

Weather Station Sensor & Data Logger

Specifications

Power	24Vdc, ~5W
Max Cable Distance	1000ft
Aspirator	6cfm Fan with Foam Filter
Temperature Range	-20 - 60°C
Temperature Accuracy	±0.2°C typical ±0.4°C maximum
Humidity Range	0-100% RH (non condensing)
Humidity Accuracy	±2% 0-80% typical ±4% maximum
Light Irradiance Range	0 - 1000W/m2
Light Accuracy	±10%
CO2 Range (optional)	0-2,000ppm
CO2 Accuracy	±50ppm +3%
Wind Speed Range	0 - 125 mph
Wind Speed Accuracy	±1mph
Wind Direction Range	0 - 359°
Wind Angle Precision	±1°
4-20mA DAC Resolution	12 bit, 0.005mA
Interface	GrowNET, MODBUS



Shown with optional WiFi and wind sensors.



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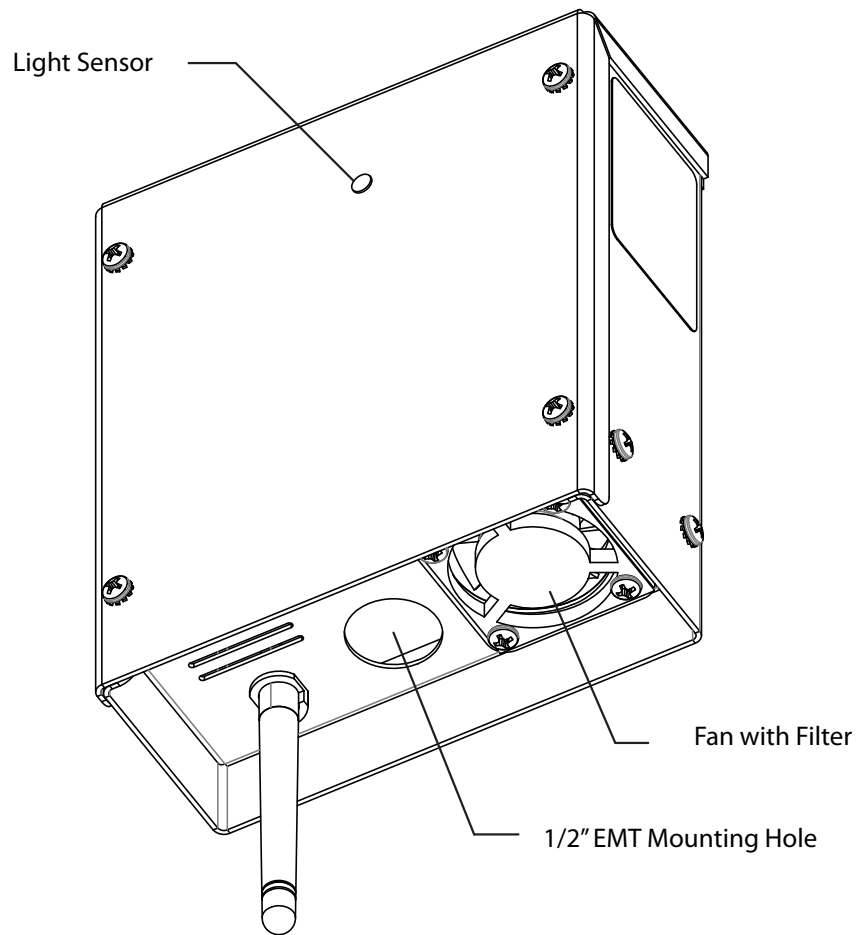
Installation Instructions

The SXW weather station is made of corrosion-proof stainless steel and is intended for mounting outdoors on a conduit pole.

A 7/8" hole is provided in the heavy mounting plate on the bottom of the sensor for installing a 1/2" EMT conduit fitting.

