SERIES 05-50

Connectivity Module - ConnectedControls
Interfacing with Ignition Controls

F-05-50
January 2023

FEATURES

- Works with Fenwal ConnectedControls mobile and desktop applications
- Can be configured for a company cloud network
- Uses 2.4 GHz Wi-Fi and Bluetooth® communications
- Includes UART communication interface with gas ignition control
- Reports all states of control to the cloud
- Provides remote reset of gas ignition control
- Includes three proving switch inputs for appliance features
- Includes 4 status LEDs
- Available Internal or External Antenna option
- Accepts AC or DC low voltage power

APPLICATIONS

- Radiant Heaters
- Unit Heaters
- Various Other Applications

DESCRIPTION

The 05-50 connectivity module is designed to connect to a compatible Fenwal gas ignition control, giving the appliance IoT capability. The module communicates all state changes in the gas ignition control to the cloud, which is made available to end users via a mobile or desktop application. Alert conditions, such as a lockout, are immediately pushed to the end user applications. Data sent to the cloud can be used to trend performance, and detect and troubleshoot issues.

The connectivity module has three additional proving switch connections to allow monitoring additional inputs such as inducer fans, gas pressure switches, and high limit sensors.

The Fenwal ConnectedControls software allows customers to manage their accounts, specific sites, individual users, and service providers. The software provides status of controls, operational logs, and service notes. In addition, the software provides troubleshooting tips and technical support links.

Agency Certifications

c UL us	UL 60730-1 CAN/CSA E60730-1
RoHS	RoHS Compliant

External Antena:	FCC ID: 2AC7Z-ESPWROOM32UE	IC ID: 21098-ESPWROOMUE
Internal Antena:	FCC ID: 2AC7Z-ESPWROOM32E	IC ID: 21098-ESPWROOM32E

Note: OEM is responsible for considerations of remote reset capability for end-use application.

SPECIFICATIONS

Input Power	18-30VAC, 9VA, 50/60Hz 20-28VDC, 9VA 10-14VDC, 9VA
Operating Temperature	-40°F to + 176°F (-40°C to +80°C)
Storage Temperature	-40°F to + 185°F (-40°C to +85°C)
UART Communication	5V TTL 3.3V RS485 (Option)
Thermostat & Proving Switch 1	12/24VDC, 24/120VAC
Proving Switch 2 & 3	12 VDC, 24VAC/DC
Enclosure	Noryl® Gray Cover
Size (LxWxH) with Enclosure	4.9 x 3.5 x 1.3 inches (12.5 x 8.9 x 3.4 cm)
Moisture Resistance	95% RH non-condensing

RECOMMENDED ACCESSORIES

SMA Cable Requirements:

- Connector: SMA Male 50 ohm to SMA Female 50 ohm

Antenna Requirements:

- 50 ohm input impedance, 2.4 GHz - 2.5 GHz, Gain 2.0 dBi
- Example: PulseLarsen Antenna W1010
- Antenna must be installed to provide a separation distance of not less than 20cm from all persons and must not be collocated or operating in conjunction with any other antenna or transmitter.

Note: Internal and External antenna options provide varying Wi-Fi signal strength and range. External antenna orientation can also impact the signal strength. Manufactures should consider that here are trade-offs between the two options and choose what best fits their needs.

PROVISIONING

Installation and Configuration with Mobile App

During initial power-up, LED2 (Green) flashes to notify user it is in provisioning mode. The mobile application walks user through the process of provisioning the appliance. The mobile application connects to the connectivity module via Bluetooth. Once securely connected, LED1 (Red) flashes while searching for available Wi-Fi networks. The user then selects the network they want to use and enter its password. The connection is then verified through the cloud and back to the mobile phone via the Internet. LED2 (Green) changes to a solid on after successfully connecting to the Internet and authenticating.

OPERATION

Power Up

On powerup, the connectivity module runs diagnostics. After a successful power up, LED2 (Green) stays solid to indicate secure connection to the internet. LED4 (Green) stays solid to indicate successful communication with gas ignition control.

If there is any data in memory of the connectivity module that has not been previously uploaded to the cloud, that data is uploaded at this time.

