



## FEATURE HIGHLIGHTS

- Supports Modbus TCP/RTU/ASCII, DNP3, IEC61850, IEC60870-5-101/104, and Ethernet/Serial in client/server master/slave modes.
- GPRS/3G/4G Cellular Protocol Gateway with extensive LTE Band support, including:
  - \* EU Model: 2100/1800/850/2600/900/800MHz (B1/B3/B5/B7/B8/B20)
  - \* US Model: 1900/AWS/850/700/700/1900MHz (B2/B4/B5/B13/B17/B25)
- Industrial-grade hardware for operating in harsh environments
- 1 x 10/100/1000Mbps Ethernet port
- 1 x RS-232/485 port – baud rate up to 921.6 Kbps
- 2 x High speed USB 2.0 ports
- Management via SMS, Web Browser and Windows Utility
- VPN over PPTP, IPSec or OpenVPN for secure communications

## PRODUCT DESCRIPTION

With Its powerful architecture and industrial-grade hardware, PG5901B provides seamless protocol conversion for devices in industrial network operations. With its rugged construction, PG5901B is designed to perform in the most demanding of industries – including power distribution, oil and gas, manufacturing, and agriculture. As a highly reliable and fault-tolerant Industrial Protocol Gateway, also features integrated 3G/4G connectivity, making it ideal for any industry looking to implement devices at remote locations for smart grid operations. Serial reach can also be extended with the Gateway's redundant Ethernet.

### Performance

Its rugged, reliable hardware features high EMC protection, wide temperature operation, and programming and installation flexibility in one device, while its advanced performance protects your data over the Internet with secure PPTP, IPsec or OpenVPN tunnels, with its powerful CPU providing up to 37.9Mbps\* software-assisted AES encryption.

### Configuration

The device can be easily configured using eNode Designer, a user-friendly Windows utility based on Java. The tool allows users to assign various protocols to different ports, define serial port settings, and define protocolspecific parameters, such as data point mapping. eNode uses a project file to represent the system as a whole, with eNode modules representing individual network devices and protocol applications for individual configuration – such as defining where data point information enters and leaves the eNode Designer system.

