SmartReader Plus - Common Specifications
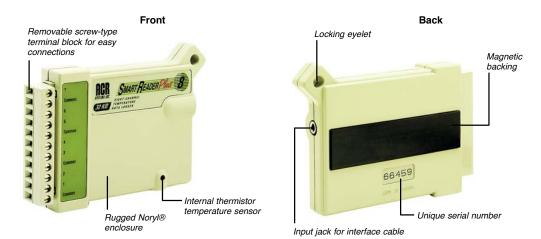
Multi-Channel, Configurable, 12-Bit Data Loggers

Front

Removable screw-type terminal block for easy connections

Rugged Noryl® enclosure

Internal thermistor temperature sensor

Back

Locking eyelet

Magnetic backing

66459

Unique serial number

Input jack for interface cable

PRODUCT SPECIFICATIONS

SmartReader Plus data loggers share many common features. For further specifications on individual models, refer to pages 7-14.

Size:
107 mm x 74 mm x 22 mm (4.2" x 2.9" x 0.9")

Weight:
110 g (3.75 oz)

Case Material:
Noryl® plastic

External Connector:
Removable screw-type terminal strip with Common (-) connection

Mounting:
Magnetic backing or locking eyelet

Operating Limits:
-40 to 70ºC (-40 to 158ºF) and 0 to 95% relative humidity (non-condensing)

Clock Accuracy:
+/- 2 seconds per day

Battery:
3.6 volt Lithium, 1 Amp-Hour

Battery Life:
10 years under normal use (factory replaceable)

Power Consumption:
5 to 10 microamps (continuous)

Memory Sizes*:
32 KB (21,500 readings)
128 KB (87,000 readings)
1.5 MB (1,048,000 readings)
*See specific models for availability

Sampling Methods:
1. Continuous (First-in, First-out – not available with sample rates faster than 8 seconds)
2. Stop when full (Fill-then-stop)

Sampling Rates:
User selectable rates from 25 per second (0.04 seconds) to once every 8 hrs*
*BP-101 Battery Pack or PS-201 Power Supply required for sample rates faster than 8 seconds (see Accessories section for details)

Resolution:
12-bit (1 part in 4,096)

PC Requirements:
PC running Windows 2000 SP4, Windows XP SP1 or Windows Vista 32 bit. PC must have one free serial or USB port depending on connection.

Software Requirements:
TrendReader® 2 (see page 32 for details)

Certifications and Standards:
- Certified to CE standard EN50082-1: 1997 (European Generic Immunity) covering ESD, RFI, EFT/B, Surge, Conducted Immunity, Power Frequency Magnetic Field Immunity, and Voltage Dips and Interruptions
- Meets CE standards EN55011 Class B: 1997 (European Radiated Emissions) and CISPR Class B: 1991 (International Radiated Emissions)

Resistance to X-Rays:
- Tested for protection against a 160kV dose @ 5mA for 30 seconds (150mA-sec) @ 38 inches F.F.D. (about 100 times that of an airport x-ray machine)
- Tested for protection against Gamma Ray (equivalent to 0.137-1.38 mega volts) IR 192 - 28 curies @ 30 second exposure source to object distance 5"

INTERNAL TEMPERATURE SENSOR
(common on all models, except SmartReader Plus 9)

Type:
Negative Temperature Coefficient Thermistor 10,000 ohms @ 25ºC (77ºF)

Range:
-40 to 70ºC (-40 to 158ºF)

Accuracy:
+/- 0.2ºC over the range of 0 to 70ºC (+/- 0.3ºF over the range of 32 to 158ºF)

Resolution:
0.03ºC at 25°C (0.05ºF at 77ºF); better than 0.07ºC (0.12ºF) between -25 and 70ºC (-13 and 158ºF); better than 0.13ºC (0.23ºF) between -40 and -25ºC (-40 and -13ºF)

SmartReader Plus 1

Two-Channel Temperature (Thermistor) Data Logger

The SmartReader Plus 1 data logger is specifically designed for easy monitoring and recording of temperature. With one internal ambient temperature channel and one input for optional remote temperature or contact closure sensing, this data logger is ideal for quick and accurate temperature recordings in a variety of applications.

