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CE *

*The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

GWNP Series

BACnet and Modbus Protocol Communication
Wall Mounted Platform for Gas Sensors

Product Overview

The GWNP Series wall mounted gas platform converts gas sensor readings into a signal that is compatible with building control sensors. To operate, the GWNP must be used with a Veris AG Series gas sensor (sold separately). The GWNP board has a connector for mounting a single AG sensor, and this sensor can be replaced at any time without removing the GWNP from its installed location. Simply remove the GWNP cover, replace the AG sensor inside, and reinstall the cover (see the installation guide for the AG sensor for more information). To maintain accuracy, keep all vents free of dust and debris. The GWNP is warranted for a period of five years.

Product Identification

GWN   ***Output***   [ ]   [X] [X]   Example: **GWNPXX**

P = Protocol: BACnet and Modbus

Specifications

Input Power	15 … 30 Vdc/24 Vac ±20%, Class 2; 50/60Hz
Relay Contact Ratings	1 A/30 Vdc, Normally Open
Operating Temperature Range	-20 … 50 °C (-4 … 122 °F)
Operating Humidity Range	0 … 90% RH non-condensing
Terminal Block Wire Size	30 … 12 AWG (0.05 … 3.31 mm²)
Terminal Block Torque	0.37 … 0.44 ft-lb (0.5 … 0.6 N-m)
Protection Class	IP20

Note: The GWNP operates only when an AG Series gas sensor is installed (sold separately). Accuracy, sensitivity, setpoints, and measurement range are dependant on the AG Series sensor connected to the GWNP platform. See the AGxx sensor installation guide for details.

Dimensions

0.6" (15 mm)
4.5" (113 mm)
2.75" (70 mm)
1.2" (30 mm)
1.1" (27 mm)
3.25" (83 mm)
1.7" (42 mm)

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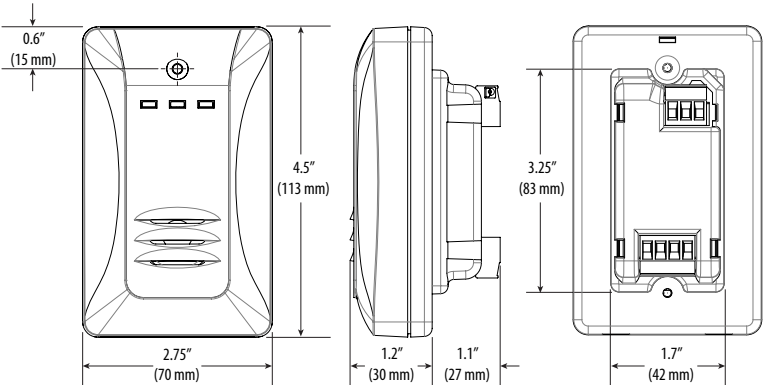
Regulatory Information

NOTICE

- The product is a Class 2 (low voltage - limited energy) device.
- The product is not intended for life or safety applications.
- Do not install the product in hazardous or classified locations.
- Read and understand the instructions before installing the product. Follow the instructions during installation.
- Turn off all power supplying equipment before working on it.
- Do NOT depend on the product for voltage indication.
- Products rated only for basic insulation must be installed on insulated conductors.
- The installer is responsible for conformance to all applicable codes and regulations.

If this product is used in a manner not specified by the manufacturer, the protection provided by the product may be impaired.

No responsibility is assumed by the manufacturer for any consequences arising out of the use of this material.

Control system design must consider the potential failure modes of control paths and, for certain critical control functions, provide a means to acheive a safe state during and after a path failure. Examples of critical control functions are emergency stop and over-travel stop.

