

### Infrared Pyrometer Sensor

#### Specifications

Power, GrowNET/MODBUS	24Vdc 1.5W average, 2.5W peak
Max Cable Distance	1000 ft
PLIR™ Temperature Range	-40 - 85°C ( -40 - 185°F )
PLIR™ Accuracy	±0.3°C typical
PLIR™ Measurement Angle	37.5° Cone
Protocols	GrowNET™ or MODBUS RTU



#### Contents

<b>Features</b>	<b>2</b>
Sensor Position	2
<b>Installation Instructions</b>	<b>3</b>
<b>Connection to GrowControl™ GCX</b>	<b>4</b>
GrowNET™ Hubs	4
<b>Connection to MODBUS RTU</b>	<b>5</b>
Serial Speed & Format	5
Supported Commands	6
Register Types	6
Sensor Value Registers	6
Toggle Units Register	6
Calibration Registers	6
MODBUS Holding Registers	7
<b>Maintenance &amp; Service</b>	<b>8</b>
Cleaning	8
<b>Storage and Disposal</b>	<b>8</b>
<b>Warranty</b>	<b>8</b>

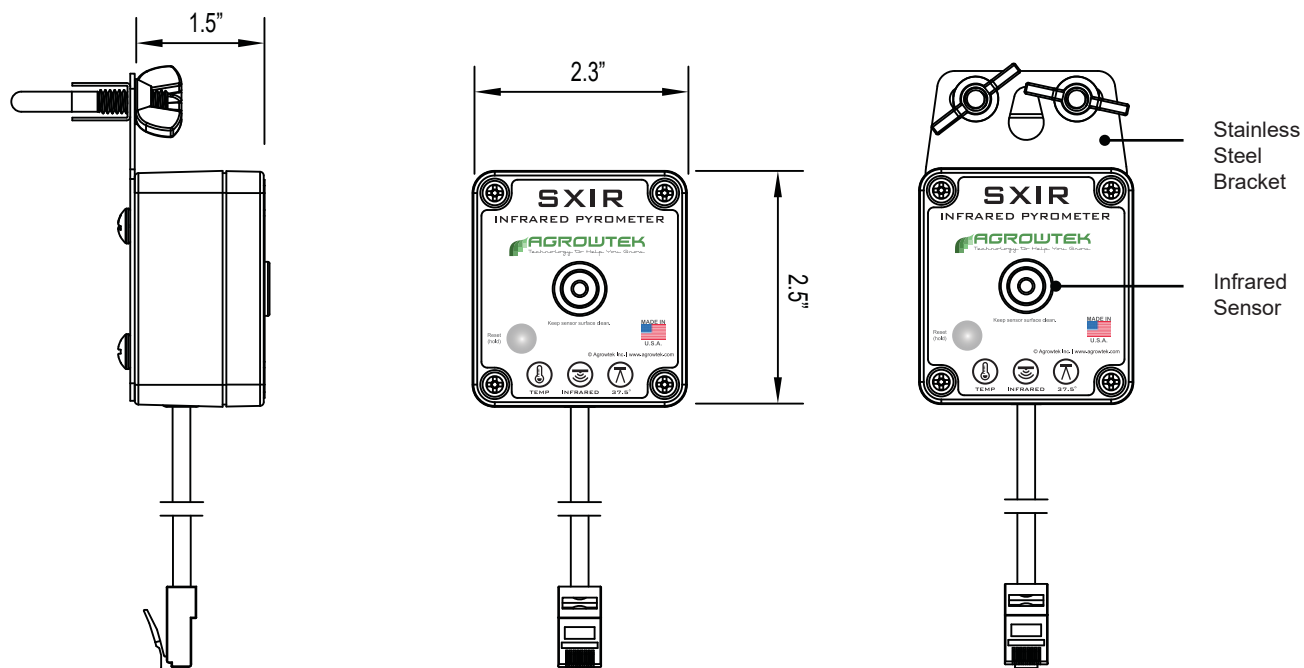
**KEEP THESE INSTRUCTIONS**

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# Features

SXIR Infrared Pyrometer is a precision non-contact IR surface temperature sensor. Featuring the same quality sensors as the PLIR™ sensor that is integrated into SXC climate sensors.

