

Digital Intelligent Dry-Contact Relay

Specifications

Input Power	12-24Vdc
Max Switching Current	10A per point
Max Switching Voltage	120Vac
Independent Contacts	8x Normally Open
Status Indicators	Red LEDs
Enclosure Knock-Outs	(2) dia. 7/8"
Enclosure Rating	IP40
Minimum Cycle Time	1 second
Interface	GrowNET, MODBUS or WiFi
Relay Ratings	1,000,000 cycles
Relay Cycle Counters	Up to 4 billion cycles per relay



Contents

Introduction	2	Technical Information	10
How "Dry-Contact" Relays Work	2	Troubleshooting	10
What Relays Control	2	Maintenance & Service	10
Installation Instructions	3	Storage and Disposal	10
Installing the RD8i Relay	3	Warranty	10
DC Power Connections	4		
Dry Contact Terminals	5		
Example Connections	6		
Connection to Intelligent Sensor	7		
Connection to USB AgrowLINK	7		
Connection to MODBUS RTU	8		
HX8 8-Port Hubs	8		
Serial Speed & Format	8		
Supported Commands	9		
Register Types	9		
MODBUS Register Map	9		

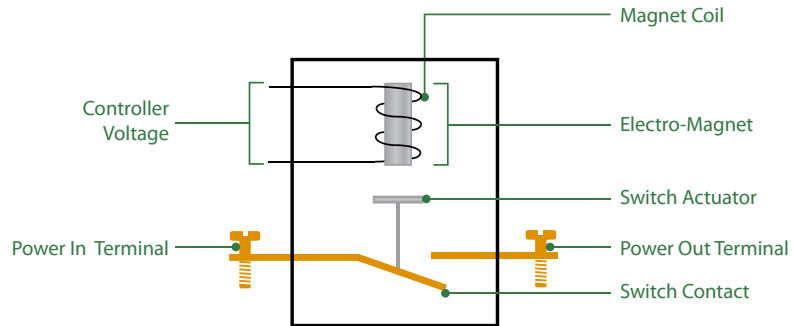
Introduction

GrowControl RD series dry-contact relays interface Agrowtek’s intelligent controllers to devices in your growing environment to control lighting, ventilation, irrigation, HVAC and much more. Dry-contacts allow many different types of equipment to be controlled.

How “Dry-Contact” Relays Work

A relay consists of a mechanical switch and an electro-magnet to turn-on (close) a switch contact. A spring opens the switch when the electromagnet is no longer powered.

The microprocessor controls power to the magnet coil to open or close the switch contact as required by the controller program.



Dry-contact relays can be thought of like a wall-switch:

- Each relay “contact” has a pair of screw terminals just like a wall-switch does.
- A wall-switch (or relay contact) does not supply power, it only allows it through.
- Each switch is independent and can operate different circuits or voltages.



A dry-contact relay is exactly the same as a wall switch, however, instead of operating the switch manually with your finger, an electromagnet operates the switch.



What Relays Control

Many types of devices can be operated with a dry-contact switch. A dry-contact interface allows Agrowtek controls to integrate with building controls, high amperage loads and other custom devices such as:



High-Amp
Relays & Contactors



HVAC Control



Irrigation / Gas
Solenoids



120V Receptacles
& Equipment

Installation Instructions

General Notes:

1. Install with the connections facing down to reduce the risk of water permeating the enclosures.
2. For indoor installation only. Enclosures are not water-proof.
3. Do not place sensor in direct sunlight.

⚠️ Disconnect power from all devices before connecting or disconnecting cables to prevent damage to components.

