



## DATA SHEET

### Description

Most companies have critical assets - assets that have a direct and significant impact on corporate performance and profitability- assets that must be managed effectively.

These critical assets are deployed locally, remotely, and are often times mobile. The problem, therefore, of continuous uptime and availability of equipment is complicated and solving it imperative.

Companies require effective solutions for centrally managing their remote assets to make their business successful in today's highly competitive environment.

Rymic's innovative Internet enabled data acquisition system, rymicNET, helps achieve these objectives by allowing companies to manage assets critical to the performance of their business regardless of where the assets are deployed. By managing critical assets more closely, companies can create competitive advantages by

- Improving the uptime of critical revenue-generating assets
- Reducing the costs of managing, maintaining and servicing those assets
- Reducing risk by managing legal compliance



### Features

- Secure Internet Enabled Device
- Open Systems (Linux™, Java™, TCP/IP)
- Java based User Interface
- Wide Variety of Sensors Supported, Including Wireless Sensors
- Wireless Networking (802.11b, CDMA, GPRS, Radio, satellite)
- Email and Paging notification
- Alarming and Reporting
- Live Video and Image Capture
- Non-volatile Data Storage (up to 1 Gbyte)
- XML and Custom Report Formats
- SQL™ Data Access
- Event capture, Threshold Monitoring, Timestamps, and Pulse Measurements
- Rules engine and Calculations
- Fixed IP and DHCP Supported
- Modbus TCP and ASCII support

### Applications



**Storage Tanks** such as fuel, chemicals, water, and other materials

**Facilities** such as buildings, plants, labs, satellite ground stations, shipyards, and passenger terminals

**Utility Properties** such as water treatment and storage facilities, pipelines, field stations, controlled access facilities, and power plants and sub-stations

