LAND

SOLO *net*

A new generation of intelligent compact digital infrared thermometers

AMETEK®
PROCESS & ANALYTICAL INSTRUMENTS

SOLOnet

The new generation of intelligent, high precision digital infrared thermometers

SOLOnet is the world's first compact web browser enabled infrared thermometer system offering the user maximum flexibility and connectivity. With SOLOnet the user can configure the thermometer system to suit his individual measurement and control requirements.

Live temperature data is displayed on a PC or computer system via the web browser, together with related measurement parameters for ease of configuration. The parameters are easily adjusted and saved using drop-down menus or text windows.

Typically, end users will appreciate the convenience of configuring the thermometer via a standard web browser, such as Internet Explorer or Netscape Navigator. Advanced users and OEMs will benefit from a lower-level interface with direct messaging via Ethernet or addressable RS485.

There are four different thermometer types with choice of operating wavelength, optical variants, laser alignment and measurement ranges to suit the chosen application within the operating range 200 to 1750°C/392 to 3182°F. The measurement span can be selected within the thermometer range, with the minimum measurement span being 50°C/90°F.

Features

- Intelligent, digital infrared thermometers with flexible methods of configuration
- RS485, Web browser or Ethernet interface
- High precision inputs/outputs, both digital and analog formats
- Simple and easy to configure to user requirements
- Field changeable optics without need to recalibrate or any additional parts
- Sapphire window is standard on all models - robust, low maintenance
- Laser alignment option
- Built-in peak picker, track & hold and averager time functions
- Choice of alarm outputs, including 'insufficient signal' alarm for ratio thermometers
- Rugged, sealed aluminium housing
- Optional water cooled and air purged mountings and accessories
- Two year warranty

Benefits

- Improve product quality
- Maximize production and throughput
- Improve efficiency
- Reduce energy costs

User configurable between four focus distances with robust sapphire protection window as standard.

A wide choice of thermometer protection, cooling and mounting options.

Optional laser targeting system, activated remotely or from the thermometer.
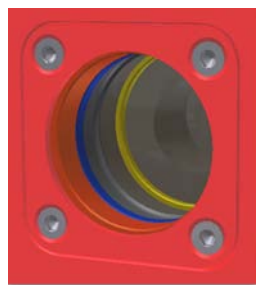
Advantages of SOLOnet digital thermometers

SOLOnet offers OEMs, system builders and end users virtually limitless flexibility of choice making system integration simpler and easier than before.

- Completely user configurable remotely via web browser, Ethernet or RS485
- Flexibility of choice of inputs/outputs and alarm types
- Flexibility of choice of interface
- Simple, compact installation
- Accurate, repeatable, fast response measurements
- Highly interchangeable
- Traceability of calibration to National Standards

Great value, versatile signal processing

The SOLOnet series of infrared thermometers provides cost effective, reliable measurement in a wide variety of process control applications.

SOLOnet can be used in stand-alone, single point or multipoint installations with individually, remotely adjustable sub-temperature ranges, current output, emissivity or non-greyness compensation and end user defined alarms settings.

Choice of built-in peak picker, track and hold or averager signal processing functions ensures accurate measurement of difficult or complex processes.

The optional DIN-rail mounted SOLOnet Webserver/Ethernet Interface Unit provides the user with a wide choice of configuration, interconnection, system monitoring and maintenance options.