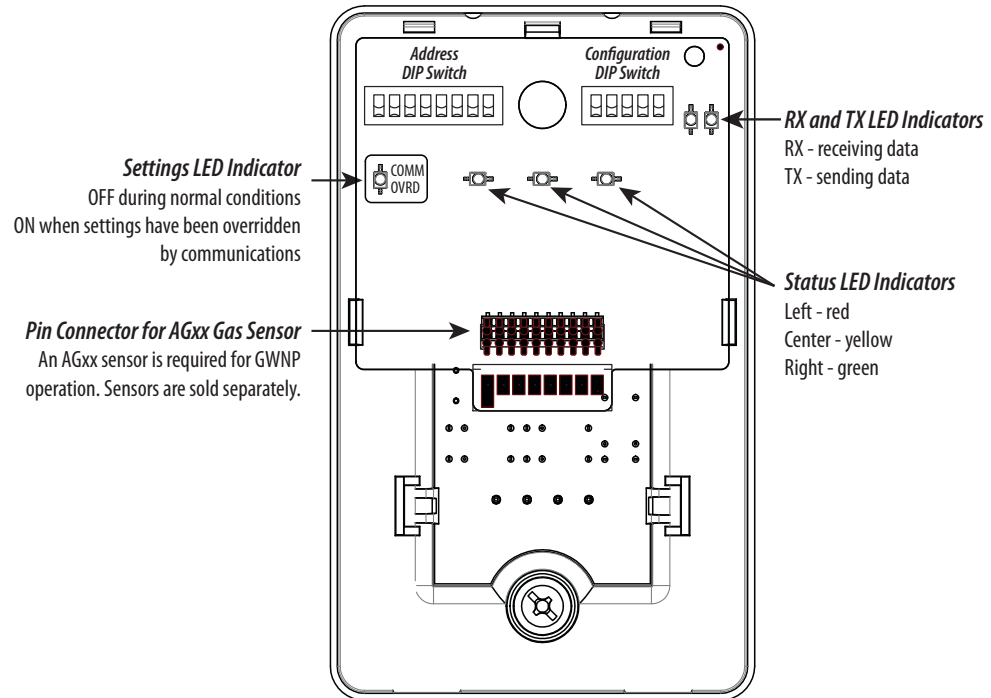### ⚠ WARNING

LOSS OF CONTROL

- Assure that the system will reach a safe state during and after a control path failure.
- Separate or redundant control paths must be provided for critical control functions.
- Test the effect of transmission delays or failures of communication links.[1]
- Each implementation of equipment using communication links must be individually and thoroughly tested for proper operation before placing it in service.

Failure to follow these instructions may cause injury, death or equipment damage.

[1]For additional information about anticipated transmission delays or failures of the link, refer to NEMA ICS 1.1 (latest edition). *Safety Guidelines for the Application, Installation, and Maintenance of Solid-State Controls* or its equivalent in your specific country, language, and/or location.

For use in a Pollution Degree 2 or better environment only. A Pollution Degree 2 environment must control conductive pollution and the possibility of condensation or high humidity. Consider the enclosure, the correct use of ventilation, thermal properties of the equipment, and the relationship with the environment.

Product Diagram

Address DIP Switch

Configuration DIP Switch

Settings LED Indicator
OFF during normal conditions
ON when settings have been overridden
by communications

Pin Connector for AGxx Gas Sensor
An AGxx sensor is required for GWNP
operation. Sensors are sold separately.

COMM OVRD

RX and TX LED Indicators
RX - receiving data
TX - sending data

Status LED Indicators
Left - red
Center - yellow
Right - green

The LED indicators allow determination of device status at a glance. The GWNP includes a light blocking insert that can be set in place of the light pipes if this visibility is not desired.

Status LED Blink Codes

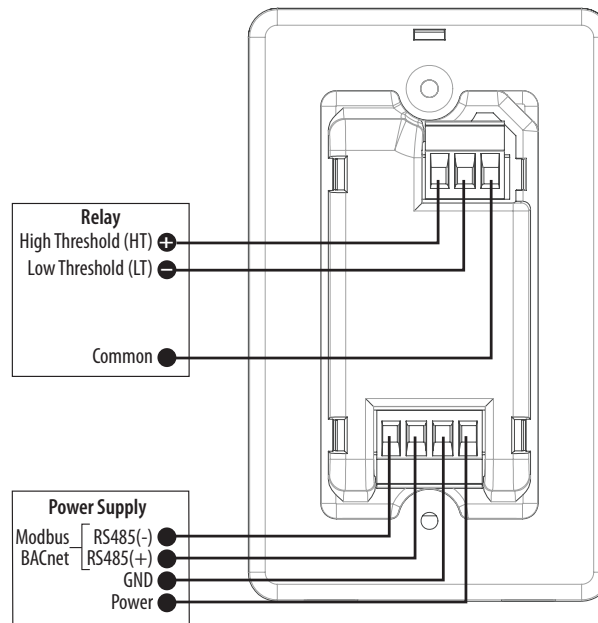| LED	Description
Red	• OFF during normal conditions. • ON solid when the high setpoint is reached. • Flashes once when the device is initially powered. • Flashes while the platform is auto-resetting, such as when a sensor is installed. • Flashes continuously when the sensor reading is over range.
Yellow	• OFF during normal conditions. • ON solid when the low setpoint is reached. • Flashes once when the device is initially powered. • Flashes while the platform is auto-resetting, such as when a sensor is installed. • 1 flash every 10 seconds if possible sensor damage is detected. • 2 flashes every 10 seconds if the sensor requires replacement. • 4 or more flashes every 10 seconds if internal problems are detected, such as if the unit needs servicing or if the operating temperature is out of range.
Green	• ON solid during normal operation. • Flashes once when the device is initially powered. • Flashes while the platform is auto-resetting, such as when a sensor is installed.

