates Unacknowledged Highest Alarm, Uses Green for Below-Alarm, Yellow for Alert / Alarm 1, Red for Danger / Alarm 2.
Relay Status	Indicates Relay Activity Showing Green When Configured and Inactive, or Red When Active. Unlit when a relay is disabled or unconfigured.

DYNAMIC INPUTS (ANALOG/SPEED)

Number of Channels	4
Channel Type	Dynamic Voltage Signal or Speed / Phase Input On Any Channel.
Performance	<p>ANALOG</p> <p>A/D Resolution: 24 bits Sampling: Simultaneous for all Analog Inputs Dynamic Range: 110dB (typical) Signal-to-Noise Ratio: 110dB (typical) Voltage Range: +/-20V Tolerant to +/-30V with Overload indicated @ <-20V or >+20V Impedance: >100kΩ Frequency Range: DC to 20kHz Amplitude Error: <1% Phase Accuracy: +/-1° between channels</p> <p>PHASE</p> <p>Minimum Pulse Width: 1usec Speed Range: 1 to 1,000,000RPM RPM Error: <0.01% (24-60kRPM) <0.13% (60k – 1,000kRPM) Pulses Per Revolution: Programmable (0.01 to 10,000) Trigger Threshold: -20V to +20V Trigger Slope: Programmable (Rising or Falling) Hysteresis: Programmable (.2V or 1V)</p>

7050MP – MACHINERY PROTECTION MODULE

MEASUREMENT SPECIFICATIONS

Measurement Type	Radial Vibration Axial Position Acceleration Velocity Eccentricity Differential Expansion Single Differential Expansion Complementary Differential Expansion Ramp Single Differential Expansion Ramp Dual Speed Reverse Rotation
Measurement Scaling	Maximum, Minimum, Clamp Value

ALARM SETTINGS

Alarm Types	Danger Alert
Alarming Signals	Dynamic Inputs Speed / Phase Inputs
Boolean Logic	Normal-AND, True-AND, OR, NOT, 2oo3
Threshold Types	Upper Lower In-Range Out-Of-Range
Latch Types	Latching and Non-Latching
Alarm Delay Time	0 to 600 Seconds
Trip Multiply Factor	1 to 10

ADVANCED BOOLEAN LOGIC OUTPUTS (VIA RELAY ON 7055IT)

Function	Alarm Fault Output
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RECORDER (4-20mA) OUTPUTS

Function	4-20mA Representation of Any On-Card Measurement Value
Performance	Resolution: 10 μ A Update Rate: Typical 10msec (Process Loading Dependent) Loop Supply Voltage: +24Vdc Supplied Internally Loop Resistance (external max load): 800 Ω Maximum 2mA Channel Not Ok Configurable

7055IT – MACHINERY PROTECTION INTERFACE CARD



The 7055IT signal input module allows installation of field wiring in a position matching any existing installations to reduce installation time and rewiring cost.

Capable of providing either +24 or -24 power to sensors, any low voltage (<24V) type signal can be connected and monitored. Wiring through standard phoenix connectors allows a technician to not have to worry about anything proprietary or unique.

The 7075IB implements the following features:

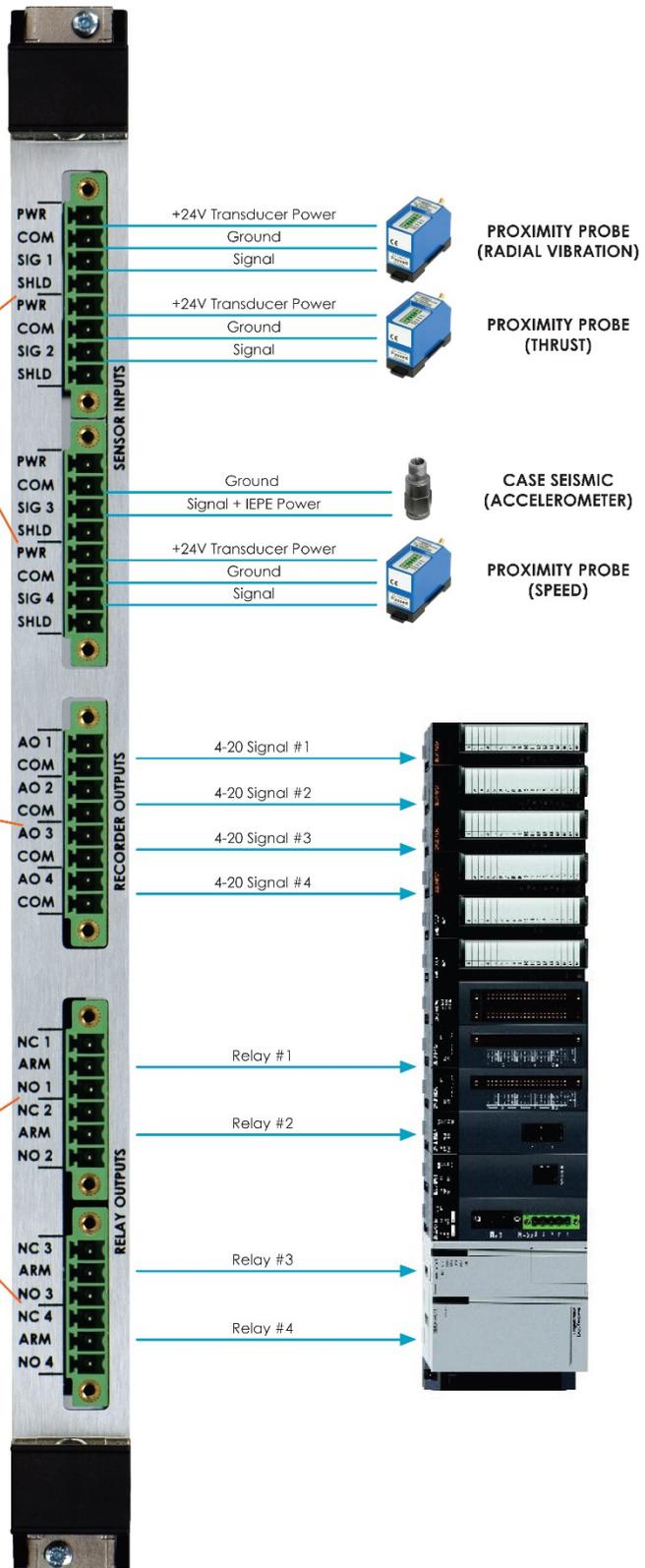
- Four BNC signal inputs
- Software-enablable IEPE power (+24v) for inline-powered sensors.
- Four 4-20mA outputs to connect to existing control systems or HMIs
- Four SPDT relays which can be independently configured for maximum flexibility

7055IT – MACHINERY PROTECTION INTERFACE CARD

UNIVERSAL SENSOR CAPABILITY
MP modules are designed to natively support wide range of sensors

RECORDER OUTPUTS
Four programmable 4-20mA outputs to send measurement values to legacy chart recorders and control systems

INTELLIGENT RELAY OUTPUTS
Four programmable relays using Boolean logic based on any local or global alarms



7055IT – MACHINERY PROTECTION INTERFACE CARD

DYNAMIC INPUTS (ANALOG/SPEED)

Number of Channels	4
Connector (electrical)	Removable Terminal Block (2 Channels per Terminal Block) PWR: Sensor Power User configurable for + or – 24Vdc @ 14mA max COM: Common for Dynamic Signal Input and Sensor Power SIG: Dynamic Signal Input User configurable IEPE, 3.3mA +/- .3mA @+24Vdc SHLD: Field Wiring Shield (referenced to chassis ground)
Connector (mechanical)	Removable Terminal Block Maximum Gauge: 16AWG Stranded Plug pin Pitch: 3.81mm Connection Type: Screw Clamp

RELAY OUTPUTS

Function	Alarm Fault Output
Connector (electrical)	Removable Terminal Block (2 channels outputs per Terminal Block) NO: Normally Open Contact, in De-Energized state Relay Open Contacts COM: Relay Common Pole NC: Normally Closed Contact, in De-Energized state Relay Closed Contacts
Connector (mechanical)	Removable Terminal Block Maximum Gauge: 10AWG Stranded Plug pin Pitch: 7.62mm Connection Type: Screw Clamp
Relay Type	1 Form C, SPDT
Contact Rating	6A @ 28Vdc or 300Vac
Max Switched Power	180 W or 1800VA
Max Switched Current	6A
Max Switched Voltage	150Vdc or 300VAC
Relay Normal State	Normal-Energize or Normal-De-Energize Through Configuration Software

RECORDER (4-20mA) OUTPUTS

Connector (electrical)	Removable Terminal Block (4 loop pairs per Block) AO: 4-20mA (Provides Loop Power) COM: 4-20mA Loop Return (Non-Isolated shared common)
Connector (mechanical)	Removable Terminal Block Maximum Gauge: 10 AWG Stranded Plug pin Pitch: 7.62 mm Connection Type: Screw Clamp