Optional Webserver/ Ethernet Interface Unit

SOLOnet Thermometer

Easy user configuration

- Configured from a laptop, PC, PLC or computer system with either temporary or permanent connection

- Stand-alone, single or multipoint systems individually addressable and configurable with independent operation

- SOLOnet Web/Ethernet Interface Unit provides simple system interconnections

- Familiar Windows operating environment

- Set up via standard web browser - no proprietary software required - or from customer/OEM process computer

- Choice of prewired cable assembly lengths for ease of installation
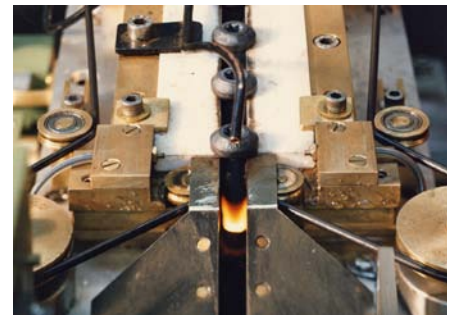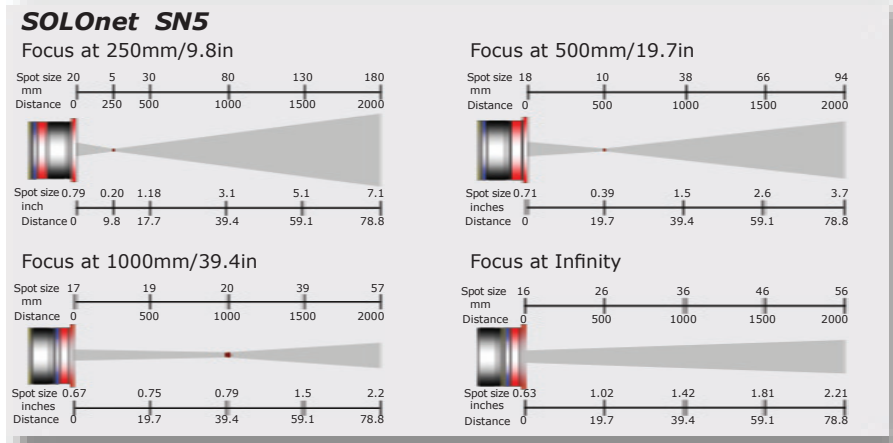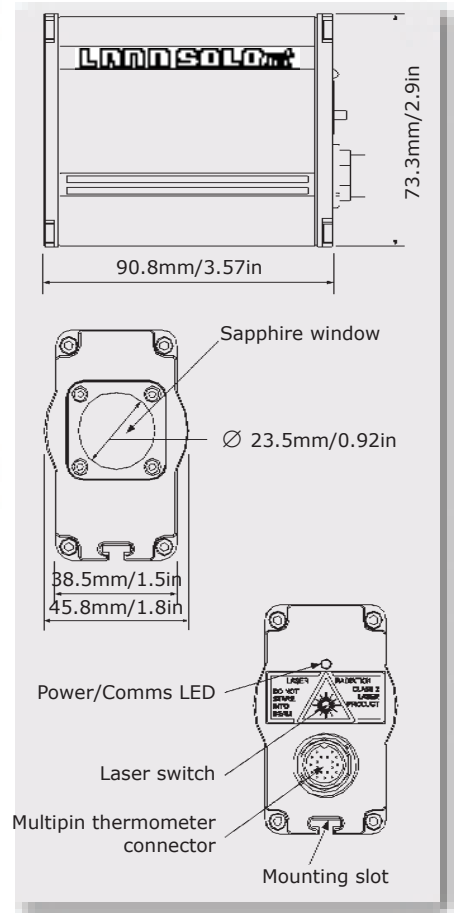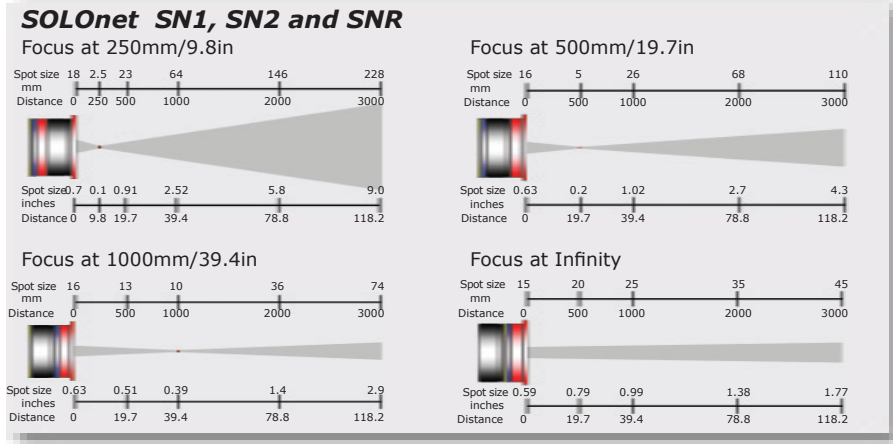