Normal Operation

The connectivity module constantly monitors the gas ignition control activity and the three proving switches. All data is stored in the module's memory during normal operation. At the completion of a burn cycle, the data is sent to the cloud and then available in the Fenwal ConnectedControls application.

Alert Conditions

In the event of a gas ignition control alert, such as a lockout, the connectivity module will immediately send all data in memory including the alert condition to the cloud. The Fenwal ConnectedControls application can be configured to notify end-users of the alert condition.

Refresh Command

Using the Fenwal ConnectedControls mobile application, a refresh command can be sent to the connectivity module. Upon receiving this command all available data in memory of the connectivity module, including the current state, is sent to the cloud.

Reset Command

Using the Fenwal ConnectedControls application, a reset command can be sent to the connectivity module during certain alert conditions. Upon receiving this command, the TH relay is momentarily opened and then re-closed to cycle the TH signal to the gas ignition control. The software contains limits controlling when and how often this reset can be done.

Loss of Power

On a loss of power, any data that has not been sent to the cloud is written to non-volatile memory for transmission on the next power up cycle.

MOUNTING AND WIRING

The 05-50 with internal antenna option is position sensitive. The internal antenna is placed on the right side of the module (as noted on the label) and must be kept a minimum of 15mm (.6") away from any metal surface, including below the module. As such, the connectivity module should not be mounted to a metal surface without the appropriate spacing.

The 05-50 with external antenna option is not position sensitive and can be mounted vertically or horizontally. The module may be mounted on any surface and fastened with #6 sheet metal screws. Consideration should be taken for mounting the external antenna to reduce signal blockage by metal surfaces. The Wi-Fi signal radiates perpendicular to the antenna.

Secure the module in an area that will experience minimum vibration and remain below the maximum ambient operational temperature of 176°F (80°C).

All connections should be made with UL approved, 105°C rated, 18 gauge stranded wire with .054" minimum insulation thickness. Refer to the appropriate wiring diagram when connecting the 05-50 to other components in the system.

CAUTION	Label all wires prior to disconnection when servicing or replacing controls. Wiring errors can cause improper and dangerous operation. A functional checkout of a replacement control should always be performed.
CAUTION	The control must be mounted and located in a manner which protects components from exposure to water (dripping, condensate, spraying, rain). Any control that has been exposed to water must be replaced.
WARNING	All wiring must be done in accordance with both local and national electrical code, and by a trained service technician. Wiring must be at least #18 AWG /AWM rated for 105°C or higher.
WARNING	The 05-50 uses voltages of shock hazard potential. Wiring and initial operation must be done by qualified service technician.
WARNING	Operation outside specifications could result in failure of the Fenwal Controls product and other equipment with injury to people and property.
WARNING	Do not disconnect any electrical loads while the automatic gas ignition control is powered. Disconnect power prior to installation or replacement of the control with the end use appliance.

TERMINAL DESIGNATIONS

Name	Description	Terminal Type
PWR/R	PWR IN	1/4" Male Q.C.
GND	PWR GND	1/4" Male Q.C.
TH/W_IN	TH In	3/16" Male Q.C.
TH/W_OUT	TH Out	3/16" Male Q.C.
TH/W_RT	TH RTN	3/16" Male Q.C.
PS1_IN	Proving Switch 1	3/16" Male Q.C.
PS1_RTN	Proving Switch 1 RTN	3/16" Male Q.C.
PS2_IN	Proving Switch 2	1/4" Male Q.C.
PS3_IN	Proving Switch 3	1/4" Male Q.C.
GND	GND	1/4" Male Q.C.
COMM 1	Comm. Rx-Receive	.100 pin (1)
COMM 2	Comm. TX-Transmit	.100 pin (2)
COMM 3	Comm. GND	.100 pin (3)
Antenna	External antenna option	SMA Female

Notes:

- If the Thermostat (TH/W_IN) is 24VAC/DC, (TH/W_RT) should be GND. If Thermostat (TH/W_IN) is 120VAC, (TH/W_RT) should be L2.
- If Proving Switch 1(PS1_IN) is 24VAC/DC, (PS1_RTN) should be GND. If Proving Switch 1(PS1_IN) is 120VAC, (PS1_RTN) should be L2.
- TACO, THER, TOG, and 0-10V are NOT used at this time.