**Equipment** such as pumps, generators, turbines, blowers, HVAC, and fuel cells

**Transportation Equipment** such as trucks, cars, trailers, and heavy equipment

**Communication Facilities** such as telecommunication, cable and data centers and relay stations

**Metering and Quality Monitoring** for water, gas, and electricity

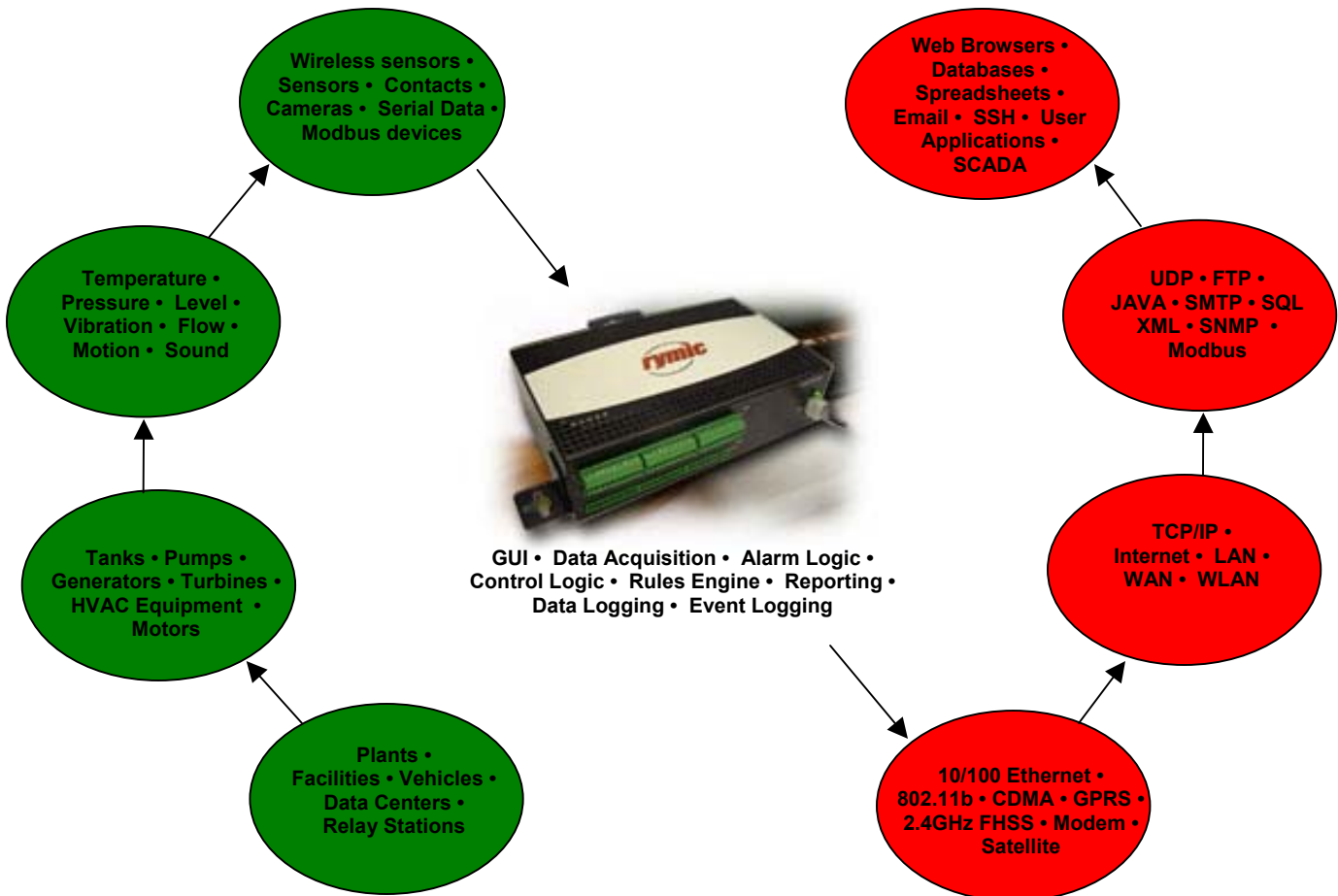


## System Overview

The rymicNET product line is a family of Internet enabled data acquisition devices with a wide variety of I/O options and software features that provide users the ability to monitor and control critical assets regardless of where the asset is deployed or where the user is located.

The rymicNET unit is a completely self-contained device that allows users to monitor and control local, remote, and mobile assets via the Internet. Users connect sensors, cameras, and other devices to the rymicNET unit and are able to interact with the system directly from their web browser. The rymicNET system is delivered with a Java based graphical user interface (GUI) that allows users to configure and view the system as well as set up the unit for their particular application.

The rymicNET system is based on an open-systems architecture. The processor board is x86 based and runs the Linux 2.4 kernel and a Java Virtual Machine (JVM). The system serves the Rymic Java applet (the GUI) to the client machine's web browser. Through the GUI, users configure the system for data collection, logging, reporting, alarming, email, paging, limit checking, etc. right from their desktop PC.





## All rymicNET models include the following capabilities:

### Self-contained and Internet accessible

- \* Low power, high performance data acquisition
- \* Includes all of the necessary hardware and software

### Wired and wireless networking support

- \* Fixed IP, DHCP, and Dynamic DNS
- \* Support for many types of network and serial communication protocols
- \* Modbus TCP support

### On-board computing capabilities

- \* Intuitive and easy to use Java based GUI
- \* User configurable calculations and conditional operations
- \* Threshold monitoring
- \* Rules engine
- \* Email notifications of events and alarms

### USB camera support

- \* Still image capture on events
- \* Live view of video images

### Secure operation

- \* Username and password encrypted using DES encryption
- \* Individual user access through login and passwords
- \* SSH system admin console access

### Data logging

- \* XML, delimited and custom report generation
- \* Data can be forwarded to other systems using FTP, email, SQL, and Modbus data delivery methods
- \* Non-volatile storage of collected data and configuration
- \* Real-time Trend Charting of data

### Data Acquisition

- \* Multiple analog, digital and serial I/O that allows simultaneous collection of data from multiple sensors and control of outputs
- \* Removable Screw terminal I/O connections
- \* External power for sensors
- \* Support for Wireless sensors
- \* Support for Modbus devices