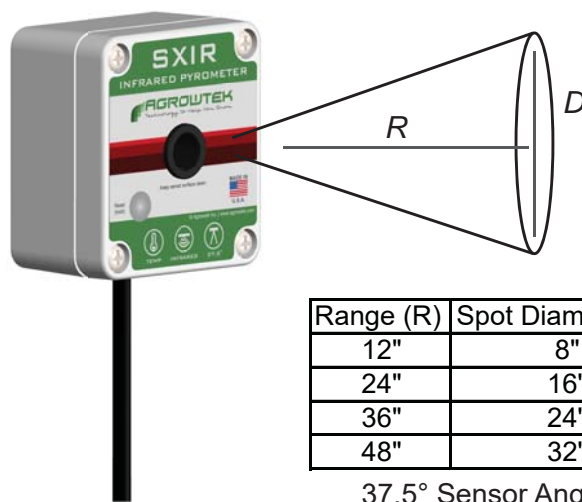
Rugged design and low cost allow the sensors to be permanently mounted in the growing environment. Locate the sensor above canopy, in tiered racks, or even aimed at equipment that you want to monitor for temperature.



## Sensor Position

Consider the measurement spot size at your target when hanging or mounting the sensor.

The spot size will increase with greater distance to the target and will be reduced as the target moves closer to the sensor unit.



# Installation Instructions

A stainless steel bracket is included for wall or pole mounting the sensor. The bracket screws to the bottom of the SXIR sensor with the included screws. Various options are available for mounting the sensor:

## Pole Mounting

Customer provided EMT or PVC conduit connects through the 7/8" diameter hole in the bracket and secures with a standard conduit fitting and nut. Pole mounting allows the sensor to be mounted in the canopy. Additionally, the pole may be mounted or bent in such a way that its height and location are easily adjustable.

## Wall/Strut Mounting

The bracket also includes two slots for mounting to a vertical surface using standard bolts or screws.

## Installation Location Requirements:

- Avoid areas where the sensor may be sprayed. Cover the sensor when spraying or in extreme humidity.
- Keep sensor away from sources of heat and radiation (that are not being measured.)
- Install in a location with ambient environment conditions.

The sensor is most accurate when it is in ambient conditions in the environment. Heating of the enclosure from alternate sources (such as a light or solar radiation) can introduce error in the temperature reading.



Mount the bracket to the back of the sensor using the included screws. The u-bolt clamp can be secured to 1/2" EMT or PVC conduit, shelving poles, etc., or use the bracket holes to mount to a tripod, etc.



**Do not connect the GrowNET™ port to Ethernet networks. Equipment damage may result.**



**Always bag or remove sensors when spraying chemicals or fogging.**



**Do not spray the sensor with water or chemicals. Protect sensor from direct water exposure.**

## Installation Notes

### ⚠ NOTICE

GrowNET™ ports use standard RJ-45 connections but are NOT compatible the Ethernet network equipment. *Do not connect GrowNET™ ports to Ethernet ports or network switch gear.*