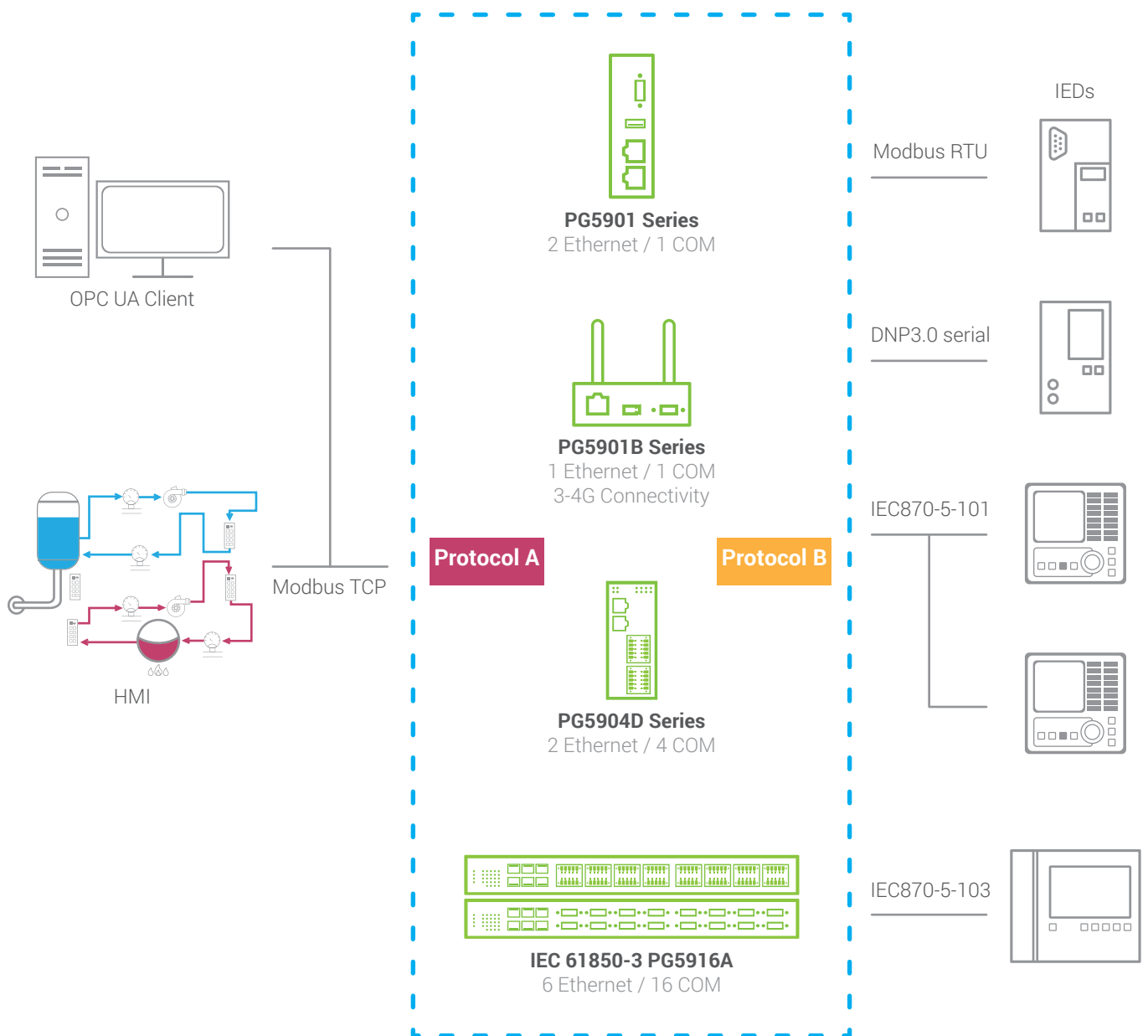
# APPLICATION

## Features

The protocol gateway's embedded protocol stacks allow

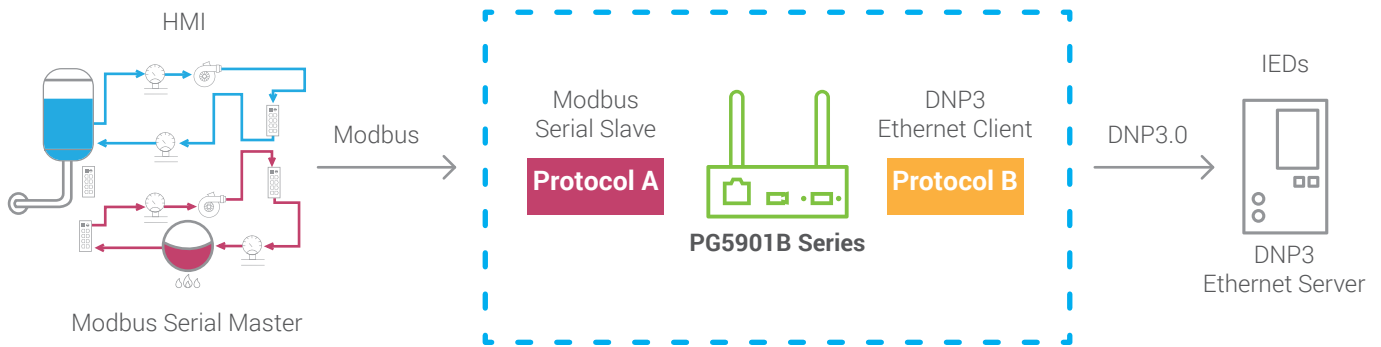
- Seamless conversion
- Exception/error Management
- Unsolicited event management for the protocols requiring them (such as DNP3)
- High performance
- Low cost

## General Architecture



\* Protocol A and Protocol B - Please refer to Protocol Availability Matrix and order information

### Application Example - Modbus Serial HMI to DNP3.0



In this example, a Modbus Serial HMI is easily connected to a DNP3 IED through Atop's Protocol Gateway. The host HMI's role is a Modbus Serial Master while the end-device to be accessed is a DNP3.0 Ethernet Server Slave. To the host HMI, Atop's Protocol Gateway acts seamlessly as a Modbus Serial Slave, answering the polling commands and write commands that come from the by using a virtual Modbus ID. Simultaneously, Atop's Protocol Gateway acts as a DNP3 Ethernet Client to any end-device whose DNP3 address is mapped to the virtual Modbus ID that the HMI is accessing.

**WARNING**

All gateway functions listed in the datasheet refer to the "Gateway" role, and not which "host" or "slave" the gateway is connected to. The SKU shown in this example is "MBSS-DNEC" (Modbus Serial Slave to DNP3.0 Ethernet Client).

