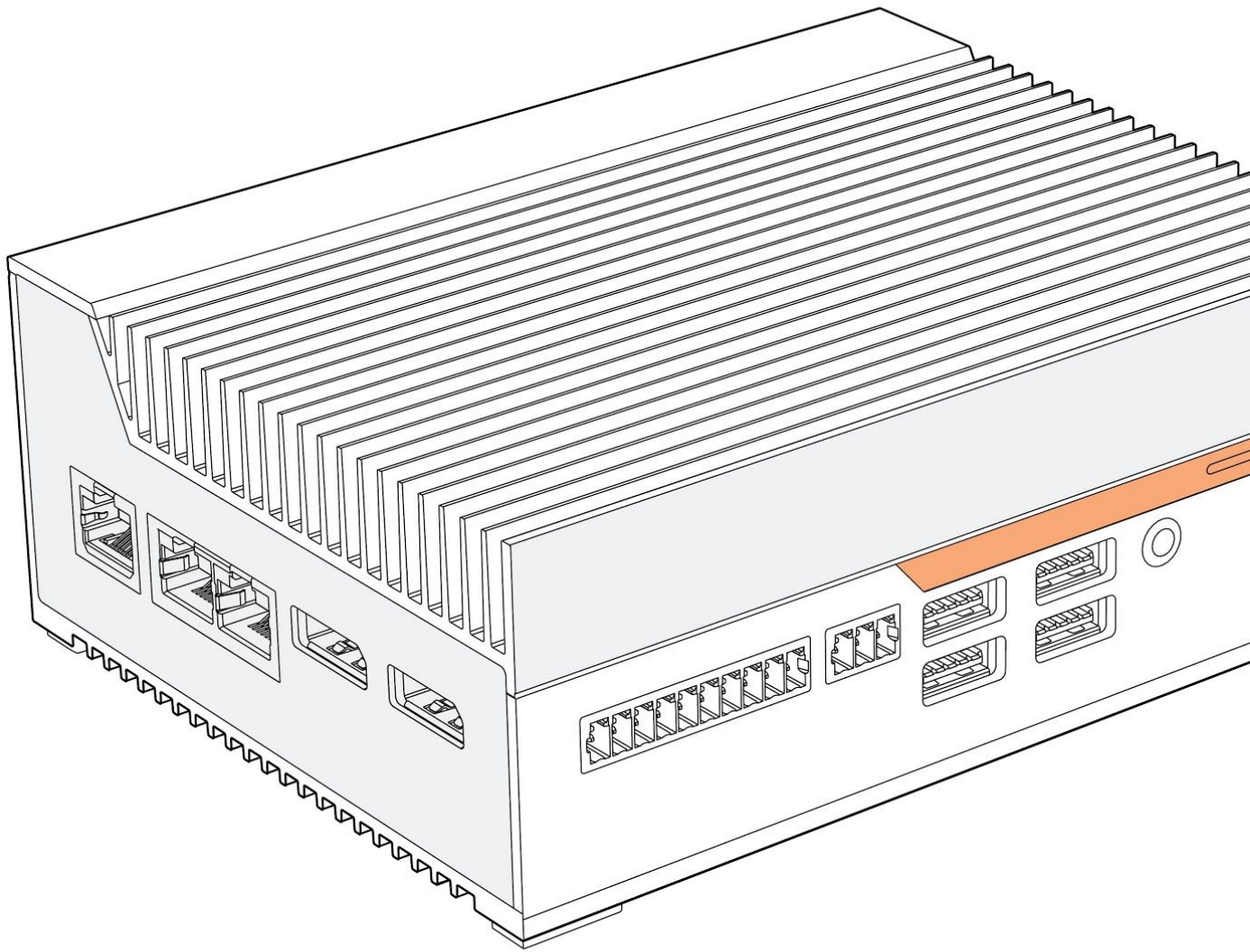


IGN200 Product Manual

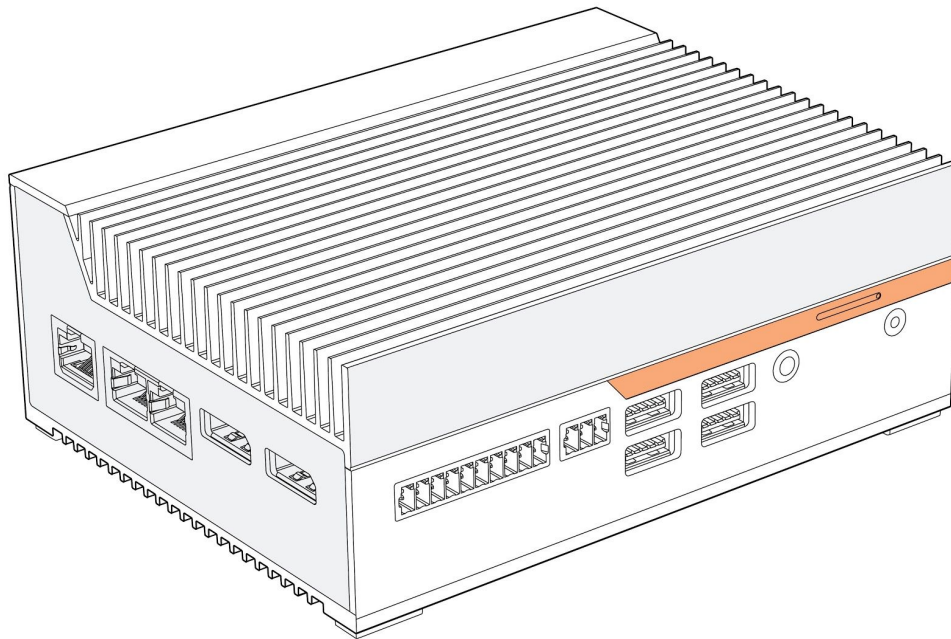


Revision History

| Revision History | Date |
|--------------------------------|------------|
| First release of IGN200 manual | 10/29/2019 |

| | |
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1 - System Overview



1.1 - Accessories

- 3-pin Power Terminal Block Connector (Dinkle PN: 2ESDVM-03P)
- 3-pin CAN bus Terminal Block Connector (Dinkle PN: EC350V-03P)
- 10-pin DIO Terminal Block Connector (Dinkle PN: EC350V-10P)
- M.2 and mPCIe expansion card screws

If you purchased additional items such as mounting brackets, power supplies or antennas, they will be located in the system box or within the outer shipping carton.

All drivers and product guides can be found on the corresponding product page. For more information on accessories and additional features, visit the IGN200 pages at:

US: <https://www.onlogic.com/ign200/>

EU: <https://www.onlogic.com/eu-en/ign200/>

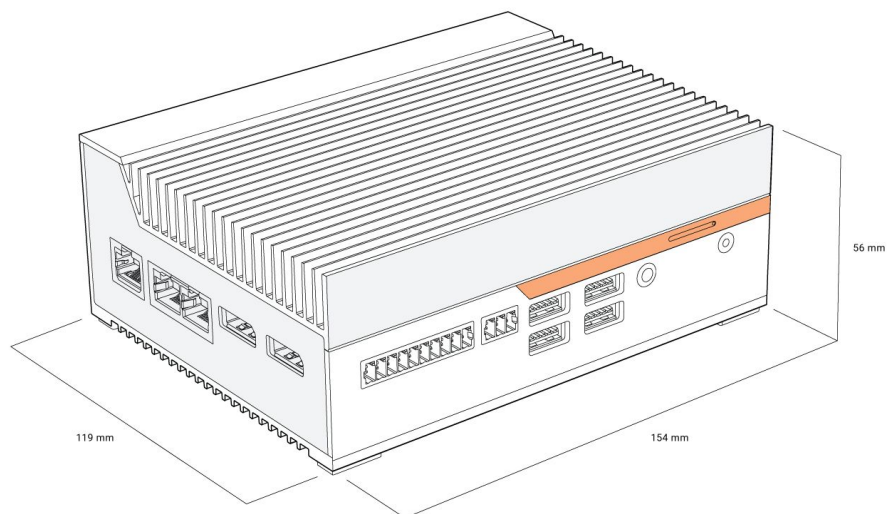
