Intelligent Transmitters

Intelligent Alarms

Math/Computation

IntelliPack® Series

Introduction

Intelligent Transmitters

Intelligent Alarms

Math/Computation

Technical Documentation

	801T	811T	841T	851T	801A	811/812A	822A	832A	892/894M	895/896M
PRIMARY FUNCTIONS										
Isolated transmitter	x	x	x	x					x	x
Single channel alarm	x	x	x	x	x	x				
Dual channel alarm						x	x	x		
Dual channel math/computation									x	x
Quad channel math/computation									x	
POWER CONFIGURATION										
DC-powered	x	x	x	x	x	x	x	x	x	x
INPUTS										
DC voltage/current input		x				x			x	x
DC millivolt input	x			x	x		x			
Thermocouple input	x				x		x			
RTD input	x				x			x		
Resistance input	x				x			x		
Frequency input			x							
AC current input (requires external sensor)		x				x			x	x
Strain gauge/load cell				x						
OUTPUTS										
DC current	x	x	x	x					x	
DC voltage	x	x	x	x					x	
Frequency/pulse/pulse-width modulation										x
SPDT or SPST relay	x	x	x	x	x	x	x	x		x
DPDT relay					x	x				

Signal Conditioning

IntelliPack® Intelligent Transmitters, Alarms, and Math Modules

The IntelliPack series is a high-performance line of multi-function I/O modules. IntelliPack units feature universal input/output ranges and an intelligent microcontroller to provide extreme flexibility and powerful signal conditioning capabilities.

Since each IntelliPack module supports many I/O configurations, you can handle a broad range of applications with only a few models. Now you can reduce your spare inventory stock and still remain covered in an emergency.

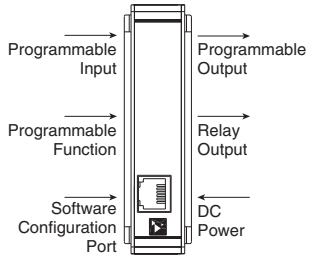
Windows® 95/98/2000/ME/NT/XP® software helps you quickly configure IntelliPacks for your application. With just a few mouse clicks, you can select your desired input/output ranges and other operating parameters from a list of available options. And if your operating requirements change, a simple reconfiguration lets you adapt in a hurry with minimal downtime.

Once configured, IntelliPacks are very easy to adjust in the field with standard calibrators (no PC required). Front panel push buttons simplify changes to setpoints, deadbands, and zero/full-scale values. LEDs clearly indicate the status and mode of operation.

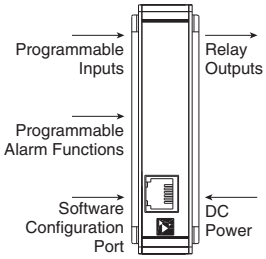
Special Features

- **Universal I/O ranges** cover a wide range of applications to reduce stock inventories.
- **Windows 95/98/2000/ME/NT/XP software** configuration simplifies IntelliPack module setup.
- **Push button field calibration** makes routine maintenance easy without a PC.
- **Internal microcontroller** provides intelligent signal processing capabilities.
- **Quick-disconnect terminals** facilitate installation and removal of I/O modules.
- **Field diagnostics** enhanced with software minimize downtime.

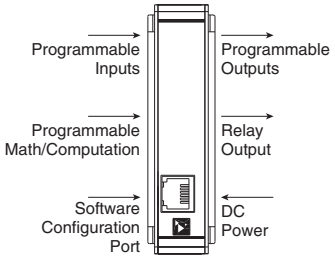
IntelliPack Transmitter



IntelliPack Alarm



IntelliPack Math/Computation Module



Transmitters .....(Page 86)

IntelliPack transmitter units convert sensor inputs to isolated process current or voltage output signals. Each unit accepts a variety of input and output ranges to support a broad range of applications. An optional relay output enables local alarms. Plus, the internal microcontroller can perform many signal processing and transfer functions.

Input

- Thermocouple/RTD/ohms/DC millivolts
- DC voltage/current
- Frequency/pulse counter
- AC current

Output

- Universal DC voltage/current
- SPDT relay

Functions

All functions are standard

- Signal linearizer
- Square root computation
- Signal average computation
- Pulse counting
- Limit alarm

Alarms .....(Page 100)

IntelliPack alarm units monitor sensor inputs and provide relay actuation if conditions exceed user-defined limits. An internal microcontroller provides signal processing and logic functions, normally found only in expensive controllers, for a variety of intelligent alarm functions. Dual relay units support two different alarm functions at the same time.

Inputs

- Thermocouple/RTD/ohms/DC millivolts
- DC voltage/current
- AC current

Outputs

- One DPDT relay or two SPDT relays

Functions

All functions are standard on every alarm unit.

- Limit and window (band-pass) alarm
- Deviation alarm
- Rate-of-change alarm
- On/off controller
- Peak/valley signal detection

Math Modules .....(Page 112)

IntelliPack math modules perform a variety of complex mathematical computations on up to four input signals and provide a DC or frequency output signal that represents the calculated result. Typical applications include calculating sums, deltas, averages, flow rates, volumes, and tracking minimum/maximum values. Equations are entered using a freeform format, the same as in most popular spreadsheet programs.

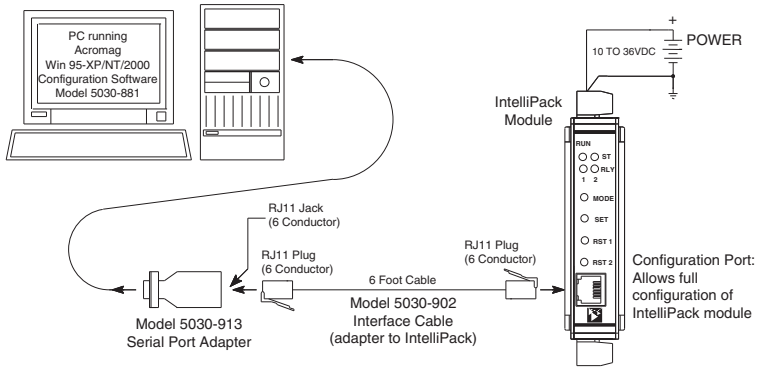
Input and Output Ranges

- Universal DC voltage/current
- Frequency, pulse, PWM outputs

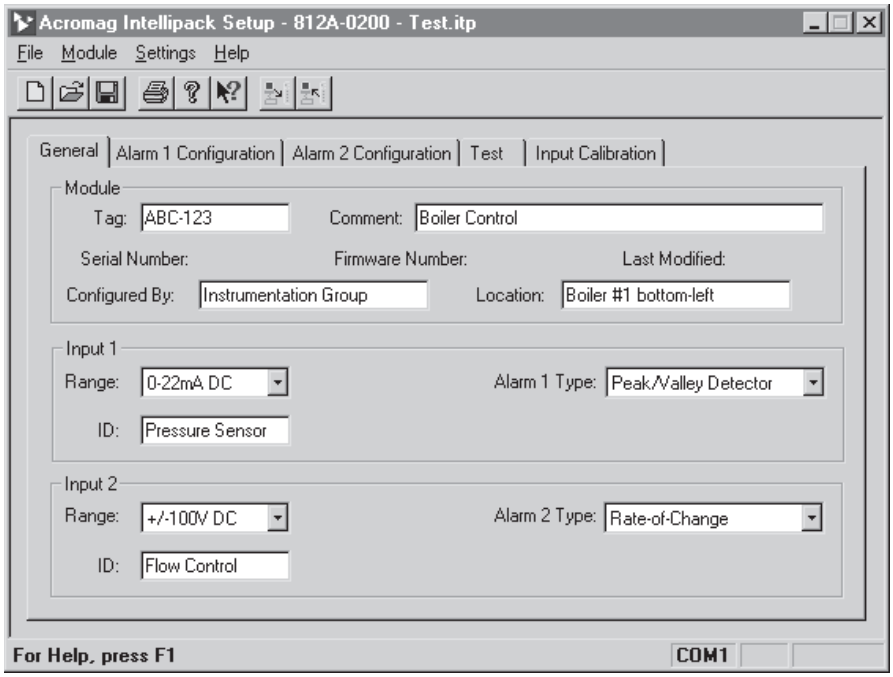
Functions

- Add, subtract, multiply, divide
- Square root, exponential, logarithmic
- Absolute value, minimum/maximum
- High/low selector, track and hold
- Trigonometric (sine, cosine, tangent)
- Conditional arguments (if, then, and, or)

Configuration Diagram



After the initial software configuration, a PC is no longer required. Field calibration is easily handled with the IntelliPack's push-buttons, status LEDs and a standard field calibrator.



Typical software configuration screen. Data is uploaded from the IntelliPack module.

Fast Installation

Step 1 Run configuration software offline to select desired operating parameters.

Step 2 Print configuration or save to disk.

Step 3 Connect PC to IntelliPack and download configuration data.

Step 4 Disconnect PC and install IntelliPack module in the field.

Step 5 Optional. Calibrate in field using push-buttons on front panel.

Easy Software Configuration

Acromag's configuration software is the key to the IntelliPack's easy-to-use operation. The software employs the friendly Windows 95/98/2000/ME/NT/XP interface with pull-down selection menus and fill-in-the-blank fields to speed you through a few brief configuration screens. No programming is required.

An adapter plugs into the serial port of your computer. It serves as an isolated interface between the IntelliPack and the PC. A cable with RJ11 phone-style plugs at each end links the adapter to the IntelliPack's serial port. The software, adapter, and cable are sold as a kit (Model 800C-SIP) for easy ordering.

Once connected, the software reads the IntelliPack's non-volatile memory to determine the unit type and loads the appropriate configuration form with several property pages. As you select the input range and alarm function on the general property page, the other pages are dynamically customized to speed you through the procedure. After you select the operating parameters, the configuration is downloaded and stored in the IntelliPack's memory. The configuration is also saved to a file for subsequent downloading to other modules or for quick modifications. This capability saves you valuable downtime and archives your settings.

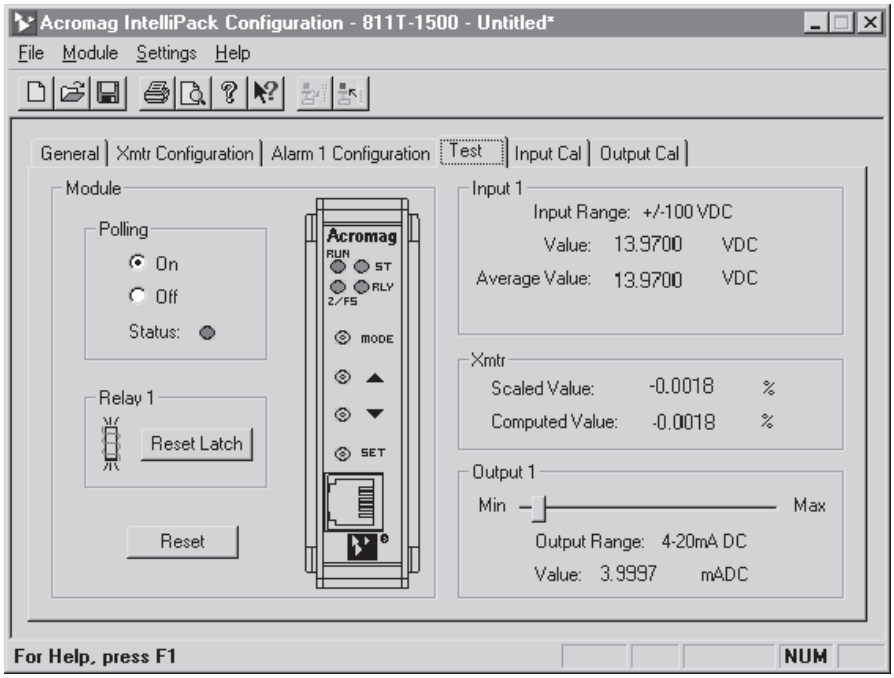
After you complete the configuration, the software provides a detailed printout to document your application.

Software Diagnostics

The configuration software also shows you the current status of your IntelliPack module. A test screen (shown at right) indicates the current input signal value and the averaged value. The status of the relay and output signal are also displayed.

You can override the output for 10 seconds to verify the system is responding properly. The screen's IntelliPack diagram has representative LEDs to help you detect any bulb failures and verify proper operation.

On alarm modules, you can reset latched relays in software by clicking the screen's reset button with your mouse.



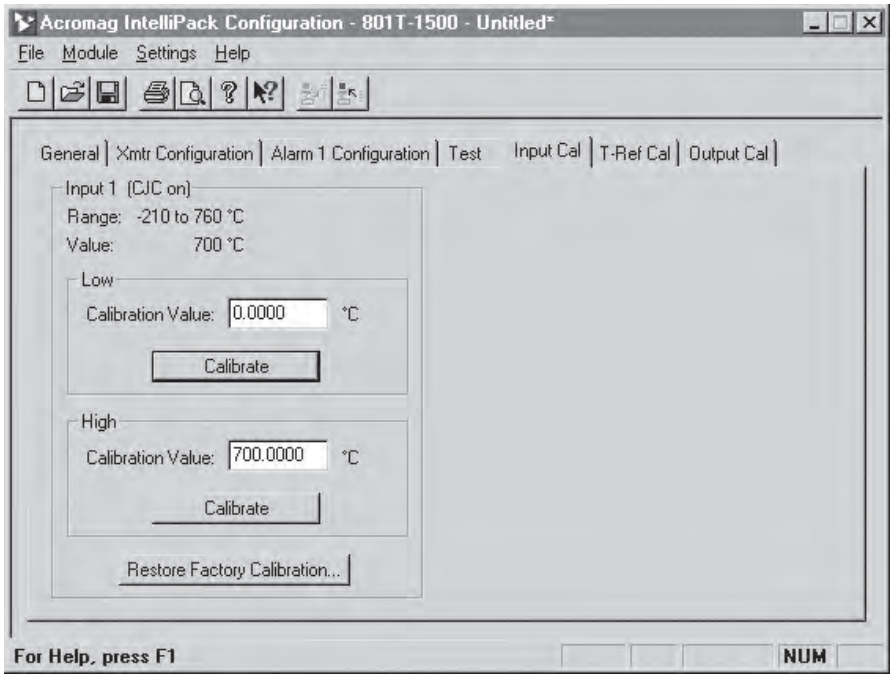
Quickly test or monitor your IntelliPack module with a software screen that displays all current values.

Software Calibration

The IntelliPack's configuration software makes calibrating your transmitters and alarms very easy. You can upload your IntelliPack's current calibration and quickly verify the settings or make changes on the input, output and thermocouple reference junction calibration property sheets.

The output calibration window has a slider control that you can drag with your mouse. This slider allows you to adjust the output current or voltage signal independent of the input signal.

If a unit is miscalibrated or you make a mistake, you can instantly restore the factory calibration settings. The original values are displayed on the screen.

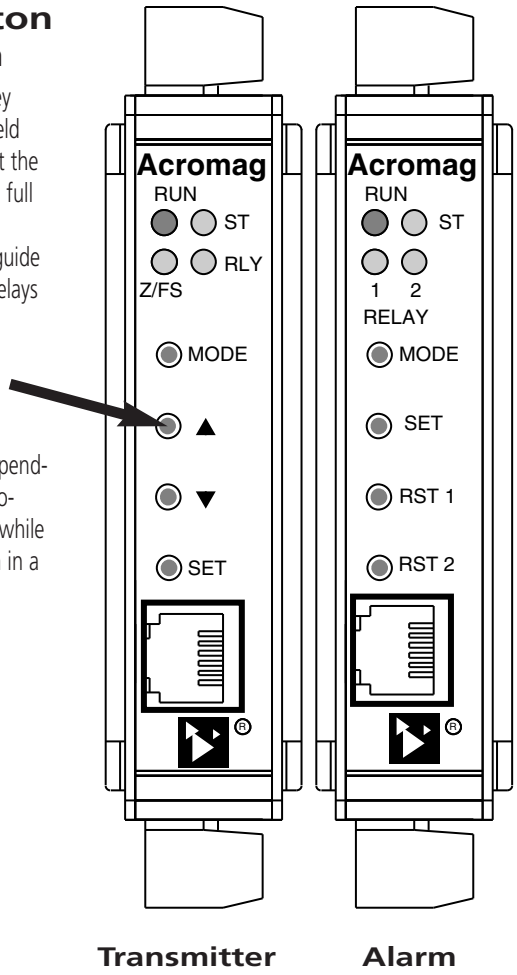


Easily set calibration values by simply typing in the values or restore original factory settings instantly.

Simple Push-Button Field Configuration

After the initial software configuration, key functions may be reprogrammed in the field without a PC. Push-buttons let you adjust the IntelliPack's setpoint, deadband, zero, and full scale signal values with conventional field calibrators. LEDs indicate the mode and guide you through a few short steps. Latched relays may also be reset in the field.

With IntelliPacks, zero and span adjustments are one-step operations. Unlike many potentiometer-based instruments, IntelliPack zero/span adjustments are independent and non-interactive. The internal microprocessor holds the zero setting constant while the span is adjusted for precise calibration in a single iteration.



Transmitter Alarm

The following tables describe push-button and LED functions for alarm and transmitter module types.

Push-Buttons (Alarms)

Mode: Push to enter field configuration mode.

Set: Accepts input data during field calibration.

RST 1: Resets a latched alarm for relay 1.

RST 2: Resets a latched alarm for relay 2.

Push-Buttons (Transmitters)

Mode: Push to enter field configuration mode.

Set: Accepts input data during field calibration.

▲: Calibrates (increases) the output signal.

▼: Calibrates (decreases) the output signal.

LED Indicators (Alarms)

Run (Green) - Indicates power applied.
Flashes when performing diagnostics.

ST (Yellow) - Status LED flashes to indicate input is out of range or a sensor break has been detected.

Relay 1 Alarm (Yellow) - Constant ON indicates alarm condition for relay 1.

Relay 2 Alarm (Yellow) - Constant ON indicates alarm condition for relay 2.

LED Indicators (Transmitters)

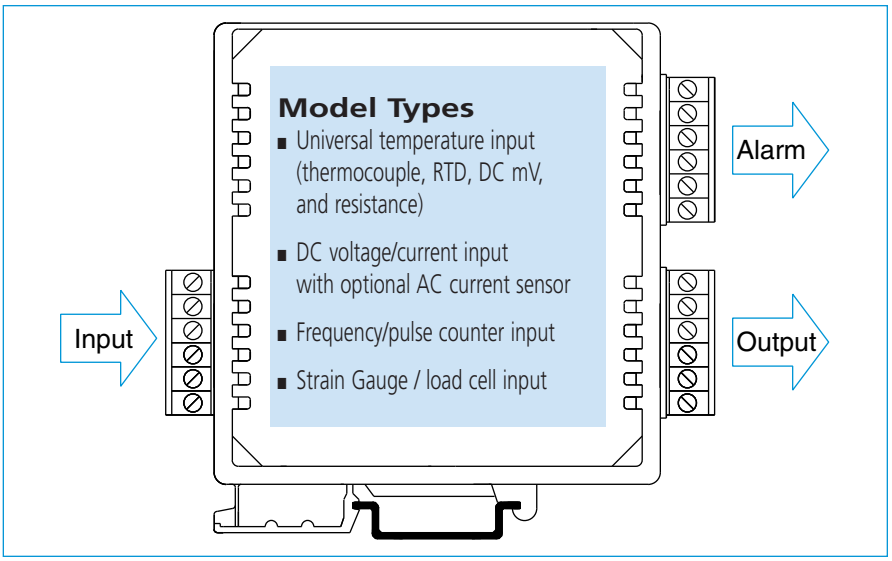
Run (Green) - Indicates power applied.
Flashes when performing diagnostics.

ST (Yellow) - Status LED flashes to indicate input is out of range or a sensor break has been detected.

Z/FS (Yellow) - Lights or flashes to indicate the input zero or full-scale value is being calibrated.

RLY (Yellow) - Lights to indicate alarm condition or relay setpoint adjustments are being made. Flashes for deadband adjustments.

Transmitter w/alarm



800T Units

Models

801T: Universal temperature input (thermocouple, RTD, DC mV, and resistance)

811T: DC voltage/current input with optional AC current sensor

841T: Frequency/pulse counter input

851T: Strain gauge / load cell input

IntelliPack transmitters isolate and convert sensor inputs to noise-free, proportional DC current or voltage output signals. An optional relay output adds a local limit alarm function.

Each unit offers a selection of input and output ranges, as well as several signal conditioning options. This flexibility enables a single IntelliPack to handle a broad range of applications. As your needs change, you can easily reconfigure the unit for different ranges or functions.

The internal microprocessor provides several computation functions. A linearizer function lets you linearize/characterize the input signal with custom break points. The averaging function outputs a signal that is proportional to the average of the previous "n" samples, where n is user-defined. IntelliPacks can also generate an output signal that is proportional to the square root of the input signal. Other functions are possible (consult factory).

Setup is very easy. IntelliPack modules are quickly configured with the user-friendly Windows software program. Field adjustments are simple with the module's front-panel push-buttons and status LEDs. Once configured, IntelliPacks operate independent of any host computer.