## PROTOCOL AVAILABILITY

Protocol Availability Matrix for PG5901 Series

| Protocol B      |                  | Protocol A      |           |            |                 |              |                  |
|-----------------|------------------|-----------------|-----------|------------|-----------------|--------------|------------------|
|                 |                  | Ethernet Server |           |            |                 | Serial Slave |                  |
|                 |                  | IEC 61850       | DNP3      | Modbus TCP | IEC 60870-5-104 | DNP3         | Modbus RTU/ASCII |
| Ethernet Client | IEC 61850        | n/a             | DNES-50EC | MBES-50EC  | 04ES-50EC       | DNSS-50EC    | MBSS-50EC        |
|                 | DNP3             | 50ES-DNEC       | n/a       | MBES-DNEC  | 04ES-DNEC       | DNSS-DNEC    | MBSS-DNEC        |
|                 | Modbus TCP       | 50ES-MBEC       | DNES-MBEC | n/a        | 04ES-MBEC       | DNSS-MBEC    | n/a              |
|                 | IEC 60870-5-104  | 50ES-04EC       | DNES-04EC | MBES-04EC  | n/a             | DNSS-04EC    | MBSS-04EC        |
| Serial Master   | DNP3             | 50ES-DNSM       | DNES-DNSM | MBES-DNSM  | 04ES-DNSM       | n/a          | n/a              |
|                 | Modbus RTU/ASCII | 50ES-MBSM       | DNES-MBSM | n/a        | 04ES-MBSM       | n/a          | n/a              |
|                 | IEC 60870-5-101  | 50ES-01SM       | DNES-01SM | MBES-01SM  | 04ES-01SM       | n/a          | n/a              |
|                 | IEC 60870-5-103  | 50ES-03SM       | DNES-03SM | MBES-03SM  | 04ES-03SM       | n/a          | n/a              |

## PROTOCOL SPECIFICATION

### IEC61850 Server/ Client

|                                    |   |
|------------------------------------|---|
| Supported Functions                | <ul style="list-style-type: none"> <li>• Generic access to the data (Read, Write)</li> <li>• Clock Synchronization</li> <li>• 8 Logical Devices per Port</li> <li>• GOOSE (Generic Object Oriented Substation Event) <ul style="list-style-type: none"> <li>– a GOOSE message will be generated by the gateway automatically upon event(*)</li> </ul> </li> <li>• (*)Being other protocols not Real-Time, there is no guarantee that GOOSE message is generated within 1 ms from the event itself.</li> </ul> |
| Supported Control Type of commands | <ul style="list-style-type: none"> <li>• Direct-with-Normal-Security Select Before Operate (SBO)-with-Normal-Security</li> <li>• Direct-with-Enhanced Security Select Before Operate (SBO)-with-Enhanced-Security</li> </ul>  |
| Implemented Protocol Subsets       | <ul style="list-style-type: none"> <li>• IEC 61850-6 (Substation Configuration Language Description: SCL)</li> <li>• IEC 61850-7-1 (Principles and Models)</li> <li>• IEC 61850-7-2 (Abstract Communication Service Interface: ACSI)</li> <li>• IEC 61850-7-3 (Common Data Classes: CDC)</li> <li>• IEC 61850-7-4 (Logical Nodes and data Object Classes)</li> <li>• IEC 61850-8-1 (Mapping to Manufacturing Message Specification: MMS)</li> <li>• Edition 1 &amp; Edition 2 are both Supported</li> </ul>   |

### DNP3 Server/ Client/ Master/ Slave

|                               |  |
|-------------------------------|--|
| General Specifications        | <ul style="list-style-type: none"> <li>• Serial Mode or Ethernet with TCP or UDP Mode</li> <li>• Server side supports serving up to 5 client in TCP Mode</li> <li>• Client side in a single RS-485 port, supports connecting up to 16 IEDs</li> <li>• Client side supports connecting up to 16 IEDs</li> <li>• Maximum Fragment size 2048 octets</li> <li>• Protocol implementation with configurable parameters conforms to IEEE Std 1815-2012 level 2</li> </ul> |
| Supported Functions           | <ul style="list-style-type: none"> <li>• Time Synchronization generic access to the data(Read, Write)</li> <li>• Commands with or without preselection (Select, Operate, Direct Operate)</li> <li>• Transmission of time-tagged events</li> <li>• Counter management (Immediate Freeze, Freeze and Clear)</li> <li>• Self-address</li> </ul>   |
| Supported DNP3 Object Library | <ul style="list-style-type: none"> <li>• Binary Inputs up to 8000 pts</li> <li>• Binary Outputs up to 2000 pts</li> <li>• Double Inputs up to 4000 pts</li> <li>• Analog Inputs up to 250 pts</li> <li>• Analog Outputs up to 250 pts</li> <li>• Counters up to 250 pts</li> </ul>   |

