

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 [ ] [X] [X] [ ]

Output: P = Protocol: BACnet and Modbus

Housing Color: Blank = Black; W = White

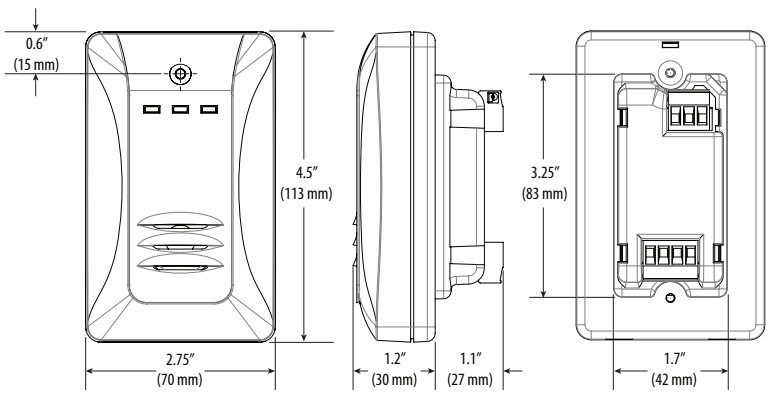
Example: **GWNPXXW**

Specifications

Input Power	15 to 30 Vdc/24 Vac ±20%, Class 2, 50/60Hz, max. 60 mA
Relay Contact Ratings	1 A/30 Vdc, Normally Open
Operating Temperature Range	-20 to 50 °C (-4 to 122 °F)
Operating Humidity Range	0 to 90% RH non-condensing
Terminal Block Wire Size	30 to 12 AWG (0.05 to 3.31 mm²)
Terminal Block Torque	0.37 to 0.44 ft-lb (0.5 to 0.6 N-m)
Protection Class (self-evaluated)	IP20
Agency Approvals	Intertek ETL Listed to UL 61010-1

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



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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.

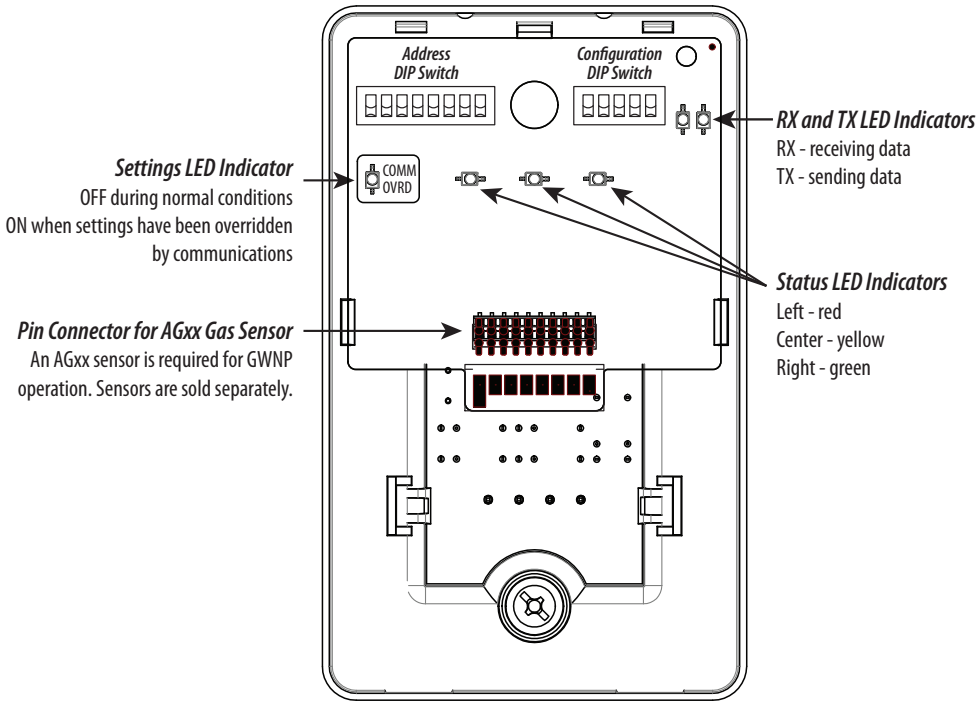
[1]For additional information about anticipated transmission delays or failures of the link, refer to NEMA ICS 1.1 (latest edition). *Safety Guidelines for the Application, Installation, and Maintenance of Solid-State Controls* or its equivalent in your specific country, language, and/or location.

