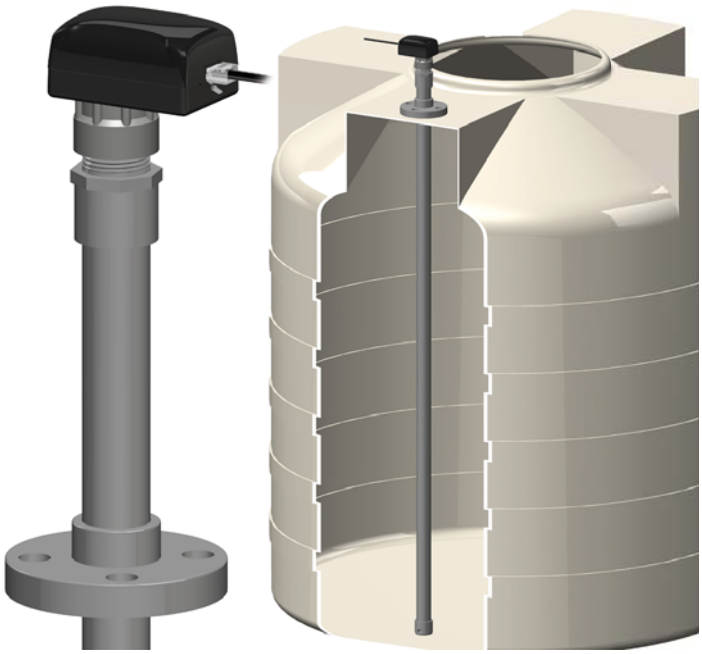
Variable Liquid Level Sensor

Specifications

Input Power (GrowNET™)	1 W @ 12-24Vdc ⎓
Max Cable Distance	1000ft
Sensing Range	SXLV-10: 10ft (3m) SXLV-30: 30ft (10m)
Resolution	0.1 in (1 cm)
Accuracy	±3% of Full Scale
Sensor Type	Pressure
Update Frequency	1 second
Interface	GrowNET™, MODBUS
LED Indicators	1: Communication 1: High (Green) / Low (Red)



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KEEP THESE INSTRUCTIONS

This product is intended for commercial use only.

REV 03/26

Warnings & Notices

GrowNET™ sensors are precision electronic instruments which require attention and care to maintain their accuracy and reliability. Failure to operate the sensors properly can cause damange and equipment failure.

⚠ READ & UNDERSTAND ENTIRE MANUAL PRIOR TO INSTALLATION OR OPERATION.
Failure to read, understand and comply with warnings and installation requirements may result in property damage, personal injury or death.

⚠ WARNING
Do not use a power supply other than the intended or included power supply. Do not exceed the maximum ratings on the product serial label or specifications listed in this manual. Any power supply with energy levels exceeding the specifications must be current limited or fused to prevent overcurrent to the device.

⚠ INDOOR LOCATIONS ONLY
This product is designed for indoor mounting only and must be protected from outdoor weather.

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This product is designed for indoor mounting only and must be protected from outdoor weather.

⚠ WARNING
This sensor is intended for water applications only. Do not use with flammable liquids.

⚠ 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 or equipment damage may result.*

⚠ 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.

- 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

⚠ NOTICE
Do not spray the sensor with water or chemicals. Protect sensor from direct water exposure. Always cover sensor openings when spraying chemicals or fogging.

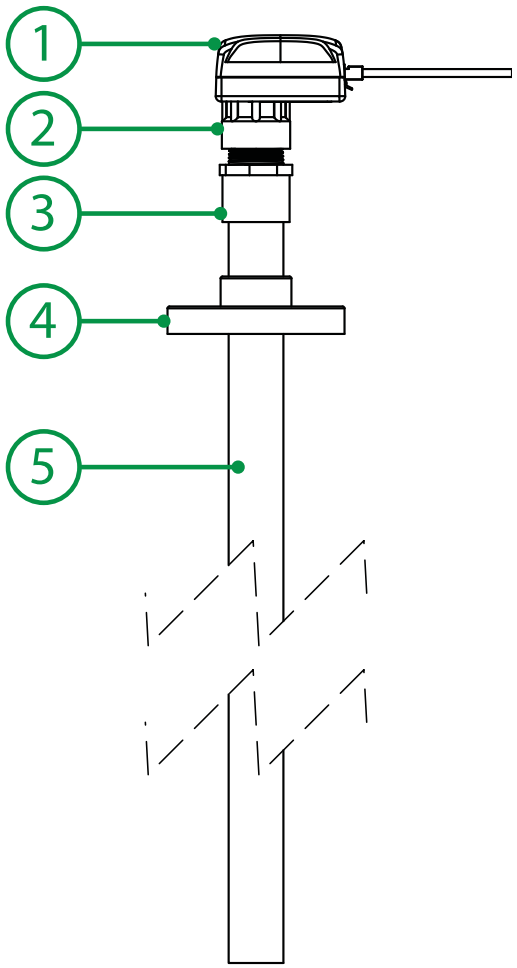
⚠ WARNING
This product may contain chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