## Software Overview

The rymicNET operating environment utilizes the Linux 2.4 Kernel and users interact with the system via the browser-based Java applet. This applet is the GUI and is used for system configuration, application set up, and viewing of the data. The GUI requires a Java applet plug in for the client computer system to allow the applet to run properly within the browser. The J2SE Runtime environment (1.4.2 or later) can be downloaded at no charge from the Sun Microsystems website (<http://java.sun.com/j2se/downloads.html>). The rymicNET GUI is compatible with Internet Explorer 5.5 SP2 or IE 6 SP1 (or later) running on the client. In addition to the GUI, the system also supports a command line interface using SSH (Secure Shell).

**SELECT THE ASSET TO BE MONITORED BY ENTERING THE IP ADDRESS OF THE rymicNET DEVICE.**

**I/O READINGS, CAMERA, AND CHARTS ARE UPDATED AUTOMATICALLY**

Name	Value
100_LED	1
AirFlow	N/A
Air_Flow_LED	1
Audio_LED	1
Master_Control	0
Humidity	114.87198
Humidity_LED	1
Link_LED	1
Power_LED	1
Temperature	84.812
Temperature_LED	1
ana_in00	0.00390995
ana_in01	0.004134182
ana_in02	0.003046208
ana_in03	0.003046208
ana_in04	0.0031614234
ana_in05	0.004277363
ana_in06	0.0034048208
ana_in07	0.0039470078
ana_out00	0.0
ana_out01	0.0
ana_out02	0.0
ana_out03	0.0
dig_in00	1
dig_in01	1
dig_in02	1
dig_in03	1
dig_in04	1
dig_in05	1
dig_out00	1
dig_out01	1



## System Features:

### I/O configuration

Each I/O point and calculated value can be assigned a unique name.

### Calculations

Users can create their own calculated values from simple engineering unit conversions to complex equations using the available JAVA math library.

### Conditions

Conditional statements provide users with the ability to build complex thresholds, limits, and logical expressions. Actions can be performed based on these conditions being met.

### Actions

Actions include sending email, generating and sending reports, logging data, writing data to a database, and setting analog and digital outputs for control.

### Thresholds

Allow users to quickly configure the system to monitor values crossing thresholds. Actions can be performed based on the thresholds being crossed. Thresholds are evaluated at user selectable frequencies.

### Rules

Rules are a series of configurable “if (condition)-then (action)-else (action)” statements that allow users to set up the system for their application. Rules are evaluated at user selectable frequencies.

### Timed Rules

Timed rules are a series of user-defined actions that are performed at programmed time intervals.

### Reports

Report formats include SQL, Modbus, XML, delimited, user defined, and delimited scan.

### Logs

System and application status can be viewed from the log screens within the GUI. These circular logs provide users with insight into how the system is operating.

### Network

Fixed and/or wireless networking options are configurable from the GUI. The system can be configured with a fixed IP address or can receive its IP address from a DHCP server.

### Test buttons

From the GUI, users have the ability to test their system settings and configurations. Email, FTP, rules, reports, etc. can be tested by clicking the Test button for the particular item.