Installing the RD8i Relay

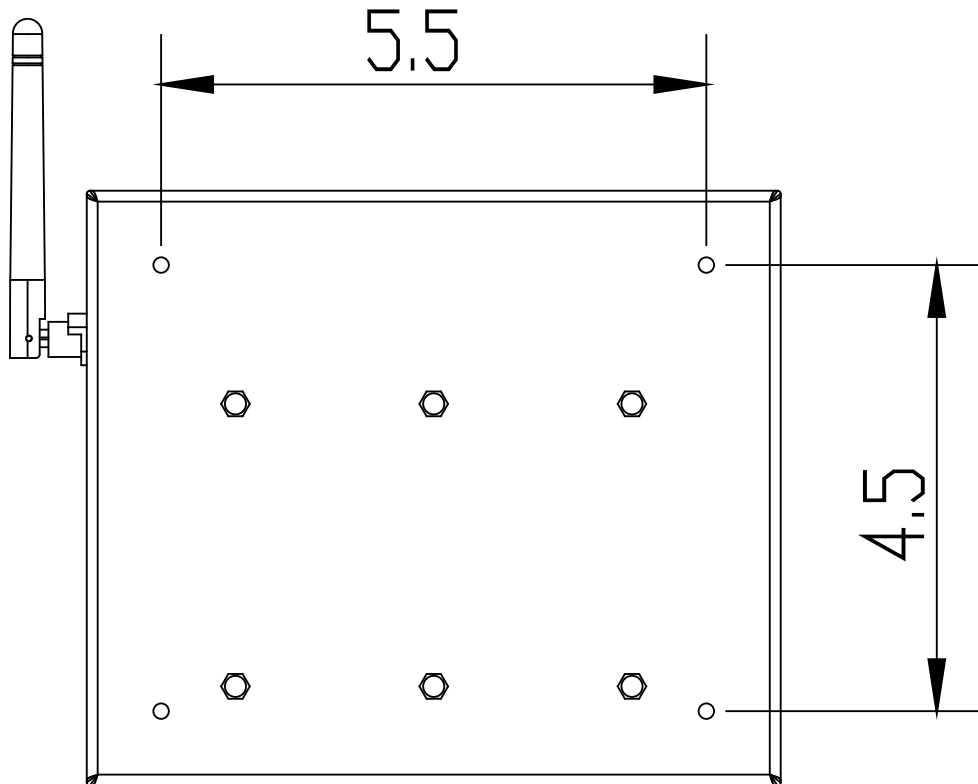
The RD8 intelligent relay is to be securely installed to a vertical wall surface using the four mounting holes provided in the rear of the enclosure.

1. Remove the front cover panel using caution not to damage the LED light pipes.
2. Locate the relay box and mark the mounting hole locations or use the dimensions below.
3. Pre-drill and install anchors if necessary. Keep dust and debris away from the circuit board.

Ensure all dust and contaminants have been blown out of the enclosure.

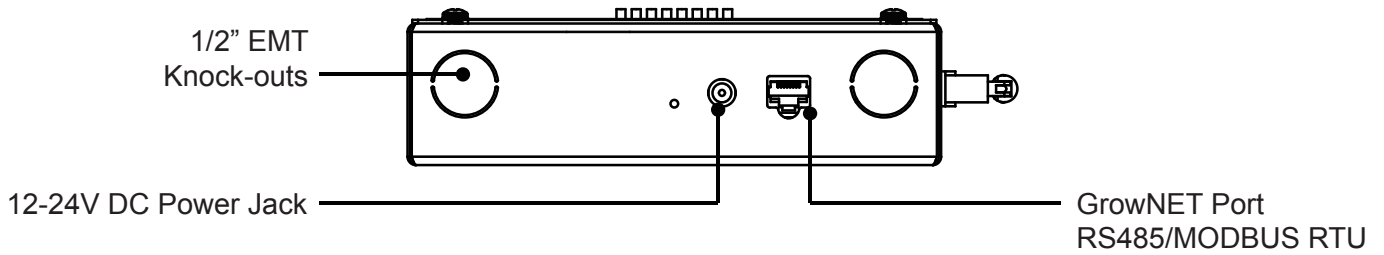
Hardware is not provided. Drywall screws are recommended.

⚠️ Do NOT drill holes into the enclosure or enlarge holes. Metal chips from drills can cause short circuits on the PCB.