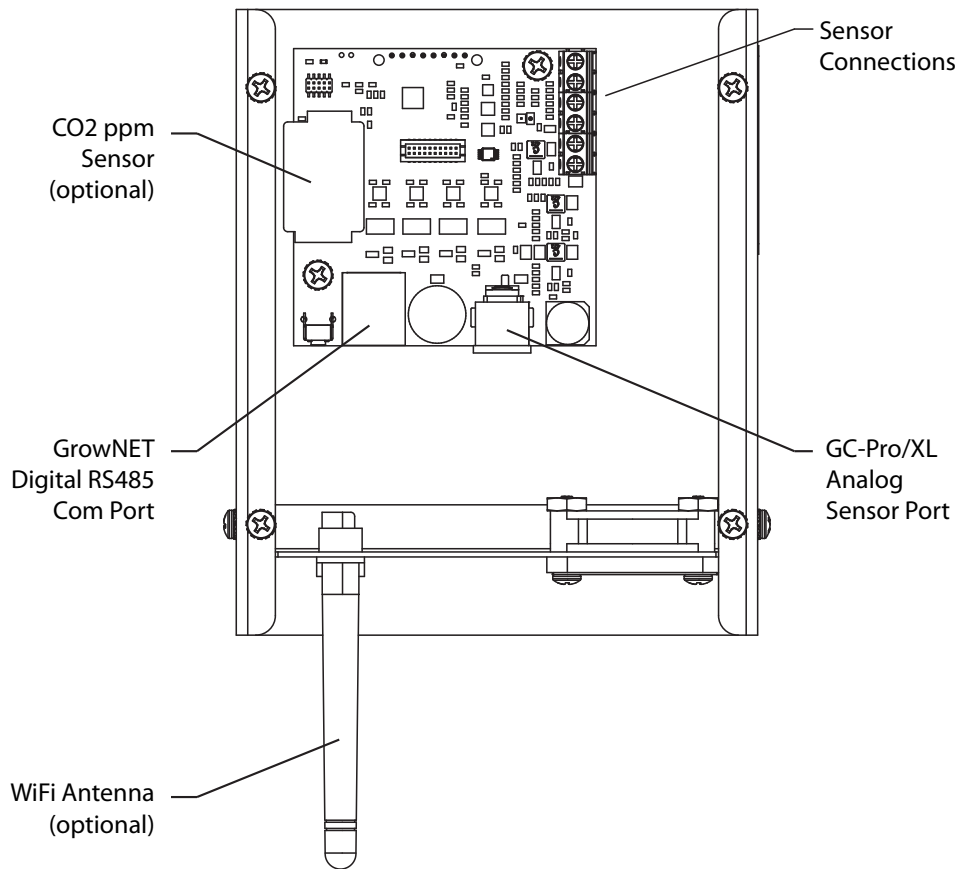
Install the sensor box in a vertical orientation with the openings facing down. The top of the box is rain proof when oriented properly. Position the light sensor facing South for maximum light sensing accuracy.

IMPORTANT: The cover screws are stainless steel and provided with a sealing washer. Do not substitute screws if lost; contact Agrowtek for replacements.



Connecting Wind Sensors

Wind speed (anemometer) and direction vane sensors are available for connection to the weather station for collection of wind data. Wind sensors connect to the terminal blocks inside of the sensor box and are mounted externally as desired.

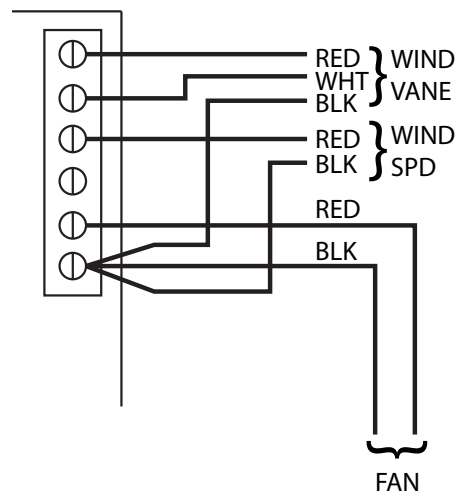


⚠ Do NOT connect the GrowNET port to Ethernet networks.

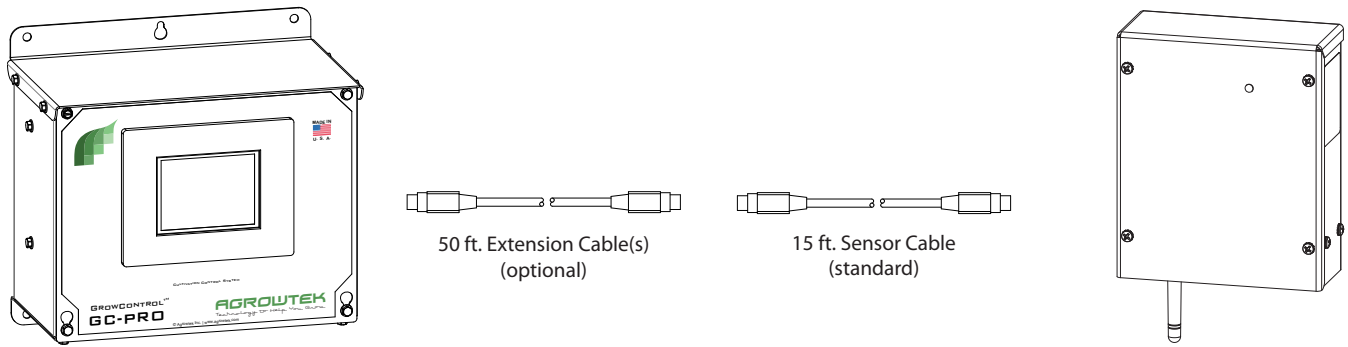
⚠ Disconnect power while making connections to prevent damage to any components.