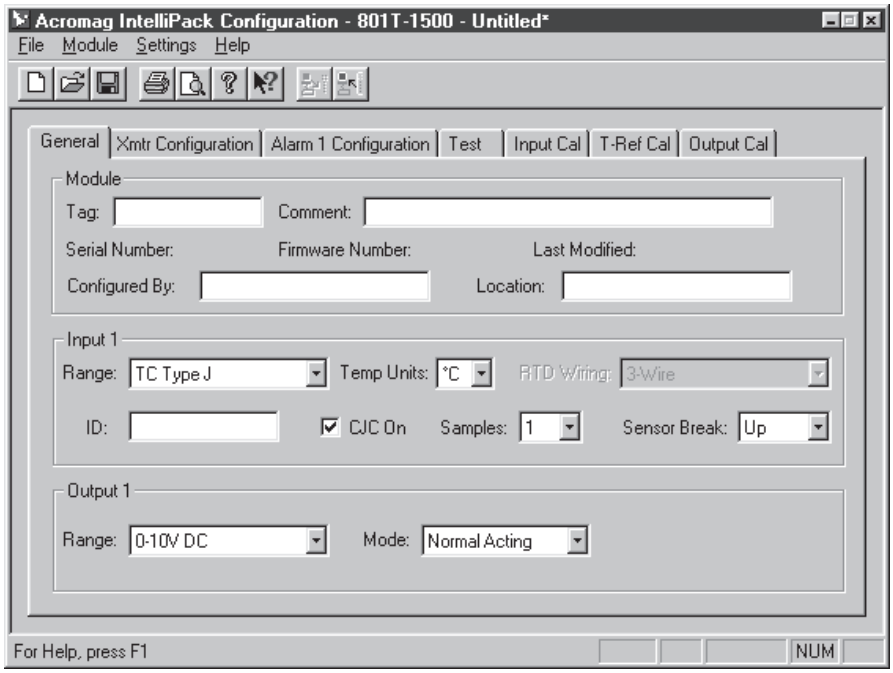
Special Features

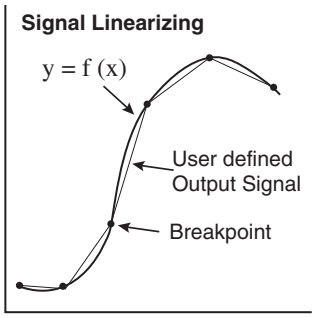
General operation

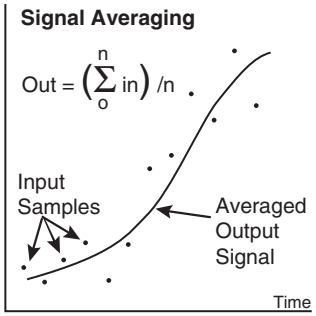
- **Advanced microcontroller** has integrated, downloadable flash memory and EEPROM for intelligent signal processing.
- **Windows 95/98/ME/NT/XP/2000 software** configuration speeds setup and replacement.
- **Push-button reprogrammability** facilitates changes in the field without a host PC.
- **Plug-in terminal blocks** make module installation and removal easy.
- **Built-in self-diagnostic routines** operate upon power-up and during operation for easy maintenance and troubleshooting.
- **4-way optical isolation** separates input, output, power, and relay contacts from each other.
- **EMC compliant.** Ruggedized circuitry meets directives to provide increased transient immunity and low emissions.
- **Wide ambient temperature range** ensures reliable performance from -25 to 70°C.
- **Wide DC supply range** with diode-coupled reverse polarity protection is useful for redundant supplies and battery backup.

Transmitter Operation

- **Multi-purpose inputs** accept many signal types to reduce spare stock requirements.
- **User-programmable outputs** let you select and change ranges to meet your needs (0-1mA, 0-20mA, 4-20mA, 0-5V, 0-10V DC).
- **Intelligent signal processing functions** perform mathematical computations on the input signal for customized outputs.
  - signal linearization (25 breakpoints)
  - average signal computation
  - square root computation
  - pulse counter (frequency input)
- **High-resolution Sigma-Delta A/D converter** delivers high accuracy with low noise.
- **Relay output option** provides local limit alarm capability in addition to the DC current/voltage output signal.
- **High-power relays** switch voltages up to 230V AC at currents up to 5A.
- **User-programmable relay settings** let you customize the alarm operation.
  - high or low limit setpoint
  - automatic or latching alarm reset
  - failsafe or non-failsafe operation
  - relay delay to filter transient signals
- **Input excitation supply** provides power for a two-wire transmitter or a relay input.







After the initial software configuration, a PC is no longer required. Field calibration is easily handled with the IntelliPack's push-buttons, status LEDs and a standard field calibrator.

Intelligent Transfer Functions

IntelliPack transmitters support the signal processing functions listed below. The functions are easily selected via the configuration software. The next page shows sample screens for the following applications.

Signal Linearizing

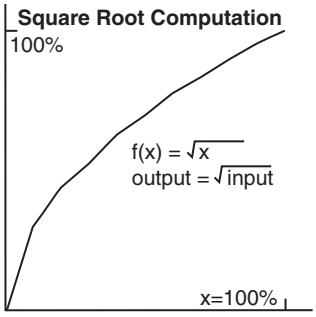
IntelliPacks let you define a transfer function where the output is a function of an equation or a complex curve. The input signal is characterized using straight line approximation with a user-defined table of up to twenty-five breakpoints. Typical applications include linearizing analyzer output, flow rates, transducer non-linearities, tank characterization, and logarithmic equations.

Signal Averaging

This function provides an output signal that is a run-time average of the input signal. Input data samples are taken every 100mS. The output is computed using a user-defined number of the previous "n" samples. Applications include temperature and level measurements subject to electrical transients, air currents, agitation, and vibration.

Square Root Computation

IntelliPacks can also output a signal that is proportional to the square root of the input signal. A common use involves flowmeters where the flow rate equals the square root of the measured differential pressure. In this case, the IntelliPack output is equivalent to a linear flow rate signal that is ideal for interfacing to a standard display device.

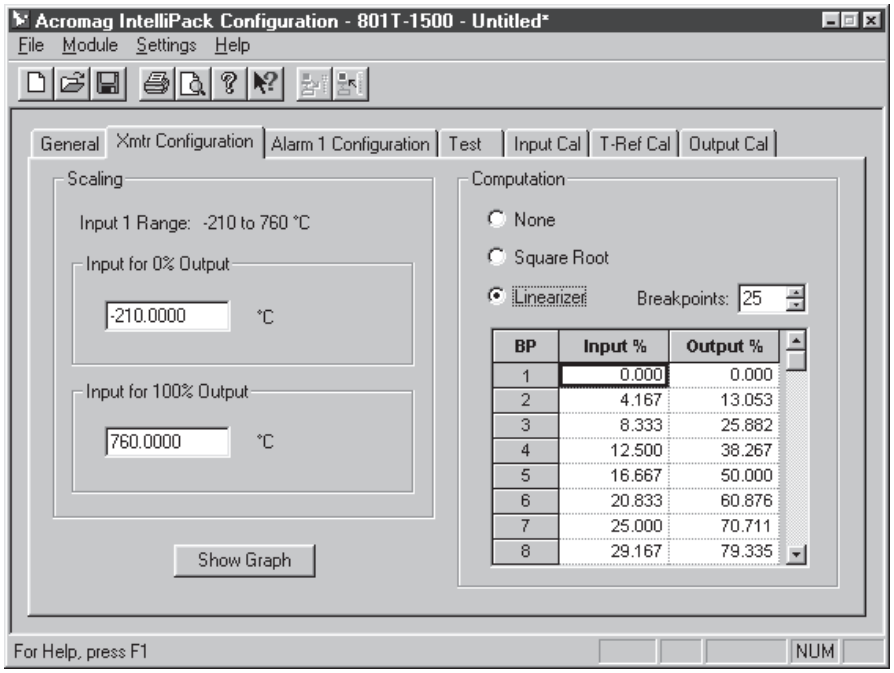


Software Configuration Examples

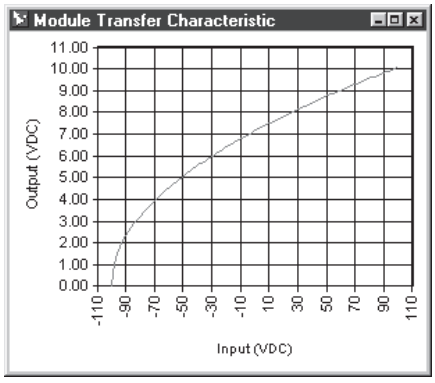
Square Root Computation

Linearizer/ Characterizer

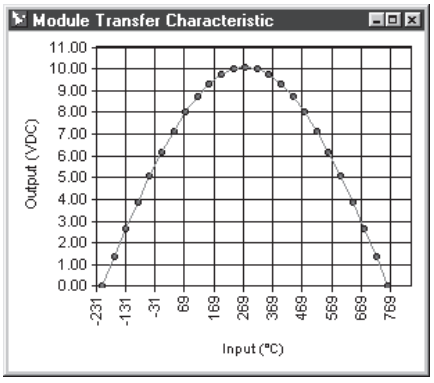
Proportional/ Inverse



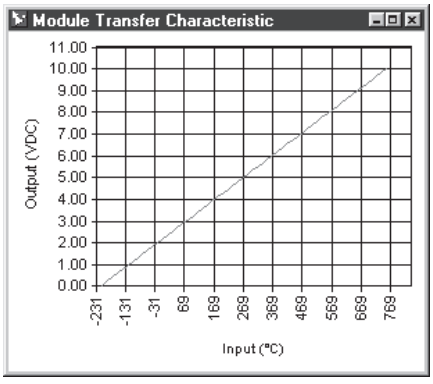
Transmitter configuration property sheet.



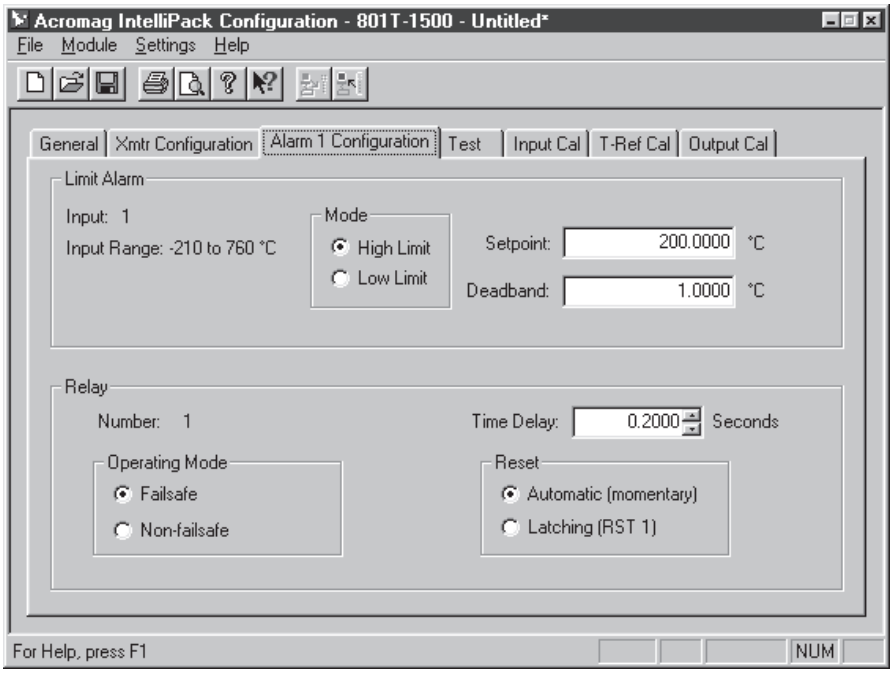
Square root transfer function graph.



Customizable linearizer transfer function graph.

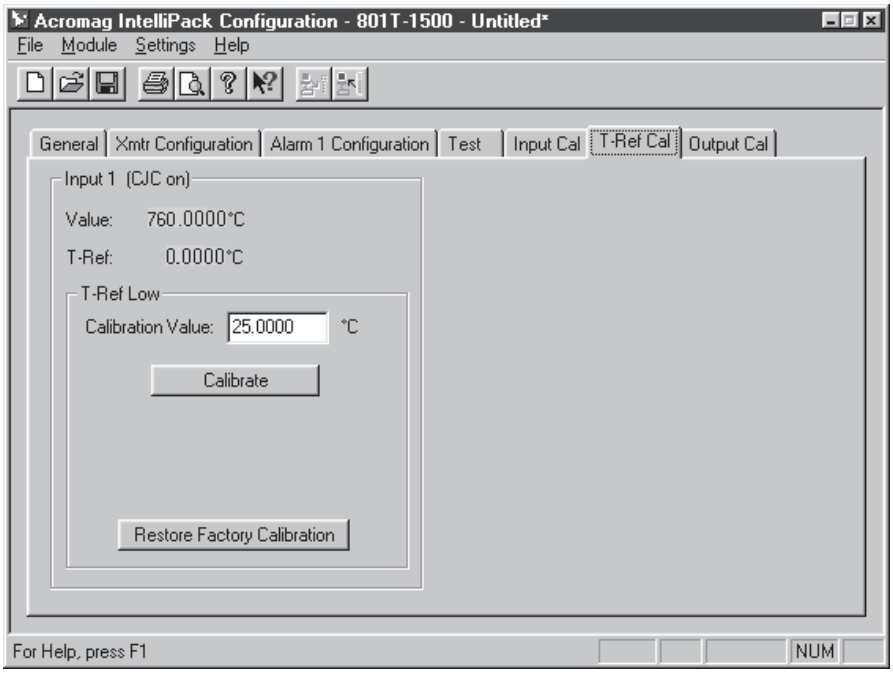


Proportional or inverse output graph.



Limit alarm property sheet.

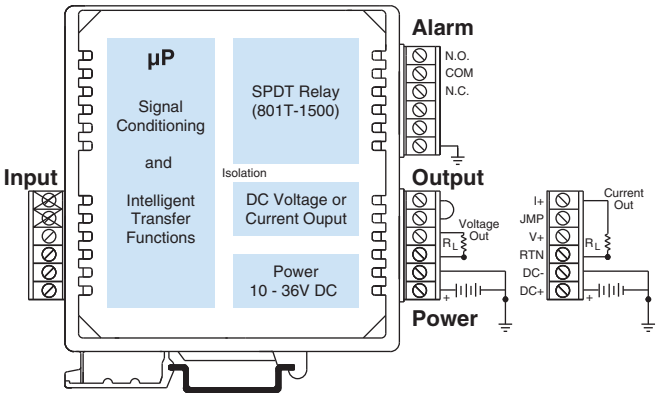
Relay Output Limit Alarm Configuration



Thermocouple reference calibration property sheet.

Thermocouple Reference Calibration

Transmitter w/alarm



801T Transmitters

Thermocouple, RTD, Millivolt, and Resistance Input

Models
801T-0500: Universal temperature transmitter
801T-1500: Transmitter with limit alarm

Input Ranges
TC types: J, K, T, R, S, E, B, N
Millivolt: ±15.625mV to ±1.0V DC
RTD: 100 ohm Pt, 120 ohm Ni, 10 ohm Cu
Resistance: 0 to 500 ohms

Output Ranges
0 to 1mA, 0 to 20mA, 4 to 20mA DC
0 to 5V, 0 to 10V DC

Limit Alarm
SPDT electro-mechanical relay (-1500 unit only)

Power Requirement
10 to 36V DC

Approvals
CE marked. UL, cUL listed.

Description

These transmitters isolate and convert sensor inputs to noise-free, proportional DC current or voltage output signals. An optional relay output adds a local limit alarm function.

Each unit offers a selection of input and output ranges, as well as several signal conditioning options. This flexibility enables a single IntelliPack to handle a broad range of applications. As your needs change, you can easily reconfigure the unit for different ranges or functions.

Setup is very easy. IntelliPack modules are quickly configured with the user-friendly Windows software program. Field adjustments are simple with the module's front-panel push-buttons and status LEDs. Once configured, IntelliPacks operate independent of any host computer.

Special Features

- High-resolution Sigma-Delta A/D converter delivers high accuracy with low noise.
- Advanced microcontroller provides intelligent signal processing power for linearization, averaging, and square root computations.
- Windows 95/98/ME/NT/XP/2000 software configuration speeds setup and replacement.
- Multi-purpose inputs and outputs reduce spare stock requirements.
- Relay output option provides local limit alarm capability.

Performance

General Input

Analog to Digital Converter (ADC)
16-bit Σ–Δ A/D converter.

Resolution
±0.005% of span or 0.1°C.

Ambient Temperature Effect
Better than ±0.005% of input span per °C or ±1µV, whichever is greater.

Noise Rejection
Normal Mode: Better than 40dB @ 60Hz.
Common Mode: Better than 130dB @ 60Hz.

Input Response Time (for input step change)
Less than 200mS typical
to 98% of final output value.

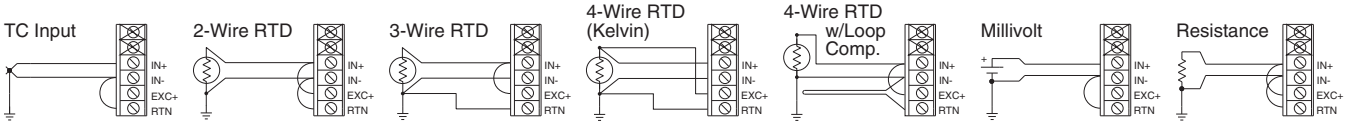
Input Overvoltage Protection
Bipolar Transient Voltage Suppressors (TVS).

Thermocouple Input

Thermocouple Input Ranges
Thermocouple type user configured. Signal linearization, cold-junction compensation, and open circuit or lead break detection are included.

TC	°C Range (°F Range)	Accuracy
J	-210 to 760°C (-346 to 1400°F)	±0.5°C
K	-200 to 1372°C (-328 to 2502°F)	±0.5°C
T	-260 to 400°C (-436 to 752°F)	±0.5°C
R	-50 to 1768°C (-58 to 3214°F)	±1.0°C
S	-50 to 1768°C (-58 to 3214°F)	±1.0°C
E	-200 to 1000°C (-328 to 1832°F)	±0.5°C
B	260 to 1820°C (500 to 3308°F)	±1.0°C
N	-230 to 1300°C (-382 to 2372°F)	±1.0°C

Thermocouple Break Detection
TC sensor failure can be configured for either upscale or downscale.



■ RTD Input

RTD Input Ranges
100 ohm Platinum, 120 ohm Nickel, or 10 ohm Copper; user-configured.

RTD	°C Range (°F Range)	Accuracy
Pt^1	-200 to 850°C (-328 to 1562°F)	±0.25°C
Pt^2	-200 to 850°C (-328 to 1562°F)	±0.25°C
Ni	-80 to 320°C (-112 to 608°F)	±0.25°C
Cu	-200 to 260°C (-328 to 500°F)	±1.00°C

Alpha: Pt1 (a = 1.3850), Pt2 (a = 1.3911), Ni (a = 1.6720), Cu (a = 1.4272).

2, 3, or 4-wire configurations supported. Module provides sensor excitation, linearization, lead-wire compensation, and sensor break detection.

RTD Excitation Current
1mA DC typical, all types.

RTD Lead-Wire Compensation
25 ohms per lead.

RTD Break Detection
RTD sensor failure can be configured for either upscale or downscale.

■ Millivolt Input

DC Millivolt/Voltage Input Ranges
±1.0V ±500mV ±250mV ±125mV ±62.5mV ±31.25mV ±15.625mV

Millivolt Accuracy
Better than ±0.05% of input span.

■ Resistance Input

Resistance Input Range
0 to 500 ohms.

Resistance Accuracy
±0.05 ohms.

■ Output (DC V/mA)

D/A Converter
16-bit Σ–Δ.

Current Output
Ranges: 0-1mA, 0-20mA, 4-20mA.
Compliance: 10V minimum (500 ohm load).
Accuracy: 0.025% of span.

Voltage Output
Ranges: 0-5V, 0-10V.
Compliance: 10mA maximum with short circuit protection. 1 ohm output impedance.
Accuracy: 0.025% of span.

Accuracy (overall input to output)
0.075% of span.

■ Output (Relay)

Relay
One SPDT electro-mechanical relay.

Relay Ratings (CSA ratings)
25V DC @ 5A.
120/240V AC @ 5A.

Relay Time Delay
Adjustable alarm delay of up to 25 seconds.

Contact Material
Silver-cadmium oxide (AgCdO).

Expected Mechanical Life
20 million operations.

■ Environmental

Ambient Temperature
Operating: -25 to 70°C (-13 to 158°F).
Storage: -40 to 85°C (-40 to 185°F).

Relative Humidity
5 to 95%.

Power Requirements
10 to 36V DC. 75mA @ 24V. 120mA @ 15V.

Isolation (optical)
4-way (input/output/relay/power).
1500V AC for 60 seconds or 250V AC continuous.

Radiated Field Immunity (RFI)
EN61000-4-3, EN50082-1.

Electromagnetic Field Immunity (EMI)
Less than ±0.25% of output span effect under the influence of electromagnetic fields from switching solenoids, commutator motors, and drill motors.

Electrical Fast Transient (EFT)
EN61000-4-4, EN50082-1.

Surge Withstanding Capability (SWC)
EN61000-4-5, EN50082-1.

Electrostatic Discharge (ESD)
EN61000-4-2, EN50082-1.

Radiated Emissions
EN50081-1 for Class B equipment.

Approvals
CE, UL listed (USA, Canada).
UL3121 - general product safety.

■ Configuration

Software Configuration
Units are fully programmable via the Windows 95/98/ME/2000/NT/XP IntelliPack Configuration Program. Configuration downloads from PC through EIA232 serial port using Acromag 800C-SIP kit.

Field Configuration
Output, zero/full-scale, relay setpoint and deadband are configurable via push-buttons and a standard calibrator.

LED Indicators
LEDs indicate power, status, calibration, and alarm.

■ Physical

Enclosure
Case: Self-extinguishing NYLON type 6.6 polyamide thermoplastic UL94 V-2 NEMA Type 1 enclosure.

Connectors (Removable Terminal Blocks)
Wire Range: AWG #14-22 (AWG #12 stranded only).

Printed Circuit Boards
Military grade FR-4 epoxy glass circuit board.

Dimensions
1.05W x 4.68H x 4.35D inches.
26.7W x 118.9H x 110.5D millimeters.

Shipping Weight
1 pound (0.45 Kg) packed.

■ Ordering Information

IMPORTANT: All IntelliPacks require initial software configuration (order 800C-SIP). See Note 1 below.

801T-0500
IntelliPack transmitter (TC/RTD/mV/resistance input).

801T-1500
Same as above, plus an SPDT relay output.

800C-SIP
Software Interface Package.
Only one kit is required for all IntelliPack models.
See diagram on Page 83 for included parts.

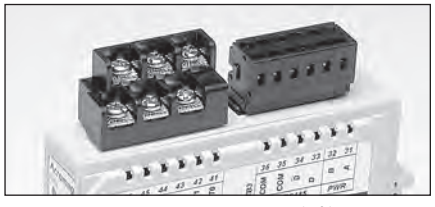
5034-225
USB-to-RS232 adapter. See page 121 for more info.

PS5R-D24
Power supply (24V DC, 2.1A).
See Power Supplies on Page 199.

TBK-B01
Optional terminal block kit, barrier strip style, 2 pcs. (Does not include terminal block for input wiring.)

TBK-S01
Optional terminal block kit, spring clamp style, 2 pcs. (Does not include terminal block for input wiring.)

NOTE 1: To order factory configuration, call Acromag for a configuration form which must accompany your order. Also, append "-C" to model number (example: 801T-1500-C). 800C-SIP kit is still recommended.



