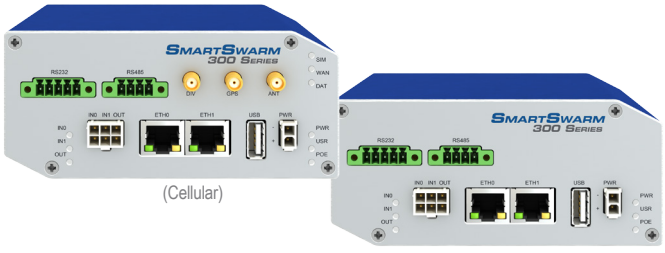
Modbus Eavesdrop to MQTT IIoT Gateway

SmartSwarm 351

B+B SmartWorx

Powered by ADVANTECH



- Transparently connects to existing serial Modbus RTU networks
- Provides parallel data feed into Enterprise IIoT systems while the existing Modbus network continues to operate
- User configurable data enrichment and event triggers
- Extensive configuration options for interpretation of Modbus data
- Cellular or Ethernet connection to IIoT system
- Also acts as LAN to WAN bridge for 3rd party device connections

SEAMLESSLY CONNECT EXISTING MODBUS PROCESS SYSTEMS TO THE INDUSTRIAL INTERNET OF THINGS

SmartSwarm 351 collects and translates your Modbus data, and makes it available to your IIoT applications without interrupting business-as-usual for your engineers. It is invisible to your existing Modbus installation. Unlike competing "Modbus to MQTT" gateways, which expect to act as the local Modbus master device, SmartSwarm 351 simply "eavesdrops" on communications between the existing master device and the connected slaves. It non-disruptively derives the I/O status of connected devices and uses this information to provide a real time data feed to connected IIoT architecture.

DATA ENRICHMENT

SmartSwarm 351 collects your Modbus data and uses a combination of MQTT topics and JSON payload formats to make the data easily consumable by upstream applications. Users may configure both the topic alias and payload transformation to provide descriptive and semantically rich content.

CONNECTIVITY

SmartSwarm 351 connects to enterprise applications via either a local Ethernet connection or an internal cellular modem. The gateway can switch between these connections at any time, providing redundancy.

CONFIGURATION

Configuration is easy with the SmartWorx Hub remote configuration management tool. SmartWorx Hub provides access to all of the configurable parameters, and also supports zero touch provisioning, where a unit's configuration can be entered prior to it arriving at site, and automatically downloaded once it is switched on. SmartWorx Hub also supports remote upgrade of applications and firmware, on an individual device and/or group basis.

SECURITY

All inbound WAN connections are protected by an Internal firewall. A second Ethernet port provides the local LAN connection. OpenVPN tunneling is supported. Outbound connections to the SmartWorx Hub remote configuration tool and the remote MQTT broker are authenticated and encrypted using TLS, with certificate authentication of the host and certificate provision by the gateway.

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
SG30000320-51	Ethernet Only, no accessories
SG30000324-51	Ethernet Only, with accessories (PSU & cellular antennae)
SG30300320-51	EMEA Cellular, no accessories
SG30300325-51	EMEA Cellular, with accessories (PSU & cellular antennae)
SG30500320-51	NATAM Cellular, no accessories

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SPECIFICATIONS

POWER			
Voltage	10 – 60 Vdc; PoE PD optional		
Power	4W typical; 11W peak		
ENVIRONMENTAL			
Operating Temperature	-40°C to 75°C (-40°F to 167°F)		
Cold Start Temperature	-35°C (-31°F)		
Storage Temperature	-40°C to 85°C (-40 to 185°F)		
Operating Humidity	0% to 95% (non-condensing)		
Storage Humidity	0 to 95% non condensing		
Ingress Protection	IP42		
MECHANICAL			
Dimensions	55 x 97 x 125mm		
Weight	375g		
Mounting	Flat Surface or DIN rail		
PORTS & INTERFACES			
Serial Modbus RTU Interface	RS-232 or RS-485		
Ethernet	2 x 10/100 Mb via RJ45		
SIM	Mini SIM (2FF)		
ANT & DIV antennae	SMA		
Cellular	LTE, UMTS/HSPA+, GPRS/EDGE		
CERTIFICATIONS & APPROVALS			
ESD	EN 61000-4-2	Enclosure contact Enclosure air	± 6 kV (crit. A) ± 8 kV (crit. A)
RF Field AM Modulated	IEC 61000-4-3	Enclosure	20 V/m (crit. A) (80 – 2700 MHz)
Fast Transient	EN 61000-4-4	Signal ports Power ports Ethernet ports	± 2 kV (crit. A) ± 2 kV (crit. A) ± 2 kV (crit. A)
Surge	EN 61000-4-5	Ethernet ports Power ports I/O ports	± 2 kV (crit. B), shielded cable ± 0,5 kV (crit. B) ±1kV,LtoL(crit. A) ±2kV,LtoGND(crit. A)
RF Conducted	EN 61000-4-6	All ports	10 V/m (crit. A) (0,15 – 80 MHz)
Radiated Emission	EN 55022	Enclosure	Class B
Conducted Emission	EN 55022	DC power ports Ethernet ports	Class B Class B
Power Frequency Magnetic Field	EN 61000-4-8	Enclosure	160 A/m (crit. A)
Dry Heat	EN 60068-2-2	+75 °C, 40% relative humidity	
Cold	EN 60068-2-1	-40 °C	
Dump Heat	EN 60068-2-78	95% relative humidity (+40 °C)	
Service Providers* NATAM Cellular	AT&T, T-Mobile		

*Contact B+B SmartWorx for the latest approvals.

MODBUS COMMANDS SUPPORTED
01 Read Coil Status
02 Read Input Status
03 Read Holding Registers
04 Read Input Registers
05 Force Single Coil* *
06 Preset Single Register*
15 Force Multiple Coils*
16 Preset Multiple Registers*
22 Mask Write 4X Register*
23 Read/Write 4X Registers*
* Note that for output command types, the unit interprets these as inputs to the IoT enrichment process. It does not support output of data from the IoT system.
MODBUS DATA TYPES SUPPORTED
Boolean
Multi-bit Encoded Boolean (e.g. 2 bits provide 4 states for one point)
16 Bit Packed Boolean
16 Bit Integer (signed/ unsigned)
16 Bit Counter
32 Bit Integer (signed/unsigned) (single 32 bit or 2x16 bit registers)
32 Bit Counter (single 32 bit or 2x 16 bit registers)
32 Bit Float (single 32 bit or 2x 16 bit registers)
32 Bit Packed Boolean (single 32 bit or 2x 16 bit registers)
Multi-register Text
Endian order is configurable both within and between registers

CELLULAR FRONT PANEL DETAIL