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.

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Product Diagram



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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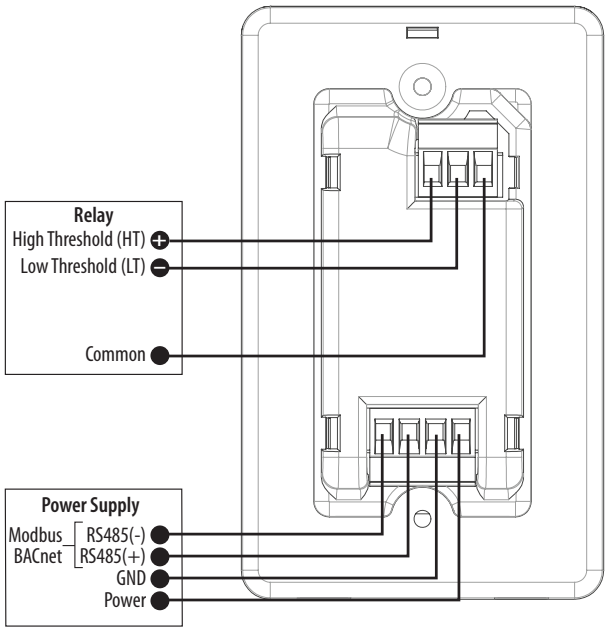
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Installation



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. Shield must NOT be connected to either of the RS-485 terminals. Doing so may result in damage to the product.



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.

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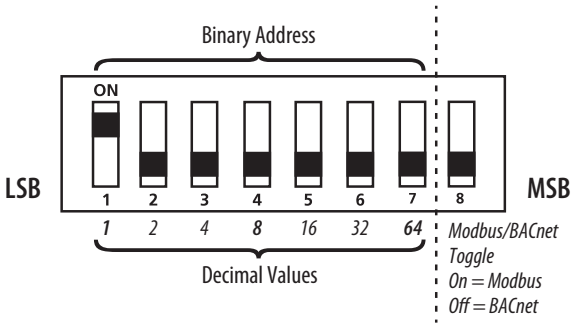
Configuration

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

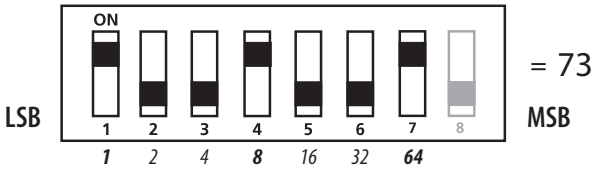
Each device on a single network must have a unique address. Set the DIP switch labeled "ADDRESS" to assign a unique address before the device is connected to the network. If an address is selected that conflicts with another device, neither device will be able to communicate.

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.



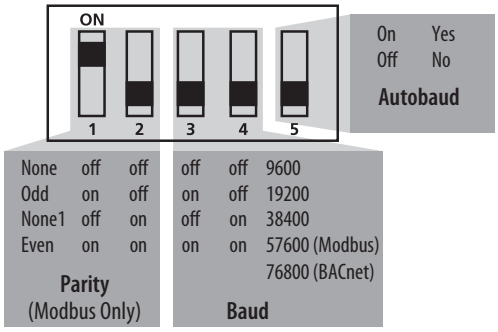
Position number 1 has an ON value of 1, position number 4 has an ON value of 8 and position number 7 has an ON value of 64 (1 + 8 + 64 = 73).

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.



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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	Sensor1 measurement (read only).
2	Sensor1 scale factor (n in 10^n, value would be -2 for percent, -6 for ppm) (read only).
3	Sensor2 measurement (read only), always zero for single gas models.
4	Sensor2 scale factor (n in 10^n, value would be -2 for percent, -6 for ppm). (read only)
5,6	Sensor1 measurement in IEEE 32-bit floating point. Most significant word first. (read only)
7,8	Sensor2 measurement in IEEE 32-bit floating point. Most significant word first. (read only)
9	Alarm bitmap (read only): Bit 0 (lsb) – High set-point exceeded Bit 1 – Low set-point exceeded Bits 2 to 15 – Zero
10	Alarm bitmap 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 to 15 – Zero
11	Time to sensor replacement (days remaining) (read only)
12	Run time (days) (read only)
13	Sensor 1 status (read only): Bit 0 – Over range Bit 1 – Warmup Bit 2 – Damage detected Bits 3 to 15 – Zero

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Modbus Point Map (cont.)