Applications

The SOLOnet series of thermometers are suitable for a wide range of manufacturing and processing industries such as: ferrous and non-ferrous metals, glass, minerals, ceramics, chemicals, electronics and research and development.

Model	Temperature	Typical applications
SN11	550 to 1750°C/ 1022 to 3182°F	Heat treatment, forging, welding, induction heating, soldering, hardening, chain annealing, ceramics, glass gobs, sub surface glass
SN21	250 to 1300°C/ 482 to 2372°F	Heat treatment, preheating, induction heating, welding, hardening, annealing, non ferrous metals moulding, aluminium welding, glass moulds
SN51	200 to 1100°C/ 392 to 2012°F	Toughening/tempering, annealing, automotive glass, architectural/decorative glass, glass containers, forming, stem/base seal, pinch seal, Sealex machine, phosphor coating, curing exit
SNR1	700 to 1750°C/ 1292 to 3182°F	Forging, welding, induction heating, soldering, hardening, chain annealing, heat treating, pipe bending, precious metals melting, automotive components, lamp wire draw and anneal, lamp black glass drop

Sighting and Dimensional Diagrams

SOLOnet offers a choice of 4 field changeable, fixed-focus optical configurations focused at 250, 500, 1000mm or infinity. The optics are simple to change using a colour coded spacer system for ease of identification - no need for recalibration - no additional parts required.

SOLOnet SN1, SN2 and SNR

Focus at 250mm/9.8in
| Spot size mm | 18 | 2.5 | 23 | 64 | 146 | 228 |
| Distance | 0 | 250 500 | 1000 | | 2000 | 3000 |

| Spot size inches | 0.7 | 0.1 0.91 | 2.52 | 5.8 | 9.0 |
| Distance | 0 | 9.8 19.7 | 39.4 | 78.8 | 118.2 |

Focus at 500mm/19.7in
| Spot size mm | 16 | 5 | 26 | 68 | 110 |
| Distance | 0 | 500 | 1000 | 2000 | 3000 |

| Spot size inches | 0.63 | 0.2 | 1.02 | 2.7 | 4.3 |
| Distance | 0 | 19.7 | 39.4 | 78.8 | 118.2 |

Focus at 1000mm/39.4in
| Spot size mm | 16 | 13 | 10 | 36 | 74 |
| Distance | 0 | 500 | 1000 | 2000 | 3000 |

| Spot size inches | 0.63 | 0.51 | 0.39 | 1.4 | 2.9 |
| Distance | 0 | 19.7 | 39.4 | 78.8 | 118.2 |

Focus at Infinity
| Spot size mm | 15 | 20 | 25 | 35 | 45 |
| Distance | 0 | 500 | 1000 | 2000 | 3000 |

| Spot size inches | 0.59 | 0.79 | 0.99 | 1.38 | 1.77 |
| Distance | 0 | 19.7 | 39.4 | 78.8 | 118.2 |

SOLOnet SN5

Focus at 250mm/9.8in
| Spot size mm | 20 | 5 | 30 | 80 | 130 | 180 |
| Distance | 0 | 250 500 | 1000 | 1500 | 2000 |

| Spot size inch | 0.79 | 0.20 1.18 | 3.1 | 5.1 | 7.1 |
| Distance | 0 | 9.8 17.7 | 39.4 | 59.1 | 78.8 |