Optional terminal blocks: barrier strip (left) and spring clamp (right). Cage clamp terminal is standard.

811T Transmitters

DC Current, DC Voltage, and AC Current Input

Models
811T-0500: Universal DC input transmitter
811T-1500: Transmitter with limit alarm

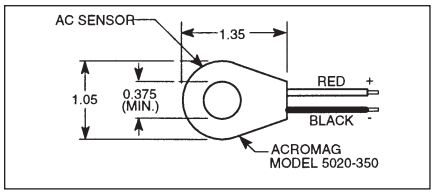
Input Ranges
DC Current: 0 to 22mA
DC Voltage: ±100V DC
AC Current: 0 to 20A AC (with external sensor)

Output Ranges
0 to 1mA, 0 to 20mA, 4 to 20mA DC
0 to 5V, 0 to 10V DC

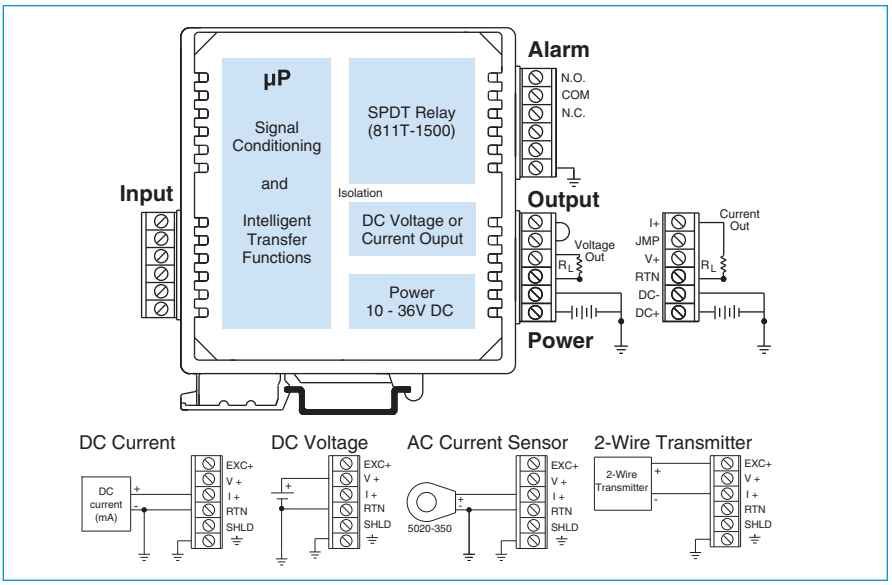
Limit Alarm
SPDT electro-mechanical relay (-1500 unit only)

Power Requirement
10 to 36V DC

Approvals
CE marked. UL, cUL listed.



AC Current Sensor Model 5020-350 (ordered separately)



Description

These transmitters isolate and convert sensor inputs to noise-free, proportional DC current or voltage output signals. An optional relay output adds a local limit alarm function.

Each unit offers a selection of input and output ranges, as well as several signal conditioning options. This flexibility enables a single IntelliPack to handle a broad range of applications. As your needs change, you can easily reconfigure the unit for different ranges or functions.

Setup is very easy. IntelliPack modules are quickly configured with the user-friendly Windows software program. Field adjustments are simple with the module's front-panel push-buttons and status LEDs. Once configured, IntelliPacks operate independent of any host computer.

Special Features

- High-resolution Sigma-Delta A/D converter delivers high accuracy with low noise.
- Advanced microcontroller provides intelligent signal processing power for linearization, averaging, and square root computations.
- Windows 95/98/ME/NT/XP/2000 software configuration speeds setup and replacement.
- Multi-purpose inputs and outputs reduce spare stock requirements.
- Relay output option provides local limit alarm capability.

Performance

General Input

Analog to Digital Converter (ADC)
16-bit Σ–Δ A/D converter.

Ambient Temperature Effect
Better than ±0.005% of input span per °C or ±1μV, whichever is greater.

Noise Rejection
Normal Mode: Better than 40dB @ 60Hz.
Common Mode: Better than 100dB @ 60Hz.

Input Response Time (for input step change)
Less than 100mS typical
to 98% of final output value.

Input Overvoltage Protection
Bipolar Transient Voltage Suppressors (TVS).

DC Current Input

DC Current Input Range (100% rangeable)

Input Ranges	Resolution
0 to 22mA DC	757nA
0 to 5mA DC	189nA

DC Current Input Impedance
24.9 ohms.

Excitation Supply (for 2-wire instruments)
+15V DC at 24mA maximum.

DC Current Input Accuracy
Better than ±0.05% of input span.

continued on next page

■ DC Voltage Input

DC Voltage Input Ranges (100% rangeable)

Input Ranges	Resolution
±100V DC	3.77mV
±50V DC	1.88mV
±25V DC	942µV
±12V DC	471µV
±6V DC	236µV
±3V DC	118µV

Input impedance
Greater than 500K ohms.

DC Voltage Input Accuracy
Better than ±0.05% of input span.

■ AC Current Input

AC Current Input Range (optional)
An optional external AC current sensor is required to monitor AC current signals (Model 5020-350).

AC Current Range	Primary Turns
0 to 20A AC	1
0 to 10A AC	2
0 to 5A AC	4
0 to 2A AC	10
0 to 1A AC	20

AC Current Input Accuracy
Better than ±0.05% of input span.

■ Output (DC V/mA)

D/A Converter
16-bit Σ–Δ.

Current Output
Ranges: 0-1mA, 0-20mA, 4-20mA.
Compliance: 10V minimum (500Ω load).
Accuracy: 0.025% of span.

Voltage Output
Ranges: 0-5V, 0-10V.
Compliance: 10mA maximum with short circuit protection. 1Ω output impedance.
Accuracy: 0.025% of span.

Accuracy (overall input to output)
0.075% of span.

■ Output (Relay)

Relay
One SPDT electro-mechanical relay.

Relay Ratings (CSA ratings)
25V DC @ 5A.
120/240V AC @ 5A.

Relay Time Delay
Adjustable alarm delay of up to 25 seconds.

Contact Material
Silver-cadmium oxide (AgCdO).

Expected Mechanical Life
20 million operations.

■ Environmental

Ambient Temperature
Operating: -25 to 70°C (-13 to 158°F).
Storage: -40 to 85°C (-40 to 185°F).

Relative Humidity
5 to 95%.

Power Requirements
10 to 36V DC. 110mA @ 24V. 170mA @ 15V.

Isolation (optical)
4-way (input/output/relay/power).
1500V AC for 60 seconds or 250V AC continuous.

Radiated Field Immunity (RFI)
EN61000-4-3, EN50082-1.

Electromagnetic Field Immunity (EMI)
Less than ±0.25% of output span effect under the influence of electromagnetic fields from switching solenoids, commutator motors, and drill motors.

Electrical Fast Transient (EFT)
EN61000-4-4, EN50082-1.

Surge Withstanding Capability (SWC)
EN61000-4-5, EN50082-1.

Electrostatic Discharge (ESD)
EN61000-4-2, EN50082-1.

Radiated Emissions
EN50081-1 for Class B equipment.

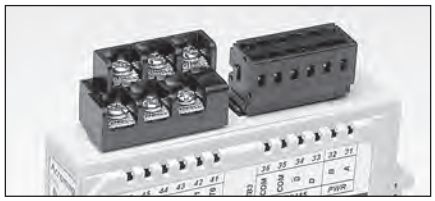
Approvals
CE, UL listed (USA, Canada).
UL3121 - general product safety.

■ Configuration

Software Configuration
Units are fully programmable via the Windows 95/98/ME/2000/NT/XP IntelliPack Configuration Program. Configuration downloads from PC through EIA232 serial port using Acromag 800C-SIP kit.

Field Configuration
Output, zero/full-scale, relay setpoint and deadband are configurable via push-buttons and a standard calibrator.

LED Indicators
LEDs indicate power, status, calibration, and alarm.



Optional terminal blocks: barrier strip (left) and spring clamp (right). Cage clamp terminal is standard.

■ Physical

Enclosure
Case: Self-extinguishing NYLON type 6.6 polyamide thermoplastic UL94 V-2 NEMA Type 1 enclosure.

Connectors (Removable Terminal Blocks)
Wire Range: AWG #14-22 (AWG #12 stranded only).

Printed Circuit Boards
Military grade FR-4 epoxy glass circuit board.

Dimensions
1.05W x 4.68H x 4.35D inches.
26.7W x 118.9H x 110.5D millimeters.

Shipping Weight
1 pound (0.45 Kg) packed.

■ Ordering Information

IMPORTANT: All IntelliPacks require initial software configuration (order 800C-SIP). See Note 1 below.

811T-0500
IntelliPack transmitter unit (DC voltage/current input).

811T-1500
Same as above, plus an SPDT relay output.

5020-350
AC current sensor. Required for AC current inputs. See Page 205 for more information.

800C-SIP
Software Interface Package.
Only one kit is required for all IntelliPack models. See diagram on Page 83 for included parts.

5034-225
USB-to-RS232 adapter. See page 121 for more info.

PS5R-D24
Power supply (24V DC, 2.1A). See Power Supplies on Page 199.

TBK-B01
Optional terminal block kit, barrier strip style, 2 pcs. (For use with 811T-0500 model.)

TBK-B02
Optional terminal block kit, barrier strip style, 4 pcs. (For use with 811T-1500 model with alarm.)

TBK-S01
Optional terminal block kit, spring clamp style, 2 pcs. (For use with 811T-0500 model.)

TBK-S02
Optional terminal block kit, spring clamp style, 4 pcs. (For use with 811T-1500 model with alarm.)

NOTE 1: To order factory configuration, call Acromag for a configuration form which must accompany your order. Also, append "-C" to model number (example: 811T-1500-C). 800C-SIP kit is still recommended.

Transmitter w/alarm

841T Transmitters

Frequency, Pulse Counter Input

Models
841T-0500: Frequency input transmitter
841T-1500: Transmitter with limit alarm

Input Ranges
Sensor types: TTL, dry contact, open collector NPN/PNP, NAMUR, magnetic pickups, proximity

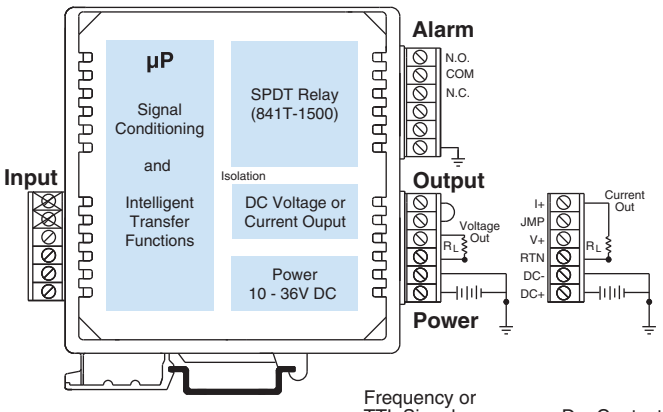
Frequency: 0 to 100Hz, 0 to 1KHz, 0 to 50KHz
Pulse: 0 to 65535 pulses

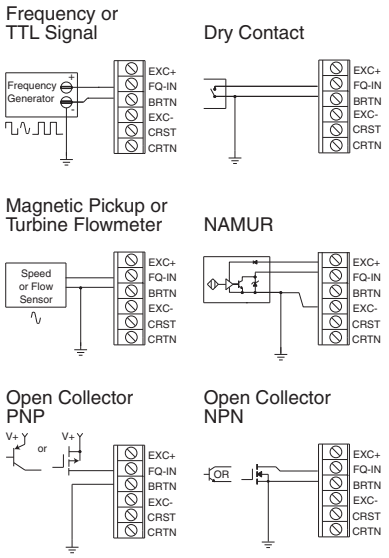
Output Ranges
0 to 1mA, 0 to 20mA, 4 to 20mA DC
0 to 5V, 0 to 10V DC

Limit Alarm
SPDT electro-mechanical relay (-1500 unit only)

Power Requirement
10 to 36V DC

Approvals
CE marked. UL, cUL listed.





Description

These transmitters isolate and convert sensor inputs to noise-free, proportional DC current or voltage output signals. An optional relay output adds a local limit alarm function.

Each unit offers a selection of input and output ranges, as well as several signal conditioning options. This flexibility enables a single IntelliPack to handle a broad range of applications. As your needs change, you can easily reconfigure the unit for different ranges or functions.

Setup is very easy. IntelliPack modules are quickly configured with the user-friendly Windows software program. Field adjustments are simple with the module's front-panel push-buttons and status LEDs. Once configured, IntelliPacks operate independent of any host computer.

Special Features

- High-resolution Sigma-Delta A/D converter delivers high accuracy with low noise.
- Advanced microcontroller provides intelligent signal processing power for linearization, averaging, and square root computations.
- Windows 95/98/ME/NT/XP/2000 software configuration speeds setup and replacement.
- Multi-purpose inputs and outputs reduce spare stock requirements.
- Relay output option provides local limit alarm capability.

Performance

General Input

Resolution

Input Range	Resolution
0 to 100Hz	0.01Hz
0 to 1000Hz	0.1Hz
0 to 50,000Hz	1Hz
0 to 65,535 pulses	1 pulse

Noise Rejection
Common Mode: Better than 80dB @ 60Hz.

Input Response Time (for input step change)
-3dB @ 35KHz.

Input Overvoltage Protection
Bipolar Transient Voltage Suppressors (TVS).

Continued on next page.

Performance

Frequency Input

Input Types
TTL, dry contact, open collector NPN/PNP, NAMUR, magnetic pickups, proximity sensors.

Frequency Ranges
0 to 100Hz
0 to 1000Hz
0 to 50,000Hz.

Pulse Counter Input Range
0 to 65535 pulses.

Minimum Input Pulse Width
Frequency inputs: 10µS.
Pulse counting inputs: 5mS.

Voltage Ranges
Unipolar: 0 to 100V DC.
Bipolar: ±50mV to ±100V peak.

Zero/Full Scale Adjustment
Zero and span: 100% full range adjustment.
Pulse counting: Up to 65535 spans within range.

Input Threshold/Hysteresis
Bipolar:
Threshold: 0.01V, typical.
Hysteresis: ±25mV or ±83mV.
Unipolar:
Threshold: 1.5V or 5V.
Hysteresis: ±25mV or ±83mV

Input Debounce (Event Counter)
0 to 1000mS (configurable in 5mS increments).

Frequency Excitation Supply
Selectable, +8.2V or +12V @ 15mA.

Input Impedance
35K ohms, typical.

Accuracy

Input Range	Accuracy
0 to 100Hz	±0.04Hz
0 to 1000Hz	±0.4Hz
0 to 50,000Hz	±10Hz
0 to 65,535 pulses	±1 pulse

Output (DC V/mA)

D/A Converter
16-bit Σ–Δ.

Current Output
Ranges: 0-1mA, 0-20mA, 4-20mA.
Compliance: 10V minimum (500Ω load).
Accuracy: 0.025% of span.

Voltage Output
Ranges: 0-5V, 0-10V.
Compliance: 10mA maximum with short circuit protection. 1 ohm output impedance.
Accuracy: 0.025% of span.

Accuracy (overall input to output)
0.075% of span.

Output (Relay)

Relay
One SPDT electro-mechanical relay.

Relay Ratings (CSA ratings)
25V DC @ 5A.
120/240V AC @ 5A.

Relay Time Delay
Adjustable alarm delay of up to 25 seconds.

Contact Material
Silver-cadmium oxide (AgCdO).

Expected Mechanical Life
20 million operations.

Environmental

Ambient Temperature
Operating: -25 to 70°C (-13 to 158°F).
Storage: -40 to 85°C (-40 to 185°F).

Relative Humidity
5 to 95%.

Power Requirements
10 to 36V DC. 100mA @ 24V. 160mA @ 15V.

Isolation (optical)
4-way (input/output/relay/power).
1500V AC for 60 seconds or 250V AC continuous.

Radiated Field Immunity (RFI)
EN61000-4-3, EN50082-1.

Electromagnetic Field Immunity (EMI)
Less than ±0.25% of output span effect under the influence of electromagnetic fields from switching solenoids, commutator motors, and drill motors.

Electrical Fast Transient (EFT)
EN61000-4-4, EN50082-1.

Surge Withstanding Capability (SWC)
EN61000-4-5, EN50082-1.

Electrostatic Discharge (ESD)
EN61000-4-2, EN50082-1.

Radiated Emissions
EN50081-1 for Class B equipment.

Approvals
CE, UL listed (USA, Canada).
UL3121 - general product safety.

Configuration

Software Configuration
Units are fully programmable via the Windows 95/98/ME/2000/NT/XP IntelliPack Configuration Program. Configuration downloads from PC through EIA232 serial port using Acromag 800C-SIP kit.

Field Configuration
Output, zero/full-scale, relay setpoint and deadband are configurable via push-buttons and a standard calibrator.

LED Indicators
LEDs indicate power, status, calibration, and alarm.

Physical

Enclosure
Case: Thermoplastic UL94 V-2 NEMA Type 1 enclosure.

Connectors (Removable Terminal Blocks)
Wire Range: AWG #14-22 (AWG #12 stranded only).

Printed Circuit Boards
Military grade FR-4 epoxy glass circuit board.

Dimensions and Shipping Weight
1.05W x 4.68H x 4.35D in. (26.7 x 118.9 x 110.5 mm)
1 pound (0.45 Kg) packed.

Ordering Information

IMPORTANT: All IntelliPacks require initial software configuration (order 800C-SIP). See Note 1 below.

841T-0500
IntelliPack transmitter unit (freq/pulse counter input).

841T-1500
Same as above, plus an SPDT relay output.

800C-SIP
Software Interface Package.
Only one kit is required for all IntelliPack models.
See diagram on Page 83 for included parts.

5034-225
USB-to-RS232 adapter. See page 121 for more info.

PS5R-D24
Power supply (24V DC, 2.1A).
See Power Supplies on Page 199.

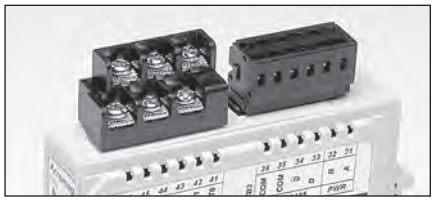
TBK-B01
Optional terminal block kit, barrier strip style, 2 pcs. (For use with 841T-0500 model.)

TBK-B02
Optional terminal block kit, barrier strip style, 4 pcs. (For use with 841T-1500 model with alarm.)

TBK-S01
Optional terminal block kit, spring clamp style, 2 pcs. (For use with 841T-0500 model.)

TBK-S02
Optional terminal block kit, spring clamp style, 4 pcs. (For use with 841T-1500 model with alarm.)

NOTE 1: To order factory configuration, call Acromag for a configuration form which must accompany your order. Also, append "-C" to model number (example: 841T-1500-C). 800C-SIP kit is still recommended.



Optional terminal blocks: barrier strip (left) and spring clamp (right). Cage clamp terminal is standard.

Bridge Interface

851T Transmitters

Strain Gauge, Load Cell Input

Input

Sensor types

Load cells (4- or 6-wire configurations),
Strain gauges (full-, half-, or quarter-bridge),
Millivolt

Bridge/gauge resistance

Supports 85 ohms or greater with 10V excitation

Input sensitivity

Accepts load cell and strain gauge rated outputs up to 10mV/V DC

Internal excitation

Adjustable from 4 to 11V DC, 120mA max.

Output

Universal output

0 to 20mA (user-configured ranges),
0 to 10V DC (user-configured ranges),

Relay Output (optional)

5A SPDT dry contact relay

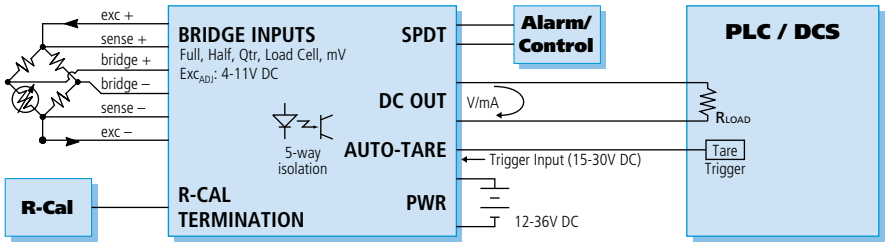
Power Requirement

12 to 36V DC

Approvals

CE marked. UL, cUL listed.

Strain Gauge / Load Cell Transmitter with Alarm



Description

IntelliPack strain gauge and load cell transmitters offer many powerful features beyond the limited capabilities found in typical bridge amplifiers. 851T models accept signals from sensors wired in a Wheatstone bridge configuration. Common uses include measurement of force, weight, level, torque, acceleration, pressure, and vibration.

The transmitter's input circuit allows true 6-wire bridge measurement and includes an adjustable bridge excitation supply (4 to 11V DC) with a remote sense feature. Sense wires ensure the programmed excitation voltage is applied at the sensor and enable lead-wire compensation. The differential input performs true ratiometric conversions for extremely stable measurements that remain accurate over time and temperature. Plus, lead break detection is inherent in the device.

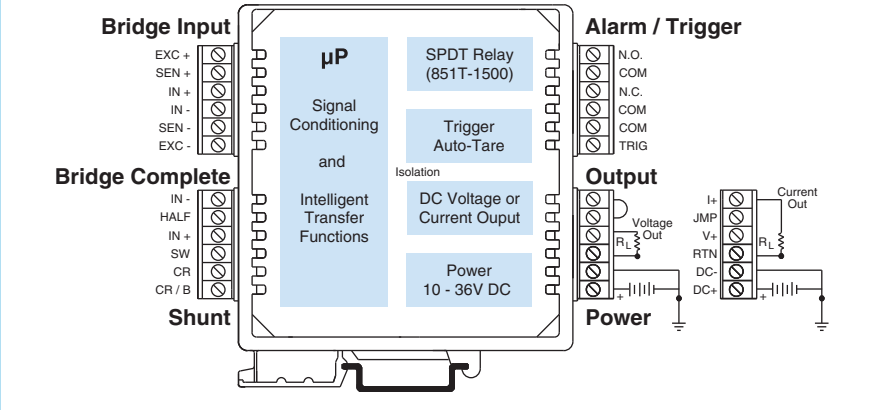
Intellipack configuration software simplifies setup for use with basic load cells, millivolt inputs, or seven bridge sensor formats. Internal bridge completion resistors are supplied for half and quarter bridges. The software also downloads sensor parameters such as gauge factor and Poisson's ratio into the transmitter for internal calculation of complex equations to determine sensor strain (ε). The strain is then converted to a representative process signal output.

