

# RADIO TELEMETRY SYSTEM

SL400 SERIES

RADIO LINK TO BASE STATION

REMOVES UNSIGHTLY WIRING

300M INDOOR RANGE

www.signatrol.com

LOCAL INDICATION

5 YEAR BATTERY LIFE

16 BIT RESOLUTION

## INTRODUCTION

The SL400 from Signatrol is the next generation of Radio Data Collectors. The system comprises of a base station, permanently connected to a personal computer, and up to 200 remote monitoring stations each with a maximum of 4 sensor inputs (giving a theoretical total of 800 channels per site). Great savings can be achieved over a wired system, both in initial installation costs and also in time saving as the information is gathered right from your desk.

Each remote transmitter is battery powered with up to 5 years battery life when sampling every 20 minutes. The remote transmitters are available with an optional liquid crystal display (LCD) giving local indication of temperature and relative humidity. The remote transmitters can be mounted up to 300m away from the base station in a typical building monitoring application, and up to 1000m away with a direct line of sight from the transmitter to the base station aerial. Alarm modules are available that focus on one particular transmitter and provide either an audible or relay output if pre-programmed limits are exceeded.

A software package running on the personal computer uses the hard disk to store the readings. If the computer is turned off, the battery backed base station will store the readings in it's own internal memory, automatically downloaded to the computer next time the computer is powered up.

The radio system uses the pan-European\*, licence free transmission frequencies of 434MHz.

The standard JAVA based software allows the operator to view the measured values in a number of formats from simple bar graphs to multi line traces. Data is viewed using a conventional web browser. Multiple users can view the stored and realtime information and remote access is possible using modems. Alarm notification can be sent using email or SMS text messaging.



## ENVIRONMENTAL MONITORING SOLUTIONS

### THE COMPLETE SERVICE

Many services are available to you when purchasing the SL400 series Radio Data Collector from Signatrol:

- ✓ Initial Site Assessment
- ✓ On-Site Maintenance Agreement
- ✓ Extended Warranty Contract
- ✓ Routine Re-Calibration Service
- ✓ Telephone Support

The SL400 series Radio Data Collectors are designed specifically to be used in a variety of different environments to monitor the changes in Temperature, Relative Humidity, Low Differential Pressure, Process Signals, Lux, Ultra Violet and Volt free contacts. Examples of such environments are listed below:

- ✓ Museums
- ✓ Warehouses
- ✓ Process Measurements
- ✓ Clean Rooms
- ✓ Cold Stores
- ✓ Data Hotels
- ✓ SCADA Integration via OPC

APPROVALS - European Standard ETS300/220

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## BENEFITS OF WIRELESS TELEMETRY

- ✓ Fast Installation
- ✓ No unsightly wiring
- ✓ Easily expanded
- ✓ Low Maintenance
- ✓ Easily interfaced to most SCADA Packages
- ✓ Centralised data collection for storage and analysis

## TYPICAL INDUSTRIAL AND STORAGE APPLICATIONS INSTALLATIONS

With multiple channel Pt100 transmitters and single channel mA and DC voltage transmitters available the possible applications are limitless. It is now becoming more and more of a requirement to monitor critical control points to satisfy HACCP or EFSIS requirements. Using the SL413, a single radio transmitter can handle up to four Pt100 temperature sensors which, when placed in chill



cabinets, cold rooms or freezers, enable the temperature to be accurately monitored. With up to 200 radio transmitters available in a system over 800 temperature points can be monitored without having to move from your office.



The single channel process input transmitters can be used to measure almost any physical property as long as a suitable transducer can be found to convert into a mA or low level DC signal. In large industrial plants transmitters can be placed in strategic locations to measure temperature, pressure, flow or level, all transmitted back to a central location using additional repeater stations if required.

## TYPICAL ENVIRONMENTAL & BUILDING MANAGEMENT SYSTEMS INSTALLATIONS

Museums and art galleries are in constant need of collecting and collating critical environmental data to ensure the preservation of their displayed artifacts. Whether on public display or in storage, old and delicate items are mostly susceptible to damage when changes occur to their surrounding environment. It is important that the relative humidity, and temperature in particular are logged on a regular basis.

