NS50P
Infrared Sensor

Operator's Manual

SENTEST
Instruments

Content

*Note: Read the manual carefully before the initial start-up. The producer reserves the right to change the herein described specifications in case of technical advance of the product.

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1. Description

1.1 Introduction
The NS50P is a non-contact infrared temperature sensor. The electronics are protected by a rugged IP65 aluminium alloy(A6061) housing. They calculate the surface temperature based on the emitted infrared energy of objects and convert the energy into temperature signal.

1.2 Scope of Delivery
• NS50P
• Mounting nut x 1
• Fixed mounting bracker x 1
• 3m connection cable (standard, 4-cores)
• User manual

1.3 Maintenance
Keep the lens clean at all times. Any foreign matter on the lens would affect measurement accuracy. The lens surface can be cleaned with a soft, humid tissue moistened with water or a water based glass cleaner. Never use cleaning compounds which contain solvents for the lens.

1.4 Electrical Interference
Keep away from strong EMF (electromagnetic fields). Avoid static electricity, arc welders, and induction heaters. Avoid abrupt changes of the ambient temperature. To avoid ground loops, make sure that only one point is earth grounded.

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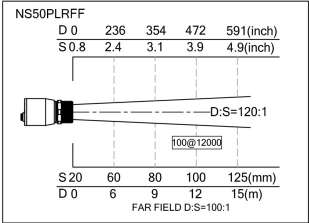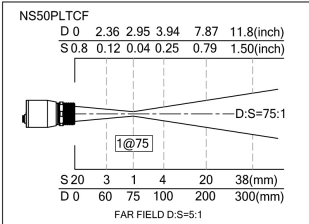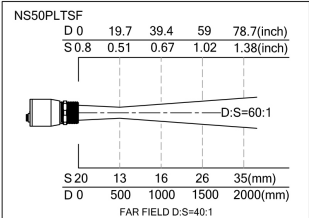
2. Basics of Infrared thermometry

Infrared thermometer is an optoelectronic sensor. Any object of a temperature above absolute zero (-273 °C) emits electromagnetic radiation. Infrared thermometer calculates the surface temperature on the basis of the emitted infrared radiation from the object. By determining its radiation intensity the temperature of an object can thereby be determined in a non-contact way.

3. Factory Defaults

Emissivity	LT/LR=0.95
	H1/H2/H3=1.00
Average	LT/LR=0.2
	H1/H2/H3=0
Peak Hold	inactive
Valley Hold	inactive
Advance Peak Hold	inactive
Unit	°C

Factory Default Setting :
Press the down (v) key (keep pressed), and then the up (∧) key. The display will appear **INIT** for confirmation.

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4. Technical Data

4.1 Measurement Specifications

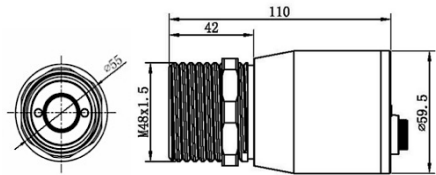| Model	Temperature Range	Spectral Response	D:S (90%)
LT	0°C ~ 900°C	8 ~ 14µm	60:1(SF)/75:1(CF)
LR	0°C ~ 1300°C	8 ~ 14µm	120:1
H1	600°C ~ 1600°C	1 µm	300:1
H2	300°C ~ 1300°C	1.6µm	300:1
H3	100°C ~ 600°C	2.3µm	140:1/120:1(FF)

Response Time (95%)	LT/LR=150 ms, H1/H2/H3=5ms
Accuracy[1]	LT/LR= ±1% of reading or ±1.5°C, which is greater
	H1/H2/H3= ±(0.5% of reading+2°C)
Repeatability[1]	LT/LR= ±0.5% of reading or ±1°C, which is greater
	H1/H2/H3= ±(0.5% of reading+2°C)
Emissivity	0.100 ~ 1.000

[1] At 23±5°C · emissivity LT/LR=0.95, H1/H2/H3=1.00

4.2 Electrical Specifications

Signal Output	4 ~20mA
Digital Communication	TTL / USB(optional)
Max. Loop Resistance	500Ω
Power Supply	24 VDC ±20%, < 100 mA
Display	6 digit backlit LCD

4.3 General Specification

Environmental Rating	IP 65
Ambient Temperature	0°C~70°C
Storage Temperature	-20°C ~ 80°C
Relative Humidity	10% ~ 95%
Cable Temperature	-20°C ~ 80°C
Cable Length	3m (standard), 5m, or 10m
Weight	500g (without cable)

5. Optical Charts

The optical diagrams indicate the target spot diameter at any given distance between the target object and the sensing head. The spot size will change in longer distance corresponding to the following drawing. In order to prevent measuring errors the object must be as least as big as the spot size.