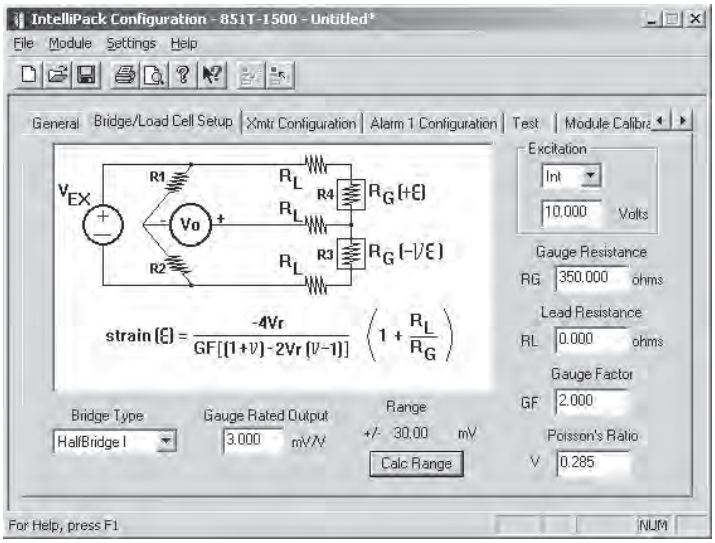
Screw terminals enable a remote "auto-tare" function to compensate for non-zero dead weights and other sensor offsets (e.g. container weight or bridge imbalances). Alternatively, these same screw terminals may be used to reset latched relay alarms.

All these powerful features combined with Acromag's user-friendly configuration software, make the 851T a versatile device that's easy to use and maintain. Plus, a rugged, compact design makes it ideal for use out in the field, on the plant floor, or inside a laboratory.

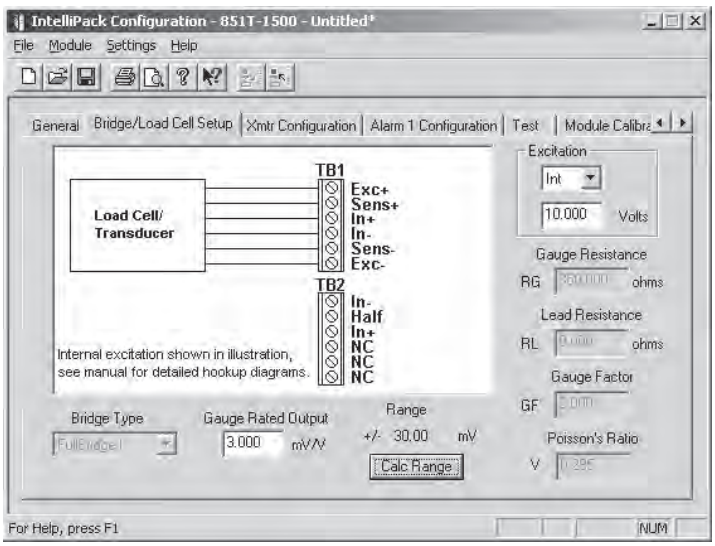
Special Features

- Intelligent signal processing functions perform math computations for custom output:
  - strain (ε) calculations
  - signal linearization (25 breakpoints)
  - average signal computation
- Relay output option provides local limit alarm capability in addition to the DC output
- Adjustable bridge excitation supports a wide variety of sensor types
- An internal bridge completion function (half-to-full and quarter-to-full) accommodates a broad range of applications
- Remote auto-tare function compensates for extraneous loads and corrects for imbalances in the input bridge
- High-resolution Sigma-Delta A/D converter delivers high accuracy with low noise.
- Windows 95/98/ME/NT/XP/2000 software configuration speeds setup and replacement.



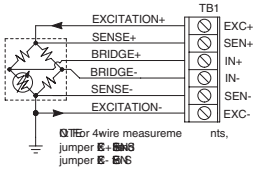


Complex strain (ε) calculations are easily configured and computed for full, half, and quarter-bridge sensors.

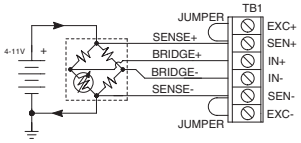


The configuration software makes it easy to set up the transmitter for use with basic load cell sensor devices. Common input sources include pressure transducers, torque converters, and vibration sensors.

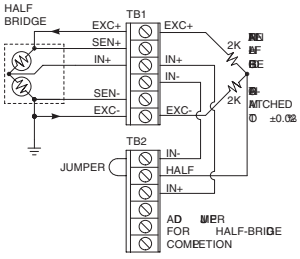
FULL-BRIDGE INPUT (INTERNAL EXCITATION)



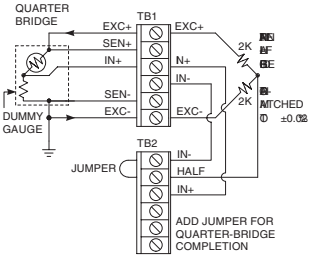
FULL-BRIDGE INPUT (EXTERNAL EXCITATION)



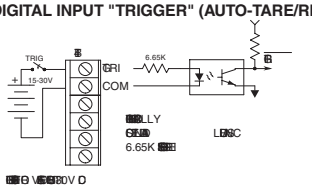
HALF-BRIDGE INPUT



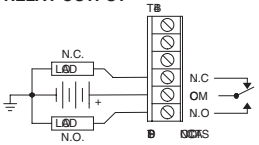
QUARTER-BRIDGE INPUT



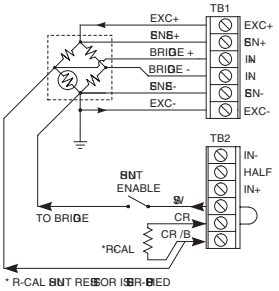
DIGITAL INPUT "TRIGGER" (AUTO-TARE/RELAY RESET)



RELAY OUTPUT



SHUNT CALIBRATION (R-CAL)



851T Transmitters

Performance

General Input

Analog to Digital Converter (ADC)
16-bit Σ–Δ A/D converter.

Resolution
±0.01% of span.

Input Reference Test Conditions
120 ohm full bridge; Excitation = 10V; Rated Output = 3mV/V; Range = ±30mV; Ambient Temperature = 25°C; Power Supply = 24V DC; Alarm Delay = 100ms.

Accuracy (overall input to output)
Better than ±0.1% of span, typical.
This value does not include sensor errors.

Ambient Temperature Effect
Better than ±0.01% of input span per °C (±100ppm/°C), or ±1.0uV/°C, whichever is greater.

Response Time (for input step change)
250mS to 98% of final output value (into 500 ohms).

Input Overvoltage Protection
Bipolar Transient Voltage Suppressors (TVS).

Bridge Input

Input Types
Select from basic load cell, two quarter-bridge options, two half-bridge options, three full-bridge options, or millivolts.

Input Span/Range
Bipolar input range is determined from the ± product of the gauge's rated output and the nominal excitation selection (2mV/V x 10V = ±20mV range).

Input Over-range
The actual input range is ±150% typical of the range obtained via the ± product of the gauge's rated output and the nominal excitation applied.

Input Sensitivity
Accepts gauge rated outputs up to 10mV/V. The range of your input signal is the product of the excitation voltage and your gauge's rated output.

Input Impedance
±IN at 1M ohms min.; ±SEN at 29.09K ohms, typical.

Input Lead Resistance
Module has sufficient overdrive to guarantee 10V bridge excitation with 5 ohms/lead and 100mA of internal excitation current. Larger lead resistances may limit the maximum achievable bridge excitation.

Input Lead Break Detection
Sensor failure detection is upscale only.

Input Bridge Excitation (Internal)
Adjustable from 4V to 11V, 120mA maximum. Internal excitation may be turned OFF for external excitation supply connection.

Input Bridge Excitation (External)
4V to 11V. The internal excitation must be turned OFF for connection to an external excitation supply.

Digital (Trigger) Input

Input Type
"Active High" input.
15-30V DC (6.65K ohms).
See connection diagram.

Operation (Tare/Alarm Modes)
The trigger function is set for "Auto-Tare" mode by default. This input can also be configured to reset latched alarms via the Configuration Software.

Output (DC V/mA)

D/A Converter
16-bit Σ–Δ.

Current Output
Ranges: 0-1mA, 0-20mA, 4-20mA.
Compliance: 10V minimum (500 ohm load).

Voltage Output
Ranges: 0-5V, 0-10V.
Compliance: 10mA maximum with short circuit protection. 1 ohm output impedance.

Output (Relay)

Relay
One SPDT, Form C, dry contact relay.

Relay Ratings (CSA ratings)
25V DC @ 5A, resistive load.
120/240V AC @ 5A, resistive load.

Relay Time Delay
Adjustable alarm delay of up to 25 seconds.

Relay Response (No Relay Time Delay)
Relay contacts switch within 580ms typical, for an input step change from 10% of span on one side of an alarm point to 5% of span on the other side of the alarm point.

Initial Dielectric Strength
1000V AC rms between open contacts.

Contact Material
Silver-cadmium oxide (AgCdO).

Expected Mechanical Life
20 million operations.

Performance specifications continued on next page.

■ Environmental

Ambient Temperature
Operating: -25 to 70°C (-13 to 158°F).
Storage: -40 to 85°C (-40 to 185°F).

Relative Humidity
5 to 95%.

Power Requirements
12 to 36V DC. 11V DC minimum.
175mA @ 24V. 290mA @ 15V.

Isolation (optical)
5-way (input/output/relays/trigger/power).
Input, analog output, trigger, and power circuits are isolated from each other for up to 1500V AC for 60 seconds or 250V AC continuous. Optional relay outputs are isolated from other circuits up to 150V AC, or 150V DC.

Radiated Field Immunity (RFI)
EN61000-4-3, EN50082-1.

Electromagnetic Field Immunity (EMI)
Less than ±0.25% of output span effect under the influence of electromagnetic fields from switching solenoids, commutator motors, and drill motors.

Electrical Fast Transient (EFT)
EN61000-4-4, EN50082-1.

Surge Withstanding Capability (SWC)
EN61000-4-5, EN50082-1.

Electrostatic Discharge (ESD)
EN61000-4-2, EN50082-1.

Radiated Emissions
EN50081-1 for Class B equipment.

Approvals
CE, UL listed (USA, Canada).
UL3121 - general product safety.

■ Configuration

Software Configuration
Units are fully programmable via the Windows 95/98/ME/2000/NT/XP IntelliPack Configuration Program. Configuration downloads from PC through EIA232 serial port using Acromag 800C-SIP kit.

Field Configuration
Output, zero/full-scale, relay setpoint and deadband are configurable via push-buttons and a standard calibrator.

LED Indicators
LEDs indicate power, status, calibration, and alarm.

■ Physical

Enclosure
Case: Self-extinguishing NYLON type 6.6 polyamide thermoplastic UL94 V-2 NEMA Type 1 enclosure.

Connectors (Removable Terminal Blocks)
Wire Range: AWG #14-22 (AWG #12 stranded only).

Printed Circuit Boards
Military grade FR-4 epoxy glass circuit board.

Dimensions
1.05W x 4.68H x 4.35D inches.
26.7W x 118.9H x 110.5D millimeters.

Shipping Weight
1 pound (0.45 Kg) packed.

■ Ordering Information

IMPORTANT: All IntelliPacks require initial software configuration (order 800C-SIP). See Note 1 below.

851T-0500
IntelliPack transmitter unit, strain gauge input

851T-1500
Same as above, plus an SPDT relay output.

800C-SIP
Software Interface Package.
Only one kit is required for all IntelliPack models.
See diagram on Page 83 for included parts.

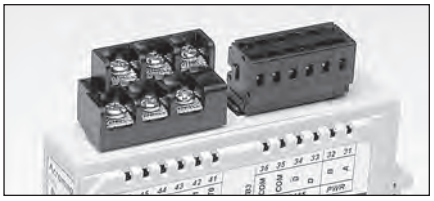
5034-225
USB-to-RS232 adapter. See page 121 for more info.

PS5R-D24
Power supply (24V DC, 2.1A).
See Power Supplies on Page 199.

TBK-B02
Optional terminal block kit, barrier strip style, 4 pcs.

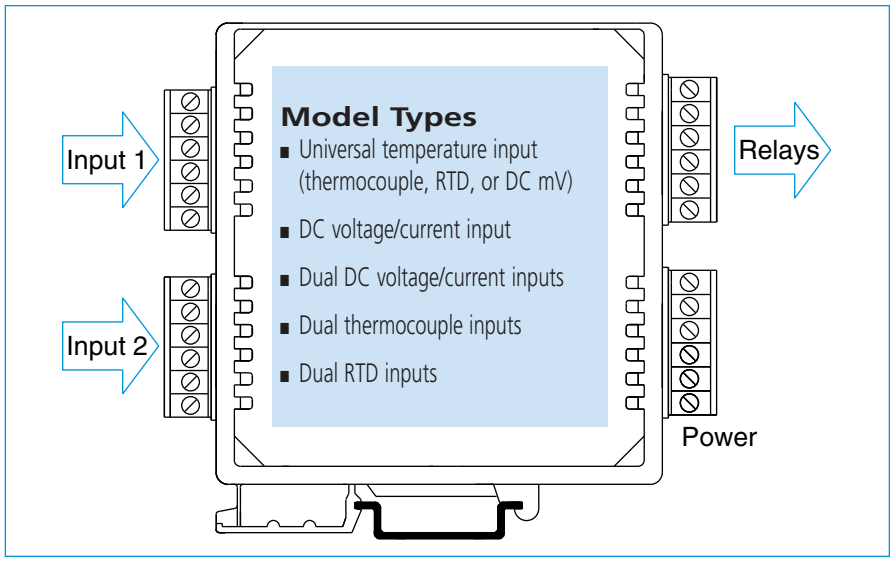
TBK-S02
Optional terminal block kit, spring clamp style, 4 pcs.

NOTE 1: To order factory configuration, call Acromag for a configuration form which must accompany your order. Also, append "-C" to model number (example: 851T-1500-C). 800C-SIP kit is still recommended.



Optional terminal blocks: barrier strip (left) and spring clamp (right). Cage clamp terminal is standard.

Intelligent Alarms



800A Units

Single input models

801A: Universal temperature input (thermocouple, RTD, or DC millivolts); One DPDT relay or two SPDT relays

811A: DC voltage/current* input; One DPDT relay or two SPDT relays

Dual input models

812A: DC voltage/current* inputs; Two SPDT relays

822A: Thermocouple inputs; Two SPDT relays

832A: RTD inputs; Two SPDT relays

* AC current sensor option available.

IntelliPack alarms compare inputs against user-defined limit setpoints to control built-in relays.

Each unit offers a selection of input ranges and alarm functions to handle a broad range of applications. As your needs change, you can easily reconfigure the unit for different ranges or functions. Alarm functions available on all models include on/off controller, limit alarm, window alarm, deviation alarm, rate-of-change alarm, and peak/valley detection. Other functions are also possible; please consult the factory.

Setup is very easy. IntelliPack alarms are configured through a user-friendly Windows 95/98/NT program. Field adjustments and recalibration are quickly performed with front-panel push-buttons and status LEDs. Once configured, IntelliPacks operate independent of any host computer.

Special Features

General Operation

- **Advanced microcontroller** has integrated, downloadable flash memory and EEPROM for intelligent signal processing.
- **Windows 95/98/ME/NT/XP/2000 software** configuration speeds setup and replacement.
- **Push-button reprogrammability** facilitates changes in the field without a host PC.
- **Plug-in terminal blocks** make module installation and removal easy.
- **Built-in self-diagnostic routines** operate upon power-up and during operation for easy maintenance and troubleshooting.
- **3-way isolation** separates inputs, power, and relay contacts from each other.
- **EMC compliant.** Ruggedized circuitry meets directives to provide increased transient immunity and low emissions.
- **Wide ambient temperature range** ensures reliable performance from -25 to 70°C.
- **Wide DC supply range** with diode-coupled reverse polarity protection is useful for redundant supplies and battery backup.

Alarm Operation

- **Multi-purpose inputs** accept numerous ranges to reduce spare stock requirements.
- **User-programmable alarm operation** lets you select or change alarm functions (see next page for supported functions).
- **Dual alarm operation** lets you perform two alarm functions at the same time.
- **High-resolution Sigma-Delta A/D converter** delivers high accuracy with low noise.
- **Input excitation supply** on each input provides power for a two-wire transmitter.
- **High-power relays** switch voltages up to 230V AC at 5A.
- **User-programmable deadband (100%)** on each setpoint eliminates relay chatter and prolongs contact life.
- **User-programmable relay reset** enables automatic alarm reset or latching alarm with manual reset.
- **Failsafe/non-failsafe operation** lets you set the default relay position.
- **Relay delay feature** lets you set the reaction time to filter transients.
- **Thermocouple and RTD signal processing** performs linearization, up/downscale break detection, reference-junction compensation and other functions.

Alarm functions

Each IntelliPack alarm unit includes all the alarm functions listed below. Acromag's configuration software helps you quickly define or modify the relay operation for your application. Unique, fill-in-the-blank screens are provided for each alarm type.

Limit Alarm

Limit alarms monitor a single setpoint (high or low) for an alarm condition. The relay enters the alarm state when the input signal exceeds the setpoint for a user-defined time period. This time period helps filter input transients. The relay remains in the alarm state until the input signal retreats past the setpoint and any applied deadband.

Window (Band-Pass) Alarm

Window alarms use two setpoints to monitor for an alarm condition. This allows both a high and low setpoint to be defined for a single input signal. The two setpoints define a minimum/maximum operating range or a window. This function is commonly referred to as a Window, Guard, or Band-Pass alarm.

The relay enters the alarm state when the input level rises or falls outside the window for a user-defined time period (to filter input transients). The relay remains in the alarm state until the input retreats back into the window, plus any applied deadband.

On/Off Controller

An on/off controller uses two setpoints to toggle a relay. No deadband is applied. This alarm type is often used for level control applications, such as filling or emptying a container (pump/valve control).

The relay enters the alarm state when the input exceeds the "on" setpoint for a user-defined time period. The relay remains in the alarm state until the input signal retreats past the "off" setpoint.

Deviation Alarm (Dual Input Models Only)

The deviation alarm generates an alarm condition based on the difference between two input signals. One signal serves as the reference input. The second input signal is monitored for a user-defined deviation value (positive, negative, or absolute) with respect to the reference input. This alarm type is useful for controlling temperature and flow.

The relay enters the alarm state when the deviation exceeds the limit for a user-defined time period. The relay remains in the alarm state until the deviation decreases below the limit, plus any applied deadband.

Peak/Valley Detection Alarm

This function detects when the input signal reaches a maximum (peak) or minimum (valley) value. Peak/valley alarms are useful for torque and pressure testing applications as well as for monitoring temperature and chemical reactions.

The detection function activates only after the input exceeds a user-defined threshold level. Once activated, the alarm unit monitors the input signal for a decrease on a rising signal or an increase on a falling signal. A relay trips when the signal exceeds a user-defined deadband following the peak/valley. The relay remains in alarm state until the signal reaches a user-defined dropout value.

Rate-of-Change

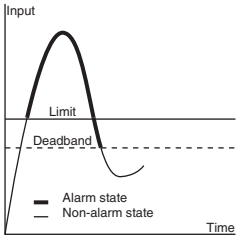
This function monitors an input for a change in value with respect to time. Intellipacks monitor absolute rate-of-change and can activate for increasing or decreasing rates.

The relay enters alarm state when the input rate-of-change exceeds the user-defined rate limit for a one second time period. The relay remains in the alarm state until the rate-of-change moves past a specified dropout level for a one second time period.

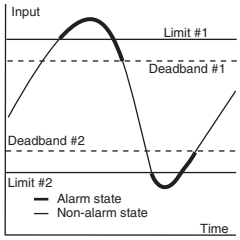
Other Alarm Functions

Internal intelligence and downloadable flash memory allow IntelliPacks to perform many other functions. If your application differs from the standard alarms above, please call the factory regarding the possibility of other functions custom-tailored to your needs.