### Modbus Server/ Client/ Master/ Slave

|                        |  |
|------------------------|--|
| General Specifications | <ul style="list-style-type: none"> <li>• Support Modbus RTU and ASCII in Serial mode</li> <li>• Support Modbus in TCP mode</li> <li>• For Modbus Client in TCP mode, support connecting up to 64 Modbus servers</li> <li>• For Modbus Server in TCP mode, support serving up to 64 Modbus clients</li> <li>• Support maximum number of data points in read direction: 8000 pts</li> <li>• Support maximum number of commands in write direction: 4000 pts</li> </ul> |
|------------------------|--|

|                           |  |
|---------------------------|--|
| Supported Function Codes  | <ul style="list-style-type: none"> <li>1: Read Coils</li> <li>2: Read Discrete Inputs</li> <li>3: Read Holding Registers</li> <li>4: Read Input Registers</li> <li>5: Write Single Coil</li> <li>6: Write Single Register</li> <li>15: Write Multiple Coils</li> <li>16: Write Multiple Registers</li> <li>43/14: Read Device Identification (server side only)</li> </ul> |
| Supported Exception Codes | <ul style="list-style-type: none"> <li>1: illegal function</li> <li>2: illegal data address</li> <li>3: illegal data value</li> <li>4: server device failure</li> <li>6: server device busy</li> </ul>   |

### IEC 60870-5-101 Master/ Slave

|                        |  |
|------------------------|--|
| General Specifications | <ul style="list-style-type: none"> <li>• Protocol implementation with configurable parameters conforms to the IEC 60870-5-101 edition 2 specification</li> <li>• Process Information in Monitor and Control Direction</li> <li>• Balanced and Unbalanced Modes</li> <li>• CP24Time2a or CP56Time2a timestamp for monitor direction report</li> </ul>   |
| Supported Functions    | <ul style="list-style-type: none"> <li>• Station Initialization</li> <li>• Interrogation</li> <li>• Read Procedure</li> <li>• Cyclic Data and Spontaneous Transmission (Slave Side only)</li> <li>• Clock Synchronization</li> <li>• Transmission of Integrated Totals</li> <li>• Direct and SBO command</li> </ul>  |
| Supported Data Types   | <ul style="list-style-type: none"> <li>• Monitors Points:<br/>Each supports up to 1000 pts: Single Point, Double Point, Step Position, Bit String, Measured with Normalized Value, Measured with Scaled Value, Measured Short Floating Point Value, Integrated Totals</li> <li>• Control Points:<br/>Each supports up to 500 pts: Single Command, Double Command, Regulating Step Command, Set Point Command with Normalized Value, Set Point Command with Scaled Value, Set Point Command Short Floating Point, Bit string</li> </ul> |

### IEC 60870-5-103 Master/ Slave

|                        |  |
|------------------------|--|
| General Specifications | <ul style="list-style-type: none"> <li>• Protocol implementation with configurable parameters conforms to the IEC 60870-5-103:1997</li> <li>• Master supports connecting up to 16 IEDs</li> <li>• Process Information in Monitor and Control Direction</li> <li>• Unbalanced Modes</li> </ul>  |
| Supported Functions    | <ul style="list-style-type: none"> <li>• Station Initialization, Supports reset FCB and CU</li> <li>• General Interrogation</li> <li>• Clock Synchronization</li> <li>• Command Transmission</li> <li>• Test Mode</li> <li>• Blocking of Monitor Direction</li> </ul>  |
| Supported Information  | <ul style="list-style-type: none"> <li>• Monitor direction: <ul style="list-style-type: none"> <li>* Status indications in monitor direction: from &lt;16&gt; to &lt;30&gt;</li> <li>* Supervision indications in monitor direction: &lt;32&gt;, &lt;33&gt;, from &lt;35&gt; to &lt;39&gt;, &lt;46&gt;, &lt;47&gt;</li> <li>* Earth fault indications in monitor direction: from &lt;48&gt; to &lt;52&gt;</li> </ul> </li> </ul> |