WIRING DIAGRAMS

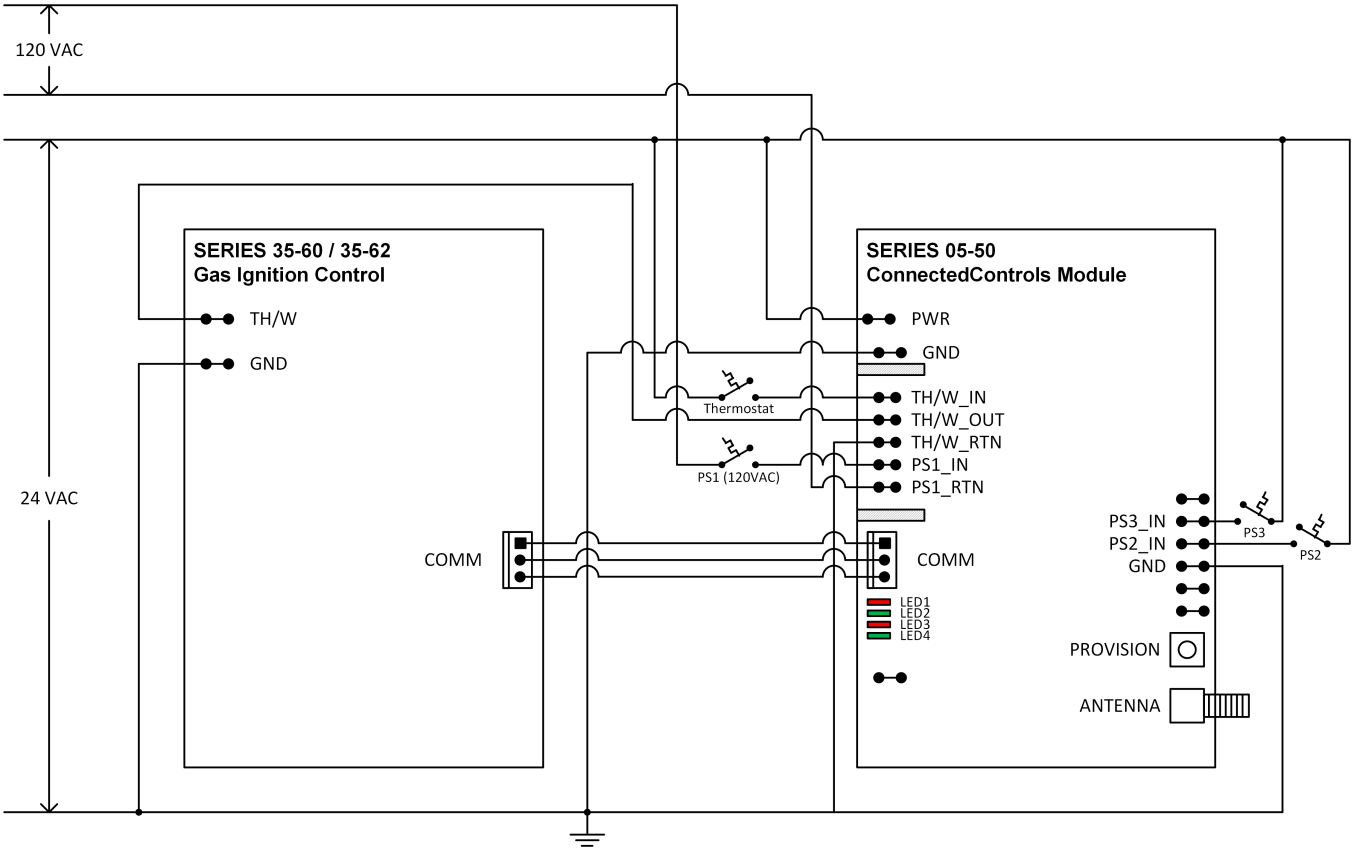

Figure 1. Wired to 24VAC Gas Control with 120VAC Proving Switch 1

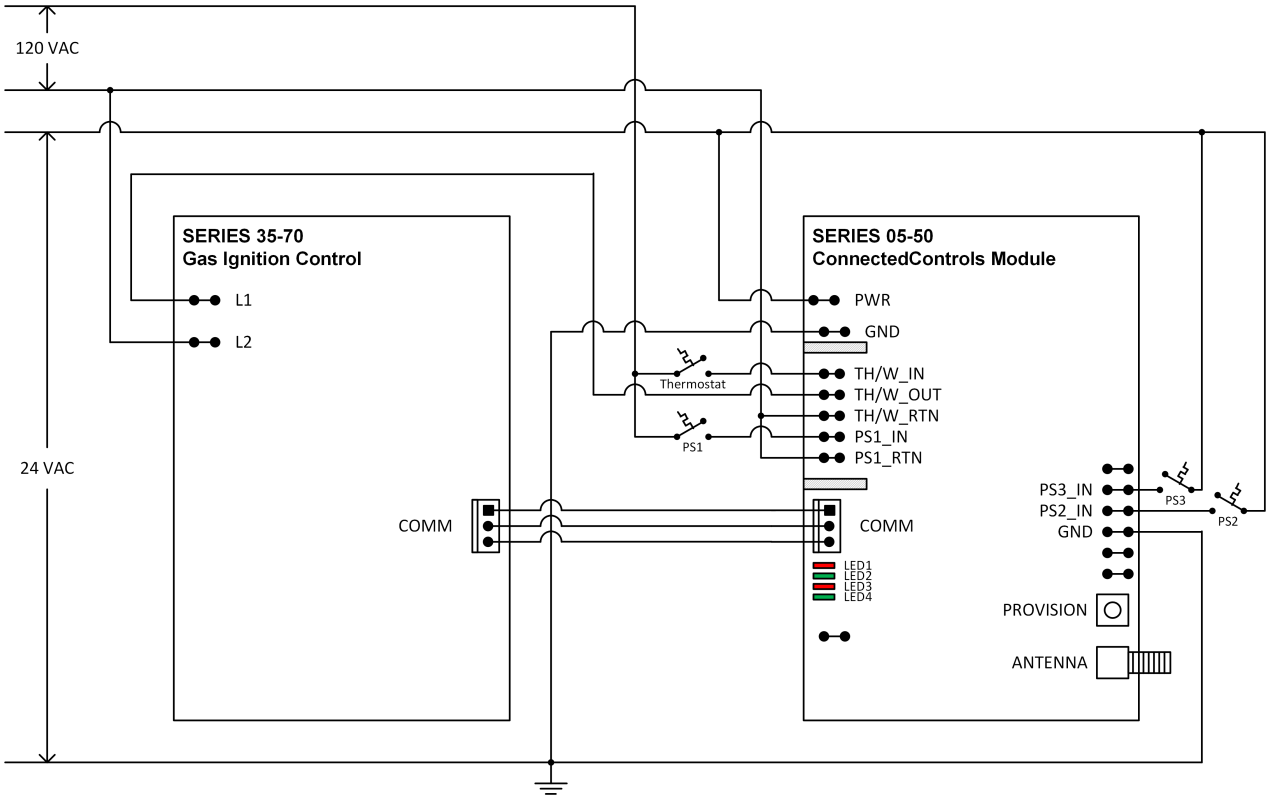

Figure 2. Wired to 120VAC Gas Control

LED DESIGNATIONS

LED	Condition/Mode
LED 1 Flashing Red	Connecting to Local Router
LED 1 Solid Red	Provisioned, No Internet
LED 2 Flashing Green	Provisioning Mode
LED 2 Solid Green	Connected to Internet
LED 3 Flashing Red	Communication Fault with Control
LED 4 Solid Green	Communicating with Control
No LEDs	No Power / Hardware Fault

TROUBLESHOOTING

WARNING	**Risk of Explosion or Fire** The 05-50 cannot be service by the user, this can lead to risk of fire and voids warranty. If controls faults are detected the 05-50 must only be replaced by a qualified service personnel. Do not use aluminum wire, this can also lead to risk of fire.