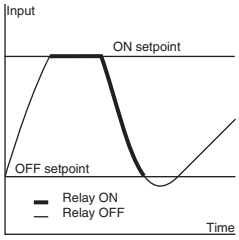
Limit Alarm



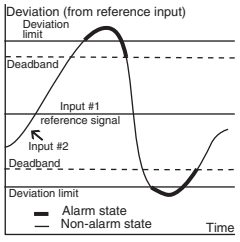
Window Alarm



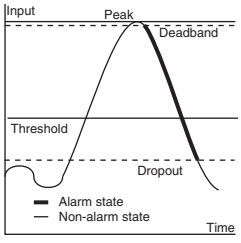
On/Off Controller



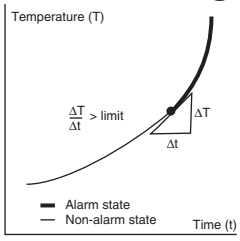
Deviation Alarm



Peak/valley Detector

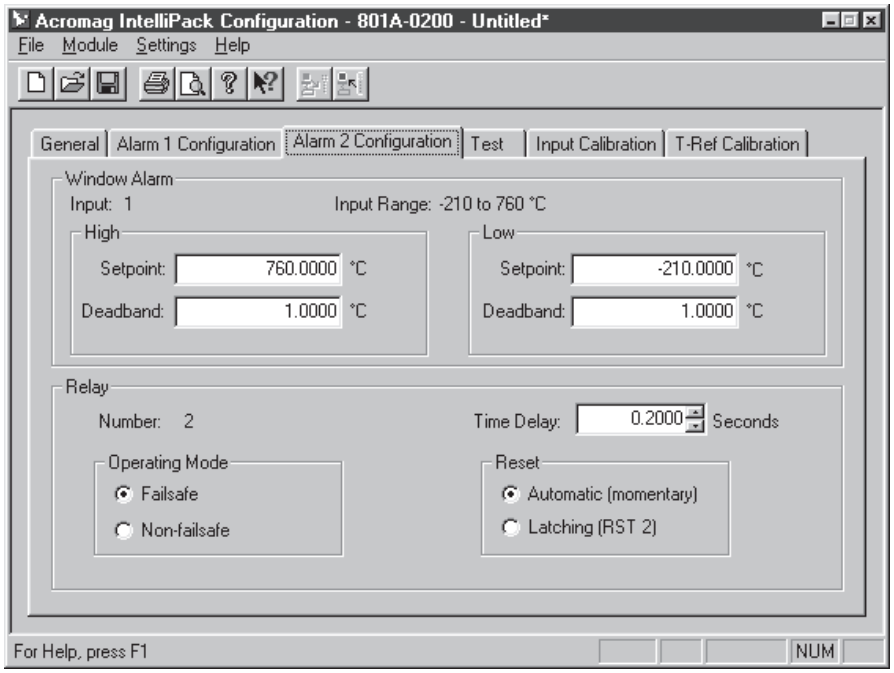


Rate of Change Alarm



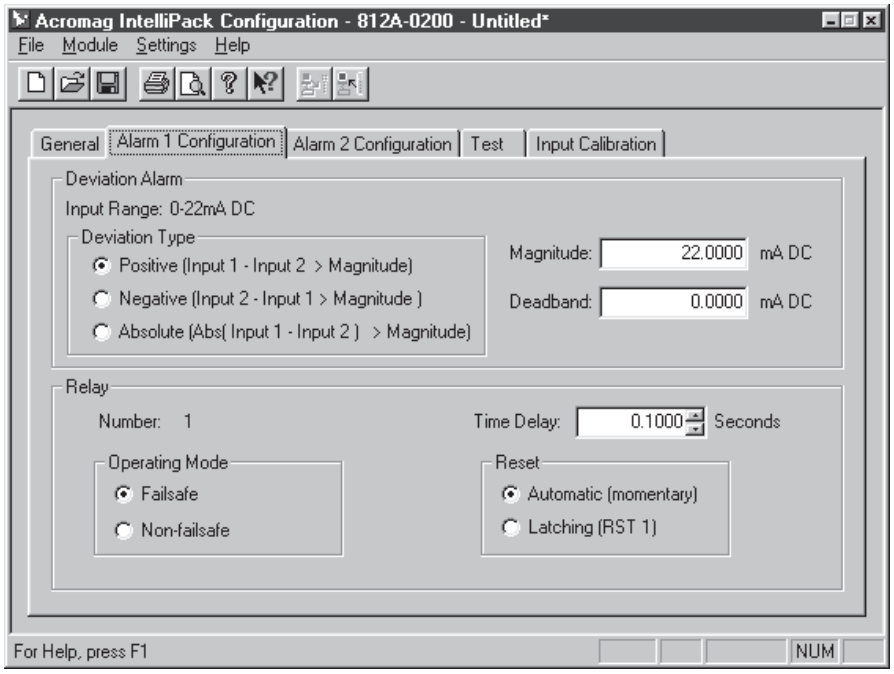
Software Configuration Examples

Limit Alarms, Window Alarms, and On/Off Controllers

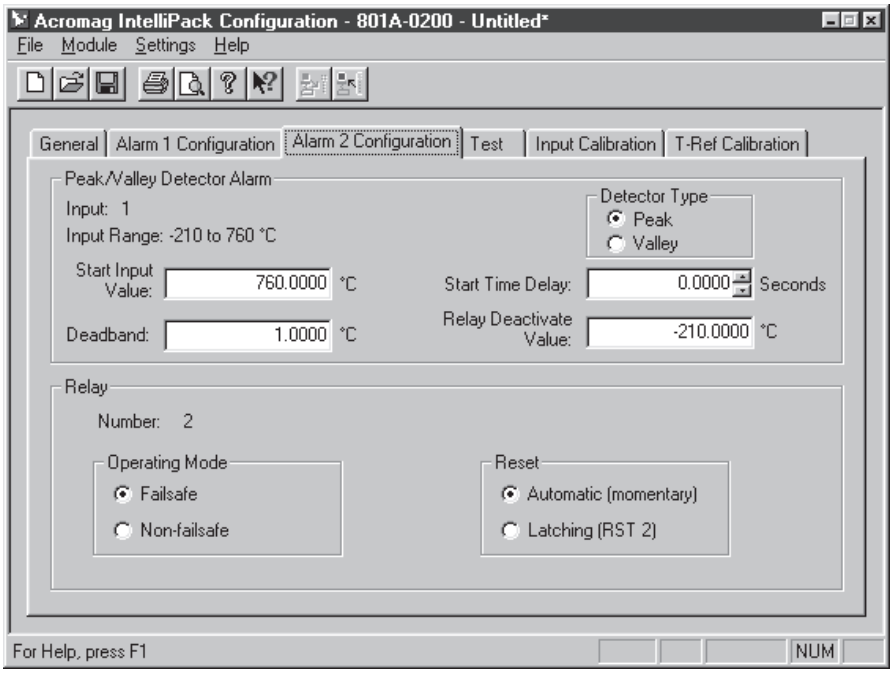


A property sheet to configure a window alarm. Limit alarms and on/off controllers are similar. Typical applications: pump control, early warning alert, safety shutdown.

Deviation Alarms

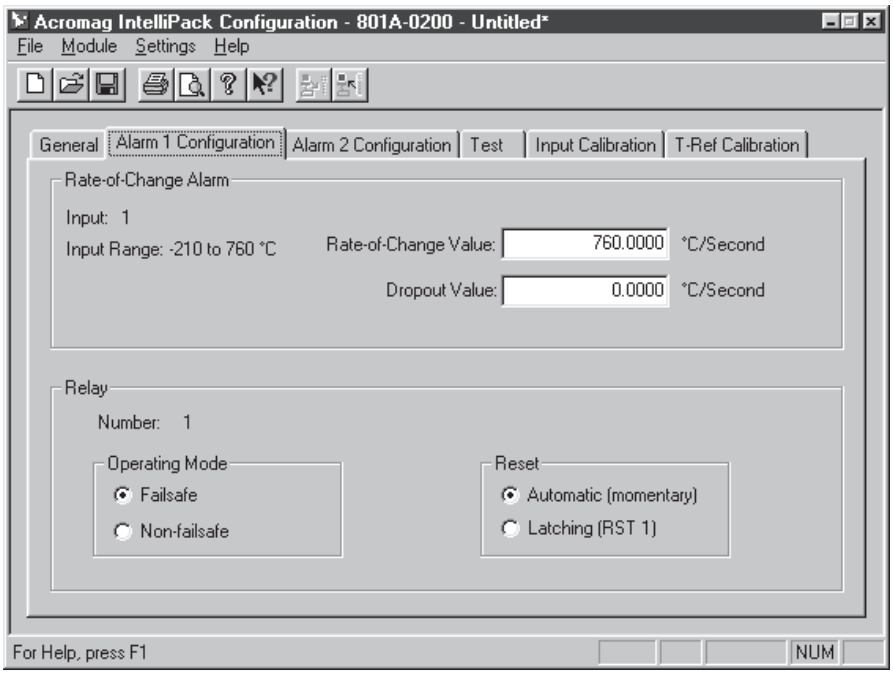


A property sheet to configure a deviation alarm. Positive, negative, and absolute deviation alarms are supported. Typical applications: speed tracking/monitoring, consistent batch temperature measurement, flow leak detection.



Peak/Valley Alarms

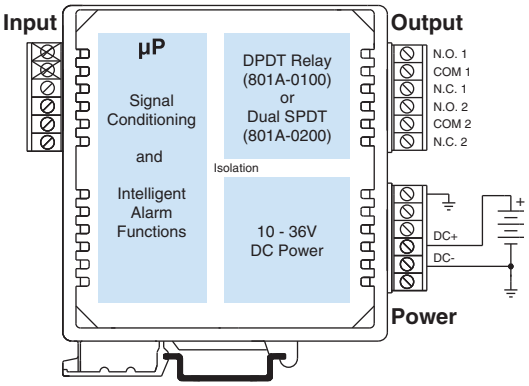
A property sheet to configure a peak/valley alarm.
Typical applications: force measurement, pressure testing, chemical mixing.



Rate-of-Change Alarms

A property sheet to configure a rate-of-change alarm.
Typical applications: injection molding, speed sensing, monitoring chemical reactions

Intelligent Alarms



801A Alarms

Thermocouple, RTD, and Millivolt Input

Models

801A-0100: Alarm with one DPDT relay
801A-0200: Alarm with two SPDT relays

Input Ranges

TC types: J, K, T, R, S, E, B, N
Millivolt: ±15.625mV to ±1.0V DC
RTD: 100 ohm Pt, 120 ohm Ni, 10 ohm Cu
Resistance: 0 to 500 ohms

Alarm Outputs

Single DPDT electro-mechanical 5A relay (-0100), Dual SPDT electro-mechanical 5A relays (-0200)

Power Requirement

10 to 36V DC

Approvals

CE marked. UL, cUL listed.

Description

IntelliPack alarms compare inputs against user-defined limit setpoints to control built-in relays.

Each unit offers a selection of input ranges and alarm functions to handle a broad range of applications. As your needs change, you can easily reconfigure the unit for different ranges or functions. Alarm functions available on all models include on/off controller, limit alarm, window alarm, deviation alarm, rate-of-change alarm, and peak/valley detection.

Setup is very easy. IntelliPack alarms are configured through a user-friendly Windows 95/98/ME/NT/XP/2000 program. Field adjustments and recalibration are quickly performed with front-panel push-buttons and status LEDs. Once configured, IntelliPacks operate independent of any host computer.

Special Features

- Integrated microcontroller performs intelligent signal processing for advanced alarm functions.
- Windows 95/98/ME/NT/XP/2000 software configuration speeds setup and replacement.
- Push-button reprogrammability facilitates changes in the field without a host PC.
- Multi-purpose inputs accept numerous ranges to reduce spare stock requirements.
- High-resolution Sigma-Delta A/D converter delivers high accuracy with low noise.
- Input excitation supply on each input provides power for a two-wire transmitter.
- Dual alarm operation lets you perform two alarm functions at the same time.

Performance

General Input

Analog to Digital (A/D) Converter
16-bit Σ–Δ A/D converter.

Resolution
±0.005% of span or 0.1°C/ LSB. ADC typically yields resolutions finer than 0.1°C/LSB.

Ambient Temperature Effect
Better than ±0.005% of input span per °C or ±1µV, whichever is greater.

Noise Rejection
Normal Mode: Better than 40dB @ 60Hz.
Common Mode: Better than 130dB @ 60Hz.

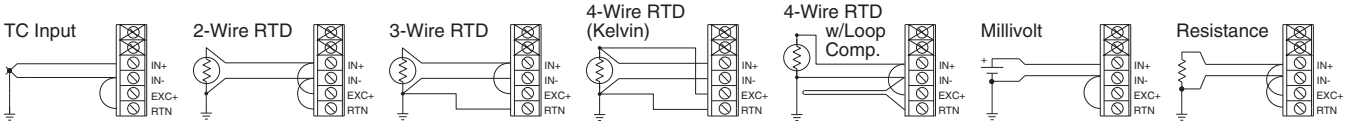
Input Filter
Normal mode filtering, plus digital filtering optimized and fixed per input range within Σ-Δ ADC.

Input Response Time
Less than 200mS to 98% of final value for a step change in the input. A software programmable delay can be implemented for filtering transients.

Relay Time Delay
Adjustable alarm delay of up to 25 seconds.

Input Overvoltage Protection
Bipolar Transient Voltage Suppressors (TVS).

Continued on next page.



■ DC Millivolt Input

DC Millivolt/Voltage Input Ranges

±1.0V	±125mV	±31.25mV
±500mV	±62.5mV	±15.625mV
±250mV		

Millivolt Accuracy

Better than ±0.05% of input span.

■ Thermocouple Input

Thermocouple Input Ranges

Thermocouple type user configured. Signal linearization, cold-junction compensation, and open circuit or lead break detection are included.

TC	°C Range (°F Range)	Accuracy
J	-210 to 760°C (-346 to 1400°F)	±0.5°C
K	-200 to 1372°C (-328 to 2502°F)	±0.5°C
T	-260 to 400°C (-436 to 752°F)	±0.5°C
R	-50 to 1768°C (-58 to 3214°F)	±1.0°C
S	-50 to 1768°C (-58 to 3214°F)	±1.0°C
E	-200 to 1000°C (-328 to 1832°F)	±0.5°C
B	260 to 1820°C (500 to 3308°F)	±1.0°C
N	-230 to 1300°C (-382 to 2372°F)	±0.5°C

■ RTD Input

RTD Input Ranges

100Ω Pt, 120Ω Ni, or 10Ω Cu; user-configured.

RTD	°C Range (°F Range)	Accuracy
Pt^1	-200 to 850°C (-328 to 1562°F)	±0.25°C
Pt^2	-200 to 850°C (-328 to 1562°F)	±0.25°C
Ni	-80 to 320°C (-112 to 608°F)	±0.25°C
Cu	-200 to 260°C (-328 to 500°F)	±1.00°C

Alpha: Pt^1 ($\alpha = 1.3850$), Pt^2 ($\alpha = 1.3911$), Ni ($\alpha = 1.6720$), Cu ($\alpha = 1.4272$).

2, 3, or 4-wire configurations supported. Module provides sensor excitation, linearization, lead-wire compensation, and sensor break detection.

RTD Excitation Current

1mA DC typical, all types.

RTD Lead-Wire Compensation

25 ohms per lead.

RTD Break Detection

Configurable for either upscale or downscale.

■ Resistance Input

Resistance Input Range

0 to 500 ohms.

Resistance Accuracy

±0.05 ohms.

■ Output

Relay (801A-0100 models)

One DPDT electro-mechanical relay.
Contact material Silver Nickel (AgNi 90/10).

Relays (801A-0200 models)

Two independent SPDT electro-mechanical relays.
Contact material Silver-Cadmium Oxide (AgCdO).

Relay Ratings (CSA ratings)

25V DC @ 5A. 120/240V AC @ 5A.

Expected Mechanical Life

20 million operations.

■ Environmental

Ambient Temperature

Operating: -25 to 70°C (-13 to 158°F).
Storage: -40 to 85°C (-40 to 185°F).

Relative Humidity

5 to 95%.

Power Requirements

10 to 36V DC. 55mA @ 24V. 75mA @ 15V.

Isolation

3-way (input/output/power).
1500V AC for 60 seconds or 250V AC continuous.

Radiated Field Immunity (RFI)

EN61000-4-3, EN50082-1.

Electromagnetic Field Immunity (EMI)

No relay trips will occur beyond ±0.25% of input span from setpoint under the influence of electromagnetic fields from switching solenoids, commutator motors, and drill motors.

Electrical Fast Transient (EFT)

EN61000-4-4, EN50082-1.

Surge Withstanding Capability (SWC)

EN61000-4-5, EN50082-1.

Electrostatic Discharge (ESD)

EN61000-4-2, EN50082-1.

Radiated Emissions

EN50081-1 for Class B equipment.

Approvals

CE marked, UL, cUL listed (USA, Canada).
UL3121 - general product safety.

■ Configuration

Software Configuration

Units are fully programmable via the Windows 95/98/ME/2000/NT/XP IntelliPack Configuration Program. Configuration downloads from PC through EIA232 serial port using Acromag 800C-SIP kit.

Field Configuration

Setpoint and deadband are configurable via push-buttons and a standard calibrator.

LED Indicators

LEDs indicate power, status, and alarm.

■ Physical

Enclosure

Case: Self-extinguishing NYLON type 6.6 polyamide thermoplastic UL94 V-2, color beige; general purpose NEMA Type 1 enclosure.

Connectors (Removable terminal blocks)

Wire Range: AWG #14-22 (AWG #12 stranded only).

Printed Circuit Boards

Military grade FR-4 epoxy glass circuit board.

Dimensions

1.05W x 4.68H x 4.35D inches.
26.7W x 118.9H x 110.5D millimeters.

Shipping Weight

1 pound (0.45 Kg) packed.

■ Ordering Information

IMPORTANT: All IntelliPacks require initial software configuration (order 800C-SIP). See Note 1 below.

801A-0100
IntelliPack alarm unit.
One TC/RTD/millivolt input, one DPDT relay.

801A-0200
Same as above except two SPDT relays.

800C-SIP
Software Interface Package.
Only one kit is required for all IntelliPack models.
See diagram on Page 83 for included parts.

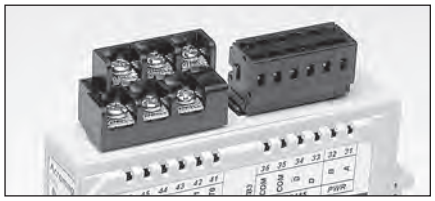
5034-225
USB-to-RS232 adapter. See page 121 for more info.

PS5R-D24
Power supply (24V DC, 2.1A).
See Power Supplies on Page 199.

TBK-B01
Optional terminal block kit, barrier strip style, 2 pcs. (Does not include terminal block for input wiring.)

TBK-S01
Optional terminal block kit, spring clamp style, 2 pcs. (Does not include terminal block for input wiring.)

NOTE 1: To order factory configuration, call Acromag for a configuration form which must accompany your order. Also, append "-C" to model number (example: 801A-0200-C). 800C-SIP kit is still recommended.



Optional terminal blocks: barrier strip (left) and spring clamp (right). Cage clamp terminal is standard.

Intelligent Alarms

811A Alarm, 812A Dual Alarm

DC Current, DC Voltage, and AC Current Input

Models

811A-0100: Alarm with one DPDT relay
811A-0200: Alarm with two SPDT relays
812A-0200: Dual alarm with two SPDT relays

Input Ranges

DC Current: 0 to 22mA
DC Voltage: ±100V DC
AC Current: 0 to 20A AC (with AC current sensor)

Alarm Outputs

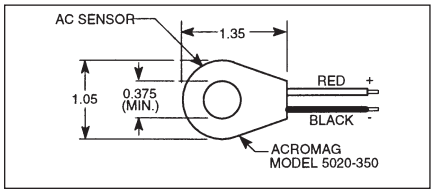
Single DPDT electro-mechanical 5A relay (-0100),
Dual SPDT electro-mechanical 5A relays (-0200)

Power Requirement

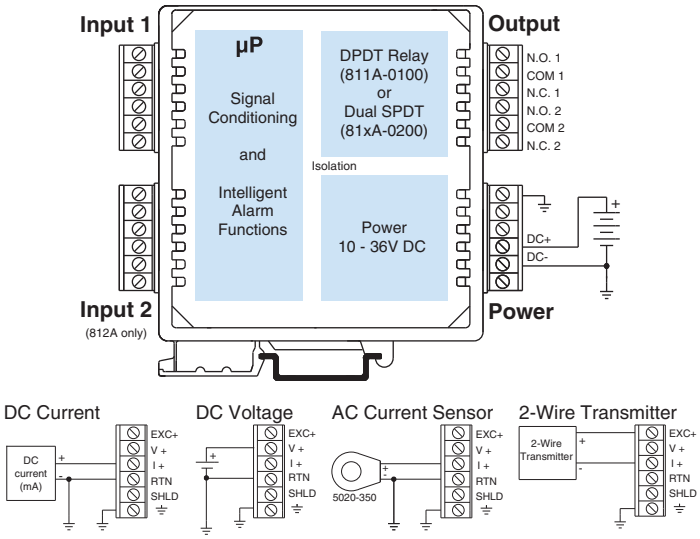
10 to 36V DC

Approvals

CE marked. UL, cUL listed.



AC Current Sensor Model 5020-350
(ordered separately)



Description

IntelliPack alarms compare inputs against user-defined limit setpoints to control built-in relays.

Each unit offers a selection of input ranges and alarm functions to handle a broad range of applications. As your needs change, you can easily reconfigure the unit for different ranges or functions. Alarm functions available on all models include on/off controller, limit alarm, window alarm, deviation alarm, rate-of-change alarm, and peak/valley detection.

Setup is very easy. IntelliPack alarms are configured through a user-friendly Windows 95/98/ME/NT/XP/2000 program. Field adjustments and recalibration are quickly performed with front-panel push-buttons and status LEDs. Once configured, IntelliPacks operate independent of any host computer.

Special Features

- Integrated microcontroller performs intelligent signal processing for advanced alarm functions.
- Windows 95/98/ME/NT/XP/2000 software configuration speeds setup and replacement.
- Push-button reprogrammability facilitates changes in the field without a host PC.
- Multi-purpose inputs accept numerous ranges to reduce spare stock requirements.
- High-resolution Sigma-Delta A/D converter delivers high accuracy with low noise.
- Input excitation supply on each input provides power for a two-wire transmitter.
- Dual alarm operation lets you perform two alarm functions at the same time.

Performance

General Input

Analog to Digital (A/D) Converter
16-bit Σ–Δ A/D converter.

Ambient Temperature Effect
Better than ±0.005% of input span per °C or ±1µV, whichever is greater.

Noise Rejection
Normal Mode: Better than 40dB @ 60Hz.
Common Mode: Better than 100dB @ 60Hz.

Input Filter
Normal mode filtering, plus digital filtering optimized and fixed per input range within Σ-Δ ADC.

Input Response Time
Less than 100mS to 98% of final value for a step change in the input. A software programmable delay can be implemented for filtering transients.

Relay Time Delay
Adjustable alarm delay of up to 25 seconds.

Input Overvoltage Protection
Bipolar Transient Voltage Suppressors (TVS).

Accuracy (DC Voltage/Current Inputs)
Better than ±0.05% of input span.

Continued on next page.

DC Current Input

DC Current Input Range

Input Ranges	Resolution
0 to 5mA DC	189nA/LSB
0 to 22mA DC	757nA/LSB

DC Current Input Impedance
24.9 ohms.

Excitation Supply (for 2-wire instruments)
+15V DC, 24mA maximum.

DC voltage Input

DC Voltage Input Ranges

Input Ranges	Resolution
±100V DC	3.77mV
±50V DC	1.88mV
±25V DC	942µV
±12V DC	471µV
±6V DC	236µV
±3V DC	118µV

Input impedance
Greater than 500K ohms.

AC Current Input

AC Current Input Range (optional)
An optional external AC current sensor is required to monitor AC current signals (Model 5020-350).

AC Current Range	Primary Turns
0 to 20A AC	1
0 to 10A AC	2
0 to 5A AC	4
0 to 2A AC	10
0 to 1A AC	20

Output

Relay (811A-0100 model)
One DPDT electro-mechanical relay.
Contact material Silver Nickel (AgNi 90/10).