Installation Instructions

SXLV sensors are designed to measure the pressure of air trapped in a vertical column. As the fluid level rises in the tank, the pressure of the air trapped in the pipe rises proportionally as the height of the fluid in the tank rises. The SXLV sensor converts this pressure reading into a height measurement of the fluid.

Mounting the SXLV Sensor

SXLV sensors are shipped with a socket-weld fitting (2) to be installed on a customer supplied length of 1" PVC pipe (5) (sch 40 or sch 80.) An adjustable mounting flange (4) is optional for securing the pipe to the top of a tank.



1. Cut the Sensing Pipe
Cut the 1" pipe (5) to a length that reaches the bottom of the tank and extends 6-12" above the top of the tank.

2. Mount the Pipe
Mount the pipe to the top of the tank. A mounting flange (4) is available for this purpose or you may supply your own mount. Adjust the height of the pipe so that it is 1/4" above the bottom of the tank, or so the bottom of the pipe is at the level you want to read "0" height.

3. Install the Threaded Fitting
Install the included fitting using solvent weld primer and adhesive. Ensure an air-tight seal is developed at the weld.

4. Install the Sensor
Install the sensor on the threaded fitting by turning only the cap fitting (2). **Do not hold the sensor body** (1) to apply torque. The sensor cap includes an o-ring which will seal tightly against the threaded fitting. Ensure the o-ring is in place. Do not over-tighten.

⚠

NOTICE:
Do not tighten or loosen the sensor by holding the sensor body. Only apply torque to the sensor cap (2).

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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.

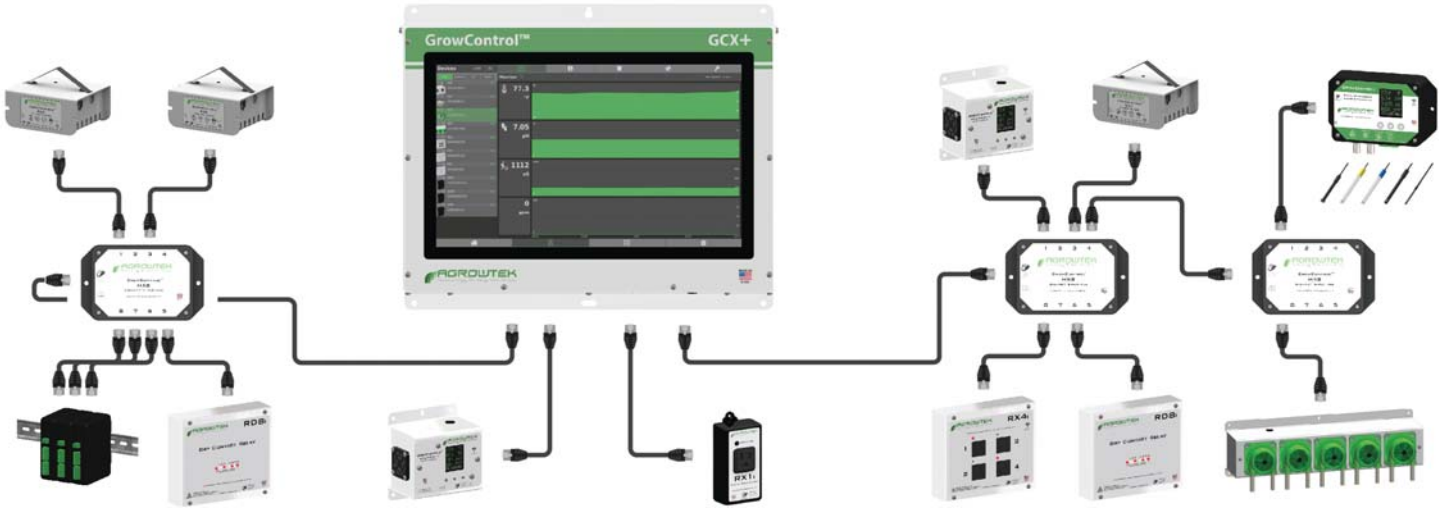
⚠ DIELECTRIC GREASE
Dielectric grease is recommended on RJ-45 GrowNET™ connections when used in humid environments. Place a small amount of grease onto the RJ-45 plug contacts before inserting into the GrowNET™ port.
Non-conductive grease is designed to prevent corrosion from moisture in electrical connectors.