Focus at 500mm/19.7in
| Spot size mm | 18 | 10 | 38 | 66 | 94 |
| Distance | 0 | 500 | 1000 | 1500 | 2000 |

| Spot size inches | 0.71 | 0.39 | 1.5 | 2.6 | 3.7 |
| Distance | 0 | 19.7 | 39.4 | 59.1 | 78.8 |

Focus at 1000mm/39.4in
| Spot size mm | 17 | 19 | 20 | 39 | 57 |
| Distance | 0 | 500 | 1000 | 1500 | 2000 |

| Spot size inches | 0.67 | 0.75 | 0.79 | 1.5 | 2.2 |
| Distance | 0 | 19.7 | 39.4 | 59.1 | 78.8 |

Focus at Infinity
| Spot size mm | 16 | 26 | 36 | 46 | 56 |
| Distance | 0 | 500 | 1000 | 1500 | 2000 |

| Spot size inches | 0.63 | 1.02 | 1.42 | 1.81 | 2.21 |
| Distance | 0 | 19.7 | 39.4 | 59.1 | 78.8 |

73.3mm/2.9in

90.8mm/3.57in

Sapphire window

∅ 23.5mm/0.92in

38.5mm/1.5in
45.8mm/1.8in

Power/Comms LED

Laser switch

Multipin thermometer connector

Mounting slot

Thermometer specifications

Model	SN11	SN21	SN51	SNR1
Operating range:	550 to 1750°C/ 1022 to 3182°F	250 to 1300°C/ 482 to 2372°F392 to 2012°F	200 to 1100°C/	700 to 1750°C/ 1292 to 3182°F
Specified range:	600 to 1750°C/ 1112 to 3182°F	300 to 1300°C/ 572 to 2372°F	250 to 1100°C/ 482 to 2012°F	750 to 1750°C/ 1382 to 3182°F
Spectral response:	1µm	1.6µm	5µm	1µm ratio
Field of view (95% energy):	100:1	100:1	50:1	100:1
Focusing:	Fixed, user configurable focus: 250mm/9.8in, 500mm/19.7in, 1000mm/39.4in and infinity			
Output:	0 or 4 to 20mA user selectable (isolated 50V)			
Response time (0 to 90%):	10ms	10ms	50ms	10ms
Emissivity:	0.10 to 1.00			-
Non greyness:	0.80 to 1.25			
Resolution (mid range):	≤1K			
Stability:	0.2°/°	0.2°/°	0.02%K/K	0.05K/K
Accuracy (absolute):	0.3%K	2K	0.35%K	0.6%K
Time functions:	Peak picker, track and hold, and averager			
Alarm outputs: (SNR1 only);	Process high, process low, internal temperature, emissivity/NG signal lost, insufficient signal rated to 50V d.c., 0.1A non-inductive, NO or NC – software selectable			
Optional sighting:	Laser defining optical axis; class 2, 1mW, 650nm, 120s ON duration, automatic switch-off			
Ambient limits:	5 to 60°C/41 to 140°F specified; 0 to 70°C/32 to 158°F operating			
EMC:	EN 61326:1999 (immunity and emission)			
Sealing:	IP65/NEMA 4X			
Vibration:	3g (10 to 300Hz)			
Power supply:	18 to 30V d.c. (24V d.c. nominal)			
Optional accessories:	Air cooled/purged jacket, water cooled/air purged jacket, air purge and mounting bracket, 1-axis and 2-axis adjustable mounting brackets, 3m, 15m, 25m prewired cable assemblies, Web/Ethernet Interface Unit SN-W/E, d.c. power supply unit, temperature indicator unit LMi			

Choice of connectivity, web browser and Ethernet interface

SOLOnet thermometers utilise addressable RS485 communications. With this, a thermometer can communicate either directly with an external customer device or with the optional Land SOLOnet Interface Unit SN-W/E.