Wire wind sensors according to the diagram below:

TERMINAL BLOCK WIRING DIAGRAM



Connection to GC-Pro/XL Controller



Sensors with analog output connect to Agrowtek’s GC-Pro and GC-ProXL controllers using the standard MINI-DIN 6 analog sensor cable. Power is provided to the sensor through this cable.

Plug the cable firmly into the analog port on the sensor and into the desired sensor port inside the GC-Pro/ XL controller. Sensor ports are located on “modules” inside of the controller. Route sensor cables through the sensor cable slot on the bottom of the controller.

50ft extension cables are available and may be used to extend up to 1000ft distance from the controller.

Sensor Mapping

Sensors must be “mapped” in the controller so it knows which sensors are connected to the sensor ports.

Each port has four “channels” which must be mapped according to the sensor’s channels.

Controller Channels:

- Port 1 = Channels 1-4
- Port 2 = Channels 5-8
- Port 3 = Channels 9-12
- Port 4 = Channels 13-16

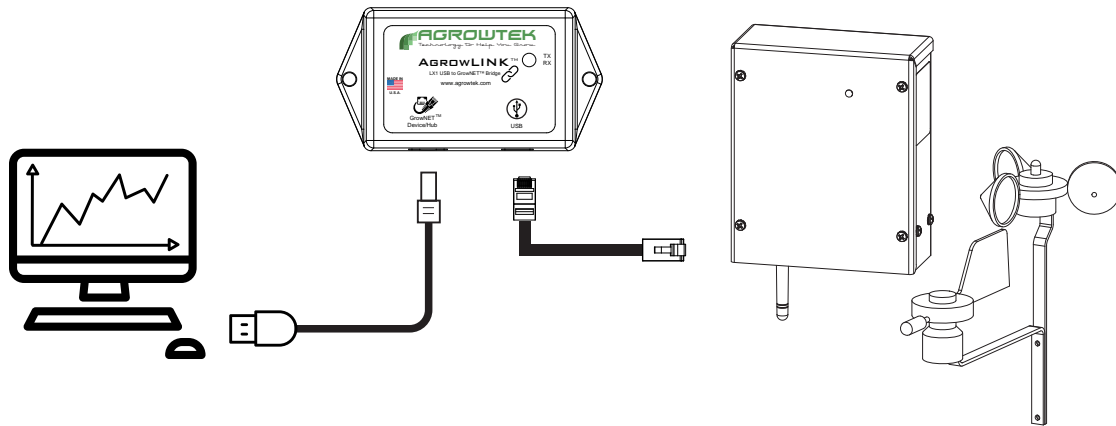
Sensor Outputs:

- Output 1 = Wind Speed
- Output 2 = Wind Direction
- Output 3 = Temperature
- Output 4 = Light

Example mapping zone 1 weather sensor connected to port#2:

- Speed = 5
- Direction = 6
- Temperature = 7
- Light = 8

Connection to USB AgrowLINK



LX1 USB AgrowLINK connects Agrowtek's devices to a computer's USB port for:

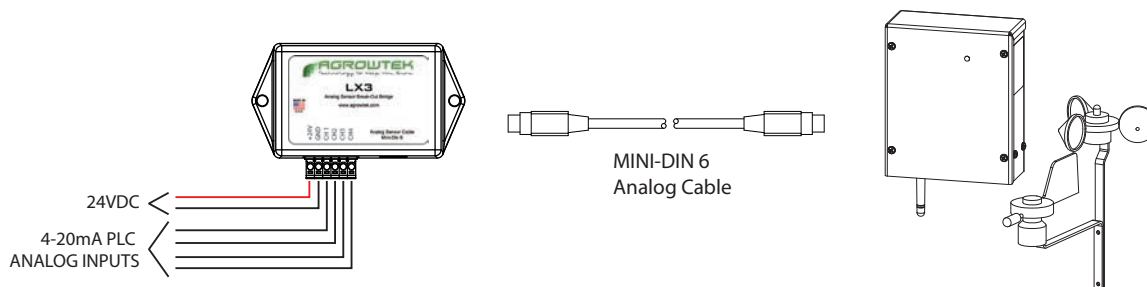
- Firmware Updates
- Calibration
- Configuration
- Data Logging Download
- More

Visit www.agrowtek.com for free software applications.