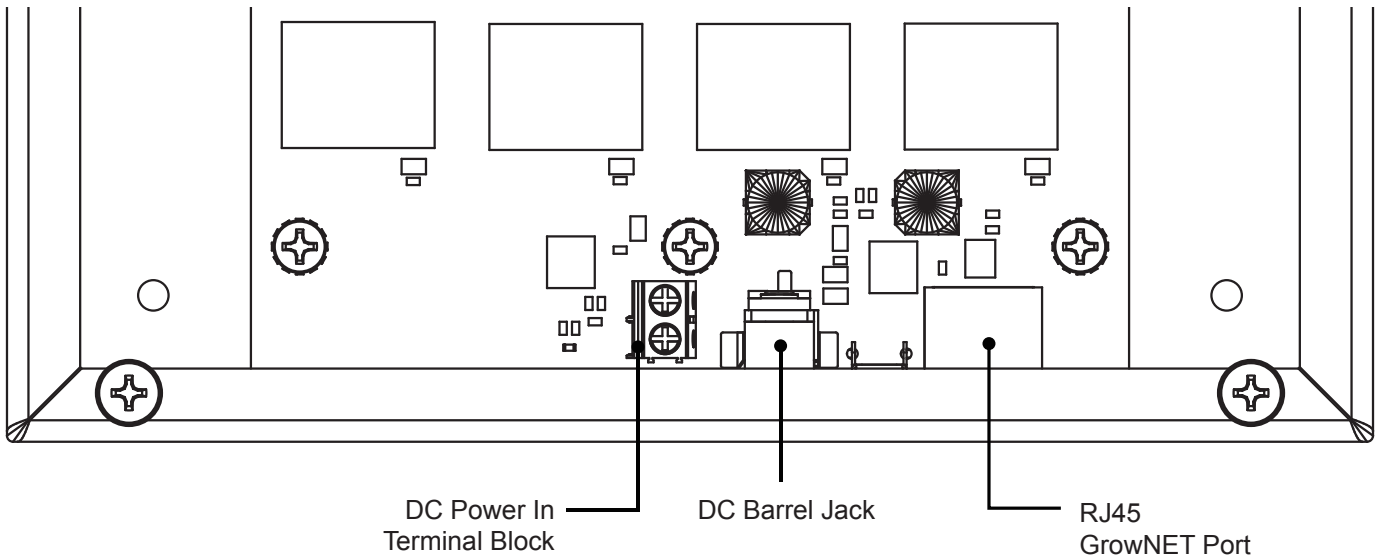
DC Power Connections

An external DC power jack and GrowNET power are located on the bottom of the relay. Standard 7/8" diameter knock-outs are provided on either side for standard 1/2" EMT conduit fittings.



12 - 24Vdc is required to operate the RD8i which may be supplied via:

- a) the 2.1mm DC barrel jack and included power supply,
- b) the GrowNET port from an HX8 hub, or
- c) the Vin terminal block on the circuit board for DIN rail power supplies.



Dry Contact Terminals

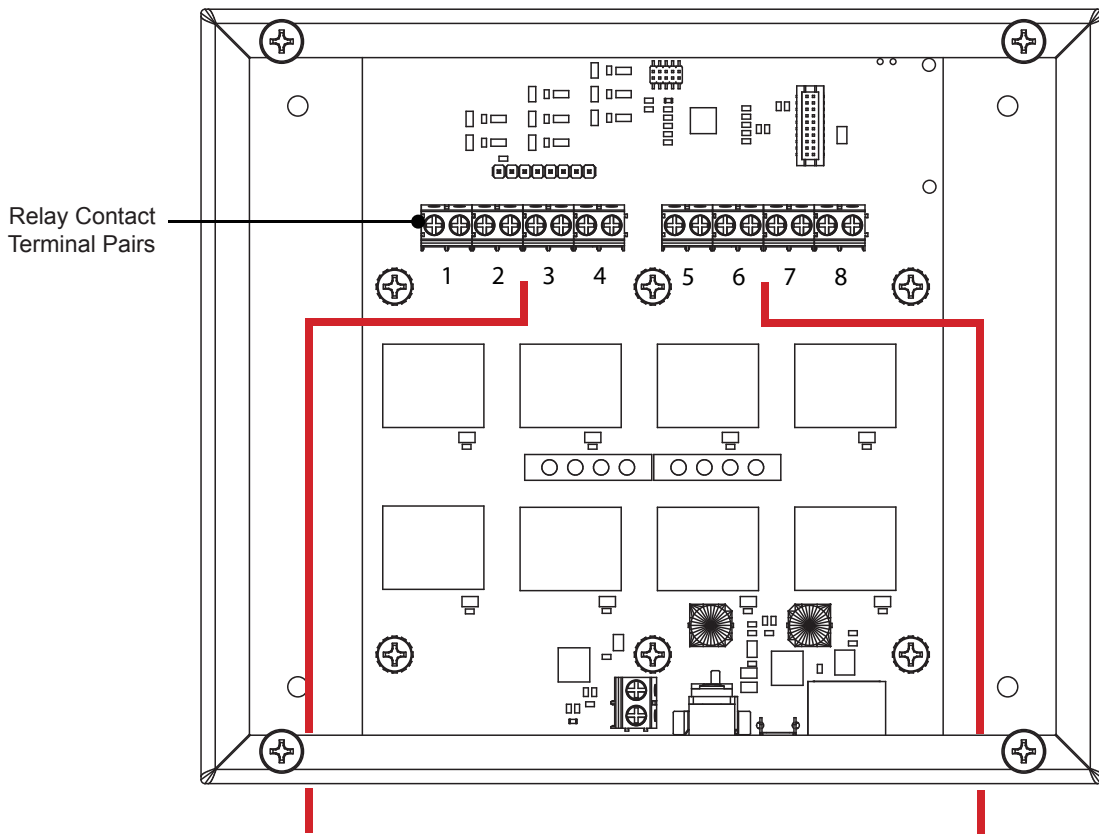
⚠ DANGER! Risk of injury or death from electric shock; disconnect all power before wiring or service.