7051CP – COMBUSTION PROTECTION MODULE



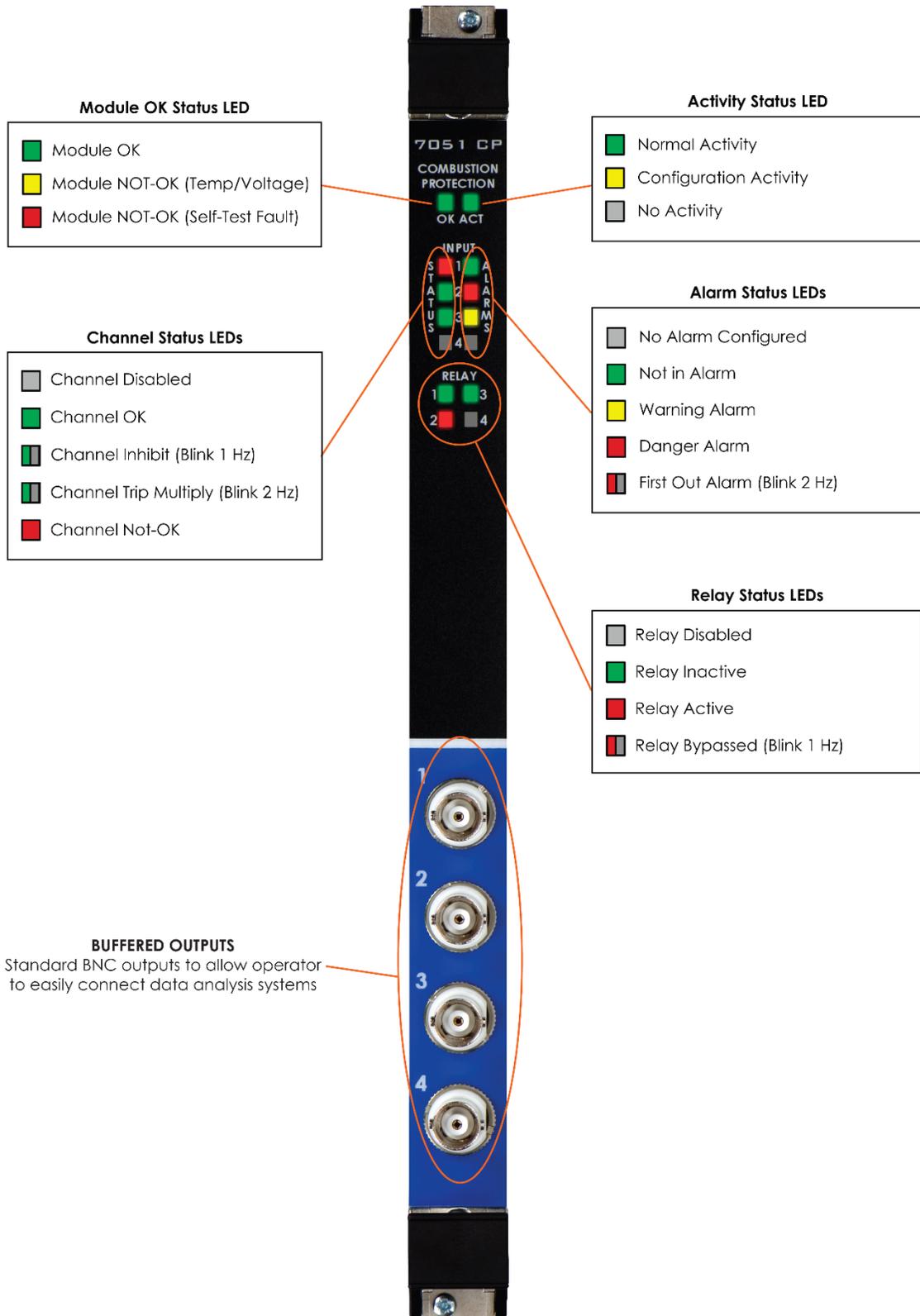
The AS-7051CP Combustion Protection module provides Alta's industry leading combustion dynamics monitoring and protection capabilities in a modular, expandable format.

As part of an AS-7000 system, the AS-7051CP delivers Combustion Dynamics Monitoring capabilities that build on the previous generations of Alta's combustion dynamics systems. Providing both embedded protection and computer based monitoring for gas turbines. The AS-7051CP is specifically tailored for combustion dynamics monitoring inputs and processing, while providing additional flexibility in the number of inputs, modularity for upgrades, and superior redundancy, communications, and response time. As part of the AS-7000 system the AS-7051CP can operate in a single or dual system configuration which allows for either multiple combustion dynamics systems in a single chassis or a combination of combustion dynamics and vibration protection in one system.