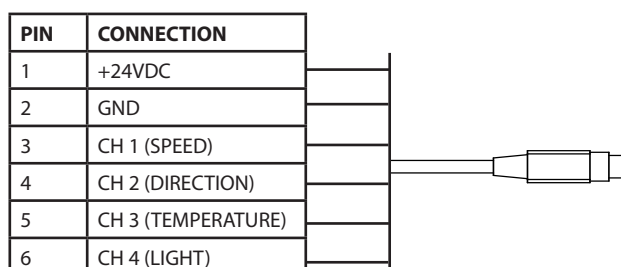
Standard FTDI drivers automatically install in Windows. GrowNET protocol available for custom software applications; sample C# code available. See software manual for more information.

Connection to 4-20mA Outputs

Option 1: Use the LX3 Analog Bridge with Mini-Din 6 analog sensor port connection and removable terminal block for wire connections. Terminal block includes 24V power terminals and four terminals for the analog channels. 4-20mA linear outputs correspond to the ranges in the specifications table.



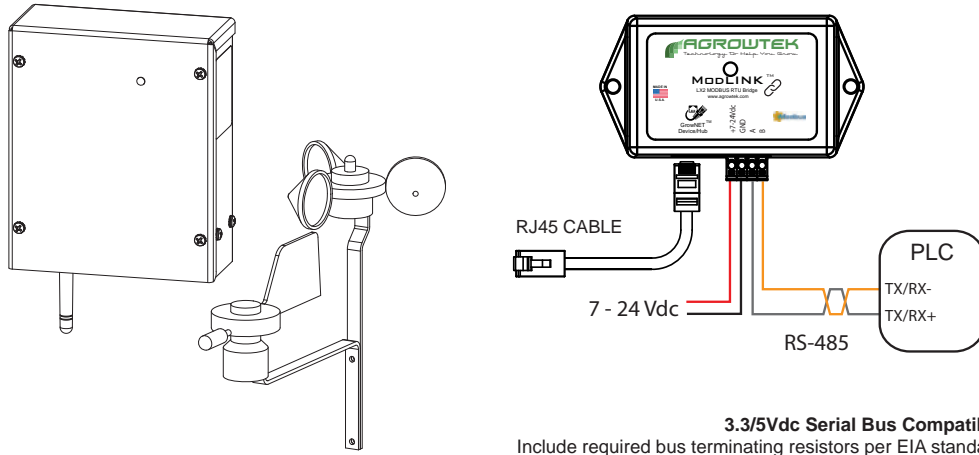
Option 2: Create a cable for direct connection to a PLC from a Mini-Din 6 cable.



Connection to MODBUS RTU

RS-485

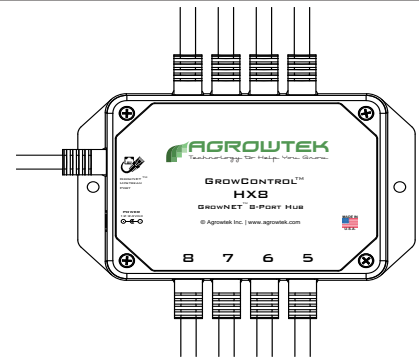
Use the LX2 ModLINK to connect MODBUS devices to the GrowNET™ port.



HX8 8-Port Hubs

HX8 GrowNET™ Hubs allow multiple GrowNET™ sensors, relays and dosing pumps to be connected to a single LX1 or LX2 interface. Individually buffered, full-duplex ports for signal integrity. Hubs can be daisy chained to form a network of up to 247 devices.