### Customization

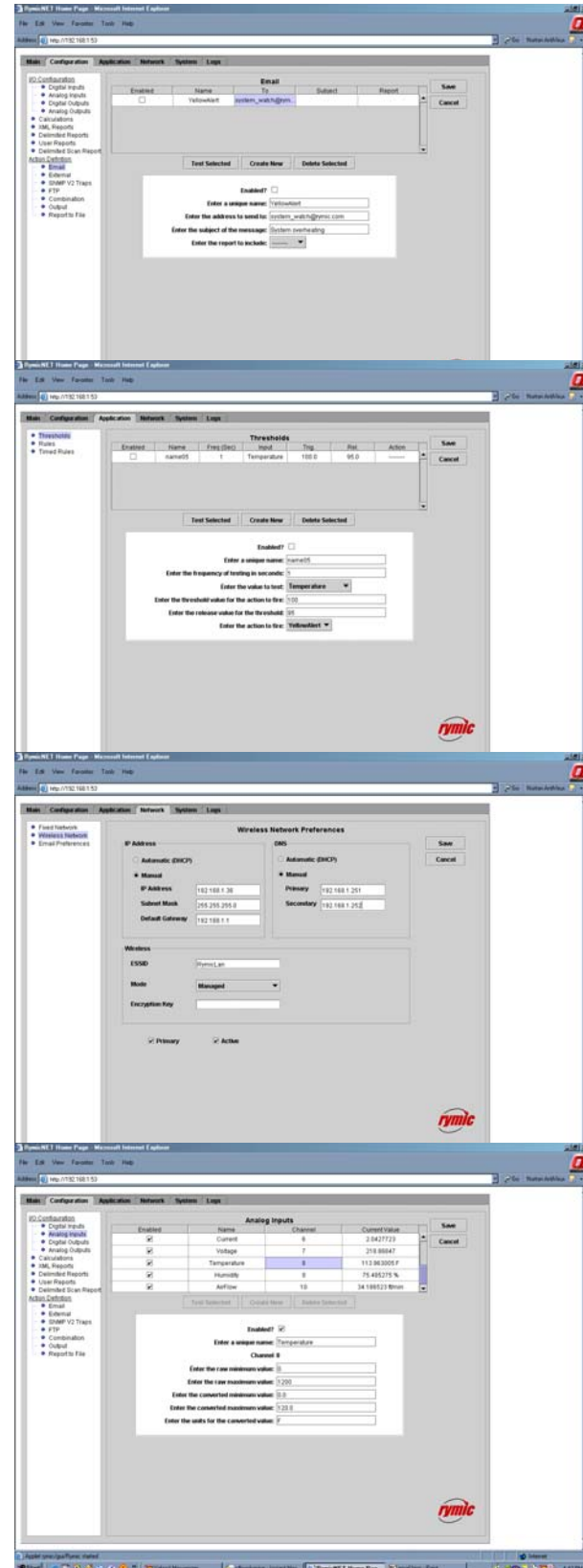
Users can select their own color schemes as well as “brand” the user interface with their company’s logo.

### Remote software updates

The rymicNET system software can easily be updated over the network connection.

### Security

Individual user access controlled through login and passwords. User names and passwords encrypted using DES encryption.



ications subject to change without notice.



## Hardware Overview

The rymicNET unit is completely self-contained consisting of the following components:

- \* 233MHz NS Geode processor (x86 compatible)
- \* Up to 256Mbytes of SDRAM
- \* Up to 1Gbyte of solid state storage using CompactFlash card
- \* 10/100 Ethernet
- \* (2) Serial ports
- \* (2) USB ports
- \* Keyboard and video ports for optional console interface
- \* Multifunction analog and digital I/O board
- \* Internal connector board providing screw terminal I/O connections and signal conditioning
- \* Optional internal DC/DC converter
- \* Optional PCMCIA slots (two type II)
- \* Optional 802.11b wireless Ethernet card
- \* Optional CDMA or GPRS, cellular modems
- \* Optional wall-wart power supply
- \* Wall mounting brackets
- \* +5V and +12V for powering external sensors and devices

Optional PCMCIA slots provide a means to include wireless technologies such as 802.11b, CDMA, and GPRS using commercially available PC Cards. RS-232 and USB 1.0 ports are provided for external devices such as cameras, wireless sensors, and Modbus devices.