Relay Contacts

Unit Condition	Low Setpoint Relay	High Setpoint Relay
OFF	Closed	Open
ON (everything OK)	Open	Open
ON (inoperative)	Closed	Closed
ON (low setpoint reached)	Closed	Open
ON (high setpoint reached)	Closed	Closed

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Installation

Observe precautions for handling static sensitive devices to avoid damage to the circuitry that is not covered under the factory warranty.

1. Disconnect and lock out all power supplies before beginning the installation.

2. Choose a location on a wall in the area to be monitored. Install the unit on a standard electrical box centrally, near main traffic paths but away from outside air vents and excessive drafts.

3. Remove the front cover of the GWNP unit, and set it aside.

4. Wiring terminals are located on the back of the unit. Determine whether these terminals fit into the electrical box chosen for the installation. In the case of some electrical boxes, such as weatherproof style boxes, the GWNP may not make a snug fit against the box. If this happens, use the Veris AA66 Foam Gasket Kit accessory to improve the fit (sold separately).

5. Run wires through the back of the electrical box and wire the GWNP as shown. Properly shielded wire must be used for all connections. For the RS-485, use shielded, twisted-pair wire. Connect the shield at one end only. The GND terminal can be used.

Relay
High Threshold (HT) ⊕
Low Threshold (LT) ⊖

Common ●

Power Supply
Modbus ⌐ RS485(-) ●
BACnet ⌐ RS485(+) ●
GND ●
Power ●

6. Mount the GWNP on the box. Use the two mounting holes on the unit and the included #6 screws. The wiring terminals must face into the electrical box, with the board facing outward.

7. Install the AGxx Series gas sensor according to the directions included with the sensor.

8. Adjust the DIP switches as needed.

9. If desired, replace the LED light pipes with the black plastic light blocking insert (included with the GWNP). The light pipes are located inside of the front cover.

10. Replace the front cover. Reconnect power.

Configuration

The GWNP includes two sets of DIP switches, as shown in the Product Diagram section. The DIP switch labeled "ADDRESS" is for addressing. The DIP switch labeled "CONFIG" is for communications configuration.

Address Configuration

Each device on a single network must have a unique address. Set the DIP switch labeled "ADDRESS" to assign a unique address before the device is connected to the network. If an address is selected that conflicts with another device, neither device will be able to communicate.

Address the GWNP as any whole number between and including 1 to 127. Note that zero is not a valid address for Modbus; zero is a valid address for BACnet. Positions 1 through 7 of the "ADDRESS" DIP switch designate the address. Position 8 toggles between the Modbus and BACnet communication protocols, as shown in the diagram below.
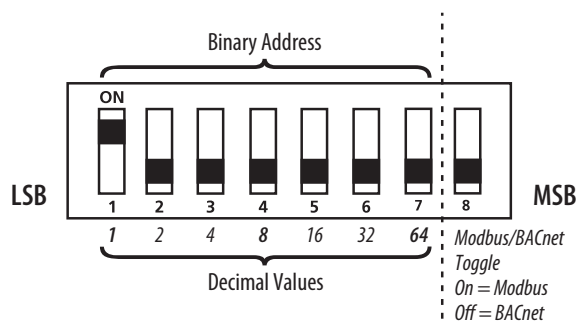
To set an address using the DIP switch, simply add the values of any switches that are in the ON position.

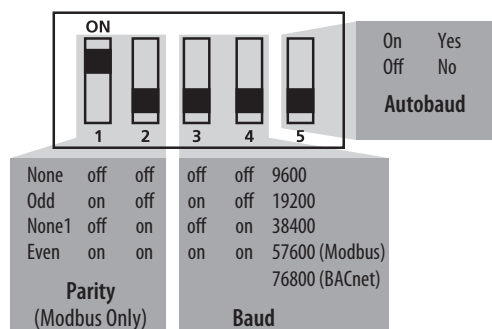For example, an address of 73 is set as shown in the diagram below.