Relays (811A-0200, 812A-0200 models)
Two independent SPDT electro-mechanical relays.
Contact material Silver-Cadmium Oxide (AgCdO).

Relay Ratings (CSA ratings)
25V DC @ 5A.
120/240V AC @ 5A.

Expected Mechanical Life
20 million operations.

Environmental

Ambient Temperature
Operating: -25 to 70°C (-13 to 158°F).
Storage: -40 to 85°C (-40 to 185°F).

Relative Humidity
5 to 95%.

Power Requirements
811A:
10 to 36V DC. 70mA @ 24V. 110mA @ 15V.
812A:
10 to 36V DC. 110mA @ 24V. 155mA @ 15V.

Isolation
3-way (input/output/power).
1500V AC for 60 seconds or 250V AC continuous.
Inputs share a common on 812A Model.

Radiated Field Immunity (RFI)
EN61000-4-3, EN50082-1.

Electromagnetic Field Immunity (EMI)
No relay trips will occur beyond ±0.25% of input span from setpoint under the influence of electromagnetic fields from switching solenoids, commutator motors, and drill motors.

Electrical Fast Transient (EFT)
EN61000-4-4, EN50082-1.

Surge Withstanding Capability (SWC)
EN61000-4-5, EN50082-1.

Electrostatic Discharge (ESD)
EN61000-4-2, EN50082-1.

Radiated Emissions
EN50081-1 for Class B equipment.

Approvals
CE marked, UL, cUL listed (USA, Canada).
UL3121 - general product safety.

Configuration

Software Configuration
Units are fully programmable via the Windows 95/98/ME/2000/NT/XP IntelliPack Configuration Program. Configuration downloads from PC through EIA232 serial port using Acromag 800C-SIP kit.

Field Configuration
Setpoint and deadband are configurable via push-buttons and a standard calibrator.

LED Indicators
LEDs indicate power, status, and alarm.

Physical

Enclosure
Case: Self-extinguishing NYLON type 6.6 polyamide thermoplastic UL94 V-2, color beige; general purpose NEMA Type 1 enclosure.

Connectors (Removable terminal blocks)
Wire Range: AWG #14-22 (AWG #12 stranded only).

Printed Circuit Boards
Military grade FR-4 epoxy glass circuit board.

Dimensions
1.05W x 4.68H x 4.35D inches.
26.7W x 118.9H x 110.5D millimeters.

Shipping Weight
1 pound (0.45 Kg) packed.

Ordering Information

IMPORTANT: All IntelliPacks require initial software configuration (order 800C-SIP). See Note 1 below.

811A-0100
IntelliPack alarm unit.
One DC voltage/current input, one DPDT relay.

811A-0200
Same as above except two SPDT relays.

812A-0200
IntelliPack alarm unit.
Two DC voltage/current inputs, two SPDT relays.

5020-350
AC current sensor. Required for AC current inputs.
See page 205 for more information.

800C-SIP
Software Interface Package.
Only one kit is required for all IntelliPack models.
See diagram on Page 83 for included parts.

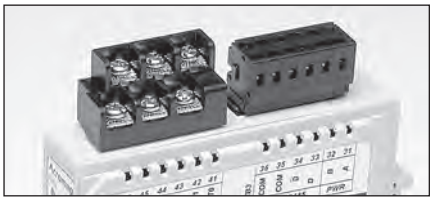
5034-225
USB-to-RS232 adapter. See page 121 for more info.

PS5R-D24
Power supply (24V DC, 2.1A).
See Power Supplies on Page 199.

TBK-B02
Optional terminal block kit, barrier strip style, 4 pcs.

TBK-S02
Optional terminal block kit, spring clamp style, 4 pcs.

NOTE 1: To order factory configuration, call Acromag for a configuration form which must accompany your order. Also, append "-C" to model number (example: 811A-0200-C). 800C-SIP kit is still recommended.



Optional terminal blocks: barrier strip (left) and spring clamp (right). Cage clamp terminal is standard.

Intelligent Alarms

822A Dual Alarm

Thermocouple and Millivolt Input

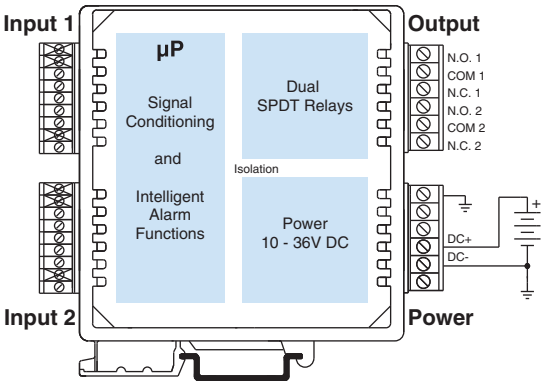
Models
822A-0200:
Dual input alarm with two SPDT relays

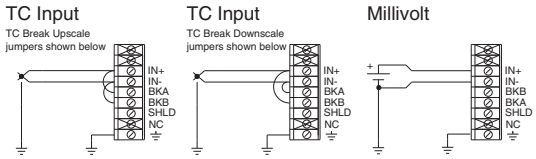
Input Ranges
TC types: J, K, T, R, S, E, B, N
Millivolt: ±15.625mV to ±1.0V DC

Alarm Outputs
Dual SPDT electro-mechanical 5A relays

Power Requirement
10 to 36V DC

Approvals
CE marked. UL, cUL listed.





Description

IntelliPack alarms compare inputs against user-defined limit setpoints to control built-in relays.

Each unit offers a selection of input ranges and alarm functions to handle a broad range of applications. As your needs change, you can easily reconfigure the unit for different ranges or functions. Alarm functions available on all models include on/off controller, limit alarm, window alarm, deviation alarm, rate-of-change alarm, and peak/valley detection.

Setup is very easy. IntelliPack alarms are configured through a user-friendly Windows 95/98/ME/NT/XP/2000 program. Field adjustments and recalibration are quickly performed with front-panel push-buttons and status LEDs. Once configured, IntelliPacks operate independent of any host computer.

Special Features

- Integrated microcontroller performs intelligent signal processing for advanced alarm functions.
- Windows 95/98/ME/NT/XP/2000 software configuration speeds setup and replacement.
- Push-button reprogrammability facilitates changes in the field without a host PC.
- Multi-purpose inputs accept numerous ranges to reduce spare stock requirements.
- High-resolution Sigma-Delta A/D converter delivers high accuracy with low noise.
- Input excitation supply on each input provides power for a two-wire transmitter.
- Dual alarm operation lets you perform two alarm functions at the same time.

Performance

General Input

Analog to Digital (A/D) Converter
16-bit Σ–Δ A/D converter.

Resolution
±0.005% of span or 0.1°C/ LSB. ADC typically yields resolutions finer than 0.1°C/LSB.

Ambient Temperature Effect
Better than ±0.005% of input span per °C or ±1µV, whichever is greater.

Noise Rejection
Normal Mode: Better than 40dB @ 60Hz.

Common Mode: Better than 130dB @ 60Hz.

Input Filter
Normal mode filtering, plus digital filtering optimized and fixed per input range within Σ-Δ ADC.

Input Response Time
Less than 500mS to 98% of final value for a step change in the input. A software programmable delay can be implemented for filtering transients.

Relay Time Delay
Adjustable alarm delay of up to 25 seconds.

Input Overvoltage Protection
Bipolar Transient Voltage Suppressors (TVS).

Thermocouple Input

Thermocouple Input Ranges
Thermocouple type user configured. Signal linearization, cold-junction compensation, and open circuit or lead break detection are included.

TC	°C Range (°F Range)	Accuracy
J	-210 to 760°C (-346 to 1400°F)	±0.5°C
K	-200 to 1372°C (-328 to 2502°F)	±0.5°C
T	-260 to 400°C (-436 to 752°F)	±0.5°C
R	-50 to 1768°C (-58 to 3214°F)	±1.0°C
S	-50 to 1768°C (-58 to 3214°F)	±1.0°C
E	-200 to 1000°C (-328 to 1832°F)	±0.5°C
B	260 to 1820°C (500 to 3308°F)	±1.0°C
N	-230 to 1300°C (-382 to 2372°F)	±0.5°C

Thermocouple Break Detection
Upscale or downscale.

DC Millivolt Input

DC Millivolt/Voltage Input Ranges
±1.0V ±125mV ±31.25mV
±500mV ±62.5mV ±15.625mV
±250mV

Millivolt Accuracy
Better than ±0.05% of input span.

Output

Relays
Two independent SPDT electro-mechanical relays. Contact material Silver-Cadmium Oxide (AgCdO).

Relay Ratings (CSA ratings)
25V DC @ 5A.
120/240V AC @ 5A.

Expected Mechanical Life
20 million operations.

Environmental

Ambient Temperature
Operating: -25 to 70°C (-13 to 158°F).
Storage: -40 to 85°C (-40 to 185°F).

Relative Humidity
5 to 95%.

Power Requirements
10 to 36V DC. 60mA @ 24V. 90mA @ 15V.

Isolation
3-way (input/output/power).
1500V AC for 60 seconds or 250V AC continuous.
Inputs are isolated (up to 48V) from each other.

Radiated Field Immunity (RFI)
EN61000-4-3, EN50082-1.

Electromagnetic Field Immunity (EMI)
No relay trips will occur beyond ±0.25% of input span from setpoint under the influence of electromagnetic fields from switching solenoids, commutator motors, and drill motors.

Electrical Fast Transient (EFT)
EN61000-4-4, EN50082-1.

Surge Withstanding Capability (SWC)
EN61000-4-5, EN50082-1.

Electrostatic Discharge (ESD)
EN61000-4-2, EN50082-1.

Radiated Emissions
EN50081-1 for Class B equipment.

Approvals
CE marked, UL, cUL listed (USA, Canada).
UL3121 - general product safety.

Configuration

Software Configuration
Units are fully programmable via the Windows 95/98/ME/2000/NT/XP IntelliPack Configuration Program. Configuration downloads from PC through EIA232 serial port using Acromag 800C-SIP kit.

Field Configuration
Setpoint and deadband are configurable via push-buttons and a standard calibrator.

LED Indicators
LEDs indicate power, status, and alarm.

Physical

Enclosure
Case: Self-extinguishing NYLON type 6.6 polyamide thermoplastic UL94 V-2, color beige; general purpose NEMA Type 1 enclosure.

Connectors (Removable terminal blocks)
Wire Range: AWG #14-22 (AWG #12 stranded only).

Printed Circuit Boards
Military grade FR-4 epoxy glass circuit board.

Dimensions
1.05W x 4.68H x 4.35D inches.
26.7W x 118.9H x 110.5D millimeters.

Shipping Weight
1 pound (0.45 Kg) packed.

Ordering Information

IMPORTANT: All IntelliPacks require initial software configuration (order 800C-SIP). See Note 1 below.

822A-0200
IntelliPack alarm unit.
Two thermocouple/millivolt inputs, two SPDT relays.

800C-SIP
Software Interface Package.
Only one kit is required for all IntelliPack models.
See diagram on Page 83 for included parts.

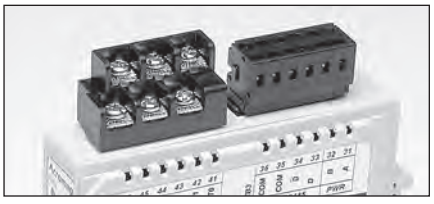
5034-225
USB-to-RS232 adapter. See page 121 for more info.

PS5R-D24
Power supply (24V DC, 2.1A).
See Power Supplies on Page 199.

TBK-B01
Optional terminal block kit, barrier strip style, 2 pcs. (Does not include terminal block for input wiring.)

TBK-S01
Optional terminal block kit, spring clamp style, 2 pcs. (Does not include terminal block for input wiring.)

NOTE 1: To order factory configuration, call Acromag for a configuration form which must accompany your order. Also, append "-C" to model number (example: 822A-0200-C). 800C-SIP kit is still recommended.



Optional terminal blocks: barrier strip (left) and spring clamp (right). Cage clamp terminal is standard.

Intelligent Alarms

832A Dual Alarm

RTD and Resistance Input

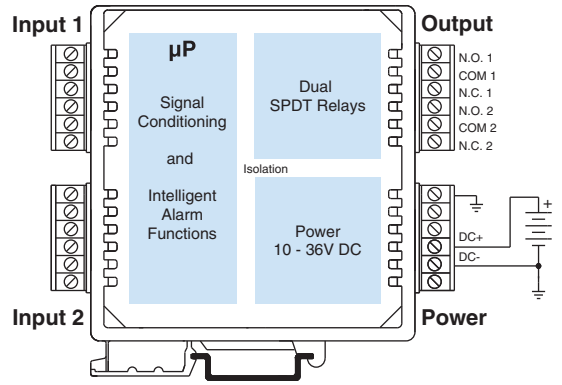
Models
832A-0200:
Dual input alarm with two SPDT relays

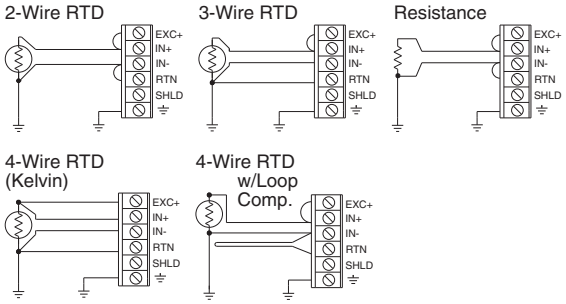
Input Ranges
RTD: 100 ohm Pt, 120 ohm Ni, 10 ohm Cu
Resistance: 0 to 500 ohms

Alarm Outputs
Dual SPDT electro-mechanical 5A relays

Power Requirement
10 to 36V DC

Approvals
CE marked. UL, cUL listed.





Description

IntelliPack alarms compare inputs against user-defined limit setpoints to control built-in relays.

Each unit offers a selection of input ranges and alarm functions to handle a broad range of applications. As your needs change, you can easily reconfigure the unit for different ranges or functions. Alarm functions available on all models include on/off controller, limit alarm, window alarm, deviation alarm, rate-of-change alarm, and peak/valley detection.

Setup is very easy. IntelliPack alarms are configured through a user-friendly Windows 95/98/ME/NT/XP/2000 program. Field adjustments and recalibration are quickly performed with front-panel push-buttons and status LEDs. Once configured, IntelliPacks operate independent of any host computer.

Special Features

- Integrated microcontroller performs intelligent signal processing for advanced alarm functions.
- Windows 95/98/ME/NT/XP/2000 software configuration speeds setup and replacement.
- Push-button reprogrammability facilitates changes in the field without a host PC.
- Multi-purpose inputs accept numerous ranges to reduce spare stock requirements.
- High-resolution Sigma-Delta A/D converter delivers high accuracy with low noise.
- Input excitation supply on each input provides power for a two-wire transmitter.
- Dual alarm operation lets you perform two alarm functions at the same time.

Performance

General Input

Analog to Digital (A/D) Converter
16-bit Σ–Δ A/D converter.

Resolution
0.1°C/ LSB. ADC typically yields resolutions finer than 0.1°C/LSB.

Ambient Temperature Effect
Better than ±0.005% of input span per °C or ±1µV, whichever is greater.

Noise Rejection
Normal Mode: Better than 40dB @ 60Hz.
Common Mode: Better than 130dB @ 60Hz.

Input Filter
Normal mode filtering, plus digital filtering optimized and fixed per input range within Σ-Δ ADC.

Input Response Time
Less than 300mS to 98% of final value for a step change in the input. A software programmable delay can be implemented for filtering transients.

Relay Time Delay
Adjustable alarm delay of up to 25 seconds.

Input Overvoltage Protection
Bipolar Transient Voltage Suppressors (TVS).

Resistance Input

Resistance Input Range
0 to 500 ohms.

Resistance Accuracy
±0.05 ohms.

RTD Input

RTD Input Ranges
100 ohm Platinum, 120 ohm Nickel, or 10 ohm Copper; user-configured.

RTD	°C Range (°F Range)	Accuracy
Pt^1	-200 to 850°C (-328 to 1562°F)	±0.25°C
Pt^2	-200 to 850°C (-328 to 1562°F)	±0.25°C
Ni	-80 to 320°C (-112 to 608°F)	±0.25°C
Cu	-200 to 260°C (-328 to 500°F)	±1.00°C

Alpha: Pt^1 ($\alpha = 1.3850$), Pt^2 ($\alpha = 1.3911$), Ni ($\alpha = 1.6720$), Cu ($\alpha = 1.4272$).

2, 3, or 4-wire configurations supported. Module provides sensor excitation, linearization, lead-wire compensation, and sensor break detection.

RTD Excitation Current
1mA DC typical, all types.

RTD Lead-Wire Compensation
25 ohms per lead.

RTD Break Detection
RTD sensor failure can be configured for either upscale or downscale.

Output

Relays
Two independent SPDT electro-mechanical relays. Contact material Silver-Cadmium Oxide (AgCdO).

Relay Ratings (CSA ratings)
25V DC @ 5A.
120/240V AC @ 5A.

Expected Mechanical Life
20 million operations.

Environmental

Ambient Temperature
Operating: -25 to 70°C (-13 to 158°F).
Storage: -40 to 85°C (-40 to 185°F).

Relative Humidity
5 to 95%.

Power Requirements
10 to 36V DC. 55mA @ 24V. 80mA @ 15V.

Isolation
3-way (input/output/power).
1500V AC for 60 seconds or 250V AC continuous.
Inputs share a common.

Radiated Field Immunity (RFI)
EN61000-4-3, EN50082-1.

Electromagnetic Field Immunity (EMI)
No relay trips will occur beyond ±0.25% of input span from setpoint under the influence of electromagnetic fields from switching solenoids, commutator motors, and drill motors.

Electrical Fast Transient (EFT)
EN61000-4-4, EN50082-1.

Surge Withstanding Capability (SWC)
EN61000-4-5, EN50082-1.

Electrostatic Discharge (ESD)
EN61000-4-2, EN50082-1.

Radiated Emissions
EN50081-1 for Class B equipment.

Approvals
CE marked, UL, cUL listed (USA, Canada).
UL3121 - general product safety.

Configuration

Software Configuration
Units are fully programmable via the Windows 95/98/ME/2000/NT/XP IntelliPack Configuration Program. Configuration downloads from PC through EIA232 serial port using Acromag 800C-SIP kit.

Field Configuration
Setpoint and deadband are configurable via push-buttons and a standard calibrator.

LED Indicators
LEDs indicate power, status, and alarm.

Physical

Enclosure
Case: Self-extinguishing NYLON type 6.6 polyamide thermoplastic UL94 V-2, color beige; general purpose NEMA Type 1 enclosure.

Connectors (Removable terminal blocks)
Wire Range: AWG #14-22 (AWG #12 stranded only).

Printed Circuit Boards
Military grade FR-4 epoxy glass circuit board.

Dimensions
1.05W x 4.68H x 4.35D inches.
26.7W x 118.9H x 110.5D millimeters.

Shipping Weight
1 pound (0.45 Kg) packed.

Ordering Information

IMPORTANT: All IntelliPacks require initial software configuration (order 800C-SIP). See Note 1 below.

832A-0200
IntelliPack alarm unit.
Two RTD/resistance inputs, two SPDT relays.

800C-SIP
Software Interface Package.
Only one kit is required for all IntelliPack models.
See diagram on Page 83 for included parts.

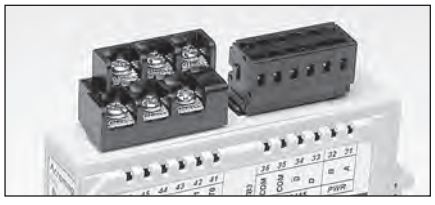
5034-225
USB-to-RS232 adapter. See page 121 for more info.

PS5R-D24
Power supply (24V DC, 2.1A).
See Power Supplies on Page 199.

TBK-B02
Optional terminal block kit, barrier strip style,4 pcs.

TBK-S02
Optional terminal block kit, spring clamp style, 4 pcs.

NOTE 1: To order factory configuration, call Acromag for a configuration form which must accompany your order. Also, append "-C" to model number (example: 832A-0200-C). 800C-SIP kit is still recommended.



Optional terminal blocks: barrier strip (left) and spring clamp (right). Cage clamp terminal is standard.

Math/Computation

890M Units

Model Types

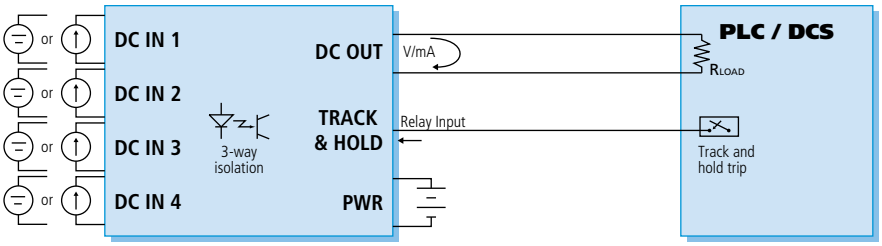
- **892M**: Dual DC voltage/current input with universal DC voltage/current output
- **894M**: Quad DC voltage/current input with universal DC voltage/current output
- **895M**: Single DC voltage/current input with frequency/pulse output
- **896M**: Dual DC voltage/current input with frequency/pulse output

Functions

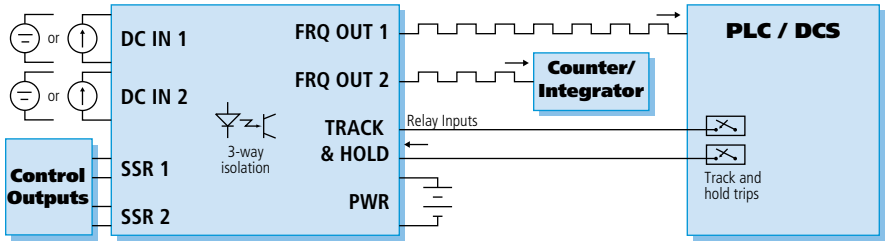
32-bit floating point math processing ensures precise computing for highly accurate output.