The 7051CP implements the following features:

- Real-time combustion dynamics protection on four dynamic inputs or with multiple AS-7051CP modules, up to 64 inputs
- Real-time analysis with synchronous sampling on all channels
- Tailored support for combustion pressure sensor inputs
- Multiple layers of redundancy to assure continuous protection
- Advanced Boolean logic (for relay control)
- Four 4-20mA outputs to connect to existing control systems or HMIs
- Buffered (Isolated) BNC outputs

7051CP – COMBUSTION PROTECTION MODULE



7051CP – COMBUSTION PROTECTION MODULE

FRONT PANEL

LED Indicators	Module OK, Module Activity, Channel Status, Alarm Status, Relay Status. 3-Color LED (Green / Yellow / Red) for Easy At-A-Glance Status Indication.
Channel Status	Indicates Channel Condition Including Channel OK / Was Not-OK /Not-OK, Trip Multiply, Alarm Inhibit, etc.
Alarm Status	Shows Highest Alarm Currently Active, Indicates Unacknowledged Highest Alarm, Uses Green for Below-Alarm, Yellow for Alert / Alarm 1, Red for Danger / Alarm 2.
Relay Status	Indicates Relay Activity Showing Green When Configured and Inactive, and Red When Active. Unlit when relay is disabled or unconfigured.

DYNAMIC INPUTS

Number of Channels	4
Channel Type	Pressure Transducer Dynamic Voltage Signal.
Performance	ANALOG A/D Resolution: 24 bits Sampling: Simultaneous for all Analog Inputs Dynamic Range: 110dB (typical) Signal-to-Noise Ratio: 110dB (typical) Voltage Range: +/-20V Tolerant to +/-30V with Overload indicated @ <-20V or >+20V Impedance: >100kΩ Frequency Range: DC to 20kHz Amplitude Error: <1% Phase Accuracy: +/-1° between channels
Connector (electrical)	Factory Configurable for Either Terminal Block or BNC Removable Terminal Block (2 Channels per Block)
Connector (mechanical)	Factory Configurable for Either Terminal Block or BNC BNC 1 Channel per BNC

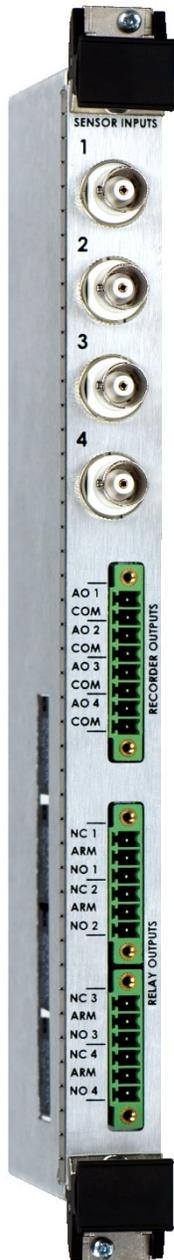
ADVANCED BOOLEAN LOGIC OUTPUTS (VIA RELAYS ON 7055IT OR 7055IB)

Function	Alarm Fault Output
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RECORDER (4-20mA) OUTPUTS

Function	4-20mA Representation of Any On-Card Measurement Value
Performance	Resolution: 10μA Update Rate: Typical 10msec (Process Loading Dependent) Loop Supply Voltage: +24Vdc Supplied Internally Loop Resistance (external max load): 800Ω Maximum 2mA Channel Not Ok Configurable