|                       |   |
|-----------------------|---|
| Supported Information | <ul style="list-style-type: none"> <li>* Fault indications in monitor direction: from &lt;64&gt; to &lt;93&gt;</li> <li>* Auto-reclosure indications in monitor direction: from &lt;128&gt; to &lt;130&gt;</li> <li>* Measurands in monitor direction: from &lt;144&gt; to &lt;148&gt;</li> <li>• Control direction:<br/>General commands in control direction: from &lt;16&gt; to &lt;19&gt;, from &lt;23&gt; to &lt;26&gt;</li> </ul> |
|-----------------------|---|

### IEC 60870-5-104 Server/ Client

|                        |   |
|------------------------|---|
| General Specifications | <ul style="list-style-type: none"> <li>• Server side supports serving up to 5 client</li> <li>• Client side supports connecting up to 10 IEDs</li> <li>• Protocol implementation with configurable parameters conforms to the IEC 60870-5-104 specification edition 2</li> <li>• Process Information in Monitor and Control Direction</li> <li>• CP56Time2a timestamp for Control Commands</li> </ul>   |
| Supported Functions    | <ul style="list-style-type: none"> <li>• Station Initialization</li> <li>• Interrogation</li> <li>• Read Procedure (Server side only)</li> <li>• Cyclic Data and Spontaneous Transmission (Server side only)</li> <li>• Clock Synchronization</li> <li>• Transmission of Integrated Totals</li> <li>• Direct and SBO command</li> </ul>   |
| Supported Data Types   | <ul style="list-style-type: none"> <li>• Monitors Points:<br/>Each supports maximum 1000 pts: Single Point, Double Point, Step Position, Bit String, Measured with Normalized Value, Measured with Scaled Value, Measured Short Floating Points Value, Integrated Totals.</li> <li>• Control Points:<br/>Each supports maximum 500 pts: Single Command, Double Command, Regulating Step Command, Set Point Command with Normalized Value, Set Point Command with Scaled Value, Set Point Command Short Floating Point, Bitstring.</li> <li>• Event Logging (Server Side only) Universal Event Buffer up to 20,000 Events</li> </ul> |

## SPECIFICATION

| Specifications |  |
|----------------|--|
| Standard       | GSM/ GPRS/ EDGE/ UMTS/ HSPA+/ SCDMA/ LTE   |
| Band Options   | EU version:<br>- FDD LTE: 2100/1800/850/2600/900/800MHz(B1/B3/B5/B7/B8/B20)<br>- TDD LTE: 2600/2300/2500MHz(B38/B40/B41)<br>- WCDMA: 2100/850/900MHz (B1/B5/B8)<br>- GSM: 900/1800<br>US version:<br>- UMTS: 1900/1700/850/700/700bMHz(B2/B4/B5/B12/B17)<br>- WCDMA: 1900/1700/850MHz (B2/B4/B5)<br>- GSM: 850/1900MHz |