## General Specifications

### Technical Specifications

**Processor:** National Semiconductor™ Geode™ processor (NS GX1-233)

**Memory:** PC-100 SDRAM module (SODIMM form-factor). Up to 256 Mbytes

**Solid State Disk:** 50-pin CompactFlash™ Card. Up to 1 Gbyte

**Ethernet:** 10/100 Base-T, IEEE 802.3u compatible, RJ-45 connector

**Serial Ports:** (1) RS-232 (diagnostics), (1) RS-232/485, DB9 connector

**USB Port:** (2) USB 1.0 compliant ports

**Video:** NS CX5530 compatible controller. Supports non-interlaced CRT resolutions up to 1280 x 1024. DB15 VGA connector

**Keyboard:** PS/2 style keyboards are supported

**PCMCIA (optional):** PCMCIA slots support PC cards of Type I, II and III

**Real Time Clock:** Battery backed RTC



## Mechanical Specifications

**Dimensions:** Width x Depth x Height: 8.25" x 5.05" x 2.40"

**Weight:** Approximately 3.25 lbs.

**Mounting options:** Wall or panel mount using supplied brackets

## Environmental Specifications

**Operating temperature:** -20° to +70° C (-4° to 158° F)

**Storage temperature:** -25° to 85° C (-13° to 185° F)

**Humidity:** 10-90% non-condensing

## Electrical Specifications

The rymicNET system operates internally using +5Vdc power at 2.4A (typical). The +5Vdc power is derived from either a Rymic supplied external wall wart power supply (AC operation) or an optional internal DC/DC converter (DC operation). Additionally, both the external wall wart and the internal DC/DC converter provide +5Vdc and +12Vdc for powering external sensors and devices.

### AC operation:

Input: 100-240~ 47-63Hz 1.35A

+5Vdc Output for system: 12W (typical)

Sensor power output available: +12Vdc @ .5A (max), +5Vdc @ .5A (max)

### DC power option:

Input: 10-36Vdc (44V absolute max.)

+5Vdc Output for system: 12W (typical)

Sensor power output available: +12Vdc @ .5A (max), +5Vdc @ .5A (max)

Isolation: 1500Vdc

Input reverse polarity protection: <6A for brief duration

## Agency Approvals

FCC Part 15 Class A (EN55022)

## Sensor Support

Any sensors meeting the analog and/or digital input specifications of the rymicNET system can be used. The rymicNET system also supports a wide variety of wireless sensors. Sensors from existing SCADA, DCS, and PLC systems can be utilized as well as 3<sup>rd</sup> party sensors. Rymic has tested and approved a number of 3<sup>rd</sup> party sensors for use with the system. +5Vdc and +12Vdc are available at the I/O terminal block for powering external sensors. Supported sensors include:

- \* Temperature
- \* Pressure
- \* Level
- \* Vibration and Acoustics
- \* Flow (liquid and gas)
- \* Power monitoring
- \* Humidity
- \* Condensation
- \* Motion
- \* Sound level
- \* Modbus compatible sensors
- \* RTD support with Model-44xx