Each relay has one pair of normally-open contacts which are labeled below each contact. Each relay terminal pair is independent allowing mixed signal control.

Routing Wires

Route wires from the conduit fittings along each side of the relay pcb and above the relays to the terminal blocks as indicated by the red lines in the diagram below.

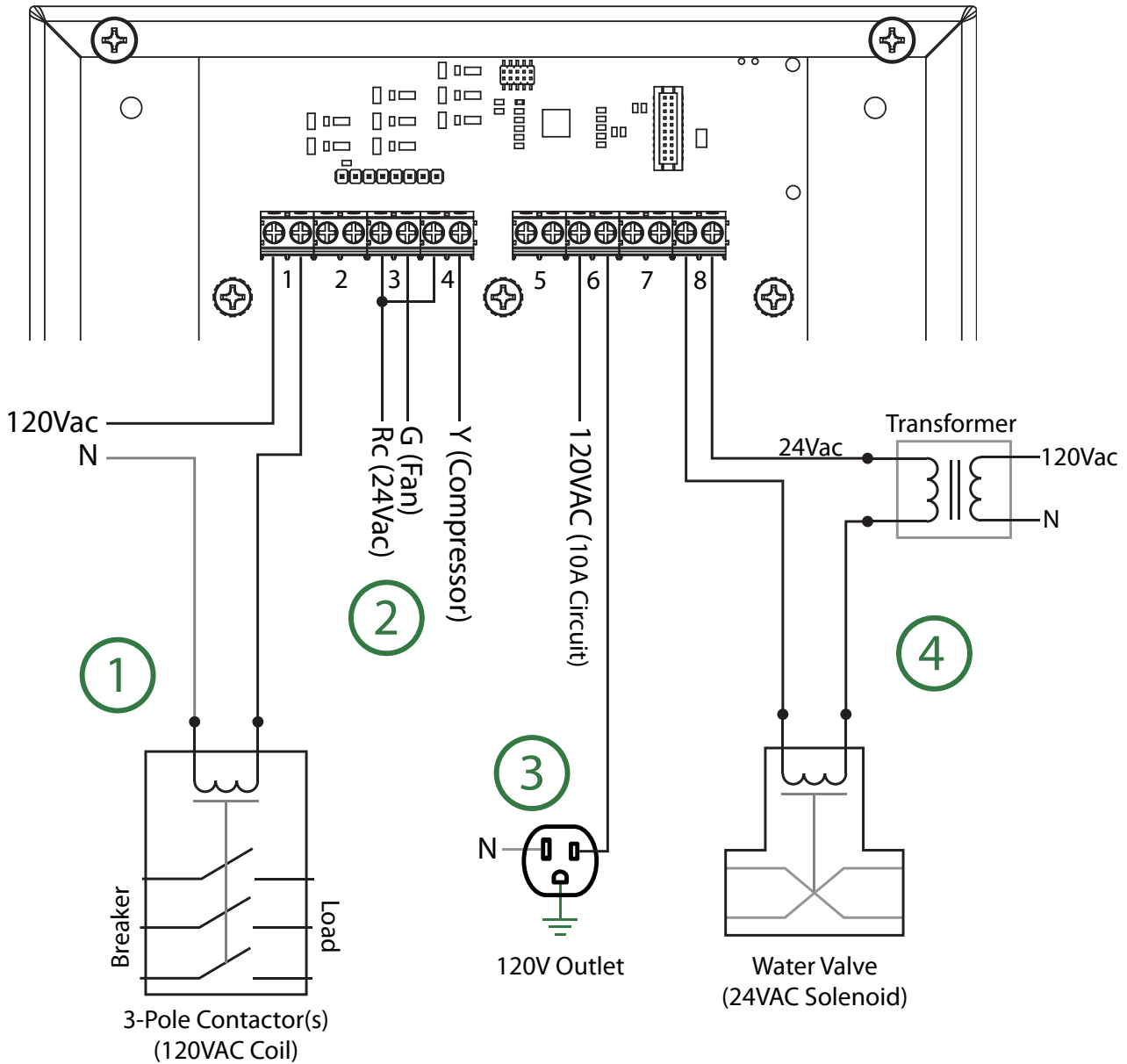
⚠ Do NOT route wires above the green terminal blocks; keep the processor area free of excess wiring.