70751B – COMBUSTION PROTECTION IO MODULE



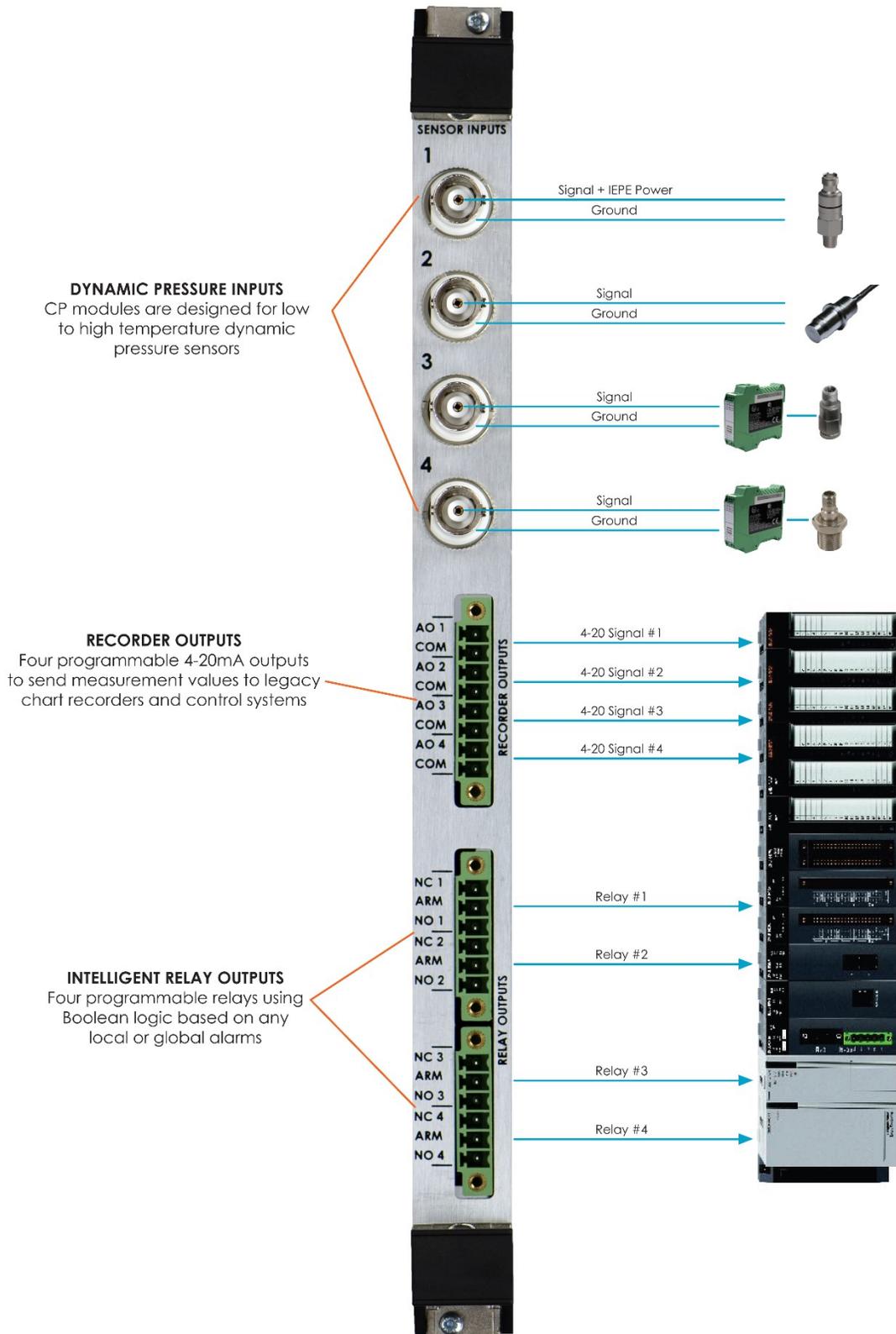
The 70751B signal input module allows a technician to use a standard BNC input cable for sensors which are externally powered, or require inline power applied.

Compatible with any standard BNC connection, this allows for easier installation of Accelerometers, Velometers, Dynamic pressure sensors, or other sensors which do not typically have flying-lead type connections.

The 70751B implements the following features:

- Four BNC signal inputs
- Software-enabable IEPE power (+24v) for inline-powered sensors.
- Four 4-20mA outputs to connect to existing control systems or HMIs
- Four SPDT relays which can be independently configured for maximum flexibility

7075IB – COMBUSTION PROTECTION IO MODULE



7075IB – COMBUSTION PROTECTION IO MODULE

DYNAMIC INPUTS (ANALOG/SPEED)

Number of Channels	4
Channel Type	Dynamic Voltage Signal or Input on Any Channel.
Connector (electrical)	BNC (75Ω) Center Pin: Dynamic Input Signal Outer Shell: Common for Dynamic Input Signal
Connector (mechanical)	BNC 1 Channel per BNC

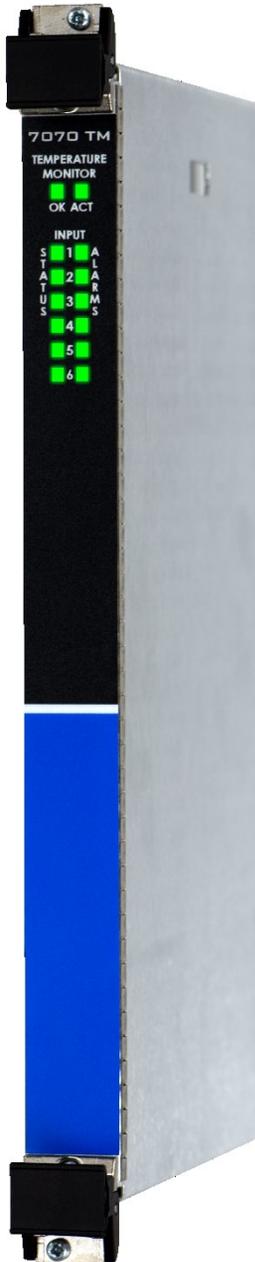
RELAY OUTPUTS

Function	Alarm Fault Output
Connector (electrical)	Removable Terminal Block (2 channels per Block) NO: De-Energized Relay Open Contacts COM: Relay Common Pole NC: De-Energized Relay Closed Contacts
Connector (mechanical)	Removable Terminal Block Maximum Gauge: 10AWG Stranded Plug pin Pitch: 7.62mm Connection Type: Screw Clamp
Relay Type	1 Form C, SPDT
Contact Rating	6A @ 28Vdc or 300Vac
Max Switched Power	180 W or 1800VA
Max Switched Current	6A
Max Switched Voltage	150Vdc or 300VAC
Relay Normal State	Normal-Energize or Normal-De-Energize Through Software