Register	Description
14	Sensor2 status (read only): Bit 0 – Over range Bit 1 – Warmup Bit 2 – Damage detected Bits 3 to 15 – Zero
15-22	Sensor gas type (read only). For example, CO. All strings packed two characters, big endian, per word. Short strings null terminated.
23-30	Sensor serial number (read only). Always eight hexadecimal digits.
31-46	Manufacturer (read only) "Veris Industries".
47-62	Model (read ony) "GWNPxx".
63-78	Location (read/write) preserved. Must be null terminated, 31 characters max.
79	High set-point for Sensor1 (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.
80	High hysteresis for Sensor1 (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.
81	Low set-point for Sensor1 (read/write preserved). Scaled by value in register 2. Valid values set are from 2 to top of range. A value of zero resets to sensor default.
82	Low hysteresis for Sensor1 (read/write preserved). Scaled by value in register 2. Valid values set are from 1 to low set-point - 1. A value of zero resets to sensor default.
83	High set-point for Sensor2 (read/write preserved). Scaled by value in register 4. Valid values to set are 2 to top of range. A value of zero resets to sensor default.
84	High hysteresis for Sensor2 (read/write preserved). Scaled by value in register 4. Valid values to set are 1 to high set-point - 1. A value of zero resets to sensor default.
85	Low set-point for Sensor2 (read/write preserved). Scaled by value in register 4. Valid vales set are from 2 to top of range. A value of zero resets to sensor default.
86	Low hysteresis for Sensor2 (read/write preserved). Scaled by value in register 4. Valid values set are from 1 to low set-point - 1.
87	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.
88-125	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

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BACnet Descriptions (cont.)

Object Type	Supported Optional Properties	Writable Properties
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.

Objects Table

Object Name	Object Identifier	Object Property
Sensor1*	AI 1	Gas concentration of Sensor1
Sensor2*	AI 2	Gas concentration of Sensor2 (only on dual gas sensor, otherwise Reliability = No Sensor)
Lifetime	AI 3	Remaining hours until sensor replacement
Runtime	AI 4	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 that is prepended to the MAC address in the device object identifier value
Sensor1_High_Set-point*	AV 3	High set-point value for Sensor1. Originally Sensor1 high set-point.
Sensor1_High_Hysteresis*	AV 4	High hysteresis value for Sensor1. Originally Sensor1 high hysteresis.
Sensor1_Low_Set-Point*	AV 5	Low set-point value for Sensor1. Originally Sensor1 low set-point.
Sensor1_Low_Hysteresis*	AV 6	Low hysteresis value for Sensor1. Originally Sensor1 low hysteresis.
Sensor2_High_Set-Point*	AV 7	High set-point value for Sensor2. Originally Sensor2 high set-point.
Sensor2_High_Hysteresis*	AV 8	High hysteresis value for Sensor2. Originally Sensor2 high hysteresis.
Sensor2_Low_Set-point*	AV 9	Low set-point value for Sensor2. Originally Sensor2 low set-point.
Sensor2_Low_Hysteresis*	AV 10	Low hysteresis value for Sensor2. Originally Sensor2 low hysteresis.
High_Set-Point_Exceeded	BI 1	Becomes ACTIVE when AI 1 ≥ AV 3 or AI 2 ≥ AV 7 ; Becomes INACTIVE when AI 1 ≤ (AV 3 - AV 4) and AI 2 ≤ (AV 7 - AV 8)
Low_Set-point_Exceeded	BI 2	Becomes ACTIVE when AI 1 ≥ AV 5 or AI 2 ≥ AV 9 ; Becomes INACTIVE when AI 1 ≤ (AV 5 - AV 6) and AI 2 ≤ (AV 9 - AV 10)
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 the 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 the register values control the settings. When BV 6 is INACTIVE, the DIP switches control.

* When using NO_2 gas type sensor, reported "Present_Value" is 10x the acutal value (e.g. If Sensor2 Present_Value = 12, Actual NO_2 Concentration = 1.2 ppm).

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BACnet Descriptions (cont.)

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.

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: 1.2
Firmware Revision: 1.1.2
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

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