Avnet SmartEdge Industrial IoT Gateway

Overview

The Avnet SmartEdge Industrial IoT Gateway connects your sensors and other devices to the cloud. This allows you to view status and control connected devices from a customizable web portal from any internet connected location.

Specifications

Raspberry Pi 3 Core

- 64-Bit, Quad-core ARM A53 (Broadcom BCM2837) SoC

- Direct connection to enclosure heat sink for heat dissipation

- Maximum clock speed limited to 900MHz for enhanced thermal range

- 1GB LPDDR2 SDRAM

- WiFi/BT, 2.4GHZ, 802.11bgn, BT 4.2

Storage Medium

- 8GB eMMC onboard

Input Power

- Voltage: 12-24VDC Input (terminal block)

- Power: 12W minimum, 18W recommended. Additional power may be needed for installed USB devices or expansion cards (mPCIe or HATs).

Environmental

- Ambient Operating Temperature Range: -20°C to 70°C*

  *Note: depending on processor workload, CPU throttling may occur above 50C ambient)

Dimensions & Mounting

- Dimensions: 125mm W x 127mm D x 43mm H (55mm H with included expansion ring)

- Weight: 0.4kg

- Mounting: Desktop, Wall (sheet metal screws included), or DIN Rail (with included DIN rail bracket for 35mm "top hat")

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Front Panel LEDs

Power/Activity LED

- Green indicates valid power

- Red flashing indicates disk activity by default, but configurable

User LED

- Green & Red can be controlled from user code

Trusted Platform Module (TPM)

- SLB9670 TCG 2.0 Trusted Platform Module

Real-time Clock (RTC) with Battery Backup

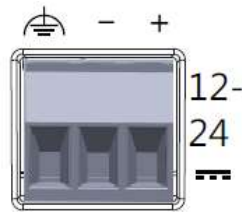- PCF8563 Real-time clock

- BR1225 backup battery

External Connections

DC-Input (terminal block)

- 12VDC - 24VDC +/- 10%

- Recommended Wire: 18-24AWG Solid or 18-22AWG Stranded

- Install Protective Earth Wire

CAN Terminal Block Connections

Signal	CANbus signal
⏚	Earth GND
-	0V (GND)
+	12-24VDC

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Dual Ethernet ports
- 10/100 Base-T
- Link / Activity LEDs

Dual USB ports
- USB 2.0 High-Speed
- 5V @ 1.2A Output, shared among all USB ports

HDMI display connector
- HDMI / DVI Compatible

Isolated RS-485 / RS-422 / RS232 (terminal block)
- SC16IS740 UART (16C550 compatible)
- Jumper selection for: RS485 termination, Shutdown, Fast/Slow Slew Rate, RS485/RS232 Mode, Half/Full Duplex

RS-485/RS-422/RS-232 Terminal Block Connections

| Signal	2-Wire RS485 (half)	4-Wire RS485 (full) RS-422	RS-232
-	(n/c)	RD (A) -	CTS
+	(n/c)	RD (B) +	RXD
G	GND	GND	GND
A	DATA (A) -	TD (A) -	TXD
B	DATA (B) +	TD (B) +	RTS
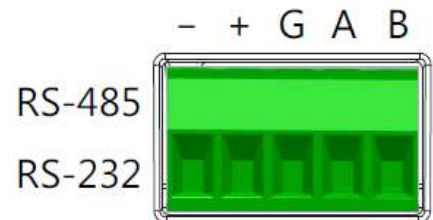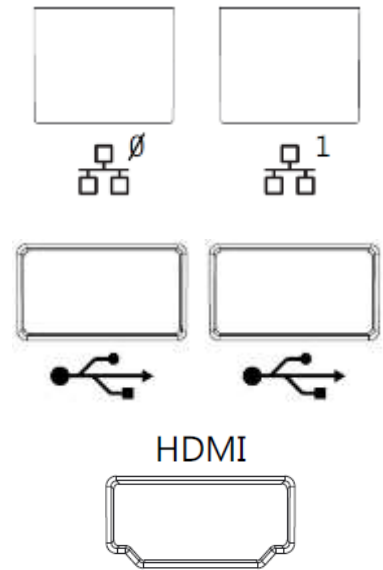
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Isolated CANbus (terminal block)