SN-W/E manages and converts the thermometer's RS485 messaging so that the user can:

- Use the SN-W/E's built-in webserver module to monitor and configure the thermometer using normal web browsing software
- Assign the SN-W/E an IP address, integrate it within the organisational network and communicate with it via Ethernet messaging
- Change the position of the front-panel mounted switch and communicate 'straight through' with addressable RS485

Current and contact-closure I/O is also fitted to each SOLOnet thermometer as standard and this can be accessed directly or via the SN-W/E customer terminals

More Features

- Flexible communications
- Set measurement in °C or °F
- Set sub-temperature span within the thermometer range (minimum span 50°C/90°F)
- Extended operating range up to 50°C/90°F lower than the thermometer specified range
- Command input to control time functions
- Provide alarm indications, via two hardware relay outputs and digital interface
- Set emissivity or non-greyness value
- Temperature output via both digital serial RS485 interface and current 0 or 4 to 20mA output
- Trigger alignment laser
- Monitor internal ambient temperature
- Provides diagnostic information – input, output and alarm states can be monitored
- User Calibration facility permits the user to apply a correction to the temperature measurement without disturbing the original factory calibration
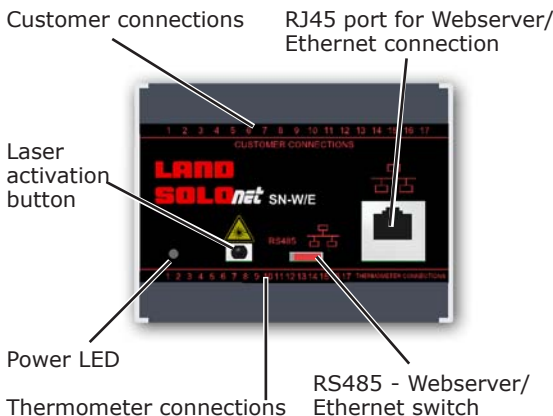- Configuration software supplied with each thermometer

Monitoring screen

User Log in screen   System set up screen

Customer connections   RJ45 port for Webserver/Ethernet connection

Laser activation button

Power LED

Thermometer connections   RS485 - Webserver/Ethernet switch

SN-W/E interface unit specifications

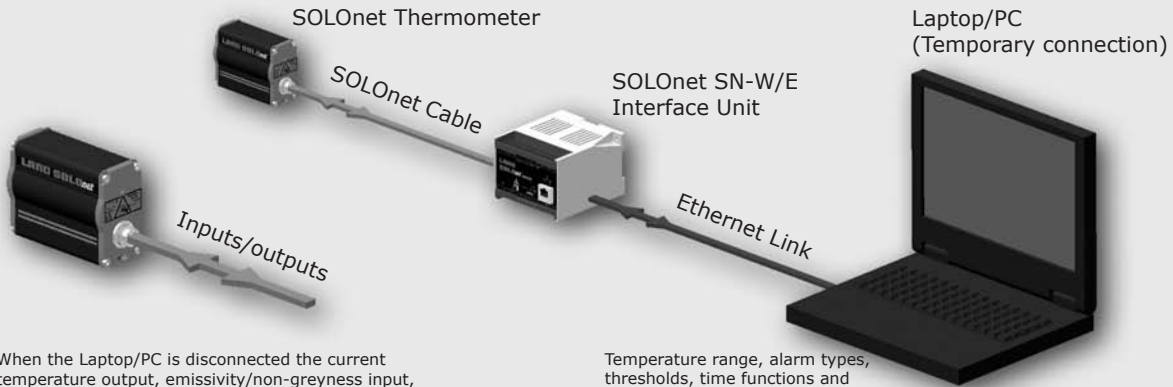|	
Mounting:	DIN-rail
Dimensions:	100 x 75mm x 110mm/ 3.94 x 2.95 x 4.33in
Power requirement:	24V d.c. nominal
Ambient operating range:	0 to 70°C/32 to 158°F
Sealing:	IP20/NEMA 1
EMC:	EN 61326:1999

Connectivity

The following diagrams are only intended to give a range of examples illustrating the flexibility of SOLOnet connectivity.