RECORDER (4-20mA) OUTPUTS

Connector (electrical)	Removable Terminal Block (4 loop pairs per Terminal Block) AO: 4-20mA Loop Source COM: 4-20mA Loop Return (Non-Isolated outputs with shared commons)
Connector (mechanical)	Removable Terminal Block Maximum Gauge: 10 AWG Stranded Plug pin Pitch: 7.62 mm Connection Type: Screw Clamp

7070TM – TEMPERATURE MONITOR MODULE

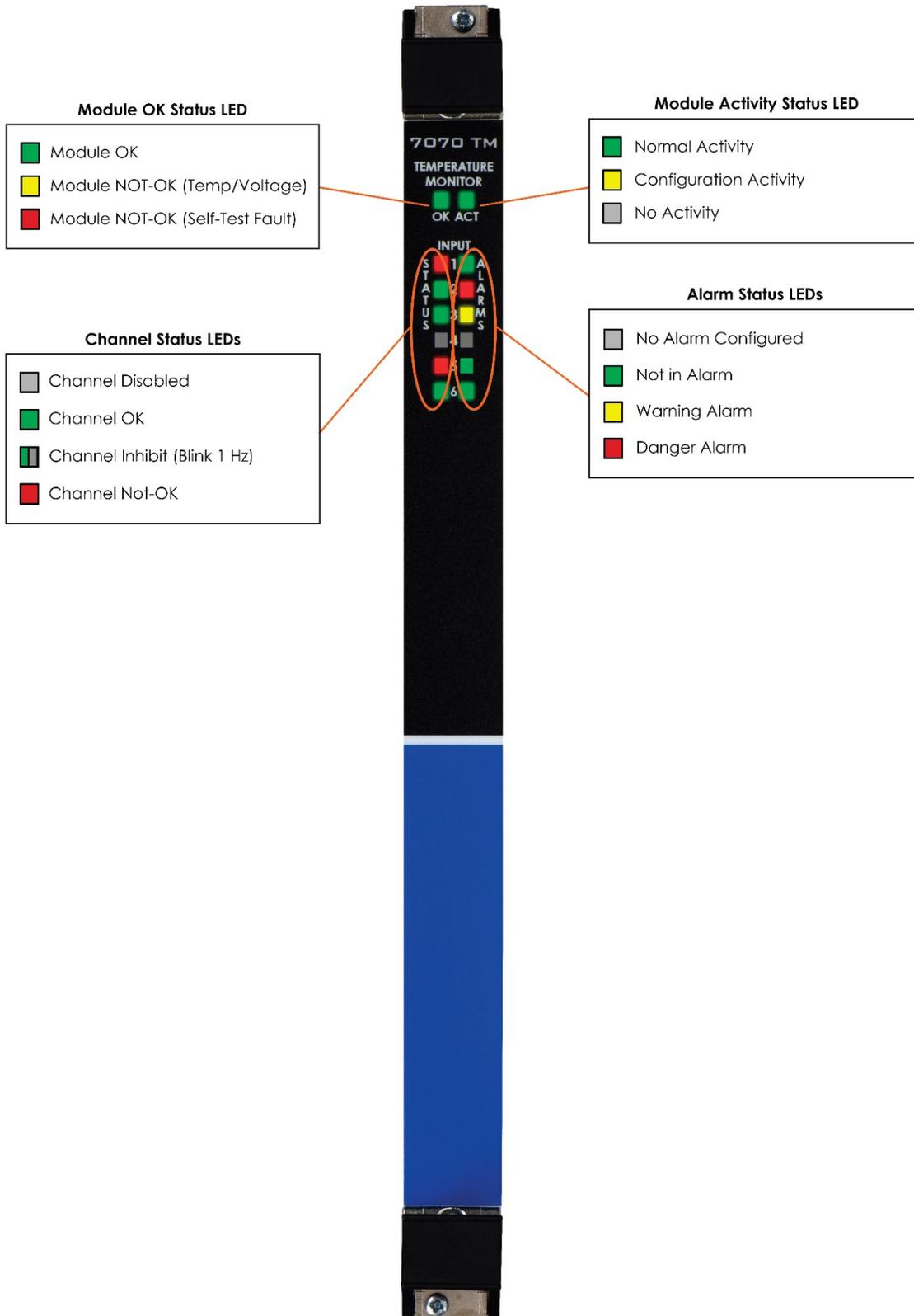


The 7070TM module processes six temperature sensor inputs, including Resistance Temperature Detector (RTD), Thermocouple (TC), and Thermistors. Flexibility is inherent in the design with the ability to configure any input channel for any type of supported temperature sensor. By utilizing modern digitizing circuitry, the 7070TM offers laboratory level accuracy in an industrial package.