- Add, subtract, multiply, divide
- Square root
- Exponential (e^n) and power (X^n)
- Logarithmic (natural and base 10)
- Sine, cosine, tangent, and inverse
- Absolute value
- Minimum/maximum
- Conditional arguments (if, then, else, and, or, >, <, <>, =, <=, >=)
- Input scaling
- High/low signal selector or discriminator
- Track and hold

DC to DC Conversion: 892/894M Math Modules



DC to Frequency Conversion: 895/896M Math Modules



Description

IntelliPack math modules perform complex mathematical computations and convert DC input signals to scaled DC or frequency outputs. They are ideal for isolating and interfacing analog signals to a PLC or controller as a voltage, current, or a pulsed input. Typical applications include calculating a sum, delta's, average, flow rate, volume, weight, power, and other scaled or computed variables.

Math modules are available with either DC voltage/current output or frequency/pulse-width modulated output. The frequency output models also provide two solid-state relays for control or alarm functions. Each output (DC, frequency, and relay channels) is controlled by a unique, user-defined equation. On relay output channels, zero/nonzero equation results and true/false conditions control the on/off state.

Frequency output models are ideal for integrator/totalizer applications. They support ultra-low frequency pulses as slow as 10 cph. And, adjustable zero dropout levels apply a minimum input threshold to filter noise and unwanted pulses.

The math/computation equations are entered into the IntelliPack configuration software in a freeform format, the same as in most popular spreadsheet programs. A simulator screen provides instant feedback to test equations and see the output response before actual installation.

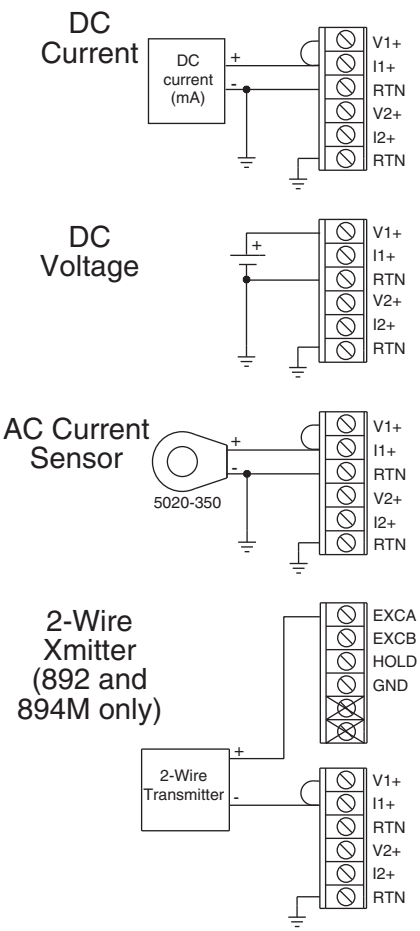
Special Features

- Universal DC analog I/O ranges provide flexibility for changing application requirements.
- Individual channel input/output scaling displays signal values in engineering units.
- Track and hold function enables easy identification of critical events and their corresponding signal values.
- 200-character equation fields (50-char. max. on 895/896M) support complex transfer functions.
- Software simulation feature allows off-line testing of equations to quickly check output signal response for a variety of conditions.
- Excitation supply for two 2-wire transmitters provides 15V DC @ 48mA to eliminate need for additional power supplies. 892/894M only.
- Diagnostic LEDs provide quick, visual indication of an out-of-range input value.

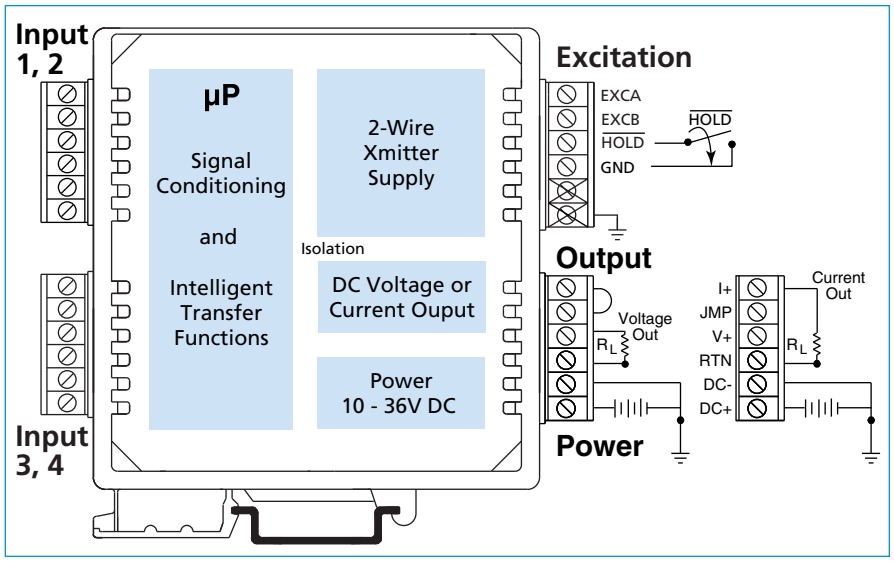
Frequency output models (895/896M) only

- Pulse output supports integrator and totalizer applications using an external counter to calculate flow, volume, weight, power, etc.
- Pulse-width modulation capability allows the user to vary the output signal's pulse width on a user-defined carrier frequency.
- Solid-state relays provide on/off control or local alarms with failsafe/ nonfailsafe capability.

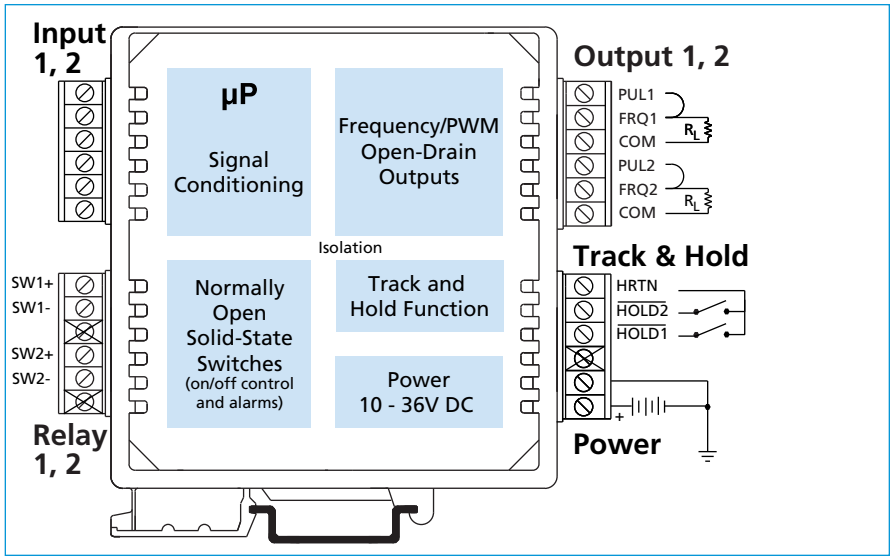
Input Connections



892/894M DC Output Math Module



895/896M Frequency Output Math Module



IntelliPack Features

- **Advanced microcontroller** has integrated, downloadable flash memory and EEPROM for intelligent signal processing.
- **Windows 95/98/ME/NT/XP/2000 software** configuration speeds setup and replacement.
- **Plug-in terminal blocks** make module installation and removal easy.
- **Built-in self-diagnostic routines** operate upon power-up and during operation for easy maintenance and troubleshooting.
- **3-way optical isolation** separates inputs, outputs, and power from each other.
- **EMC compliant.** Ruggedized circuitry meets directives to provide increased transient immunity and low emissions.
- **Wide ambient temperature range** ensures reliable performance from -25 to 70°C.
- **Wide DC supply range** has diode-coupled reverse polarity protection.

892/894M DC Output Math Modules

Application Example

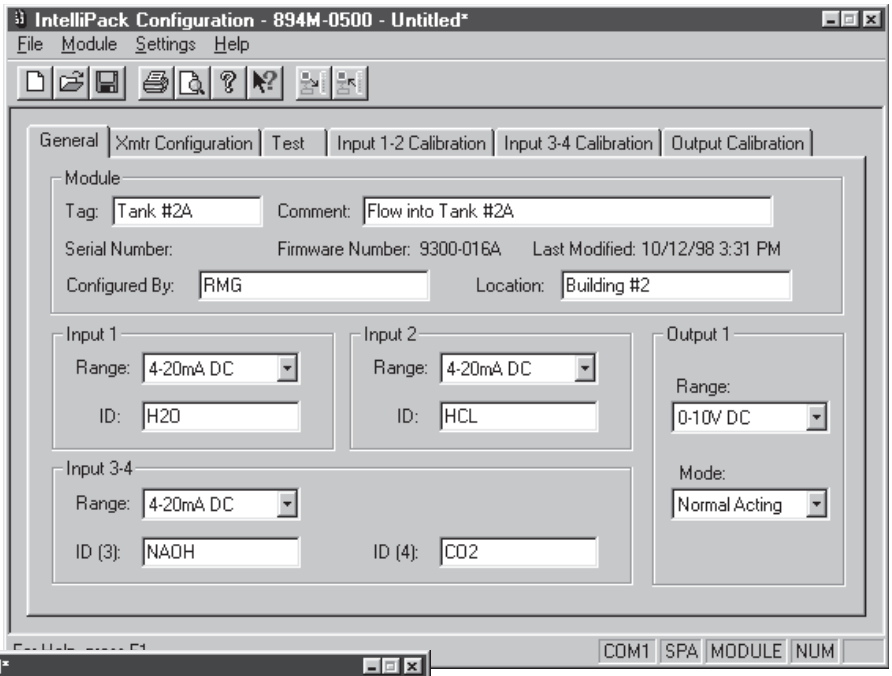
A typical application involves calculating the composite flow rate of several flows. The 894M easily sums up to four inputs and provides the total as an output scaled in engineering units.

Configuration Procedures

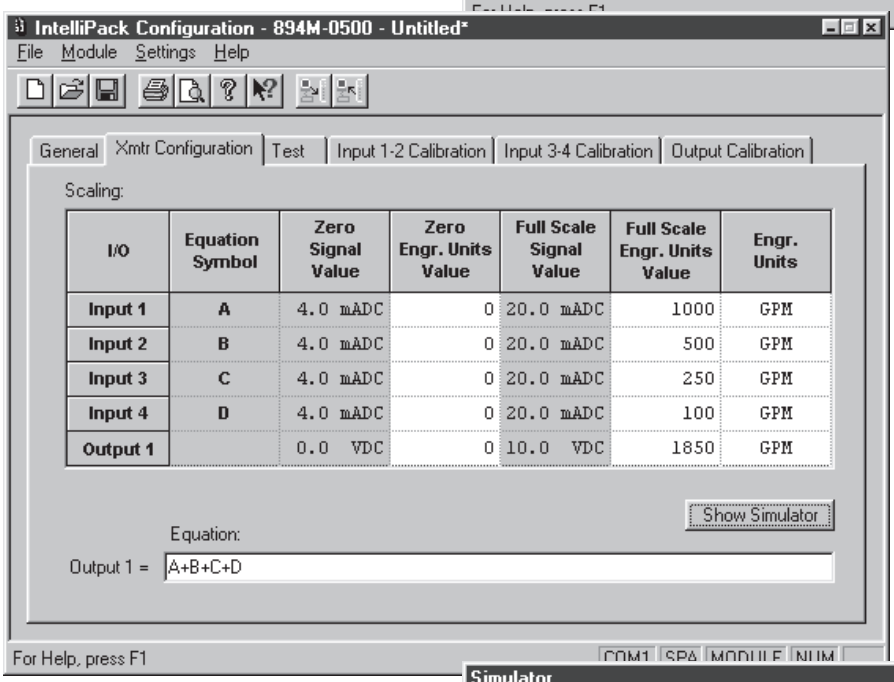
1) Enter optional tag identifiers and other desired application information.

2) Select your input ranges from the pull-down menus and identify the sources.

3) Select the output range and either normal or reverse acting (proportional/inverse) mode.



IntelliPack Configuration Software makes it very easy to set up your input and output ranges and other operational parameters.



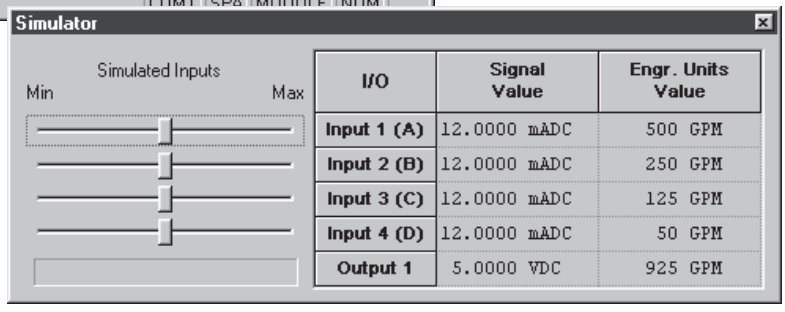
The IntelliPack math module's configuration property sheet simplifies the entry of equations.

4) Enter the zero/full scale values in engineering units for input variables A, B, C and D.

5) Enter the output scaling parameters, also in engineering units.

6) Enter your equation (up to 200-characters) in the equation field to define the output.

7) Use the I/O equation simulator (shown below) to verify the expected results for various field conditions.



The pop-up simulator sheet helps you test equations in software with slider bars to simulate input conditions.

895/896M Frequency Output Math Modules

Application Example

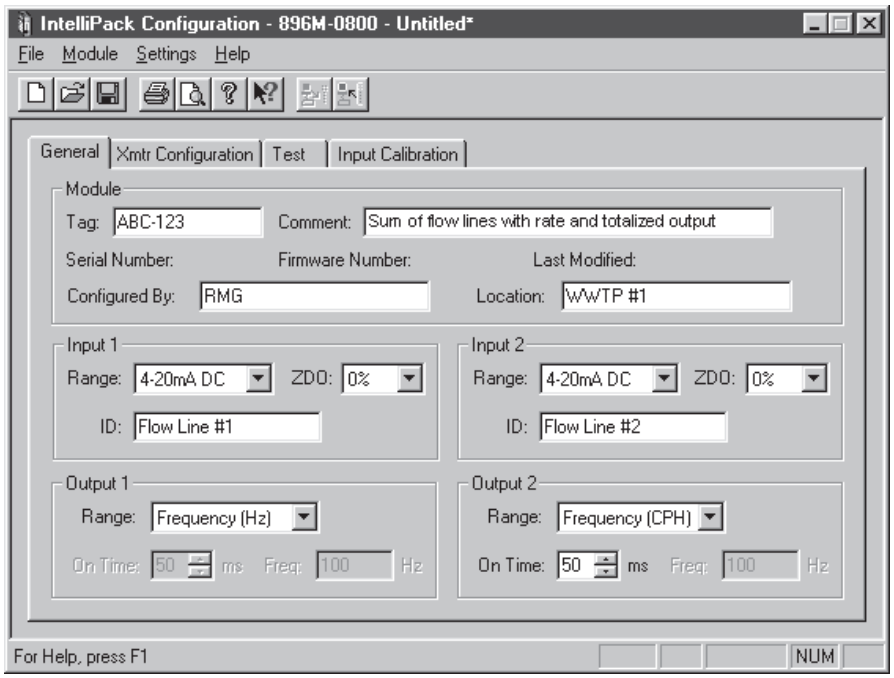
Both models are designed for integrator/totalizer applications. The 896M is ideal for demand metering applications. With one high speed pulse output and one low speed output to a pulse counter, you can measure the sum, flow, rate, and total volume.

Configuration Procedures

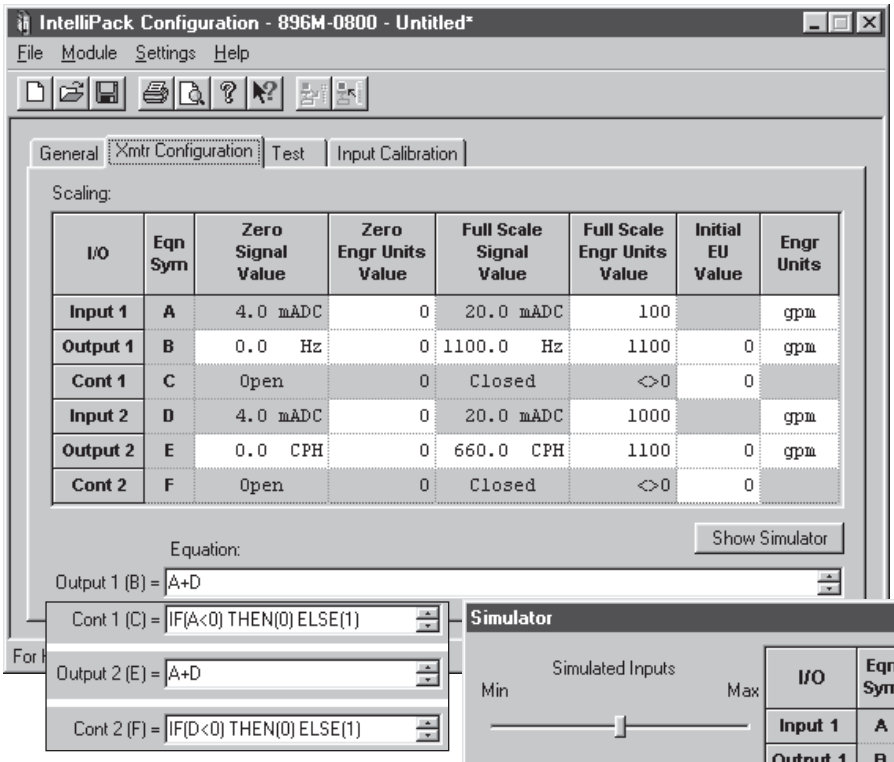
1) Enter optional tag identifiers and application information.

2) Select input ranges and zero dropout values from pull-down lists and identify the device.

3) Select output ranges from the pull-down menu and set the duty cycle (on-time).



IntelliPack Configuration Software makes it very easy to set up your input and output ranges and other operational parameters.



The IntelliPack math module's configuration property sheet simplifies the entry of equations.

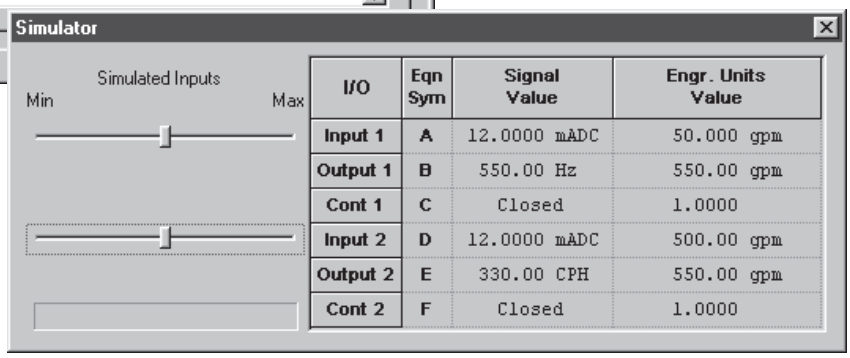
4) Enter the scaling parameters in engineering units for input variables A and D.

5) Enter the frequency scaling parameters for outputs B and E.

6) Enter the initial start-up conditions for outputs B, C, E, and F in engineering units.

7) Enter up to four 50-character equations in the scroll-down fields to define each output.

8) Use the I/O equation simulator (shown below) to verify the expected results for various field conditions.



The pop-up simulator sheet helps you test equations in software with slider bars to simulate input conditions.

Real Time Monitoring

892/894M DC Output Math Modules

Models

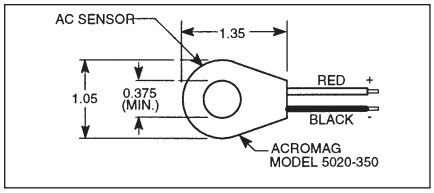
892M-0500: Two input channels
894M-0500: Four input channels

Input Ranges

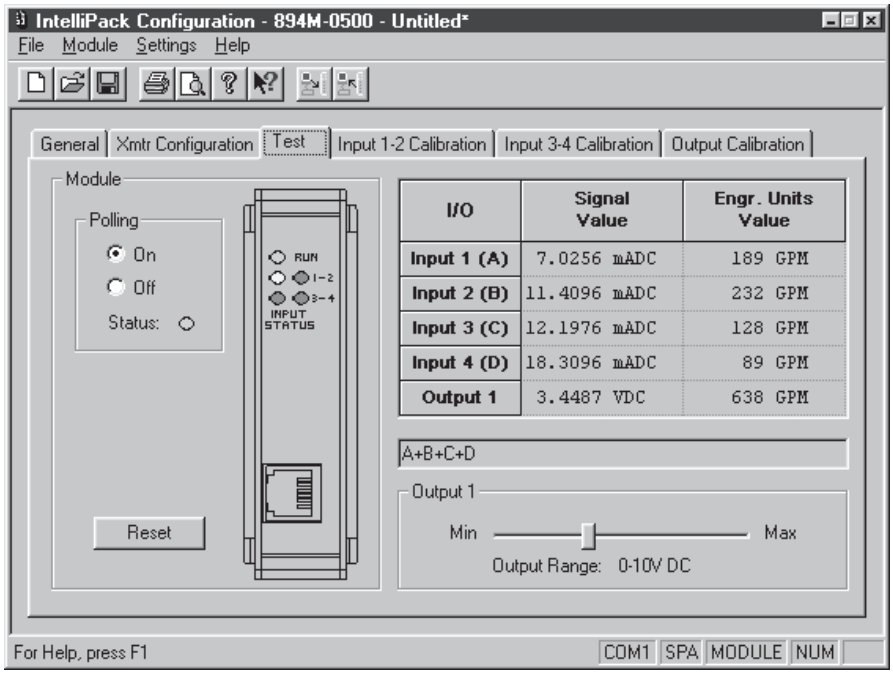
0 to 1mA, 0 to 20mA, or 4 to 20mA DC
0 to 5V or 0 to 10V DC
0 to 20A AC (with AC current sensor)

Output Ranges

0 to 1mA, 0 to 20mA, or 4 to 20mA DC,
0 to 5V or 0 to 10V DC



AC Current Sensor Model 5020-350
(ordered separately)



The test property sheet displays run-time input/output values for easy troubleshooting and diagnostics.