If your application differs from those illustrated please contact us for information on how SOLOnet can be configured to suit your specific requirements.
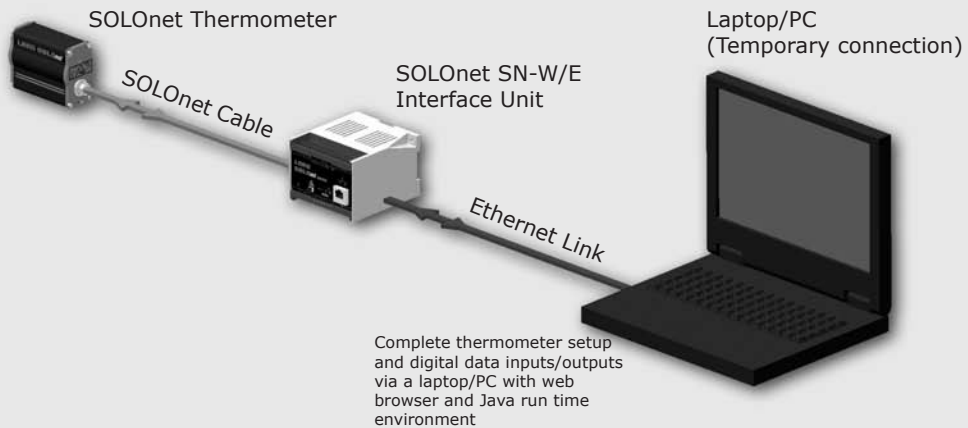
Simple stand alone system

SOLOnet Thermometer

Laptop/PC
(Temporary connection)

SOLOnet Cable

SOLOnet SN-W/E
Interface Unit

Ethernet Link

Inputs/outputs

When the Laptop/PC is disconnected the current temperature output, emissivity/non-greyness input, alarm outputs, command input, laser trigger are offered by the thermometer to the process

Temperature range, alarm types, thresholds, time functions and outputs are all configured using a laptop/PC

Single thermometer system for process monitoring

SOLOnet Thermometer

Laptop/PC
(Temporary connection)