Position number 1 has an ON value of 1, position number 4 has an ON value of 8 and position number 7 has an ON value of 64 (1 + 8 + 64 = 73).

Communications Configuration

See the Product Diagram section for the location of the DIP switch labeled "CONFIG". The following parameters are configurable:

- Parity (Modbus only): None, Odd, None1 (one stop bit), Even
- Baud rate: 8600, 19200, 38400, 57600 (Modbus), 76800 (BACnet)
- Autobaud: On, Off

Note: Autobaud may not be able to automatically determine the baud rate in some situations. In this case, set Autobaud to OFF and use the manual baud setting.

On	Yes
Off	No
Autobaud	

			Parity (Modbus Only)			Baud	
None	off	off		off	off	9600	
Odd	on	off		on	off	19200	
None1	off	on		off	on	38400	
Even	on	on		on	on	57600 (Modbus)	
						76800 (BACnet)	

Configuration (cont.)

Example: No Parity, 19200 Baud, Autobaud Off

1	2	3	4	5
off	off	on	off	off
None		19200 Baud		Autobaud Off

Modbus Point Map

Function Codes

Function Code	Function
03	Read holding registers
06	Write single register
08	Diagnostics (Sub-function 00 — Return query data)
16	Write multiple registers
17	Report slave ID — Returns manufacturer, model name, and serial number (standard Veris format)

All of these values correspond to BACnet objects with the same name. See the BACnet Conformance Statement for their definitions.

Note that an attempt to write to "read only" holding registers will give an error and the entire write command will not be executed even if writing to read/write locations were also requested. Exception code 2 is given in this case. "Preserved" means the values is maintained through power outages.

Holding Registers

Register	Description
1	Sensor measurement (read only)
2	Sensor scale factor (n in 10^n, value would be -2 for percent, -6 for ppm) (read only)
3,4	Sensor measurement in IEEE 32-bit floating point. Most significant word first. (read only)
5	Alarm bit map (read only) Bit 0 (lsb) — High set-point exceeded Bit 1 — Low set-point exceeded Bits 2-15 — Zero
6	Alarm bit map override Bit 0 — High set-point override Bit 1 — Low set-point override Bit 2 — High set-point level (1 — Above, 0 — Below) Bit 3 — Low set-point level Bits 4-15 — Zero
7	Time to sensor replacement (days remaining) (read only)
8	Run time (days) (read only)
9	Status (read only) Bit 0 — Over range Bit 1 — Warmup Bit 2 — Damage detected Bits 3-15 — Zero
10-17	Sensor gas type (read only). For example, CO. All strings packed two characters, big endian, per word. Short strings null terminated.
18-25	Sensor serial number (read only) (always eight hexadecimal digits)
26-41	Manufacturer (read only) "Veris Industries"
42-57	Model (read only) "GWNPxx"

Modbus Point Map (cont.)

Register	Description
58-73	Location (read/write) preserved. Must be null terminated, 31 characters max.
74	High set-point (read/write preserved). Scaled by value in register 2. Valid values to set are 2 to top of range. A value of zero resets to sensor default.
75	High hysteresis (read/write preserved). Scaled by value in register 2. Valid values to set are 1 to high set-point - 1. A value of zero resets to sensor default.
76	Low set-point (read/write preserved). Scaled by value in register 2. Valid values set are 2 to top of range. A value of zero resets to sensor default.
77	Low hysteresis (read/write preserved). Scaled by value in register 2. Valid values to set are 1 to low set-point - 1. A value of zero resets to sensor default.
78	DIP switch values. Changing to a non-zero value will cause the current DIP switch settings to be locked in place. Changing to zero restores dip switch functionality.
79-125	Reserved (read only) returns 0x8000

BACnet Descriptions

Note: In the tables below, all properties are read-only unless otherwise noted. "Preserved" means the value is maintained through power outages.