NS50PLTSF

D 0	19.7	39.4	59	78.7(inch)
S 0.8	0.51	0.67	1.02	1.38(inch)

D:S=60:1

| S 20 | 13 | 16 | 26 | 35(mm) |
| D 0 | 500 | 1000 | 1500 | 2000(mm) |

FAR FIELD D:S=40:1

NS50PLTCF

D 0	2.36	2.95	3.94	7.87	11.8(inch)
S 0.8	0.12	0.04	0.08	0.79	1.50(inch)

D:S=75:1

1@75

| S 20 | 3 | 1 | 4 | 20 | 38(mm) |
| D 0 | 60 | 75 | 100 | 200 | 300(mm) |

FAR FIELD D:S=5:1

NS50PLRFF

D 0	236	354	472	591(inch)
S 0.8	2.4	3.1	3.9	4.9(inch)

D:S=120:1

100@12000

| S 20 | 6 | 80 | 100 | 125(mm) |
| D 0 | 6 | 9 | 12 | 15(m) |

FAR FIELD D:S=100:1

NS50PH3FF

S 20:120:1,FAR FIELD D:S=80:1

S 20	16	20	30	45(mm)

30@3600

12@3600

| S 20 | 8 | 8.6 | 12 | 18(mm) |
| D 0 | 1000 | 2000 | 3600 | 5000(mm) |

NS50PH1FF
NS50PH2FF

NS50PH3SF

S 20:140:1,FAR FIELD D:S=25:1

S 20	9.8	6	5	9	22(mm)

5@700

2.3@700

| S 20 | 6.1 | 2.7 | 2.3 | 5.8 | 13(mm) |
| D 0 | 300 | 500 | 700 | 1000 | 1400(mm) |

NS50PH1SF
NS50PH2SF

S 20:300:1,FAR FIELD D:S=50:1

NS50PH3CF2

S 20:140:1,FAR FIELD D:S=15:1

S 20	5	2	7	20	40(mm)

2@280

1@300

| S 20 | 4 | 1 | 4.5 | 13 | 28(mm) |
| D 0 | 200 | 300 | 400 | 600 | 800(mm) |

NS50PH1CF2
NS50PH2CF2

S 20:300:1,FAR FIELD D:S=20:1

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6. Dimensions

7. Installation

7.1 Mechanical Installation

The NS50P comes with a standard 3 m cable, a mounting and fixed mounting bracket. You can mount the sensor in brackets or cutouts of your own design. For easy mounting and aligning the sensor to the measured object a fixed or adjustable mounting bracket is available.
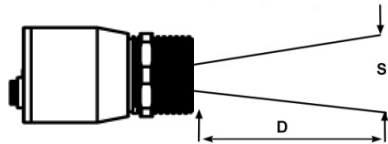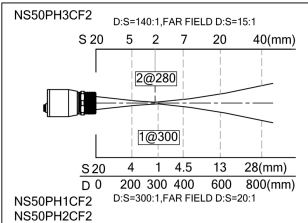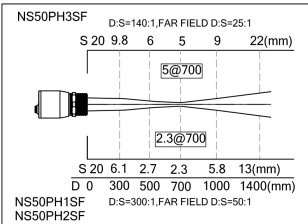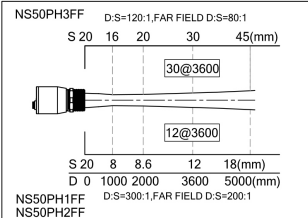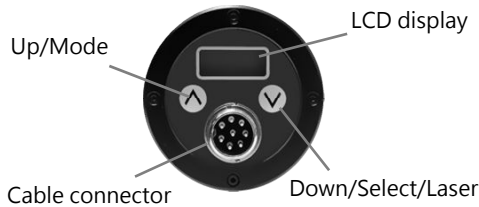
For exact measurement of the object temperature the sensor must be aligned correctly onto the object. Mount the sensor so the measured spot is the same or smaller than the target.

7.2 Wiring

red------	24VDC power (+)
black----	24VDC power (-)
white----	4~20mA signal (+)
green----	4~20mA signal (-)
orange---	TX (TTL),optional
grey-----	RX (TTL), optional
blue -----	GND (TTL), optional
bare-----	Shield Ground

8. Aiming and Focusing

Position the sensor so the two laser beams are marking the exactly location and size of the target. Please gently move it around until the temperature signal reads the highest. Hold the sensor in place and secure the mounting base. At ambient temperature > 50°C, the laser will be switched off automatically.

LASER LIGHT
DO NOT STARE INTO BEAM
CLASS 2 LASER
<1mW / 650 nm
IEC 825 (1994)

WARNING: Do not point the laser directly at the eyes of persons or animals! Do not stare into the laser beam. Avoid indirect exposure via reflective surfaces!