SOLOnet Cable

SOLOnet SN-W/E
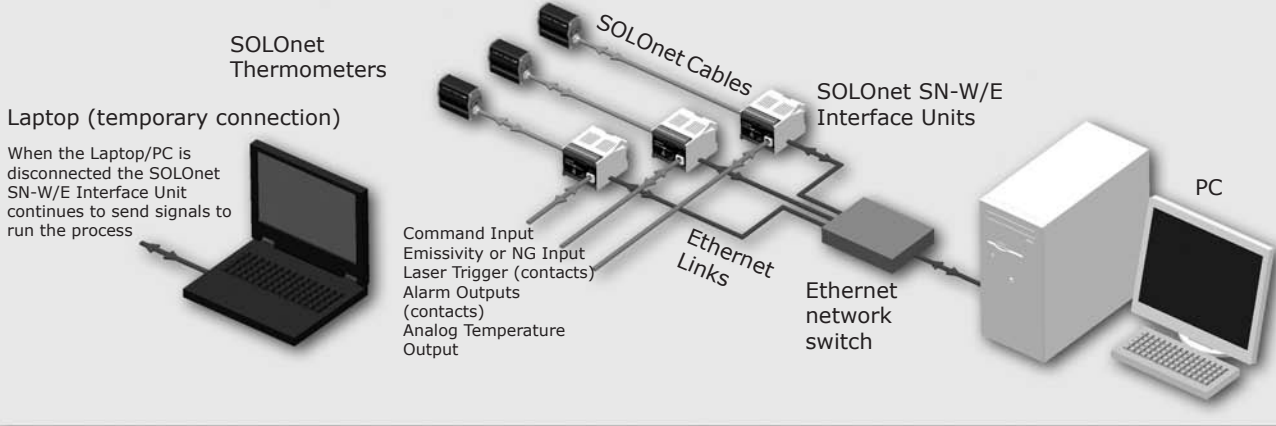Interface Unit

Ethernet Link

Complete thermometer setup and digital data inputs/outputs via a laptop/PC with web browser and Java run time environment
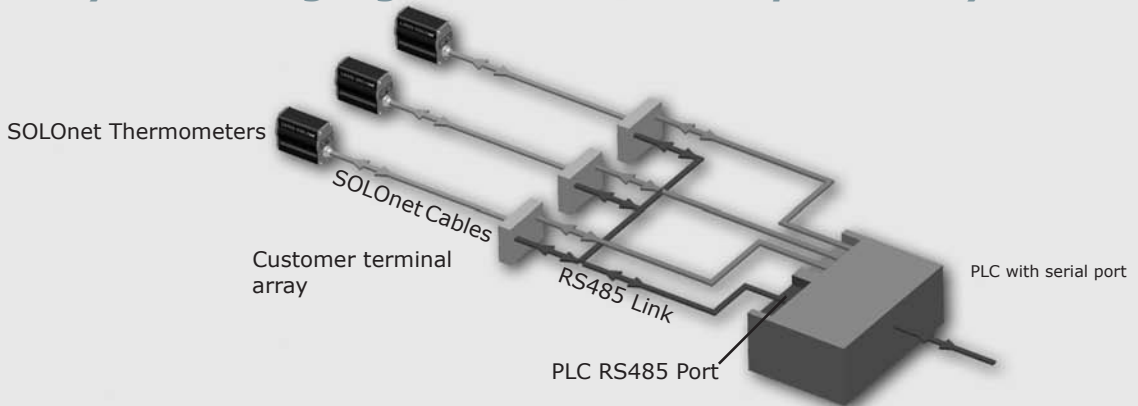
Multi point system for process monitoring

SOLOnet SN-W/E
Interface Units
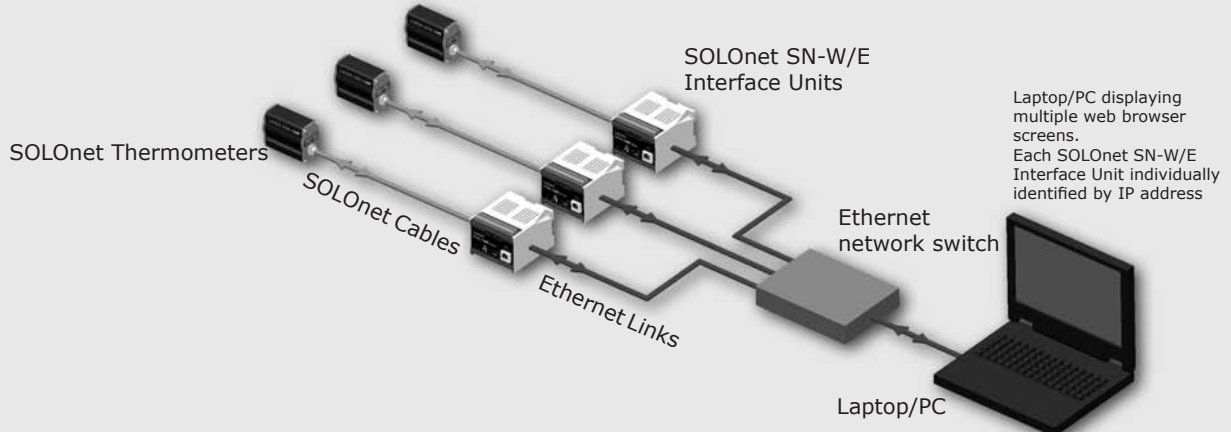
Laptop/PC displaying multiple web browser screens.
Each SOLOnet SN-W/E Interface Unit individually identified by IP address