General wire routing path shown by the bold red lines..

NOTICE: Install and connect equipment in accordance with all national and local electrical codes.

Example Connections



1. High-Amp Contactors

High amp contactors and relays are operated by controlling the power to the magnet coil. When the magnet is energized, high current/voltage is switched on from a breaker panel to load receptacles.

2. HVAC Control Signals

24VAC HVAC control signals may be operated by dry contact. Use jumper wires for relays with a common source connection.

3. 120V Outlets

Contacts can switch up to 10A to directly feed receptacles or other 120V equipment.

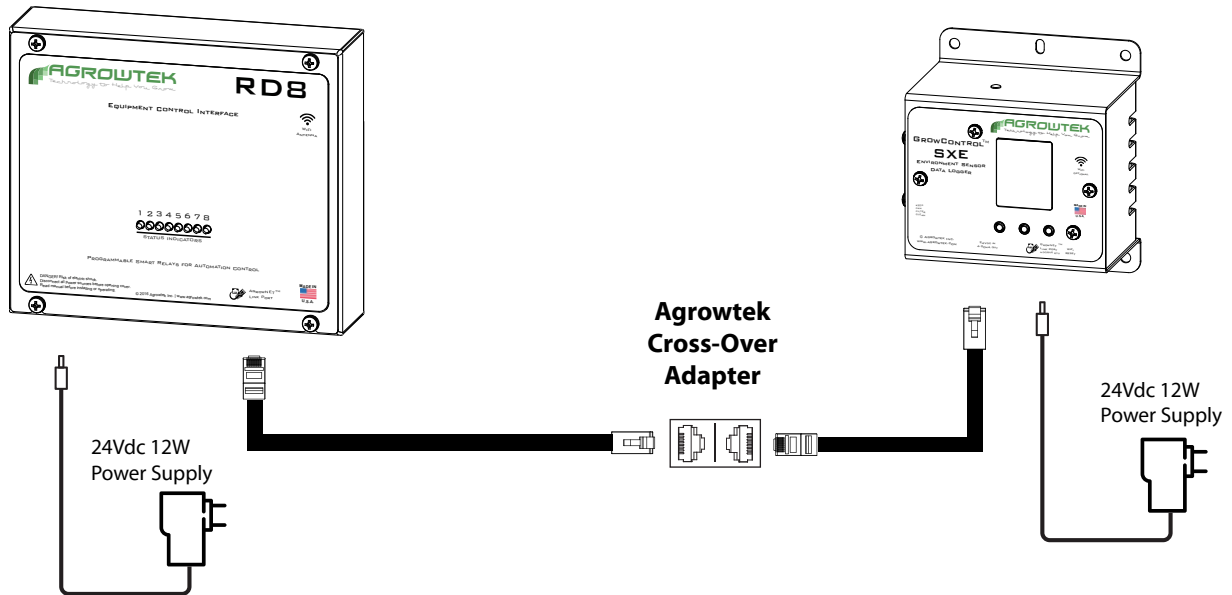
4. Solenoid Valves

24VAC irrigation and gas valves can be controlled by switching power supplied by a step-down transformer. *24VAC is safer and more common than line-voltage for water/irrigation solenoids.*