1.2 - Product Specifications

| | IGN200 Series |
|----------------------------|---|
| | K300-E3950-8-P |
| Processor | Intel Atom x7-E3950 Quad-core |
| Memory | 8GB Onboard LPDDR4 |
| Integrated Graphics | Intel HD Graphics 505 |
| Bottom I/O | 3x GbE LAN |
| | 2x Full-size DisplayPort |
| Top I/O | 2x Serial RS-232/422/485 |
| | 3-pin Power input |
| | 4x Antenna holes |
| Front I/O | Power button |
| | 1x 3.5 mm Audio jack (mic-in, line-out) |
| | 8-bit Isolated DIO |
| | 4x USB 3.0 Type A |
| | 8x Status LEDs |
| | 3-pin CAN bus 2.0B |
| | Nano-SIM slot (4FF) |
| Storage | M.2 2280 M-key (PCIe x2, SATA) |
| Expansion | Full-length mPCIe slot (PCIe, SATA) |
| | M.2 2230 E-key (PCIe, USB) |
| Special Features | OnLogic Microcontroller (MCU) |
| | Onboard TPM 2.0 (Nuvoton NPCT750) |
| | Automotive Ignition Power Sensing |
| | SuperCap backup for RTC battery |
| Operating Systems | Windows 10, Ubuntu 18.04 |
| LAN Controllers | Intel Ethernet Controller 1210-IT |
| Voltage Input | 9~36 VDC |