The 7070TM implements the following features:

- 2-wire, 3-wire, and 4-wire RTD support, including PT-100, CU-10, and NI-120.
- Type J, K, E, and T Thermocouple
- +/-1°C accuracy
- Automatic Burn Out, Short-circuit and fault detection
- Front-panel multi-colored LEDs indicating sensor status or faults

7070TM – TEMPERATURE MONITOR MODULE



7070TM – TEMPERATURE MONITOR MODULE

FRONT PANEL

LED Indicators	Module OK, Module Activity, Channel Status, Alarm Status. 3-Color LED (Green / Yellow / Red) For Easy At-A-Glance Status Indication.
Channel Status	Indicates Channel Condition Including Channel OK / Was Not-OK /Not-OK, Trip Multiply, Alarm Inhibit, etc.
Alarm Status	Shows Highest Alarm Currently Active, Indicates Unacknowledged Highest Alarm, Uses Green for Below-Alarm, Yellow for Alert / Alarm 1, Red for Danger / Alarm 2.

CHANNEL SPECIFICATIONS

Number of Channels	6
Sensor Types	Thermocouple, RTD, Thermistor
Connector Type	Terminal Strip
Terminal Specifications	Three removable 10-Pin terminal plugs, two channels per terminal plug Screw-Clamp, 16AWG max, 3.81mm Pitch Plug pinout (One plug, Channels 1 and 2 shown): 1A, 1B, 1C, 1D, SHLD, 2A, 2B, 2C, 2D, SHLD
Units	°C or °F
Accuracy	+/- 1°C

INPUT SENSOR SPECIFICATIONS

RTD	
Types	PT-100 (Platinum 100 Ohm) CU-10 (Copper 10 Ohm) NI-120 (Nickel 120 Ohm)
Wiring	2, 3, and 4 wire
Standards (Alpha)	American (0.003911) European (0.003850) Japanese (0.003916) ITS-90 (0.003926)
THERMOCOUPLE	
Types	J, K, E, T

7070TM – TEMPERATURE MONITOR MODULE

MEASUREMENT SPECIFICATIONS

Measurement Type	Direct Composite (Group Average) Differential (Direct – Group Average)
Measurement Scaling	Maximum, Minimum, Clamp Value

ALARM SETTINGS

Alarm Types	Danger Alert
Boolean Logic	AND, OR, NOT
Threshold Types	Upper Lower In-Range Out-Of-Range
Latch Types	Latching and Non-Latching
Alarm Delay Time	0 to 600 Seconds

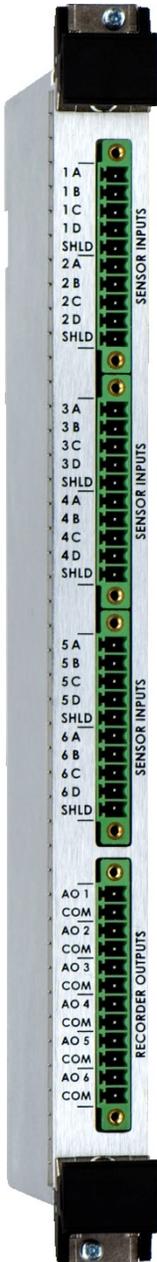
RECORDER (4-20mA) OUTPUTS

Connector Type	One removable 12-Pin terminal plug, six channels per terminal plug Screw-Clamp, 16AWG max, 3.81mm Pitch Plug pinout: AO 1, COM, AO 2, COM, AO 3, COM, AO 4, COM, AO 5, COM, AO 6, COM AO X = 4-20mA Loop Source COM = 4-20mA Loop Return 2 mA Channel Not Ok Configurable
Output Value	Any On-Card Measurement Value
Type	Non-Isolated Output, All Outputs Share Common
Resolution	10 uA
Update Rate	Typical 10 msec (Process Loading Dependent)
Loop Supply Voltage	+24 Vdc Supplied Internally
Loop Resistance (external load)	800 Ohm Maximum

PHYSICAL SPECIFICATIONS

Dimensions	10" x 6.5" x .8"(H x D x W)
Rack Space	1 slot (front and rear)