|   |  |
|---|--|
| Maximum 4G throughput                                 | <p>EU version:</p> <ul style="list-style-type: none"> <li>- LTE-FDD Max 150Mbps (DOWNLINK), Max 50Mbps (UPLINK)</li> <li>- LTE-TDD Max 130Mbps (DOWNLINK), Max 35Mbps (UPLINK)</li> <li>- DC-HSPA+ Max 42Mbps (DOWNLINK), Max 5.76Mbps(UPLINK)</li> <li>- UMTS Max 384Kbps(DOWNLINK), Max 384Kbps(UPLINK)</li> <li>- TD-SCDMA Max 4.2Mbps (DOWNLINK), Max 2.2Mbps (UPLINK)</li> <li>- EDGE Max.236.8 Kbps (DOWNLINK), Max.236.8 Kbps (UPLINK)</li> <li>- GPRS Max.85.6 Kbps (DOWNLINK), Max 85.6 Kbps (UPLINK)</li> </ul> <p>US version:</p> <ul style="list-style-type: none"> <li>- LTE-FDD Max 100Mbps (DOWNLINK), Max 50Mbps (UPLINK)</li> <li>- LTE-TDD Max 61Mbps (DOWNLINK) Max 18Mbps (UPLINK)</li> <li>- DC-HSPA+ Max 42Mbps (DOWNLINK) Max 5.76Mbps(UPLINK)</li> <li>- UMTS Max 384Kbps(DOWNLINK) Max 384Kbps(UPLINK)</li> <li>- TD-SCDMA Max 4.2Mbps(DOWNLINK) Max 2.2Mbps(UPLINK)</li> <li>- EDGE Max.236.8 Kbps (DOWNLINK)/ Max.236.8 Kbps (UPLINK)</li> <li>- GPRS Max.85.6 Kbps (DOWNLINK)/ Max.85.6 Kbps (UPLINK)</li> </ul> |
| <b>Network Interface</b>                              |  |
| Ethernet Port   | 1x 10/100/1000BASE-TX RJ-45  |
| Compliance  | IEEE 802.3 10BASE-T<br>IEEE 802.3u for 100BASE-T(X)<br>IEEE 802.3ab for 1000BASE-T   |
| <b>Serial Interface</b>                               |  |
| Connector   | 14-Pin 5.08mm Terminal Block (integrated with DI/DOs) or D-Sub9 connector  |
| Port  | 1 or 2 (IO model only)   |
| Mode  | 1 port RS-232/485 (2-wire) software selectable<br>1 port RS-232 (IO model only)  |
| Baud Rate   | 1,200~921,600 bps  |
| Parity  | None, Odd, Even, Space, Mark   |
| Data Bits   | 7, 8   |
| Stop Bits   | 1, 2   |
| Flow Control  | None, Xon/Xoff, RTS/CTS (RS-232 only)  |
| <b>USB Interface</b>                                  |  |
| Speed   | USB 2.0  |
| Connector   | USB A Type *2  |
| <b>DI/DO Interface (IO model only)</b>                |  |
| DI  | 2 channels photo coupler isolated digital input  |
| DO  | 2 channels digital output. N.O.( 2A@24VDC)   |
| <b>Internal Battery function (Battery model only)</b> |  |
| Battery function                                      | Provide normal operation at least 10 seconds after power failure function  |
| <b>Power Characteristics</b>                          |  |
| Connector   | 3-Pin 5.08mm Lockable Terminal Block   |
| Input Voltage   | 9-48 VDC   |
| Power Consumption                                     | 0.6A @ 12VDC   |
| Power Redundancy                                      | USB DC 5V Power Input  |
| Reverse Polarity Protection                           | Yes  |
| <b>Mechanicals</b>                                    |  |
| Housing   | IP30 protection, metal housing   |
| Dimensions(W x H x D)                                 | 32mm x 122mm x 92mm  |
| Installation  | DIN-Rail or Wall-Mount (optional kit)  |
| Reset Button  | Yes  |
| Weight  | 400g   |

| Environmental Limits      |   |
|---------------------------|---|
| Operating Temperature     | -40°C ~ 70°C (-40°F ~ 158°F)  |
| Storage Temperature       | -40°C ~ 85°C (-40°F ~ 185°F)  |
| Ambient Relative Humidity | 5 ~ 95% RH, (non-condensing)  |
| Software                  |   |
| Protocols                 | ARP, IPv4, ICMP, TCP, UDP, DHCP Client, NTP Client, SNMPv1/v2c/v3, HTTP, HTTPS, RFC2217, RSTP, and SMTP/TLS |
| Additional features       | Remote SMS monitoring   |
| Security                  | VPN through IPsec tunneling (max 10 tunnels), OpenVPN, and PPTP on cellular or LAN                          |
| Network                   | NAT   |