SOLOnet Thermometers
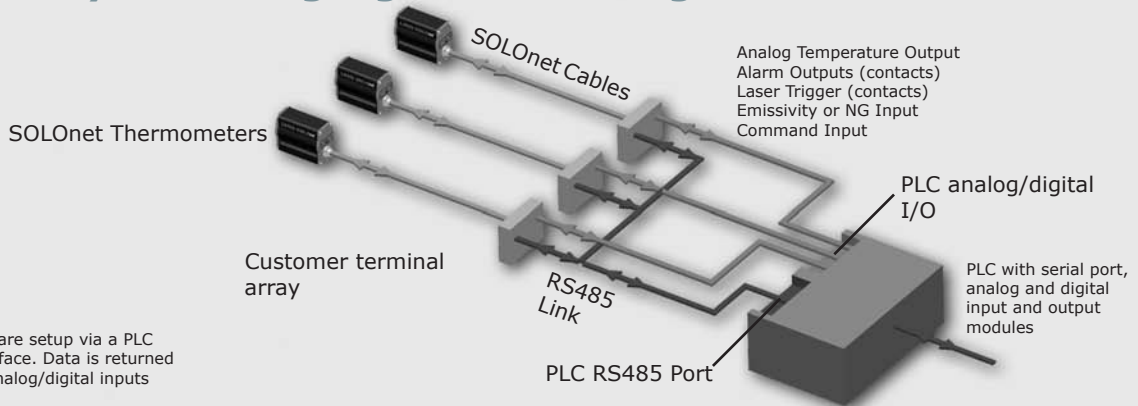
SOLOnet Cables

Ethernet
network switch

Ethernet Links

Laptop/PC

Multi point system for process control - permanent monitoring by PC

SOLOnet
Thermometers

SOLOnet Cables

SOLOnet SN-W/E
Interface Units

Laptop (temporary connection)

When the Laptop/PC is
disconnected the SOLOnet
SN-W/E Interface Unit
continues to send signals to
run the process

Command Input
Emissivity or NG Input
Laser Trigger (contacts)
Alarm Outputs
(contacts)
Analog Temperature
Output

Ethernet
Links

Ethernet
network
switch

PC

Multi point system using digital PLC or data acquisition system

SOLOnet Thermometers

SOLOnet Cables

Customer terminal
array

RS485 Link

PLC RS485 Port

PLC with serial port

Multi point system using digital and analog PLC

SOLOnet Cables

Analog Temperature Output
Alarm Outputs (contacts)
Laser Trigger (contacts)
Emissivity or NG Input
Command Input

SOLOnet Thermometers

PLC analog/digital
I/O

Customer terminal
array

RS485
Link

PLC with serial port,
analog and digital
input and output
modules

Thermometers are setup via a PLC
serial port interface. Data is returned
to PLC via its analog/digital inputs
and outputs

PLC RS485 Port

Thermometer mountings and accessories
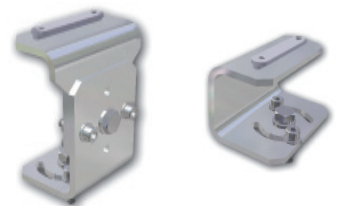
Air cooled protection jacket
with air purge.

*For use in ambient temperatures exceeding 60°C/140°F or where radiant
heat levels are high.*

Water cooled protection
jacket with air purge.

Mounting plate with air
purge for use in ambient
temperatures up to
60°C/140°F.

Dual and single axis
mounting brackets for
adjustable sighting.

Non-Contact Temperature
Measurement Solutions

LASER RADIATION
DO NOT STARE INTO BEAM
CLASS 2 LASER PRODUCT
1mW MAX OUTPUT AT 635nm
IEC 60825-1:2001

UKAS
CALIBRATION
0034

UKAS
MANAGEMENT
SYSTEMS
001

LABORATORY
ACCREDITATION
BUREAU
ACCREDITED
ISO/IEC 17025:2005

REGISTERED
ISO 9001
MANAGEMENT SYSTEM

Applies in the UK   Applies in the USA