### ⚠ DIELECTRIC GREASE

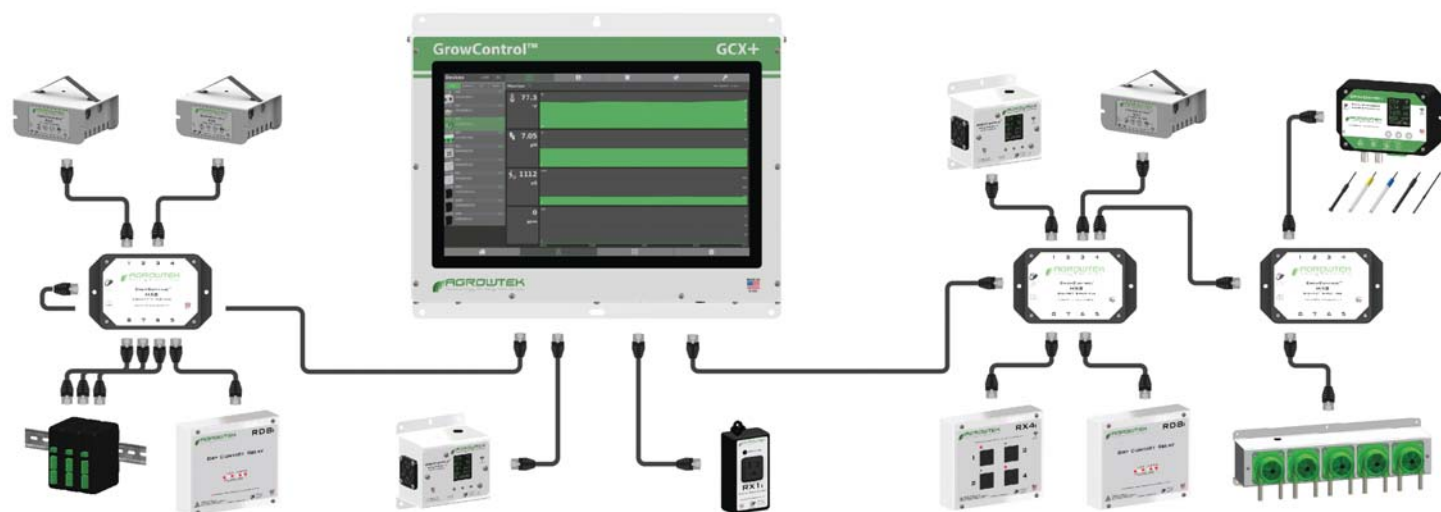
Dielectric grease is recommended on RJ-45 GrowNET™ connections when used in humid environments. Place a small amount of grease onto the RJ-45 plug contacts before inserting into the GrowNET™ port. *Non-conductive grease is designed to prevent corrosion from moisture in electrical connectors.*

- Loctite LB 8423
- Dupont Molykote 4/5
- CRC 05105 Di-Electric Grease
- Super Lube 91016 Silicone Dielectric Grease
- Other Silicone or Lithium based insulating grease

## Connection to GrowControl™ GCX

All GrowNET™ devices are connected using standard CAT5 Ethernet cable with RJ-45 connections.

Devices can be connected directly to the GrowNET™ ports on the bottom of the controller, or through HX8 GrowNET™ hubs. It is typical to simplify cabling by locating hubs centrally in hall ways and rooms allowing single runs from an 8-port device hub back to a central hub or back to the controller.



Refer to the GCX controller manual for details on adding the device to the system.

## GrowNET™ Hubs

HX8 GrowNET™ hubs expand a single port into eight more ports. Hubs can be daisy-chained to form a network of up to 100 devices per GrowNET™ bus. Individually buffered port transceivers provide excellent signal integrity and extended communication strength and range.

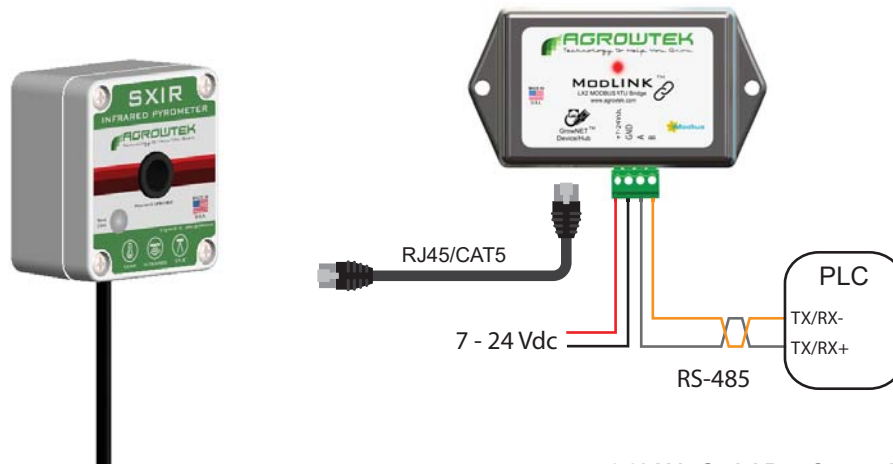
Hubs provide up to 1A of power for operating sensors and most relays directly over the CAT5 cable. A DC jack on the hub provides 24Vdc power to the ports from the included wall power supply. A terminal block power option is also available.