## REGULATORY APPROVALS

| Regulatory Approvals |   |                   |   |   |
|----------------------|---|-------------------|---|---|
| Safety               | EN 60950-1, UL60950-1, IEC60950-1   |                   |   |   |
| EMC                  | FCC Part 15, Subpart B, Class A<br>EN301489-19, EN301489-52, EN301908-1, EN303413, EN 55024, EN 55032, EN61000-6-4, EN 61000-3-2, EN 61000-3-3, EN61000-6-2 |                   |   |   |
| Test                 | Item  | Value             | Level   |   |
| IEC 61000-4-2        | ESD   | Contact Discharge | ±8KV  | 4 |
|                      |   | Air Discharge     | ±15KV   | 4 |
| IEC 61000-4-3        | RD  | 80-1000MHz        | 10 V/m  | 3 |
| IEC 61000-4-4        | EFT   | AC Power Port     | ±2.0KV  | 3 |
|                      |   | Signal Port       | ±2.0KV  | 4 |
| IEC 61000-4-5        | Surge   | AC Power Port     | Line-to Line±1.0KV  | 3 |
|                      |   | AC Power Port     | Line-to Earth±2.0KV   | 3 |
|                      |   | Signal Port       | Line-to Earth±2.0KV   | 3 |
| IEC 61000-4-6        | CS  | 0.15-80MHz        | 10 Vrms   | 3 |
| IEC 61000-4-8        | PFMF  | Enclosure         | 10 A/m  | 3 |
| IEC 61000-4-11       | DIP   | AC Power Port     | 1. >95%,Reduction,0.5period<br>2. 30%, Reduction,25 period<br>>95%,Reduction,250 period | — |
| Shock                | MIL-STD-810G Method 516.7   |                   |   |   |
| Drop                 | MIL-STD-810G Method 516.7   |                   |   |   |
| Vibration            | MIL-STD-810G Method 514.7   |                   |   |   |
| RoHS                 | Yes   |                   |   |   |
| MTBF                 | 20.88 years according to MIL-HDBK-217F (Model average)  |                   |   |   |
| Warranty             | 5 years   |                   |   |   |



## ORDERING INFORMATION

### Hardware

|                        |  |
|------------------------|--|
| PG5901B-D3G-US         | Ind. Cellular Protocol Gateway with 1 Serial port, DB9, 3G, US                     |
| PG5901B-IO-D3G-US      | Ind. Cellular Protocol Gateway with 1 Serial port, TB14, 3G, 2 DI, 2 DO, US        |
| PG5901B-IO-D3G-GPS-US  | Ind. Cellular Protocol Gateway with 1 Serial port, TB14, 3G, 2 DI, 2 DO, GPS, US   |
| PG5901B-4G-US          | Ind. Cellular Protocol Gateway with 1 Serial port, DB9, 4G, US                     |
| PG5901B-IO-4G-US       | Ind. Cellular Protocol Gateway with 1 Serial port, TB14, 4G, 2 DI, 2 DO, US        |
| PG5901B-IO-4G-GPS-US   | Ind. Cellular Protocol Gateway with 1 Serial port, TB14, 4G, 2 DI, 2 DO, GPS, US   |
| PG5901B-4G-B-US        | Ind. Cellular Protocol Gateway with 1 Serial port, DB9,4G, Internal battery, US    |
| PG5901B-IO-4G-B-US     | Ind. Cellular Protocol Gateway with 1 Serial port, TB14,4G,2DI,2DO,Pwr Bank, US    |
| PG5901B-IO-4G-GPS-B-US | Ind. Cellular Protocol Gateway with 1 Serial port, TB14,4G,2DI,2DO,GPS,Pwr Bank,US |
| PG5901B-D3G-EU         | Ind. Cellular Protocol Gateway with 1 Serial port, DB9, 3G, EU                     |
| PG5901B-IO-D3G-EU      | Ind. Cellular Protocol Gateway with 1 Serial port, TB14, 3G, 2 DI, 2 DO, EU        |
| PG5901B-IO-D3G-GPS-EU  | Ind. Cellular Protocol Gateway with 1 Serial port, TB14, 3G, 2 DI, 2 DO, GPS, EU   |
| PG5901B-4G-EU          | Ind. Cellular Protocol Gateway with 1 Serial port, DB9, 4G, EU                     |
| PG5901B-IO-4G-EU       | Ind. Cellular Protocol Gateway with 1 Serial port, TB14, 4G, 2 DI, 2 DO, EU        |
| PG5901B-IO-4G-GPS-EU   | Ind. Cellular Protocol Gateway with 1 Serial port, TB14, 4G, 2 DI, 2 DO, GPS, EU   |
| PG5901B-4G-B-EU        | Ind. Cellular Protocol Gateway with 1 Serial port, DB9,4G , Internal Battery, EU   |
| PG5901B-IO-4G-B-EU     | Ind. Cellular Protocol Gateway with 1 Serial port,TB14,4G,2DI,2DO,Pwr Bank, EU     |
| PG5901B-IO-4G-GPS-B-EU | Ind. Cellular Protocol Gateway with 1 Serial port,TB14,4G,2DI,2DO,GPS,Pw Bank,EU   |