PRODUCT SPECIFICATIONS

No. of Channels:
Two - One for ambient temperature
- One for temperature (with thermistor probe), switch status or resistance

Memory Sizes:
32 KB, 128 KB and 1.5 MB

Common Specifications:
See page 6

Software Specifications:
See page 32

Remote & Network Communications:
See page 35

Accessories:
ACR ET Series Temperature Probes or any NTC thermistor probe

Order Information

MODEL	MEMORY	CATALOG #
SRP-001	32 KB	01-0008
SRP-001-128K	128 KB	01-0112
SRP-001-1.5M	1.5 MB	01-0141

SmartReader Plus 2

Four-Channel Temperature and Relative Humidity Data Logger

The SmartReader Plus 2 is a self-contained data logger that can monitor and record temperature and relative humidity - right out of the box. The on-board RH sensor is temperature compensated, permitting reliable, worry-free RH readings. For remote sensing of temperature and RH, simply attach ACR's temperature/RH probe, or for remote temperature sensing, attach up to two thermistor probes.

PRODUCT SPECIFICATIONS

No. of Channels:
Four - One for ambient temperature
- One for relative humidity (internal sensor)
- One for relative humidity (external sensor)
- One for temperature, resistance or switch status

Relative Humidity Sensor:
Capacitive thin polymer film

Range:
0 to 95% RH (non-condensing)

Accuracy:
+/- 3% RH from 10 to 90% RH (-20 to 40°C [-4 to 104°F])

Resolution:
Better than 0.04% between 25 and 60% RH at 25°C (77°F)

Response Time:
Adequate ventilation increases the response time which is approximately 5 minutes in still air.

Environmental Conditions:
Like all relative humidity sensors, when exposed to contaminants and/or extreme environmental conditions, accuracy degradation could result. For maximum long-term stability, sensor should not be exposed or subjected to organic solvents, corrosive agents (strong acids, SO_2, H_2SO_4, Cl_2, HCl, H_2S, etc.) and strong bases (compounds with PH greater than 7). Dust settling on the sensor surface will not affect sensor performance except possibly to decrease the speed of response.

Memory Size:
128 KB

Common Specifications:
See page 6

Software Specifications:
See page 32

Remote & Network Communications:
See page 35

Accessories:
ACR EH-020A Temperature & RH Probe
ACR ET Series Temperature Probes or any NTC thermistor probe

Order Information

MODEL	MEMORY	CATALOG #
SRP-002-128	128 KB	01-0113

Eight-Channel AC Current and Voltage Data Logger

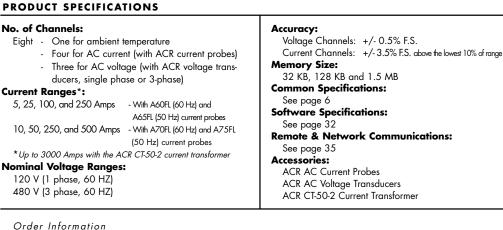The SmartReader Plus 3 easily and accurately records AC current and voltage. Simply connect ACR's current probes (which are clamped around the power leads) and ACR's voltage transducer to the data logger and begin recording. From the data collected, you can even determine energy consumption (kWh) using ACR's powerful, versatile and easy to use software, TrendReader® 2.

PRODUCT SPECIFICATIONS

No. of Channels:
 Eight - One for ambient temperature
  - Four for AC current (with ACR current probes)
  - Three for AC voltage (with ACR voltage transducers, single phase or 3-phase)

Current Ranges*:
 5, 25, 100, and 250 Amps - With A60FL (60 Hz) and A65FL (50 Hz) current probes
 10, 50, 250, and 500 Amps - With A70FL (60 Hz) and A75FL (50 Hz) current probes
 Up to 3000 Amps with the ACR CT-50-2 current transformer

Nominal Voltage Ranges:
 120 V (1 phase, 60 HZ)
 480 V (3 phase, 60 HZ)

Accuracy:
 Voltage Channels: +/- 0.5% F.S.
 Current Channels: +/- 3.5% F.S. above the lowest 10% of range
Memory Size:
 32 KB, 128 KB and 1.5 MB
Common Specifications:
 See page 6
Software Specifications:
 See page 32
Remote & Network Communications:
 See page 35
Accessories:
 ACR AC Current Probes
 ACR AC Voltage Transducers
 ACR CT-50-2 Current Transformer

Order Information

MODEL	MEMORY	CATALOG #
SRP-003	32 KB	01-0010
SRP-003-128K	128 KB	01-0114
SRP-003-1.5M	1.5 MB	01-0143

ACR **SmartReader Plus 4**

Four-Channel Pressure, Temperature and Relative Humidity Data Logger

The SmartReader Plus 4 data logger provides easy monitoring and troubleshooting of pneumatic control systems. The unit is completely self-contained with a 1/4" quick-release pressure fitting to allow a fast and trouble-free connection. As an added bonus, the SmartReader Plus 4 also monitors ambient temperature and either external temperature (with thermistor probes) or temperature and relative humidity together (with an RH/temperature probe). Probes and sensors are sold separately through ACR.