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9. Operation

LCD display
Up/Mode
Cable connector
Down/Select/Laser

| Display	Mode	Adjustment Range
S ON	Laser Sighting (ON) / (OFF)	Press the Down (v) or Up (∧) key
E 1.000	Emissivity	0.100 ~ 1.000
A 0.2	Signal output average	0.0 ~ 600.0s
P 0.0	Signal output Peak hold (inactive)	0.0 ~ 600.0s
V 0.0	Signal output Valley hold (inactive)	0.0 ~ 600.0s
AP OFF	Advanced Peak Hold (inactive)	ON / OFF
AP xxx	Trigger value for AP	depending on user
	The signal processing features (Peak, Valley and AP hold) cannot be used concurrently.	
L xxx	Lower Limit signal output [4mA]	depending on model
H xxxx	Upper Limit signal output [20mA]	
Unit C	Temperature unit	°C / °F

Sensor Setup :

1. Pressing the up (∧) key and down (v) keys simultaneously to enter setup function.

2. Press the down (v) key, when a (-) symbol appears at the right side of the selected function confirming into Setting Mode.

3. Press the down (v) or up (∧) key to select the functional parameter.

4. No action for 7s forces the unit to leave the Setting Mode and save the parameter.

5. Laser ON/OFF : Pressing the down (v) key to switch laser sighting on or off.

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10. Accessories

10.1 Mounting Bracket

Fixed Mounting Bracket   Adjustable Mounting Bracket
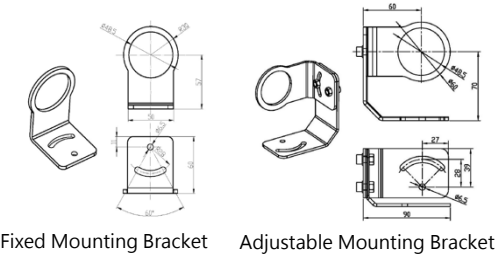
10.2 Air Purge Collar

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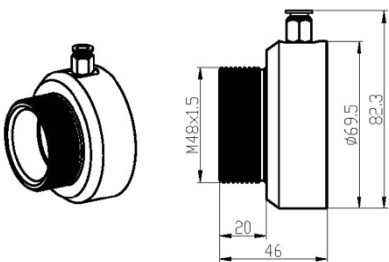
11. Software

11.1 Install driver for USB Adapter :

Please install the driver for USB cable first. After connecting the USB adapter cable to your PC, the system will allocate the infrared thermometer adapter driver automatically.

To find out which COM-Port number your computer set, open the device manager (Start – Settings – Control Panel – System – Hardware – Device Manager). In the category "Ports (COM & LPT)" you can find the "Infrared Thermometer Adapter (DR 6.x)" (only if your USB adapter is plugged in). In parenthesis the COM Port number is shown.

11.2 STonline Software

1) Please connect the sensor to your PC and start STonline software, and open at first [Menu: Setup(S)\Interface Settings], to choose the correct Com port and set the Baud Rate to 115,200.

After the unit connected to your personal computer, and the STonline software is started successfully; the communication has been established. The status line will be displayed in the left bottom: active COM port and successfully communication with the connected sensor. And the target temperature will show on the left in digital form.

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2) Starting the measurement
Please press the measuring key:
[Menu:Measurement(M)\ Start]

3) Scaling of the temperature axis
In the menu item settings [Diagram(A)]
Global Auto Scaling: the temperature range of the diagram is automatically adapted to the respective peak values.
Local Auto Scaling: the temperature range of the diagram will be dynamically adapted to the respective peak values.
Manual scaling: It can be done at any time using the control elements of the temperature axis.

4) Stop the measurement
To stop the current measurement, please press the stop key [Menu:Measurement(M)\ Stop].
The save key [Menu: File(F)\Save Diagram] opens an explorer window to select destination and file name.

5) Diagram setting
The menu item settings [Menu: Diagram(A)\Settings] enable the settings for data diagram.
Color: temperature graph and digital display.
Initial Time Interval(S): time frame on x-axis at the beginning of measurement.

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12. Warranty

Each product passes through a quality process. Nevertheless, if a failure occurs please contact the customer service at once. The period of warranty starts from the date of delivery of the product to the customer and shall cover a period of 12 months. This warranty shall not apply to fuses, batteries, or any product that has been subject to misuse, neglect, accident, or abnormal conditions of operation.

The manufacturer shall not be liable for any special, incidental or consequential damages, whether in contract, tort, or otherwise. If a failure occurs during the warranty period, the product will be replaced, calibrated or repaired without further charges. The freight costs will be paid by the sender. The manufacturer reserves the right to exchange components of the product instead of repairing it.

If the failure results from misuse, neglect, accident, or abnormal conditions of operation or storage, the user has to pay for the repair. In that case you may ask for a cost estimate beforehand.

Test Standards:
- EN 61010-1:2010
- EN 61326-1:2013
Complies with the following relevant provisions:
-EC Low Voltage Directive (2014/35/EU)
-EC Electromagnetic Compatibility Directive (2014/30/EU)

CE RoHS compliant