**rymicNET Specifications**

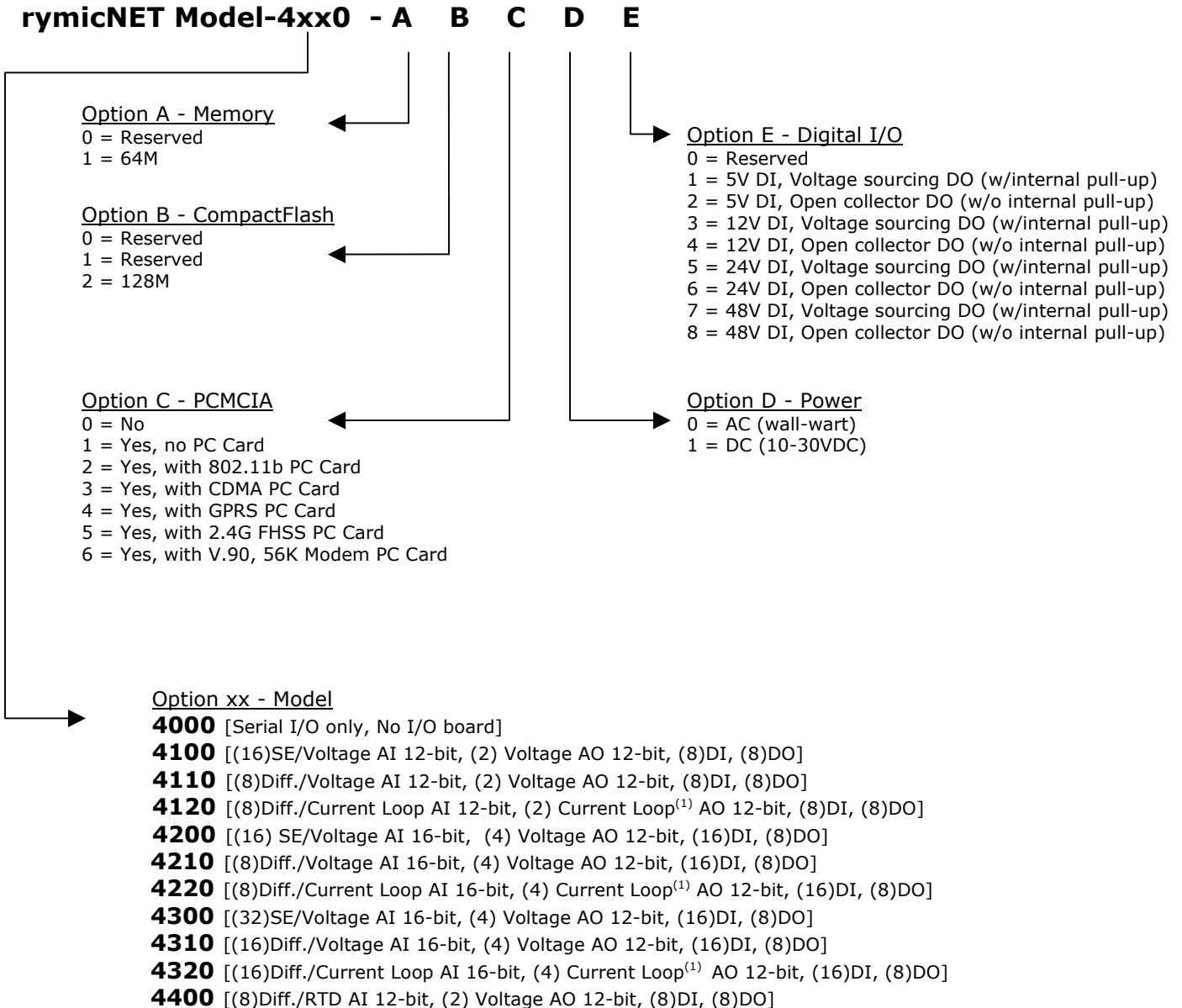
	Model 4100	Model 4110	Model 4120	Model 4200	Model 4210	Model 4220	Model 4300	Model 4310	Model 4320	Model 4400
<b>Analog Inputs</b>										
Number of inputs	16 SE <sup>(4)</sup>	8 Diff <sup>(4)</sup>	8 Diff.	16 SE <sup>(4)</sup>	8 Diff <sup>(4)</sup>	8 Diff.	32 SE <sup>(4)</sup>	16 Diff <sup>(4)</sup>	16 Diff.	8 RTD
A/D resolution	12-bit	12-bit	12-bit	16-bit	16-bit	16-bit	16-bit	16-bit	16-bit	12-bit
Bipolar input ranges	±10V, ±5V, ±2.5V, ±1.25V ±0.625V	±10V, ±5V, ±2.5V, ±1.25V ±0.625V	N/A	±10V, ±5V, ±2.5V, ±1.25V	±10V, ±5V, ±2.5V, ±1.25V	N/A	±10V, ±5V, ±2.5V, ±1.25V ±0.625V	±10V, ±5V, ±2.5V, ±1.25V ±0.625V	N/A	N/A
Unipolar input ranges	0-10V, 0-5V, 0-2.5V, 0-0.625V	0-10V, 0-5V, 0-2.5V, 0-0.625V	0-20mA, (4-20mA w/ SW offset)	0-10V, 0-5V, 0-2.5V, 0-1.25V	0-10V, 0-5V, 0-2.5V, 0-1.25V	0-20mA, (4-20mA w/ SW offset)	0-10V, 0-5V, 0-2.5V, 0-1.25V	0-10V, 0-5V, 0-2.5V, 0-1.25V	0-20mA, (4-20mA w/ SW offset)	PT-100 RTD
Input impedance	10 <sup>13</sup> Ω	10 <sup>13</sup> Ω	250 Ω (Current loop)	10 <sup>13</sup> Ω	10 <sup>13</sup> Ω	250 Ω (Current loop)	10 <sup>13</sup> Ω	10 <sup>13</sup> Ω	250 Ω (Current loop)	10 <sup>13</sup> Ω
Overvoltage protection	±60V	±60V	±60V	±60V	±60V	±60V	±60V	±60V	±60V	±60V
Nonlinearity	N/A	N/A	N/A	±3LSB (NMC)	±3LSB (NMC)	±3LSB (NMC)	±3LSB (NMC)	±3LSB (NMC)	±3LSB (NMC)	±3LSB (NMC)
Autocalibration	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
<b>Analog Outputs</b>										
Number of outputs	2 SE	2 SE	2 SE	4 SE	4 SE	4 SE	4 SE	4 SE	4 SE	2 SE
D/A resolution	12-bit	12-bit	12-bit	12-bit	12-bit	12-bit	12-bit	12-bit	12-bit	12-bit