Using radio telemetry gives several advantages. The installation cost is low, the transmitters do not have to be wired; so the building fabric is not disturbed, labour savings are made because the data does not have to be collected and the data is provided on a live basis.

It is not just the large national museums that have found this technique advantageous, smaller, established regional galleries and museums have also benefited from the cost savings that radio brings.

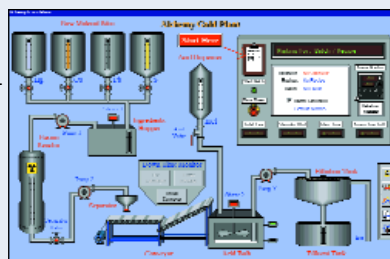
The ability to transfer data via modem has enabled establishments to monitor remote site storage, museums and properties without the need to travel to the site on a regular basis.



## PROCESS REPRESENTATION USING SL400-SCADA

Transmitter	Temperature	Humidity	
Cold Store	-16.0 °C	33 %	Cold Store
Prep Room 1	28.8 °C	45 %	
Prep Room 2	27.1 °C	44 %	Prep Rooms
Goods In	20.4 °C	41 %	
Goods Out	23.2 °C	40 %	Goods In/Out
Finishing	21.7 °C	41 %	
Warehouse	24.7 °C	43 %	Out Buildings
Laboratory	28.0 °C	51 %	
Office	29.1 °C		
Corridor	28.4 °C		Miss
Mobile Fridge	1.7 °C		Mobile Fridge

Using graphical SCADA packages like SL400-SCADA, realtime measurements can be shown on screen as actual moving images. The operator builds a graphical interface that visually represents the application being monitored. Each part of the graphical display can be animated to show positions of valves, level in storage tanks or actual temperatures in a particular process. The actual measured parameters can also be superimposed over the top of actual digital photographs to show the measured parameters in a real life situation.



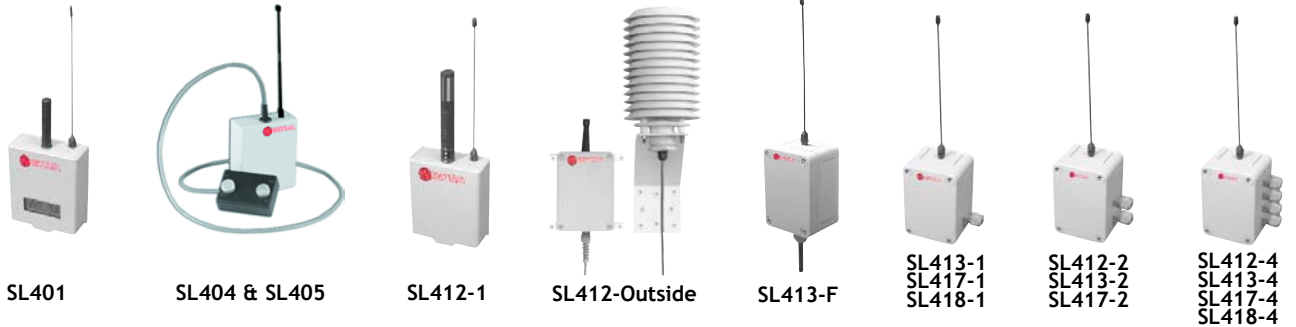
## TECHNICAL SPECIFICATIONS

### Base Station - SL400

<b>Power Supply</b>	Mains powered adaptor, 16VDC @ 350mA. Internal Battery backup provides 12 hours use during power failure.
<b>Memory</b>	Sufficient for 4 days storage if not connected to a personal computer.
<b>Ambient Temperature</b>	0 to +70°C
<b>Physical Size</b>	260mm x 156mm x 63mm
<b>Operating Frequency</b>	434MHz @ 10mW - Licence Free
<b>Number of Channels</b>	200 (Maximum)