- MCP2515 CAN Controller

- Recommended Cable: Shielded Twisted Pair, 120ohm impedance (Belden 3105A)

- Route multiple device connections as daisy chain, with termination only at endpoints

- Jumper selection for: CAN termination

CAN Terminal Block Connections

| Signal	CANbus signal
G	Ground
L	CANL
H	CANH
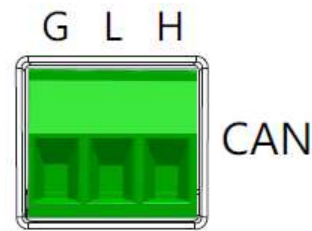
Isolated Digital I/O (terminal block)

- Dual isolated blocks A & B, with each block having two (2) inputs and two (2) outputs

- Digital Outputs:
  - Outputs are open drain
  - High Level: up to 60V can be applied to Digital Output
  - Low Level: 1.5V max @ 500mA

- Digital Inputs:
  - Inputs have internal pull-down of 6.8kOhm.
  - High Level: minimum of 5V @ 1mA at the input terminal, 60V @ 10mA max
  - Low Level: maximum of 1V at the input terminal

Digital I/O Terminal Block Connections

Label	Digital I/O Signal
Ox	Output x
Ix	Input x
G	Ground
Oy	Output y
Iy	Input y
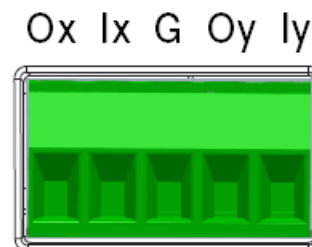
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Internal Expansion

Raspberry Pi HAT expansion slot, with full I/O support

- Support for standard Raspberry Pi HAT boards

- Standard device-tree overlays can be used

- Enclosure expansion rings can be stacked to increase the enclosure height

- HATs have access to full 40pin HAT I/O and alternate functions*

  *NOTE: I2C1 Bus (GPIO2/GPIO3) is shared with onboard devices. I2C addresses: 0x33, 0x43, 0x44, 0x51 are reserved for onboard devices

Raspberry Pi HAT Expansion Connector (J8)

Pin	Signal Name	Signal Name	Pin
1	3.3Vout	5Vout	2
3	I2C1_SDA (GPIO2)	5Vout	4
5	I2C1_SCL (GPIO3)	Ground	6
7	GPIO4	GPIO14	8
9	Ground	GPIO15	10
11	GPIO17	GPIO18	12
13	GPIO27	Ground	14
15	GPIO22	GPIO23	16
17	3.3Vout	GPIO24	18
19	GPIO10	Ground	20
21	GPIO9	GPIO25	22
23	GPIO11	GPIO8	24
25	Ground	GPIO7	26
27	ID_SD (GPIO0)	ID_SC (GPIO1)	28
29	GPIO5	Ground	30
31	GPIO6	GPIO12	32
33	GPIO13	Ground	34
35	GPIO19	GPIO16	36
37	GPIO26	GPIO20	38
39	Ground	GPIO21	40

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mPCIe slot (J34)

- Full size mPCIe slot

- Supports USB, SIM, and WWAN LED for optional cellular modem

USB header

- 2x4 header with two USB ports for optional internal USB devices

- Specially designed HATs can use USB

USB Header (J12)

Pin	Signal Name	Signal Name	Pin
1	Vbus	Vbus	2
3	USB1-	USB2-	4
5	USB1+	USB2+	6
7	Ground	Ground	8