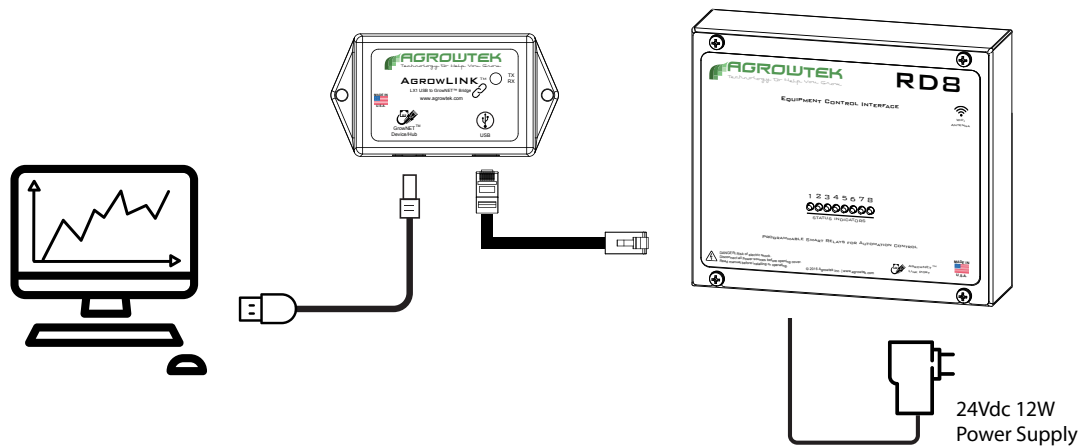
Connection to Intelligent Sensor

A direct-link connection between a SXE sensor and intelligent relay requires Agrowtek’s cross-over adapter.

⚠ IMPORTANT! ONLY use cross-over adapters provided by Agrowtek.
Incorrect cross-over adapters or cables can cause damage to the equipment.



Connection to USB AgrowLINK



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

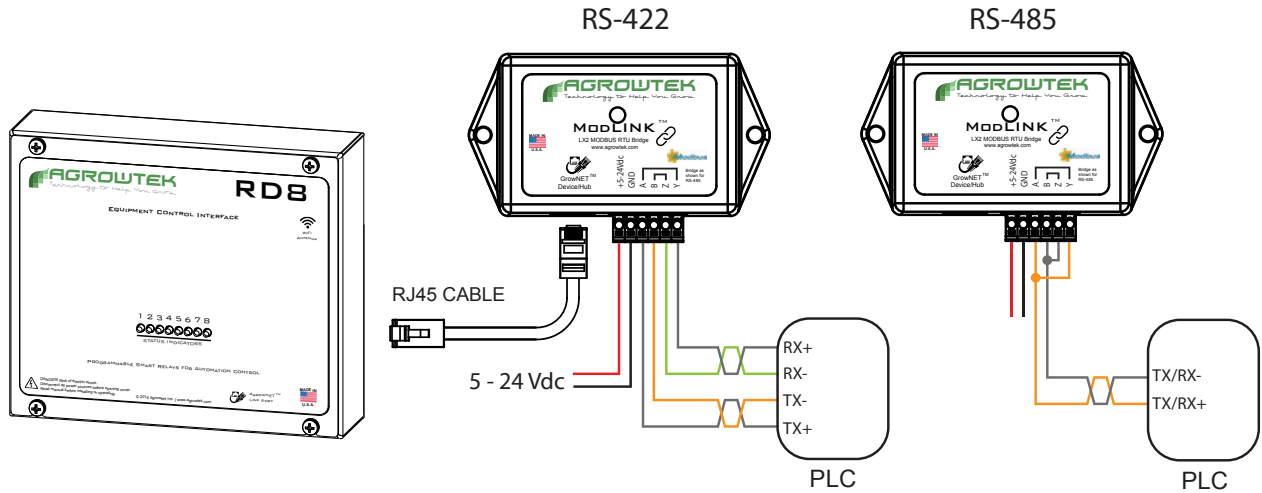
- Firmware Updates
- Manual Operation
- API Based Control
- More

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. GrowNET API is available for custom software applications.

Connection to MODBUS RTU

RS-485 / RS-422

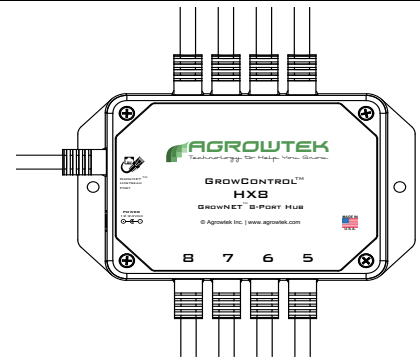
Use the LX2 ModLINK to connect MODBUS devices to the GrowNET™ port.