### SL400 - Radio Transmitter Range



### Common Specifications

<b>Ambient Temp. Range</b>	-10°C to +55°C (Excl SL401)
<b>Sample Rates*</b>	15, 30, 45, 60, 75, 90, 105, 120, 135 Seconds 10, 20, 30, 40, 50, 60, 70, 80, 90 Minutes
<b>Battery Life</b>	5 Years @ 20 minute sample rates
<b>Battery Type</b>	Four AA User Replaceable
<b>Transmission Frequency</b>	434MHz @ 10mW

\* Sample rates can be mixed on the same system

#### SL401 - Temperature & RH with LCD Display

Self contained radio transmitter that measures temperature and relative humidity and transmits the measured values back to the SL400 base station. The SL401 has a built in LCD display that permanently displays both parameters.

<b>Accuracy</b>	Temperature $\pm 0.3^\circ\text{C}$ Relative Humidity $\pm 4\%\text{RH}$
<b>Measuring Range</b>	Temperature $-30^\circ\text{C}$ to $+70^\circ\text{C}$ Relative Humidity 0 to 100%RH
<b>Ambient Temperature Sensor Type</b>	Temperature - Pt100 Relative Humidity/ Capacitive
<b>Physical Size</b>	101mm x 82mm x 38mm Aerial 160mm

#### SL404 - Light Level

Battery powered transmitter that measures light level. With a range of 0 to 1000 Lux, the SL404 is used in applications where light on / light off is to be recorded.

<b>Measuring Range</b>	0 - 1000 Lux
<b>Accuracy</b>	$\pm 5\%$
<b>Lead Length</b>	1m PVC cable
<b>Physical Size</b>	101mm x 82mm x 38mm Aerial 160mm

#### SL405 - Ultra Violet and Light Level

Functionally the same as the SL404 but with an ultra violet sensor fitted. Primarily used in environmental monitoring applications where direct sunlight should be monitored.

<b>Measuring Ranges</b>	0 - 1000 Lux
<b>UV Wavelength</b>	300 - 400nm
<b>Accuracy</b>	$\pm 5\%$
<b>Lead Length</b>	1m PVC cable
<b>Physical Size</b>	101mm x 82mm x 38mm Aerial 160mm

#### SL412 - OUTSIDE Temperature & RH, no Display

Functionally the same as the SL412, the SL412-OUTSIDE has an up-rated enclosure to provide IP67 sealing to protect the electronics. The SL412-OUTSIDE also includes a radiation shield to stop direct heating of the sensors from the sun. This transmitter should be wall mounted.

<b>Accuracy</b>	Temperature $\pm 0.3^\circ\text{C}$ Relative Humidity $\pm 1.5\%\text{RH}$
<b>Measuring Range</b>	Temperature $-30^\circ\text{C}$ to $+70^\circ\text{C}$ %RH 0 to 100%RH
<b>Sensor Type</b>	Rotronic Hygroclip
<b>Physical Size</b>	101mm x 82mm x 38mm Aerial 160mm

#### SL412-1/2/4 - Temperature & RH, no Display

The SL412 Uses the Rotronic Hygroclip to measure temperature and relative humidity. The transmitter is available in 1, 2, or 4 channel variants. The Hygroclip sensor can be mounted directly on the the enclosure or on flying leads up to 5 metres long.

<b>Input</b>	SL412-1 Single channel, SL412-2 Dual channel, SL412-4 Quad channel,
<b>Accuracy</b>	Temperature $\pm 0.3^\circ\text{C}$ Relative Humidity $\pm 1.5\%\text{RH}$
<b>Measuring Range</b>	Temperature $-30^\circ\text{C}$ to $+70^\circ\text{C}$ %RH 0 to 100%RH
<b>Sensor Type</b>	Rotronic Hygroclip
<b>Physical Size</b>	101mm x 82mm x 38mm Aerial 160mm

### SL413-1FIXED - 3 Wire Pt100

Totally self contained radio transmitter, designed to be wall mounted. The transmitter measures the ambient temperature and transmits it back to the SL400 base station. Applications include monitoring temperature in warehouses, clean rooms and for monitoring storage areas.