7075I – MACHINERY PROTECTION INTERFACE CARD

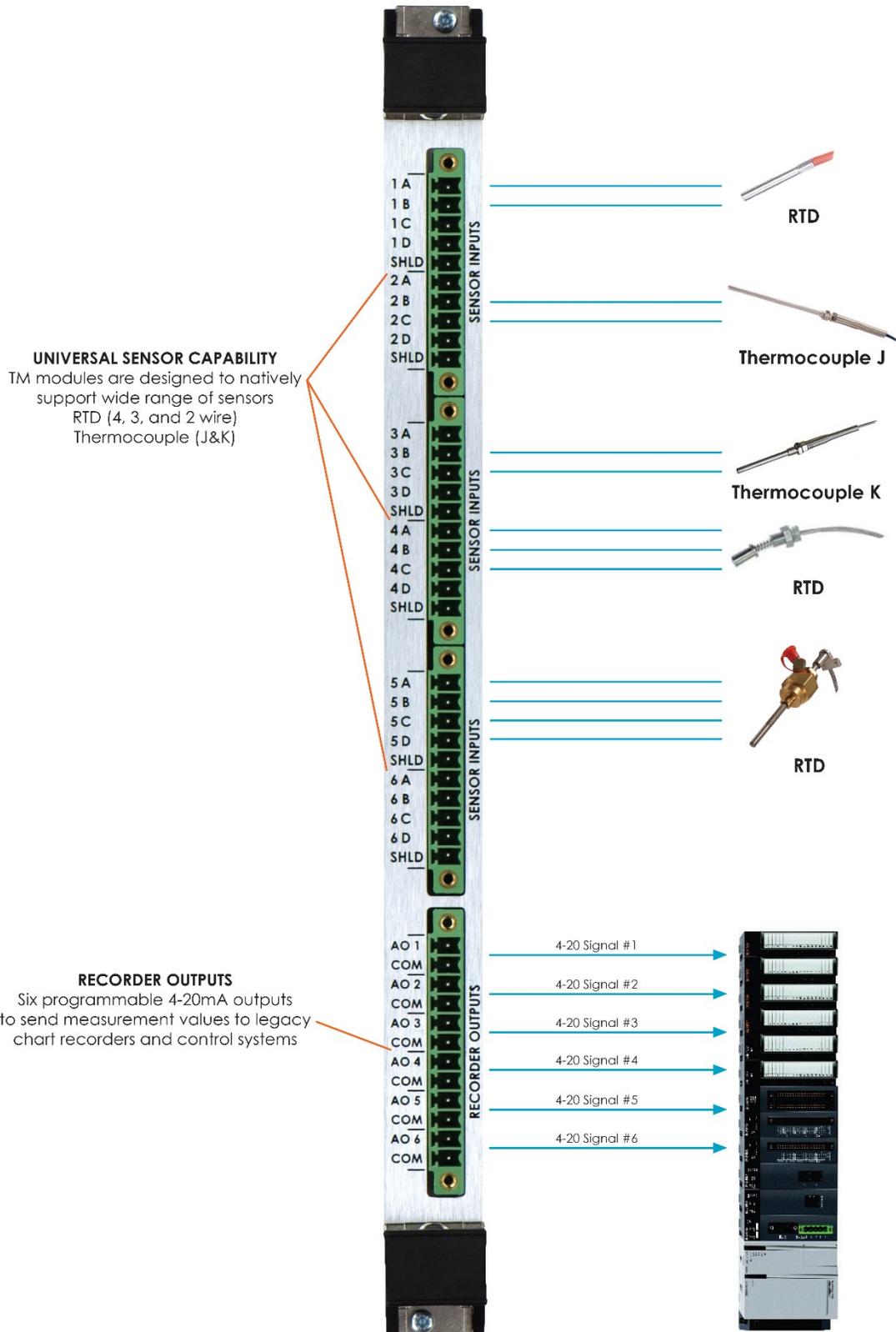


The 7075I is the field interface card for the 7070TM Temperature Monitor module. This card provides the circuit protected field wiring termination for up to six temperature sensor inputs and six 4-20mA outputs. The flexible terminal plugs accommodate the different sensor types supported by the 7070TM.

The 7075I implements the following features:

- Six temperature sensor inputs
- Six 4-20mA outputs
- Protected input circuitry with integrated shield landing terminals

7075I – MACHINERY PROTECTION INTERFACE CARD



7075I – MACHINERY PROTECTION INTERFACE CARD

DYNAMIC INPUTS (ANALOG/SPEED)

Number of Channels	4
Connector (electrical)	Removable Terminal Block (2 Channels per Terminal Block) PWR: Sensor Power User configurable for + or – 24Vdc @ 14mA max COM: Common for Dynamic Signal Input and Sensor Power SIG: Dynamic Signal Input User configurable IEPE, 3.3mA +/- .3mA @+24Vdc SHLD: Field Wiring Shield (referenced to chassis ground)
Connector (mechanical)	Removable Terminal Block Maximum Gauge: 16AWG Stranded Plug pin Pitch: 3.81mm Connection Type: Screw Clamp

RECORDER (4-20mA) OUTPUTS

Connector (electrical)	Removable Terminal Block (4 loop pairs per Block) AO: 4-20mA (Provides Loop Power) COM: 4-20mA Loop Return (Non-Isolated shared common)
Connector (mechanical)	Removable Terminal Block Maximum Gauge: 10 AWG Stranded Plug pin Pitch: 7.62 mm Connection Type: Screw Clamp



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