PRODUCT SPECIFICATIONS

No. of Channels:
Four - One for ambient temperature
- One for pressure
- One for relative humidity
- One for temperature, resistance or switch status
Calibrated Accuracy:
+/- 0.5% of full scale @ 25ºC (77ºF)
Memory Sizes:
32 KB and 128 KB

Common Specifications:
See page 6
Software Specifications:
See page 32
Remote & Network Communications:
See page 35
Accessories:
ACR EH-020A RH/Temperature Probe
ACR ET Series Temperature Probes or any NTC thermistor probe

PRESSURE SPECIFICATIONS

Range	Resolution	Pressure Accuracy	Thermal Accuracy
+/- 10" H$_2$O	0.006"	+/- 2% FS @ 25ºC (77ºF)	+/- 3% FS 0 to 70ºC (32 to 158ºF)
0 to 5 psi (30 kPa)	0.003 psi (0.02 kPa)	+/- 1% FS @ 25ºC (77ºF)	+/- 1.5% FS 0 to 70ºC (32 to 158ºF)
0 to 30 psi (200 kPa)	0.015 psi (0.10 kPa)	+/- 0.5% FS @ 25ºC (77ºF)	+/- 0.5% FS 0 to 70ºC (32 to 158ºF)
0 to 100 psi (700 kPa)	0.05 psi (0.34 kPa)	+/- 0.5% FS @ 25ºC (77ºF)	+/- 0.5% FS 0 to 70ºC (32 to 158ºF)

Order Information

MODEL	PRESSURE RANGE	MEMORY	CATALOG #
SRP-004-010	0-10" H$_2$O	32 KB	01-0090
SRP-004-010-128K	0-10" H$_2$O	128 KB	01-0120
SRP-004-5G	0-5 PSI-G	32 KB	01-0091
SRP-004-5G-128K	0-5 PSI-G	128 KB	01-0115
SRP-004-30G	0-30 PSI-G	32 KB	01-0093
SRP-004-30G-128K	0-30 PSI-G	128 KB	01-0117
SRP-004-30A	0-30 PSI-A	32 KB	01-0092
SRP-004-30A-128K	0-30 PSI-A	128 KB	01-0116
SRP-004-100G	0-100 PSI-G	32 KB	01-0095
SRP-004-100G-128K	0-100 PSI-G	128 KB	01-0119
SRP-004-100A	0-100 PSI-A	32 KB	01-0094
SRP-004-100A-128K	0-100 PSI-A	128 KB	01-0118
SRP-004-150G	0-150 PSI-G	32 KB	01-0097
SRP-004-150G-128K	0-150 PSI-G	128 KB	01-0139

SmartReader Plus 4 LPD

Two-Channel Low Pressure Differential Data Logger

The SmartReader Plus 4 LPD data logger is designed to be used in applications where very precise, low differential pressure measurements are required.

PRODUCT SPECIFICATIONS

No. of Channels:
Two -   One for ambient temperature
     -   One for low pressure
Sensor Type:
Silicone piezoresistive strain gauge
Pressure Ranges (Water Column):
+/- 0.5", +/- 1.0", +/- 2.0", +/- 5.0", +/- 10"
Maximum Pressure:
Four times full scale
Media:
Non-corrosive gases and dry air
Temperature Range:
Operating: -40 to 70ºC (-40 to 158ºF)
Compensated: 0 to 70ºC (32 to 158ºF)
Accuracy:
Calibrated: +/- 0.05" for 0.5", 1.0" and 2.0" ranges
             +/- 1.0" for 5.0" and 10.0" ranges
Thermal: +/- 0.5% FS (over compensated range)
Resolution:
< 0.01" WC

Non-linearity:
+/- 0.05% FS (best fit straight line)
Hysteresis & Repeatability:
+/- 0.05% FS (typical)
Long Term Stability:
+/- 0.5% FS
Memory Size:
32 KB
Common Specifications:
See page 6
Software Specifications:
See page 32
Remote & Network Communications:
See page 35

Order Information

MODEL	PRESSURE RANGE	ACCURACY	MEMORY	CATALOG #
SRP-004-LPD-0.5	+/- 0.5" WC	+/- 0.05"	32 KB	01-0310
SRP-004-LPD-1	+/- 1.0" WC	+/- 0.05"	32 KB	01-0311
SRP-004-LPD-2	+/- 2.0" WC	+/- 0.05"	32 KB	01-0312
SRP-004-LPD-5	+/- 5.0" WC	+/- 1.0"	32 KB	01-0313
SRP-004-LPD-10	+/- 10.0" WC	+/- 1.0"	32 KB	01-0314

SmartReader Plus 5

Three-Channel Temperature (Thermocouple) Data Logger

The SmartReader Plus 5 data logger is ideal for those applications that require monitoring high temperatures or monitoring temperature over a wide range. The logger has one internal channel for measuring ambient temperature and two external channels for use with ACR thermocouple wire or any J, K, S, T or E type thermocouple wire. At 12-bit resolution, the SmartReader Plus 5 offers greater accuracy and more precise measurements than the SmartReader 5.