WARNING	This product can expose you to chemicals including Lead and Nickel which are know to the State of California to cause Cancer and Birth defects or other Reproductive Harm. For more information, go to www.P65Warnings.ca.gov

Troubleshooting Guide	
Symptom	**Recommended Actions**
1.Dead (No LED's after power up.)	A. Miswired B. Fuse/circuit breaker fault C. No voltage at PWR D. Faulty control
2. No Internet (LED1 Solid Red)	A. Restart Router B. Restart Modem C. Reposition Antenna

Disposal

Do not discard the connectivity module in the trash, recycle per local guidance.

Wi-Fi Network Change

If the connectivity module must be connected to a new network or the network password changes, the module will need be re-provisioned again. This can be accomplished by pressing the Reset button on the connectibity module. Alternatively, on power up, if the module cannot connect to the router there is a brief period where the provisioning mode is open.

Internal Control Failure

If the connectivity module detects a software or hardware error, all outputs are turned off. If this condition persists after an attempt to restart, then the control must be replaced.

DIMENSIONS

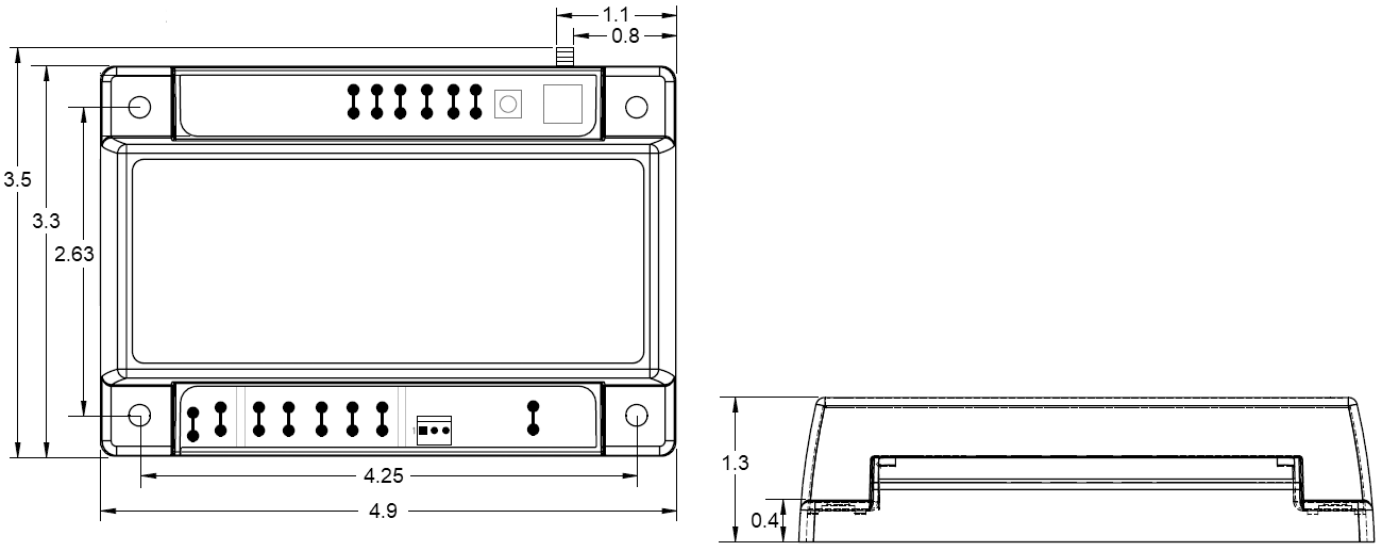

Figure 3. Control with Cover

STANDARD PART NUMBER CONFIGURATION

05 – 50 X X X 0 – X X X Description

CUSTOMER SPECIFIC CONFIGURATION
001 = Standard Product
9XX = Customer Specific

COMMUNICATIONS
0 = TTL
1 = RS485

ENCLOSURE | ANTENNA
0 = NORYL Gray Cover | Internal Antenna
1 = NORYL Gray Cover | External Antenna

FEATURES
1 = Basic (Comm with 3 Proving Switches)

EXPORT INFORMATION (USA)
Jurisdiction: EAR
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This document contains technical data subject to the EAR.

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