### Optional Accessories

| Model Name           | Part Number     | Description   |
|----------------------|-----------------|---|
| UN315-1212(US-Y) LV6 | 50500151120003G | Y-Type (5.08 mm) power adaptor, 100-240VAC input, 1.25A @ 12VDC output, US plug, LV6. |
| UNE315-1212(EU-Y)LV6 | 50500151120013G | Y-Type (5.08 mm) power adaptor, 100-240VAC input, 1.25A @ 12VDC output, EU plug, LV6. |
| ADP-DB9(F)-TB5       | 59906231G       | Female DB9 to Female 3.81mm TB5 Converter   |
| WMK-315-Black        | 70100000000050G | Black Aluminum Wall Mount Kit   |

### Protocols

|           |  |
|-----------|--|
| 04ES-01SM | IEC 60870-5-104 Ethernet Server to IEC 60870-5-101 Serial Master |
| 04ES-03SM | IEC 60870-5-104 Ethernet Server to IEC 60870-5-103 Serial Master |
| 04ES-50EC | IEC 60870-5-104 Ethernet Server to IEC 61850 Ethernet Client     |
| 04ES-DNEC | IEC 60870-5-104 Ethernet Server to DNP3 Ethernet Client          |
| 04ES-DNSM | IEC 60870-5-104 Ethernet Server to DNP3 Serial Master            |
| 04ES-MBEC | IEC 60870-5-104 Ethernet Server to Modbus Ethernet Client        |
| 04ES-MBSM | IEC 60870-5-104 Ethernet Server to Modbus Serial Master          |
| 50ES-01SM | IEC 61850 Ethernet Server to IEC 60870-5-101 Serial Master       |
| 50ES-03SM | IEC 61850 Ethernet Server to IEC 60870-5-103 Serial Master       |
| 50ES-04EC | IEC 61850 Ethernet Server to IEC 60870-5-104 Ethernet Client     |

|           |   |
|-----------|---|
| 50ES-DNEC | IEC 61850 Ethernet Server to DNP3 Ethernet Client         |
| 50ES-DNSM | IEC 61850 Ethernet Server to DNP3 Serial Master           |
| 50ES-MBEC | IEC 61850 Ethernet Server to Modbus Ethernet Client       |
| 50ES-MBSM | IEC 61850 Ethernet Server to Modbus Serial Master         |
| DNES-01SM | DNP3 Ethernet Server to IEC 60870-5-101 Serial Master     |
| DNES-03SM | DNP3 Ethernet Server to IEC 60870-5-103 Serial Master     |
| DNES-04EC | DNP3 Ethernet Server to IEC 60870-5-104 Ethernet Client   |
| DNES-50EC | DNP3 Ethernet Server to IEC 61850 Ethernet Client         |
| DNES-DNSM | DNP3 Ethernet Server to DNP3 Serial Master                |
| DNES-MBEC | DNP3 Ethernet Server to Modbus Ethernet Client            |
| DNES-MBSM | DNP3 Ethernet Server to Modbus Serial Master              |
| DNSS-04EC | DNP3 Serial Slave to IEC 60870-5-104 Ethernet Client      |
| DNSS-50EC | DNP3 Serial Slave to IEC 61850 Ethernet Client            |
| DNSS-DNEC | DNP3 Serial Slave to DNP3 Ethernet Client                 |
| DNSS-01SM | DNP3 Serial Slave to IEC 60870-5-101 Serial Master        |
| DNSS-03SM | DNP3 Serial Slave to IEC 60870-5-103 Serial Master        |
| DNSS-MBEC | DNP3 Serial Slave to Modbus Ethernet Client               |
| MBES-01SM | Modbus Ethernet Server to IEC 60870-5-101 Serial Master   |
| MBES-03SM | Modbus Ethernet Server to IEC 60870-5-103 Serial Master   |
| MBES-04EC | Modbus Ethernet Server to IEC 60870-5-104 Ethernet Client |
| MBES-50EC | Modbus Ethernet Server to IEC 61850 Ethernet Client       |
| MBES-DNEC | Modbus Ethernet Server to DNP3 Ethernet Client            |
| MBES-DNSM | Modbus Ethernet Server to DNP3 Serial Master              |
| MBSS-04EC | Modbus Serial Slave to IEC 60870-5-104 Ethernet Client    |
| MBSS-50EC | Modbus Serial Slave to IEC 61850 Client                   |
| MBSS-DNEC | Modbus Serial Slave to DNP3 Ethernet Client               |