Arithmetic Functions

Function	Equation
Addition	A+B+C+D
Subtraction	A - B+C - D
Multiplication	4*A - 2*B+3*C - 6*D
Division	(A/4+B/2 - 3*C)/8
Square Root	SQRT(A - B+C - D)
Absolute Value	ABS(A - B+C - D)
Exponential	EXP(2*A) = e^{2A}
Power	POWER(A, B) = A^B
Natural Log	LN(A+B)
Log Base 10	LOG10(A/B)
SIN, COS, TAN, ASIN, ACOS, ATAN	SIN(A - B) ACOS(A*B)
Minimum	MIN(A/2, B/4, 3*C, D)
Maximum	MAX((A - B)/4, C+D)

Conditional

Function	Equation
If, Then, Else, And, Or	IF (A>B) THEN (2*C)
>, <, <>, =, >=, <=	IF (OR (A=B, B>=C) THEN (D)

Track & Hold Function

A digital input on the math module accepts a logic level signal from PLCs and other devices to hold the output constant at the last known value.

Real Time Monitoring

895/896M Frequency Output Math Modules

Models

895M-0800: Single I/O channel
896M-0800: Dual I/O channels

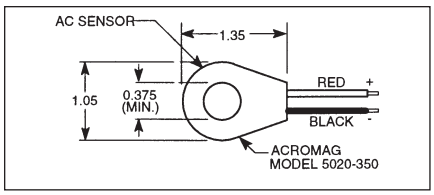
Input Ranges

0 to 1mA, 0 to 20mA, or 4 to 20mA DC
0 to 5V or 0 to 10V DC
0 to 20A AC (with AC current sensor)

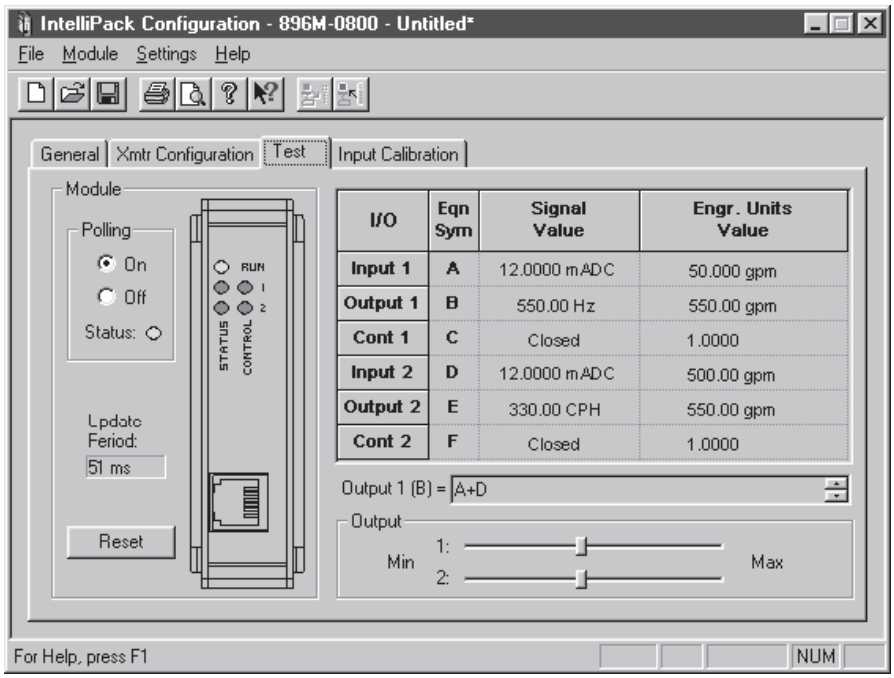
Output Ranges

0 to 36,000 pulse counts per hour,
0 to 10KHz Open-drain MOSFETs (60V DC @ 1A),
Solid-state relays (60V DC @ 500mA)

High-voltage open-drain outputs interface to a variety of discrete level devices and to TTL level systems with the use of internal 5V pull-ups.



AC Current Sensor Model 5020-350
(ordered separately)



The test property sheet continuously displays polled information and input/output signal values for easy troubleshooting and diagnostic checkout.

Arithmetic Functions

Function	Equation
Addition	A + D
Subtraction	A - D
Multiplication	4*A - 6*D
Division	(A/4 + D/2) / 8
Square Root	SQRT (A + D)
Absolute Value	ABS (A - D)
Exponential	EXP (2*A) = e^{2A}
Power	POWER (A, D) = A^{D}
Natural Log	LN (A + D)
Log Base 10	LOG10 (A/D)
SIN, COS, TAN, ASIN, ACOS, ATAN	SIN (A - D) ACOS (A*D)
Minimum	MIN (A/2, 3*D)
Maximum	MAX ((A - D)/4, A + D)

Conditional

Function	Equation
If, Then, Else, And, Or	IF (A > D) THEN (2*B)
>, <, <>, =, >=, <=	IF (OR (A = D, D <= 4*A) THEN (E/2)

Track & Hold Function

Discrete inputs on the math module accept logic level signals from PLCs and other devices to hold the associated output constant at the last known value. This function is helpful in determining conditions at the time of a critical event.

892/894M Performance Specs

General

Analog to Digital Converter (ADC)
16-bit Σ–Δ A/D converter.

Ambient Temperature Effect
Better than ±0.005% of input span per °C or ±1µV, whichever is greater.

Noise Rejection
Normal Mode: 40dB @ 60Hz, 100 ohm unbalance.
Common Mode: 100dB @ 60Hz, .100 ohm unbalance. (49.9 ohm unbalance for process current inputs).

Response Time (for input step change)
800mS typical to 98% of final output value.

Input Overvoltage Protection
Bipolar Transient Voltage Suppressors (TVS).

DC Current Input

DC Current Input Ranges

Input Ranges	Resolution
0 to 1mA DC	0.0370%
0 to 20mA DC	0.0025%
4 to 20mA DC	0.0025%

DC Current Input Impedance
49.9 ohms.

DC Current Input Accuracy
Better than 0.05% of input span, typical.
Better than 0.3% of input span typ. for 0-1mA range.

DC Voltage Input

DC Voltage Input Ranges

Input Ranges	Resolution
0 to 5V DC	0.0030%
0 to 10V DC	0.0025%

Input impedance
Greater than 500K ohms.

DC Voltage Input Accuracy
Better than 0.05% of input span, typical.

Output (DC V/mA)

D/A Converter
16-bit Σ–Δ.

Current Output
Ranges: 0-1mA, 0-20mA, 4-20mA.
Compliance: 10V minimum (500Ω load).
Accuracy: 0.025% of span (0-1mA: 0.3% of span).

Voltage Output
Ranges: 0-5V, 0-10V.
Compliance: 10mA maximum with short circuit protection. 1 ohm output impedance.
Accuracy: 0.025% of span.

Accuracy (overall input to output)
Better than 0.075% of span, typical.
Better than 0.5% of span for 0-1mA, typical

Environmental

Ambient Temperature
Operating: -25 to 70°C (-13 to 158°F).
Storage: -40 to 85°C (-40 to 185°F).

Relative Humidity
5 to 95%.

Power Requirements
10 to 36V DC. 120mA @ 24V. 200mA @ 15V.

Isolation (optical)
3-way (input/output/power).
Input circuits share a common.
1500V AC peak or 250V AC (354V DC) continuous.

Radiated Field Immunity (RFI)
EN61000-4-3, EN50082-1.

Electromagnetic Field Immunity (EMI)
Less than ±0.25% of output span effect under the influence of electromagnetic fields from switching solenoids, commutator motors, and drill motors.

Electrical Fast Transient (EFT)
EN61000-4-4, EN50082-1.

Surge Withstanding Capability (SWC)
EN61000-4-5, EN50082-1.

Electrostatic Discharge (ESD)
EN61000-4-2, EN50082-1.

Radiated Emissions
EN50081-1 for Class B equipment.

Approvals
CE marked.
UL listed (UL508 and UL1604)
cUL listed (C22.2, 142-M1987 and 213-M1987).
Hazardous Loc.: Class I; Division 2; Groups A, B, C, D.

Configuration

Software Configuration
Units are fully programmable via the Windows 95/98/ME/2000/NT/XP IntelliPack Configuration Program. Configuration downloads from PC through EIA232 serial port using Acromag 800C-SIP kit.

LED Indicators
LEDs indicate power and status.

Physical

Enclosure
Case: Self-extinguishing NYLON type 6.6 polyamide thermoplastic UL94 V-2 NEMA Type 1 enclosure.

Connectors (Removable Terminal Blocks)
Wire Range: AWG #14-22 (AWG #12 stranded only).

Printed Circuit Boards
Military grade FR-4 epoxy glass circuit board.

Dimensions
1.05W x 4.68H x 4.35D inches.
26.7W x 118.9H x 110.5D millimeters.

Shipping Weight
1 pound (0.45 Kg) packed.

Ordering Information

IMPORTANT: All IntelliPack units require initial software configuration (order 800C-SIP). See Note 1 below.

892M-0500
Dual input computation module with single output.

894M-0500
Quad input computation module with single output.

5020-350
AC current sensor. Required for AC inputs..
See Page 205 for more information.

800C-SIP
Software Interface Package.
Only one kit is required for all IntelliPack models.
See diagram on Page 83 for included parts.

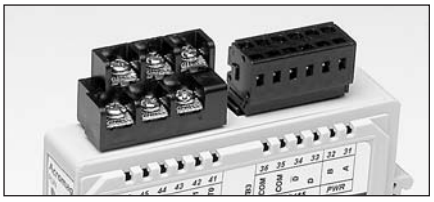
5034-225
USB-to-RS232 adapter. See page 121 for more info.

PS5R-D24
Power supply (24V DC, 2.1A).
See Power Supplies on Page 199.

TBK-B02
Optional terminal block kit, barrier strip style, 4 pcs.

TBK-S02
Optional terminal block kit, spring clamp style, 4 pcs.

NOTE 1: To order factory configuration, call Acromag for a configuration form which must accompany your order. Also, append "-C" to model number (example: 892M-0500-C). 800C-SIP kit is still recommended.



Optional terminal blocks: barrier strip (left) and spring clamp (right). Cage clamp terminal is standard.

895/896M Performance Specs

General

Analog to Digital Converter (ADC)
16-bit Σ–Δ A/D converter.

Input Accuracy
Better than ±0.05% of input span.

Input Zero Dropout Threshold
0 to 10% of input span, user-defined.

Ambient Temperature Effect
Better than ±0.005% of input span per °C or ±1µV, whichever is greater.

Noise Rejection
Normal Mode: Better than 40dB @ 60Hz.
Common Mode: Better than 100dB @ 60Hz.

Input Overvoltage Protection
Bipolar Transient Voltage Suppressors (TVS).

Input Scaling
Input signal endpoints are scaled using IntelliPack Configuration Software.

Response Time (for input step change)
70mS typical to 98% of final output value.

DC Current Inputs

DC Current Input Ranges
0 to 1mA, 0 to 20mA, 4 to 20mA DC.

DC Current Input Impedance
49.9 ohms.

DC Voltage Inputs

DC Voltage Input Ranges
0 to 5V, 0 to 10V DC.

DC Voltage Input impedance
Greater than 500K ohms.

Frequency Output

Output Type
Open -drain MOSFETs, 60V DC @ 1A DC.
On resistance: 0.2 ohms.

Frequency Range
0 to 10KHz (100% scalable) or
0 to 36,000 counts per hour (CPH).

Output Scaling
Output signal endpoints are scaled using IntelliPack Configuration Software. Output frequency is limited from a minimum span of 0-10Hz to a maximum span of 0-10KHz or from 0-10CPH to 0-36000 CPH.

Output Pullups
470 ohms to 5V via pullup terminals.
60V DC with external pullup resistor.

Output Duty Cycle
User-defined on-time from 0 to 100% of frequency range.

Relay Control Outputs

Solid-State Relay
Form A normally-open switch.
Maximum current: 500mA DC.
Maximum off-state voltage: 60V DC.
Maximum on-state resistance: 0.7 ohms.

Environmental

Ambient Temperature
Operating: -25 to 70°C (-13 to 158°F).
Storage: -40 to 85°C (-40 to 185°F).

Relative Humidity
5 to 95%.

Power Requirements
10 to 36V DC. 55mA @ 24V.

Isolation (optical)
4-way (input/output/relays/power).
Input circuits share a common.
1500V AC peak or 250V AC (354V DC) continuous.

Radiated Field Immunity (RFI)
EN61000-4-3, EN50082-1.

Electromagnetic Field Immunity (EMI)
Less than ±0.25% of output span effect under the influence of electromagnetic fields from switching solenoids, commutator motors, and drill motors.

Electrical Fast Transient (EFT)
EN61000-4-4, EN50082-1.

Surge Withstanding Capability (SWC)
EN61000-4-5, EN50082-1.

Electrostatic Discharge (ESD)
EN61000-4-2, EN50082-1.

Radiated Emissions
EN50081-1 for Class B equipment.

Approvals
CE, UL listed (USA, Canada).
UL3121 - general product safety.

Configuration

Software Configuration
Units are fully programmable via the Windows 95/98/ME/2000/NT/XP IntelliPack Configuration Program. Configuration downloads from PC through EIA232 serial port using Acromag 800C-SIP kit.

LED Indicators
LEDs indicate power, status, and relay.

Physical

Enclosure
Case: Self-extinguishing NYLON type 6.6 polyamide thermoplastic UL94 V-2 NEMA Type 1 enclosure.

Connectors (Removable Terminal Blocks)
Wire Range: AWG #14-24.

Printed Circuit Boards
Military grade FR-4 epoxy glass circuit board.

Dimensions
1.05W x 4.68H x 4.35D inches.
26.7W x 118.9H x 110.5D millimeters.

Shipping Weight
1 pound (0.45 Kg) packed.

Ordering Information

IMPORTANT: All IntelliPack units require initial software configuration (order 800C-SIP). See Note 1 below.

895M-0800
Single channel math module with one frequency output and one control/relay output.

896M-0800
Dual channel math module with two frequency outputs and two control/relay outputs.

5020-350
AC current sensor. Required for AC inputs..
See Page 205 for more information.

800C-SIP
Software Interface Package.
Only one kit is required for all IntelliPack models.
See diagram on Page 83 for included parts.

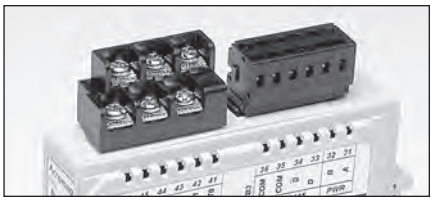
5034-225
USB-to-RS232 adapter. See page 121 for more info.

PS5R-D24
Power supply (24V DC, 2.1A).
See Power Supplies on Page 199.

TBK-B02
Optional terminal block kit, barrier strip style, 4 pcs.

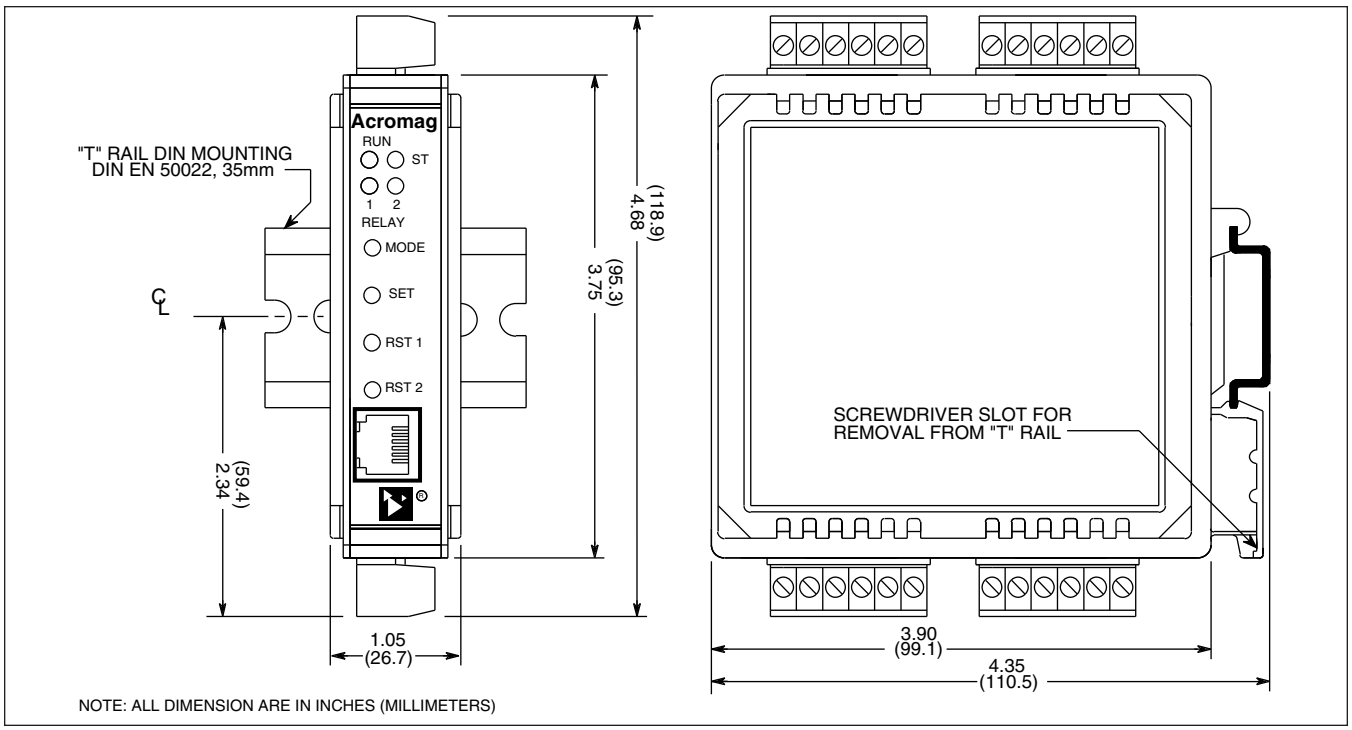
TBK-S02
Optional terminal block kit, spring clamp style, 4 pcs.

NOTE 1: To order factory configuration, call Acromag for a configuration form which must accompany your order. Also, append "-C" to model number (example: 892M-0500-C). 800C-SIP kit is still recommended.



Optional terminal blocks: barrier strip (left) and spring clamp (right). Cage clamp terminal is standard.

Dimensions


"T" RAIL DIN MOUNTING
DIN EN 50022, 35mm
Acromag
RUN
ST
1 2
RELAY
MODE
SET
RST 1
RST 2
(118.9)
4.68
(95.3)
3.75
(59.4)
2.34
1.05
(26.7)
SCREWDRIVER SLOT FOR
REMOVAL FROM "T" RAIL
3.90
(99.1)
4.35
(110.5)
NOTE: ALL DIMENSION ARE IN INCHES (MILLIMETERS)

Accessories

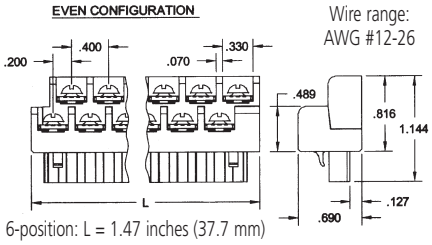
Terminal Blocks

Barrier strip (left) and spring clamp (right).

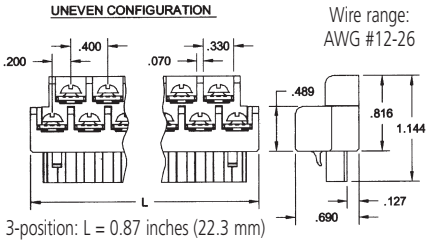
Ordering Information

See individual I/O modules for compatibility.

Barrier Strip Terminal Blocks



6-position: L = 1.47 inches (37.7 mm)



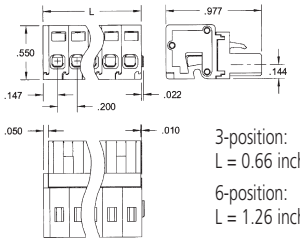
3-position: L = 0.87 inches (22.3 mm)

TBK-B01
Terminal block kit, two 6-position pieces

TBK-B02
Terminal block kit, four 6-position pieces

TBK-B03
Terminal block kit, one 3-position and three 6-position pieces

Spring Clamp Terminal Blocks



Wire range:
AWG #12-26

3-position:
L = 0.66 inches (16.9 mm)

6-position:
L = 1.26 inches (32.3 mm)

TBK-S01
Terminal block kit, two 6-position pieces

TBK-S02
Terminal block kit, four 6-position pieces

TBK-S03
Terminal block kit, one 3-position and three 6-position pieces

Mounting Hardware

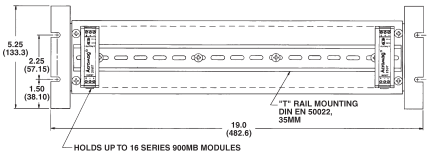
DIN-Rail Mounting

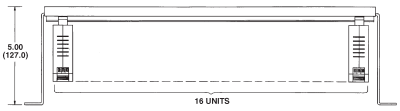
For your convenience, Acromag offers several mounting accessories to simplify your system installation. Our 19" rack-mount kit provides a clean solution for mounting your I/O modules and a power supply. Or you can buy precut DIN rail strips for mounting on any flat surface.

Ordering Information

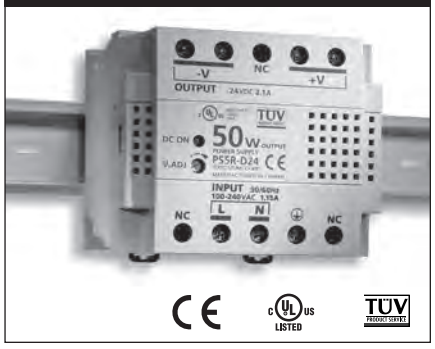
20RM-16-DIN
19" rack-mount kit with DIN rail.

DIN RAIL 3.0
DIN RAIL 16.7
DIN rail strip, Type T, 3 inches (75mm) or 16.7 inches (425mm)





Power Supplies



50W Supply

Input Power Requirement
85 to 264V AC or 105 to 370V DC

Output
24V DC, 2.1A (50W)

Ordering Information

PS5R-D24
Universal 50W power supply

See Power Supplies on Page 199 for other models and more information.

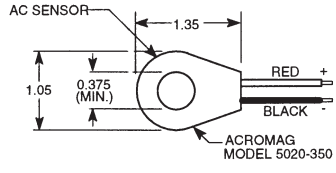
USB / RS232 Adapter

Length: 3.15 in (8.0 cm)
Height: 0.80 in (2.03 cm)
Width: 1.75 in (4.44 cm)
Weight: 1.6 oz (45.36 g)

Ordering Information

5034-225
USB-to-RS232 adapter

AC Current Sensor



Ordering Information

5020-350
AC current sensor (See page 205)