PRODUCT SPECIFICATIONS

No. of Channels:
    Three - One for ambient temperature (also for cold-junction compensation)
          - Two for temperature (with thermocouples)
Accuracy:
  +/- 0.5% of range + resolution*
Memory Size:
  32 KB and 128 KB

Common Specifications:
  See page 6
Software Specifications:
  See page 32
Remote & Network Communications:
  See page 35
Accessories:
  ACR Thermocouple Wire or any J, K, S, T, and E type thermocouple wire

Order Information

MODEL	MEMORY	CATALOG #
SRP-005	32 KB	01-0012
SRP-005-128K	128 KB	01-0121

SmartReader Plus 6

Eight-Channel Temperature (Thermocouple) Data Logger

Monitor temperature over a wide range with the SmartReader Plus 6 data logger. Easily and accurately record temperature from any J, K, S, T or E type thermocouple probe. At 12-bit resolution, the SmartReader Plus 6 offers greater accuracy and more precise measurements than the SmartReader 6. With seven inputs for thermocouple probes and an on-board cold-junction thermistor, this logger is one of the most versatile thermocouple data loggers available.

PRODUCT SPECIFICATIONS

No. of Channels:
    Eight - One for ambient temperature (also for cold-junction compensation)
         - Seven for temperature (with thermocouples)
Accuracy:
  +/- 0.5% of range + resolution*
Memory Size:
  32 KB, 128 KB and 1.5 MB

Common Specifications:
  See page 6
Software Specifications:
  See page 32
Remote & Network Communications:
  See page 35
Accessories:
  ACR Thermocouple Wire or any J, K, S, T, and E type thermocouple wire

Order Information

MODEL	MEMORY	CATALOG #
SRP-006	32 KB	01-0013
SRP-006-128K	128 KB	01-0122
SRP-006-1.5M	1.5 MB	01-0151

THERMOCOUPLE TEMPERATURE *(For both SmartReader Plus 5 and 6)*

Type	Range	*Resolution
J	-50 to 600ºC (-55 to 1100ºF)	0.30ºC (0.55ºF)
K	-100 to 1150ºC (-145 to 2100ºF)	0.50ºC (0.90ºF)
S	0 to 1450ºC (32 to 2642ºF)	1.0ºC (1.8ºF)
T	-200 to 400ºC (-325 to 750ºF)	0.40ºC (0.75ºF)
E	-50 to 680ºC (-58 to 1250ºF)	0.24ºC (0.44ºF)

SmartReader Plus 7

Eight-Channel Process Signal Data Logger

The SmartReader Plus 7 records a variety of different process signals including the popular 4-20mA and 0-5V. With seven input channels it is ideal for monitoring (through commercially available transducers) a wide variety of measurement parameters such as flow, level, pressure, and much more. All process signals can be displayed in their own engineering units using the simple equation editor in ACR's TrendReader® 2 software.

PRODUCT SPECIFICATIONS

No. of Channels:
    Eight - One for ambient temperature
         - Seven for analog inputs

Standard Model:

Input type:	Input impedance:
0-2.5 V (1 channel)	Greater than 1M Ohm
0-5 V (2 channels)	Greater than 1M Ohm
0-10 V (1 channel)	Greater than 1M Ohm
0-200 mV (1 channel)	Greater than 1M Ohm
0-25 mA (2 channels)	20 Ohm

Other Models:
    All inputs: 0-2.5 V, 0-5 V, 0-10 V, or 0-25 mA

Accuracy:
    +/- 0.5% of full scale

Overload Protection:
    Voltage channels: +/- 40 Volts
    Current channels: +/- 70 mA (reverse polarity protected)

Transducer Restrictions:
    The use of a single power supply is recommended to avoid ground loops or use loop isolators.