Bipolar output ranges	±5V	±5V	N/A	±5V	±5V	N/A	±10V, ±5V	±10V, ±5V	N/A	±5V
Unipolar output ranges	0-5V	0-5V	4-20mA <sup>(3)</sup>	0-5V	0-5V	4-20mA <sup>(3)</sup>	0-10V, 0-5V	0-10V, 0-5V	4-20mA <sup>(3)</sup>	0-5V
Output current (max.)	±15mA	±15mA	30mA	±15mA	±15mA	30mA	±15mA	±15mA	30mA	±15mA
Settling time (max. to 0.01%)	4μsec	4μsec	4μsec	6μsec	6μsec	6μsec	6μsec	6μsec	6μsec	4μsec
Relative accuracy	±1LSB	±1LSB	±1LSB	±1LSB	±1LSB	±1LSB	±1LSB	±1LSB	±1LSB	±1LSB
Autocalibration	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
<b>Digital Inputs <sup>(1)</sup></b>										
Number of inputs	8	8	8	8	8	8	16	16	16	8
Input range	5V, 12V, 24V, 48V	5V, 12V, 24V, 48V	5V, 12V, 24V, 48V	5V, 12V, 24V, 48V	5V, 12V, 24V, 48V	5V, 12V, 24V, 48V	5V, 12V, 24V, 48V	5V, 12V, 24V, 48V	5V, 12V, 24V, 48V	5V, 12V, 24V, 48V
Overvoltage protection	±60V	±60V	±60V	±60V	±60V	±60V	±60V	±60V	±60V	±60V
<b>Digital Outputs <sup>(2)</sup></b>										
Number of outputs	8	8	8	8	8	8	8	8	8	8
Isink (open-collector)	140mA	140mA	140mA	140mA	140mA	140mA	140mA	140mA	140mA	140mA
Isource (w/pullup)	47mA	47mA	47mA	47mA	47mA	47mA	47mA	47mA	47mA	47mA
Max. Output voltage	±60V	±60V	±60V	±60V	±60V	±60V	±60V	±60V	±60V	±60V

Notes:

- (1) All digital inputs provide current limiting and debounce filtering.
- (2) All digital outputs are TVS protected against kick back voltages and PTC protected against short circuit/over-current.
- (3) 0-20mA also available. Contact factory.
- (4) 15KHz lowpass filter standard. Contact factory for other cut off frequencies.



## Ordering Options



### Notes:

(1) Can also be ordered as 0-20mA Current Loop or Voltage outputs. Contact factory.