- 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.



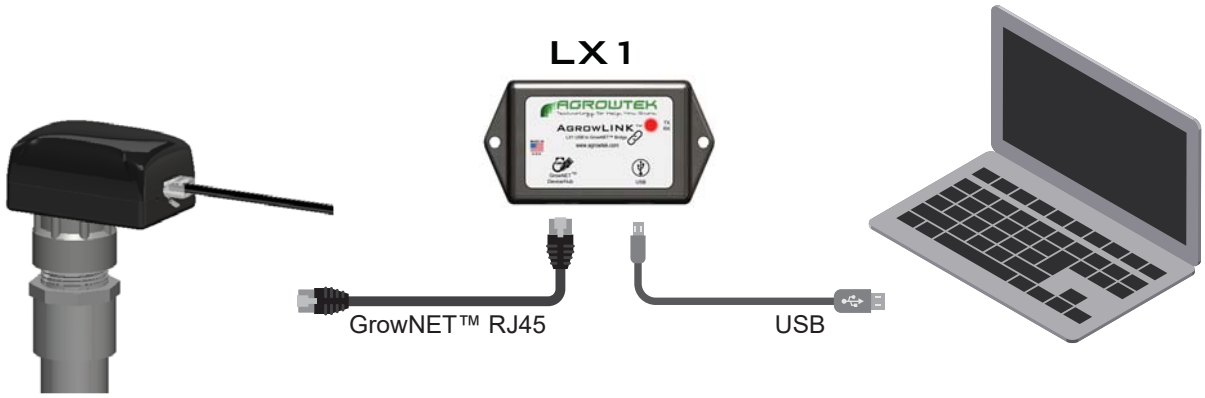
Refer to the GCX controller manual for details on adding the device to the system.

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 transcievers 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 USB AgrowLINK



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

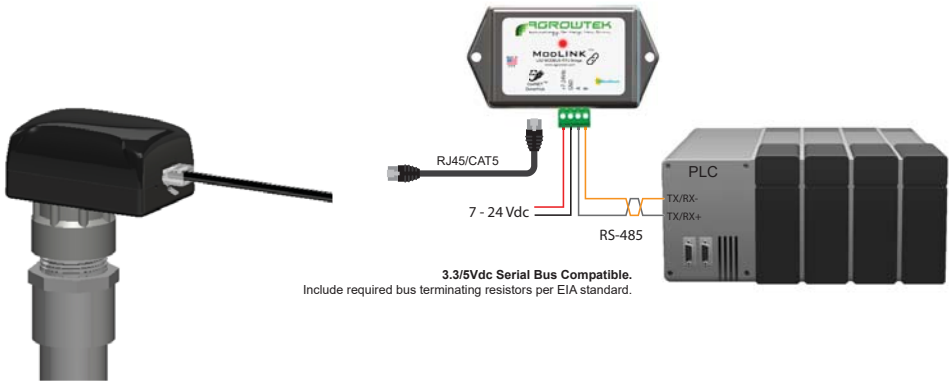
- Firmware Updates
- Manual Operation
- API Based Control
- More

Agrowtek's intelligent relays may be connected to the LX1 USB AgrowLINK for firmware updates, communication protocol configuration, addressing and manual operation. Standard drivers automatically install in Windows for the LX1 USB AgrowLINK.

Connection to MODBUS RTU

RS-485 / RS-422

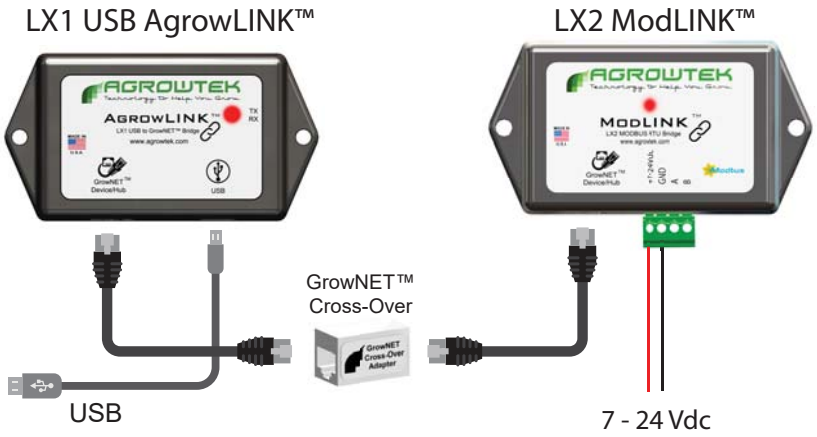
Use the LX2 ModLINK to connect MODBUS devices to the GrowNET™ port.