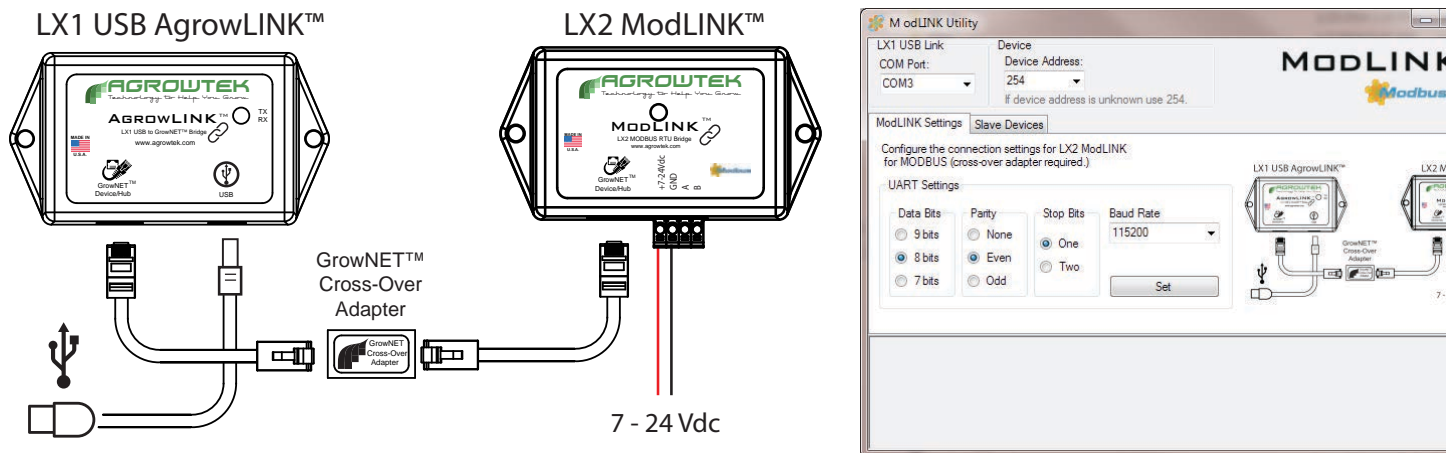
Hubs provide up to 1A of power for operating sensors and some relays directly over the GrowNET cable. A DC jack on the hub provides 24Vdc power to the ports from the included 120V wall power supply.



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.



Supported Commands

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

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

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)
2	Humidity	x10	0 - 1000 (0 - 100%)
3	Light	x1	0 - 1000 W/m ²
4	CO ₂	x1	0 - 10,000 ppm
5	Speed	x1	0 - 125mph
6	Direction	x1	0 - 359°
7	Barometric Pressure		NOT CURRENTLY AVAILABLE
8	Rain		0 - 1

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 (with the exception of CO₂ which will read 0.)

Toggle Units Register

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

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.”

Analog Calibration (± 1 calibration bit = ± 0.005 mA adjustment)

Analog output calibration sends a positive or negative offset to the respective output channel’s digital to analog converter (DAC.) The DAC has a resolution of 0.005mA/bit.

For example: to shift the analog output up by 0.1 mA, set the analog offset value to +20. ($0.1 / 0.005 = 20$)

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
Sensor Reading, Integer	Temperature	-2000 - 6000 (-20 - 60°C)	16 bit, signed	R	40101
	Humidity	0 - 1000 (0 - 100%)			40102
	Light	0 - 1000 W/m2			40103
	CO2	0 - 10,000ppm			40104
	Speed	0 - 125mph			40105
	Direction	0 - 359°			40106
	Barometric Pressure	N/A			40107
	Rain	0 - 1			40108
Sensor Reading, Float	Temperature	-20.00- 60.00 °C	32 bit, floating pt	R	40201
	Humidity	0 - 100.0 %			40203
	Light	0 - 1000 W/m2			40205
	CO2	0 - 10,000ppm			40207
	Speed	0 - 125mph			40208
	Direction	0 - 359°			40211
	Barometric Pressure	N/A			40213
Calibration Input, Offset (Zero)	Temperature	See integer ranges above.	16 bit, signed	W	41101
	Humidity				41102
	Light				41103
	CO2				41104
	Speed				41105
	Direction				41106
	Barometric Pressure				41107
Calibration Input, Analog Output	Temperature	-255 - 255 (bits)	16 bit, signed	W	41301
	Humidity				41302
	Light				41303
	CO2				41304

A request to read or write a register that is not available will return an illegal address exception.

Maintenance & Service

Sensors require periodic maintenance to ensure proper performance.

Fan Filter

The fan air filter should be periodically removed for cleaning. **It is NOT necessary to remove the fan.**

1. Pry the retaining grate out using a small flat blade eye-glass screwdriver or tip of a pocket knife.
2. Remove the foam filter and replace, or clean with mild dish detergent and water, then pat dry.
3. Re-install the foam filter and grate by gently snapping the grate back into place.

Storage and Disposal

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.