# Connection to MODBUS RTU

## RS-485

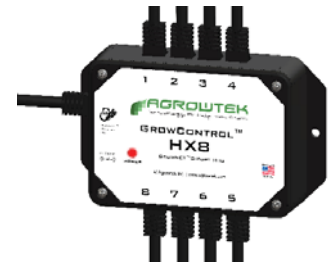
Use the LX2 ModLINK to connect MODBUS devices to the GrowNET™ port.



**3.3/5Vdc Serial Bus Compatible.**

Include required bus terminating resistors per EIA standard.

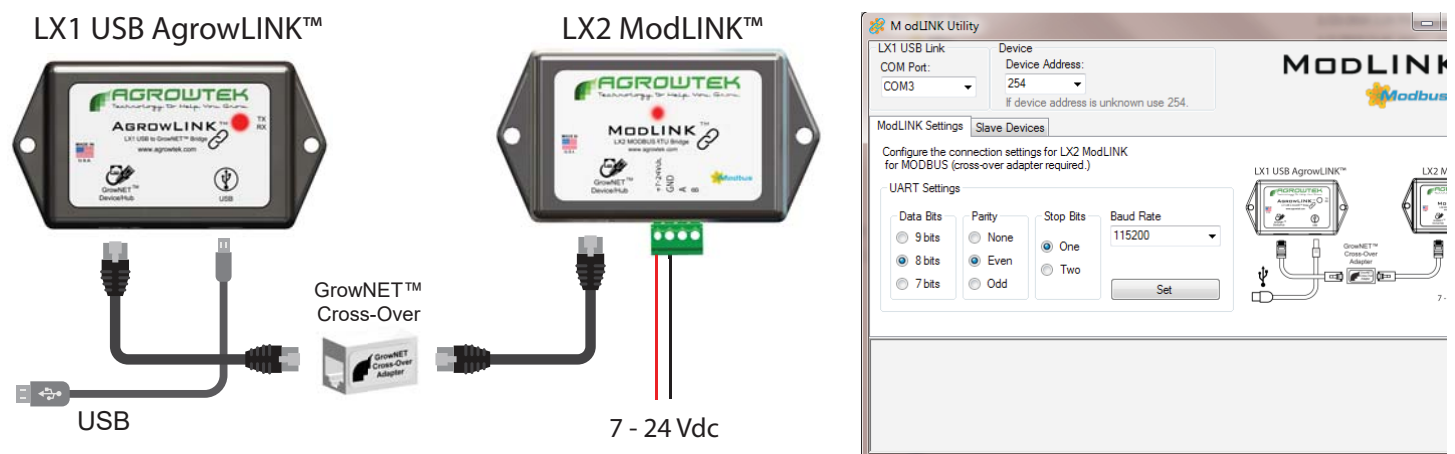
HX8 GrowNET™ hubs are compatible with LX2 ModLINK™ and MODBUS. Connect multiple devices to a single LX2 and benefit from the superior buffered communication of the HX8 hub.



## Serial Speed & Format

The default serial data format for the LX2 ModLINK interface is: **19,200 baud, 8-N-1.**

Alternate speeds and formats between 9,600 - 115,200 baud may be configured with the free AgrowLINK PC utility using a LX1 USB AgrowLINK and the cross-over adapter supplied with the LX2 ModLINK.



See MODBUS manual for more information.



[MODBUS Manual](#)

## Supported Commands

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0x03 Read Multiple Registers

0x06 Write Single Register

A request to use a function that is not available will return an illegal function exception.

## Register Types

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Data registers are 16 bits wide with addresses using the standard MODICON protocol. Floating point values use the standard IEEE 32-bit format occupying two contiguous 16 bit registers. ASCII values are stored with two characters (bytes) per register in hexadecimal format.

## Sensor Value Registers

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Sensor values are available in integer or floating point formats depending on the register requested (see map.)

Sensor #	Type	Integer Scale	Range
1	Temperature	x100	-2000 - 6000 (-20 - 60°C) / -400 - 14000 (-4 - 140°F)

For example: an integer temperature value of 2417 is equal to a temperature reading of 24.17°C.