Present_Value Range Restrictions

Object Name	Minimum Value	Maximum Value
Device_Instance	0	4,194,302
Identifier_Value_Prefix	0	4194
High_Set-point Low_Set-point	2	Maximum range of installed sensor.
High_Hysteresis Low_Hysteresis	1	High_Set-point-1 Low_Set-point-1

Standard Object Types Supported

Object Type	Supported Optional Properties	Writable Properties
Analog Input – AI	Description Reliability	None
Analog Value – AV	Description	Present_Value
Binary Input (supports change of value)	Description Reliability	None
Binary Value – BV	Description	Present_Value
Device – DEV	Description Location Max_Master Max_Info_Frames Active_COV_Subscriptions	APDU_Timeout Description Location, Max_Master Object_Identifier Object_Name

Note: Reliability is "No Sensor" if no sensor is installed.

BACnet Descriptions (cont.)

Objects Table

Object Name	Type and Instance	Description of Present_Value Property
SENSOR	AI 1	Gas concentration of sensor.
LIFETIME	AI 2	Remaining hours until sensor replacement.
RUNTIME	AI 3	Hours of runtime for sensor.
Device_Instance	AV 1	Alternative way to change object_identifier property of device. Fractional values are truncated.
Identifier_Value_Prefix	AV 2	Initially 133, this is the value is prepended to the MAC address in the device object identifier value.
High_Set-point	AV 3	High set-point value. Originally sensor high set-point.
High_Hysteresis	AV 4	High hysteresis value. Originally sensor high set-point hysteresis.
Low_Set-point	AV 5	Low set-point value. Originally sensor low set-point.
Low_Hysteresis	AV 6	Low hysteresis value. Originally sensor low set-point hysteresis.
High_Set_point_Exceeded	BI 1	Becomes ACTIVE when $AI\ 1 \geq AV\ 3$; becomes INACTIVE when $AI\ 1 \leq (AV\ 3 - AV\ 4)$.
Low_Set_point_Exceeded	BI 2	Becomes ACTIVE when $AI\ 1 \geq AV\ 5$; becomes INACTIVE when $AI\ 1 \leq (AV\ 5 - AV\ 6)$.
Device_Object_Reset	BV 1	Always reads INACTIVE. Write ACTIVE to reset the Device Objects Object_Name and Object_Identifier to their defaults.
High_Relay_Override	BV 2	ACTIVE means BV 3 controls relay, otherwise BI 1 controls the relay.
High_Relay_Level	BV 3	When BV 2 is ACTIVE, an ACTIVE BV 3 behaves like the set-point has been exceeded.
Low_Relay_Override	BV 4	ACTIVE means BV 5 controls relay, otherwise BI 2 controls the relay.
Low_Relay_Level	BV 5	When BV 4 is ACTIVE, an ACTIVE BV 5 behaves like the set-point has been exceeded.
Lock_Settings	BV 6	When BV 6 is ACTIVE, DIP switches are disabled, and register values control the settings. When BV 6 is INACTIVE, the DIP switches control.

Device Objects Table

Object Name	Object Identifier	Object Property	Description
GWNxxxx	Device 133nnn	Object_Identifier (R/W)	Unique value where nnn initially is MS/TP address. GWN is the product name.
		Object_Name (R/W)	Unique name, initially a combination of model and serial number. Maximum length is 64 characters.
		APDU_Timeout	Default is 3000, maximum value is 60000.
		Max_Master	Default is 127
		Description	Maximum length is 64 characters
		Location	Maximum length is 31 characters

Conformance Statement

BACnet Protocol Implementation Conformance Statement

Vendor Name: Veris Industries
Product Name: Veris GWNP Gas Platform Base
Product Model Number: GWNPxx
Application Software Version: 1.0
Firmware Revision: 0.8.2
BACnet Protocol Version: 1
BACnet Protocol Revision: 12
Product Description: Environmental Sensor
BACnet Standardized Device Profile (Annex L):
BACnet Application Specific Controller (B-ASC)
List all BACnet Interoperability Building Blocks Supported (Annex K):
DS-RP-B,DS-RPM-B,DS_WP-B, DS-COV-B,DM-DDB-B,DM-DOB-B,DM-DCC-B
Segmentation Capability: Segmentation not supported
Standard Object Types Supported:

       No dynamic creation or deletion supported
       No proprietary properties or object types
       (other information about objects on preceding pages)
Data Link Layer Options: MS/TP master (Clause 9), baud rates: 9600, 19200, 38400, 76800
Device Address Binding: Static device binding is not supported. (No client functionality is included).
Networking Options: None
Character Sets Supported: ANSI X3.4