Memory Size:
    32 KB, 128 KB and 1.5 MB

Common Specifications:
    See page 6

Software Specifications:
    See page 32

Remote & Network Communications:
    See page 35

Order Information

MODEL	INPUT RANGE(S)	MEMORY	CATALOG #
SRP-007	Standard Model	32 KB	01-0014
SRP-007-128K	Standard Model	128 KB	01-0123
SRP-007-1.5MB	Standard Model	1.5 MB	01-0152
SRP-007-0-2.5V	0-2.5 Volt	32 KB	01-0018
SRP-007-0-2.5V-128K	0-2.5 Volt	128 KB	01-0127
SRP-007-0-5V	0-5 Volt	32 KB	01-0107
SRP-007-0-5V -128K	0-5 Volt	128 KB	01-0124
SRP-007-0-5V-1.5M	0-5 Volt	1.5 MB	01-0154
SRP-007-0-10V	0-10 Volt	32 KB	01-0020
SRP-007-0-10V-128K	0-10 Volt	128 KB	01-0125
SRP-007-0-10V-1.5M	0-10 Volt	1.5 MB	01-0155
SRP-007-25mA	0-25 mA	32 KB	01-0017
SRP-007-25mA-128K	0-25 mA	128 KB	01-0126
SRP-007-25mA-1.5M	0-25 mA	1.5 MB	01-0156

SmartReader Plus 8

Eight-Channel Temperature (Thermistor) Data Logger

The SmartReader Plus 8 data logger can measure temperature in eight different locations simultaneously using ACR's ET series thermistor probes. Monitor and record high temperature, low temperature, pipe surface, skin surface, or a variety of other temperatures.

PRODUCT SPECIFICATIONS

No. of Channels:
Eight - One for ambient temperature
- Seven for temperature (with thermistors), resistance, or switch status

Memory Sizes:
32 KB, 128 KB and 1.5 MB

Common Specifications:
See page 6

Software Specifications:
See page 32

Remote & Network Communications:
See page 35

Accessories:
ACR ET Series Temperature Probes or any NTC thermistor probe

Order Information

MODEL	MEMORY	CATALOG #
SRP-008	32 KB	01-0015
SRP-008-128K	128 KB	01-0129
SRP-008-1.5M	1.5 MB	01-0158

SmartReader Plus 9

Two-Channel Pulse Data Logger

The SmartReader Plus 9 is a versatile data logger designed for easy counting and recording of digital pulses or switch contact closures. It has two pulse/contact input channels. Data can be displayed in custom engineering units using the simple equation editor of ACR's TrendReader® 2 software.

PRODUCT SPECIFICATIONS

No. of Channels:
Two - Two for externally-generated pulse signals and dry switch contact closures

Pulse Inputs:
Range: 4095 pulses/sample period
Accuracy: +/- 1 pulse/sample period
Max Voltage: +24/-22 volts DC
Input Impedance: > 1.0 M ohm for Vin < 5V
> 4.0 K ohm for Vin > 5V

Min. Pulse Wide
50% Duty Cycle: Slow input: 2 milliseconds
Fast input: 10 microseconds

Voltage Inputs:
Input type: Active logic signals
Input voltage: Low = 0 to 0.5 volts DC
High = 4.5 to 24 volts DC

Switch Inputs:
Input Type: Uncommitted "dry" contacts (relay or switch)
Excitation: 5 microamps contact current
3.6 volts open circuit
Contacts: Sealed gold-plated recommended

Maximum Frequency:
100 KHz

Memory Size:
32 KB and 128 KB

Common Specifications:
See page 6

Software Specifications:
See page 32

Remote & Network Communications:
See page 35

Order Information

MODEL	MEMORY	CATALOG #
SRP-009	32 KB	01-0016
SRP-009-128K	128 KB	01-0130

SmartReader Plus 10

Four-Channel Temperature (RTD) Data Logger

The SmartReader Plus 10 data logger is designed to precisely measure temperature over a wider temperature range than a thermistor without sacrificing accuracy or resolution. With four channels, measurements can be made in several different locations.

PRODUCT SPECIFICATIONS

No. of Channels:
Four - One for ambient temperature
- Three for temperature (with RTD probes)
RTD Type:
Any 100 or 1000 Ohm Platinum RTD with a
Temperature Coefficient of Resistance (TCR) of 0.00385
Accuracy (100 and 1000 Ohm):
+/- 0.3ºC (+/- 0.54ºF) + resolution
Resolution (100 and 1000 Ohm):
+/- 0.14°C (+/- 0.25°F)
Temperature Range (100 and 1000 Ohm):
-230 to 300ºC (-382 to 572ºF)

Wiring Configurations:
2, 3, or 4 wire RTDs
Memory Size:
128 KB
Common Specifications:
See page 6
Software Specifications:
See page 32
Remote & Network Communications:
See page 35

Order Information

MODEL	MEMORY	CATALOG #
SRP-010-128K	128 KB	01-0132