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.

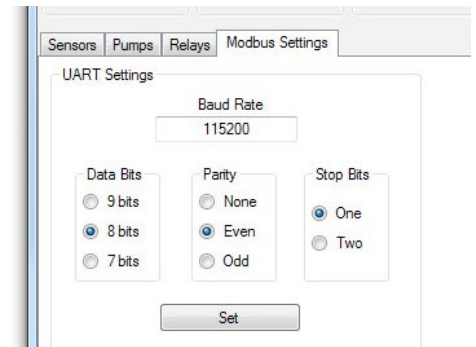
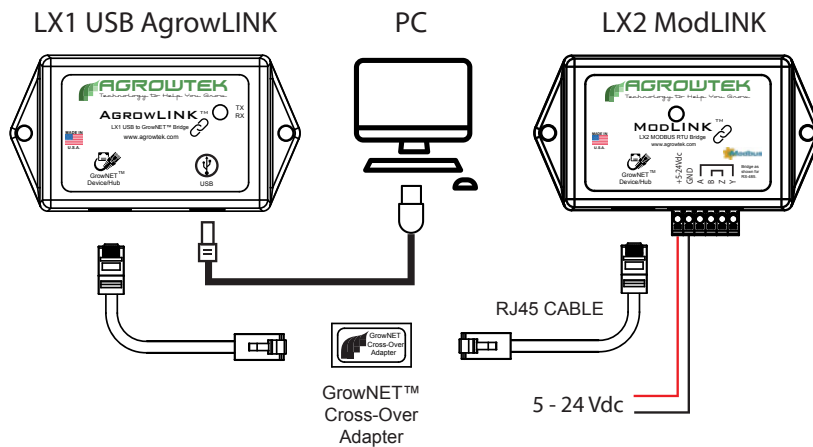
Hubs provide up to 1A of power for operating sensors and some relays directly over the GrowNET cable. A DC jack on the hub provides 24Vdc power to the ports from the included 120V wall power supply.



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.

 [MODBUS Manual](#)

Supported Commands

0x01 Read Coils
0x03 Read Multiple Registers
0x05 Write Single Coil
0x06 Write Single Register
0x15 Write Multiple Coils

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.

Coil registers are single bit values which control and indicate the status of a relay; 1 being on and 0 being off.

MODBUS Register Map

Parameter	Function	Type	Scale	Access	Address
Device Address	Slave Address	Value, 1-247	8 bit	R/W	40001
Serial#	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
Relay 1 Count	Operation Cycle Count	Value	32 bit	R	49000
Relay 2 Count	Operation Cycle Count	Value	32 bit	R	49002
Relay 3 Count	Operation Cycle Count	Value	32 bit	R	49004
Relay 4 Count	Operation Cycle Count	Value	32 bit	R	49006
Relay 5 Count	Operation Cycle Count	Value	32 bit	R	49008
Relay 6 Count	Operation Cycle Count	Value	32 bit	R	49010
Relay 7 Count	Operation Cycle Count	Value	32 bit	R	49012
Relay 8 Count	Operation Cycle Count	Value	32 bit	R	49014
Relay Coil 1	Relay Coil	Coil	1 bit	R/W	00001
Relay Coil 2	Relay Coil	Coil	1 bit	R/W	00002
Relay Coil 3	Relay Coil	Coil	1 bit	R/W	00003
Relay Coil 4	Relay Coil	Coil	1 bit	R/W	00004
Relay Coil5	Relay Coil	Coil	1 bit	R/W	00005
Relay Coil 6	Relay Coil	Coil	1 bit	R/W	00006
Relay Coil 7	Relay Coil	Coil	1 bit	R/W	00007
Relay Coil 8	Relay Coil	Coil	1 bit	R/W	00008

Technical Information

Troubleshooting

Relays are not activating, no power LED on PCB

Ensure the relay input power has 12-24Vdc and are correctly wired for polarity. A dimly lit red LED should illuminate when the circuit board has power.

Maintenance & Service

Exterior Cleaning

Exterior may be wiped with a damp cloth with 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 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.