The value "9999" is representative of a failed sensor.

## Toggle Units Register

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Sensors with alternate units may toggle the units using the "toggle units" register. To toggle the units, send the sensor channel number to the toggle register. *This register is write-only.*

For example: to toggle between °F and °C, send a "1" to register 1002.

## Calibration Registers

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Calibration registers are 16-bit signed integers for the purpose of calibrating the sensor values or analog output channels. Calibration may be achieved by writing the desired calibrated value to the associated register. Writing to the calibration registers automatically invokes the calibration routine for that register.

### Offset Calibration

Offset, or zero calibration, is an arithmetic positive or negative correction to the sensor reading and is the only type of sensor calibration available on climate/environmental sensors.

To perform a sensor offset calibration, simply write the corrected sensor value to the offset calibration register (taking into account the integer scale as shown above.)

For example: to set the temperature to a calibrated value of 25°C, write the value "2500."

## MODBUS Holding Registers

Parameter	Description	Range	Type	Access	Address
Address	Device Slave Address	1 - 247	8 bit	R/W	40001
Serial#	Device Serial Number	ASCII	8 char	R	40004
DOM	Date of Manufacture	ASCII	8 char	R	40008
HW Version	Hardware Version	ASCII	8 char	R	40012
FW Version	Firmware Version	ASCII	8 char	R	40016
Toggle Units	Toggle sensor units	1 - 4	16 bit, unsigned	W	41002
Heater Power	RH Sensor Heater	0 - 16 *	16 bit, unsigned	W	41003
Sensor Reading, Integer	Temperature	-4000 - 8500 (-40 - 85°C)	16 bit, signed	R	40101
Sensor Reading, Float	Temperature		32 bit, floating pt	R	40201
Calibration Input, Offset (Zero)	Temperature	See integer ranges above.	16 bit, signed	W	41101

A request to read or write a register that is not available will return an illegal address error (0x02).



# Maintenance & Service

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Sensors require periodic maintenance to ensure proper performance.

## Cleaning

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Exterior and label surfaces may be wiped with a damp cloth with mild dish detergent, then wiped dry. Avoid spraying the sensor with chemicals or water spray.

## Storage and Disposal

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### Storage

Store equipment in a clean, dry environment with ambient temperature between 10-50°C.

### Disposal

This industrial control equipment may contain traces of lead or other metals and environmental contaminants and must not be discarded as unsorted municipal waste, but must be collected separately for the purpose of treatment, recovery and environmentally sound disposal. Wash hands after handling internal components or PCB's.

## Warranty

Agrowtek Inc. warrants that all manufactured products are, to the best of its knowledge, free of defective material and workmanship and warrants this product for 1 year from the date of purchase. This warranty is extended to the original purchaser from the date of receipt. This warranty does not cover damages from abuse, accidental breakage, or units that have been modified, altered, or installed in a manner other than that which is specified in the installation instructions. Agrowtek Inc. must be contacted prior to return shipment for a return authorization. No returns will be accepted without a return authorization. This warranty is applicable only to products that have been properly stored, installed, and maintained per the installation and operation manual and used for their intended purpose. This limited warranty does not cover products installed in or operated under unusual conditions or environments including, but not limited to, high humidity or high temperature conditions. The products which have been claimed and comply with the aforementioned restrictions shall be replaced or repaired at the sole discretion of the Agrowtek Inc. at no charge. This warranty is provided in lieu of all other warranty provisions, express or implied. It is including but not limited to any implied warranty of fitness or merchantability for a particular purpose and is limited to the Warranty Period. In no event or circumstance shall Agrowtek Inc. be liable to any third party or the claimant for damages in excess of the price paid for the product, or for any loss of use, inconvenience, commercial loss, loss of time, lost profits or savings or any other incidental, consequential or special damages arising out of the use of, or inability to use, the product. This disclaimer is made to the fullest extent allowed by law or regulation and is specifically made to specify that the liability of Agrowtek Inc. under this limited warranty, or any claimed extension thereof, shall be to replace or repair the Product or refund the price paid for the Product.