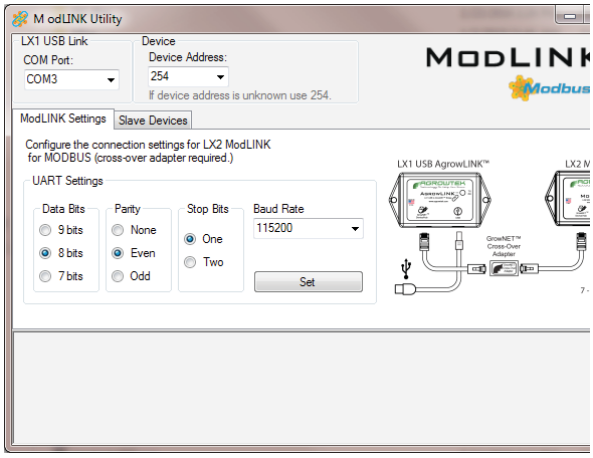


Serial Speed & Format

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

0x01 Read Coils
0x03 Read Multiple Registers
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.

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

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	Height	IN x10, m x100	SXLV10: 0 - 120in (0-3m) | SXLV30: 0 - 360in (0-10m)
2	Pressure	x100	SXLV10: 0 - 5 psi (0-33kPa) | SXLV30: 0 - 15 psi (0-100kPa)

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 to the toggle register. *This register is write-only.*

For example: to toggle between inch/PSI and m/kPA, send a "1" to register 1002.

Calibration Registers

Calibration registers are 16-bit signed integers for the purpose of calibrating the sensor values. 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.

SXLV sensors offer a span calibration for the height reading only. Zero height calibration is not required. Calibration of the pressure reading is not required.

MODBUS Register Map

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	0 - 1	16 bit, unsigned	W	41002
Sensor Reading, Integer	Height	0 - 120in (0-3m)	16 bit, signed	R	40101
	Pressure	0 - 5psi (0 - 33kPa)			40102
Sensor Reading, Float	Height	0 - 120in (0-3m)	32 bit, floating pt	R	40201
	Pressure	0 - 5psi (0 - 33kPa)			40203
Calibration Input, Height Calibration	Height	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).

Technical Information

Troubleshooting

Problem	Solution
The device is shown as "offline" on the control system.	Check if the status LED is illuminated green or amber. If there are no LED's illuminated, the PCB is not receiving power. In most applications the PCB receives power from the RJ-45 connection. Check the RJ-45 connection for damage. Test the RJ-45 cable with a tester tool. Check the upstream device (HX8 hub or GCX controller) that the device is connected to. It should be providing power. If connected to an HX8 hub, ensure the hub's LED is illuminated to indicate it has power. Try an alternate hub port to ensure there is not a problem with the hub port. Try an alternate RJ-45 cable to ensure there is not a problem with the cable.
Sensor Height is Incorrect	Ensure the sensor has been calibrated for the maximum height that will be achieved in the tank. Sensors are automatically calibrated for zero (atmospheric.)

Maintenance & Service

Exterior Cleaning
Exterior may be wiped with a damp cloth wish mild dish detergent, then wiped dry. Disconnect power before cleaning the enclosure to prevent electrical shock.

Storage and Disposal

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

Disposal
This indsutrial 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 one (1) year from the date of purchase. This warranty is extended to the original purchaser from the date of purchase. Returns not purchased directly from Agrowtek Inc. must include proof of purchase date otherwise purchase date is considered as date of manufacture. This warranty does not cover damages from abuse, accidental breakage, or items that have been modified, altered, or installed in a manner other than that which is specified in the installation instructions. 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, excessive humidity or extreme temperature conditions outside of the specified limits. Agrowtek Inc. must be contacted prior to return shipment of any returns for a return authorization. No returns will be accepted without a return authorization. Customer is responsible for return shipment to Agrowtek Inc. for warranty service. Return authorization number(s) must be printed on the outside of the box or the return may be rejected and returned to the sender. Agrowtek Inc. is not responsible for supplying replacement products or parts in advance of return(s) for warranty claim. 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.