Input	Integral Pt100
Measuring Ranges	-35°C to +95°C (default)
Accuracy	±0.5°C
Physical Size	130mm x 95mm x 58mm Aerial 160mm

### SL417/-1/-2/-4 - Process Signal Inputs

1, 2, or 4 channel radio transmitters used to monitor the most common process signals. The SL417 has a passive input and is connected in to existing current loops. The transmitter measures the process signals and transmits it back to the SL400 base station.

Input	SL417-1 Single channel, SL417-2 Dual channel, SL417-4 Quad channel,
Measuring Ranges (link selectable)	mA or DC Voltage 4-20mA 0-20mA 0-5VDC 1-5VDC 0-10VDC
Accuracy	±0.5% Full Scale
Resolution	0.39% Full Scale
Physical Size	94mm x 65mm x 58mm Aerial 160mm

### SL418/-1/-2 - Alarm Unit

The alarm unit is assigned the I.D of a transmitter as well as high or low alarms. When the alarm points are exceeded, either the internal buzzer (SL418-1) or mains rated relay (SL418-2) is activated.

## INTERFACING TO EXISTING ETHERNET NETWORKS

Using the optional SLACC-20 network adaptor, the SL400 maybe connected remotely on an existing Ethernet network, allowing the base station to be accessed from anywhere on a local area network.

### SOFTWARE FEATURES

- ✓ Trending
- ✓ Historical Replay
- ✓ Alarm Indicator
- ✓ Hard Copy Generation

### HARDWARE REQUIREMENTS

- ✓ Pentium PC
- ✓ 10Mb Program Space\*
- ✓ 8Mb Ram
- ✓ Windows 2000 or XP

\*Data files require extra space



### SL413/-1/-2/-4 - 3 Wire Pt100

Designed to be integrated with existing or new Pt100 sensors. Available in either 1, 2, or 4 channel variants. The transmitter measures the process temperatures and transmits it back to the SL400 base station.

Applications include monitoring temperature in process applications and fridges & freezers.

Input	SL413-1 Single channel, SL413-2 Dual channel, SL413-4 Quad channel,
Connection	Screw type terminal block
Measuring Range	-100°C to +500°C Maximum span 500°C
Accuracy	±0.5°C
Max Lead Resistance	10 Ohms, all leads matched
Physical Size	130mm x 95mm x 58mm Aerial 160mm

## ORDER CODE

SL400	Narrowband basestation, 434MHz
SL406	Narrowband repeater
<b>8-Bit Resolution</b>	
SL401	Temp & RH transmitter - Standard WITH display
SL404	Radio transmitter with Lux sensor
SL405	Radio transmitter with Lux and UV Sensors

## 16-Bit Resolution

SL412-1	Single Channel Hydroclip Tx - Includes Hydroclip
SL412-2	Dual Channel Hydroclip Tx - Includes 2 Hydroclips
SL412-4	Quad Channel Hydroclip Tx - Includes 4 Hydroclips
SL412-OUTSIDE	SL412 in IP68 enclosure with Sensor on 1m flying lead & Shield.
SL413-1FIXED	Single Channel Pt100 - Integral 40mm Sensor
SL413-1	Single Channel Pt100 - Sensors Extra
SL413-2	Dual Channel Pt100 - Sensors Extra
SL413-4	Quad Channel Pt100 - Sensors Extra
SL417-1	Single Channel Process Input
SL417-2	Dual Channel Process Input
SL417-4	Quad Channel Process Input
SL418-1	Alarm Unit - Integral Buzzer
SL418-2	Alarm Unit - Mains Rated Relay

## Accessories

SL400-ACC1	Hydroclip Sensor
SL400-IP68	Additional cost to add IP68 to any SL400 transmitter
SL400-JAVA	JAVA based Software
SLACC-20	Network Adaptor