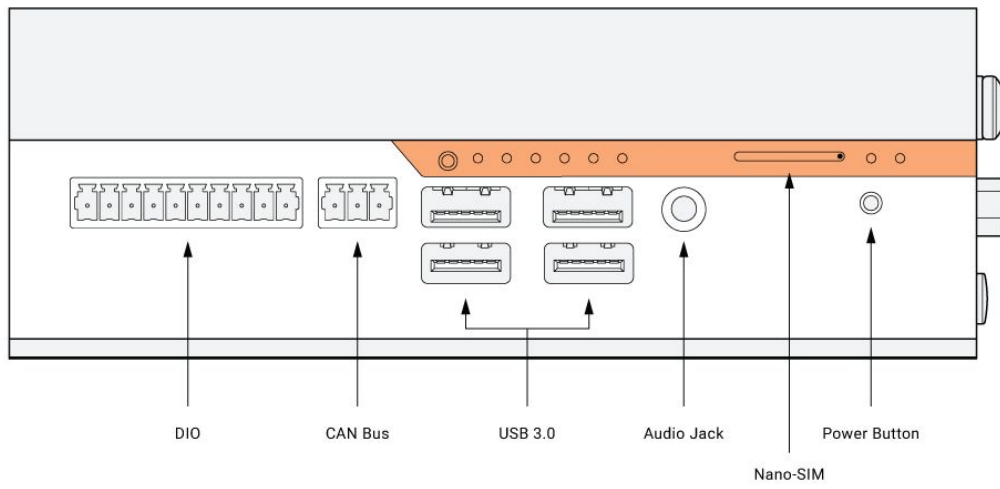
| | |
|-----------------------|--|
| Dimensions | 56 x 154 x 119 mm |
| Mounting | Wall mount (edge and bottom) DIN Rail mount (edge and bottom) VESA mount (bottom) |
| Environment | Operating Temperature: -25°C ~ 70°C |
| | Operating Humidity: 0 ~ 90% |
| | Storage Temperature: -40°C ~ 85°C |
| | Storage Humidity: 0 ~ 90% |
| Certifications | FCC 47 CFR Part 15 EN 55024 EN 55032 EN 62368-1 2011/65/EU (RoHS 2 Directive) WEEE Directive (2012/19/EU) IEC 60068-2-27 IEC 60068-2-64 |

1.3 - Exterior Features and Dimensions

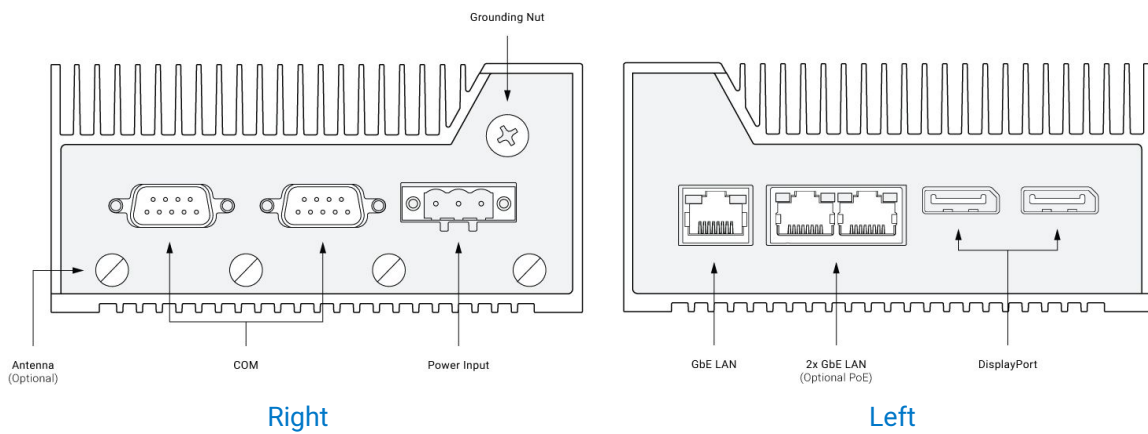
1.3.1 - IGN200 Dimensions



1.3.2 - Front I/O

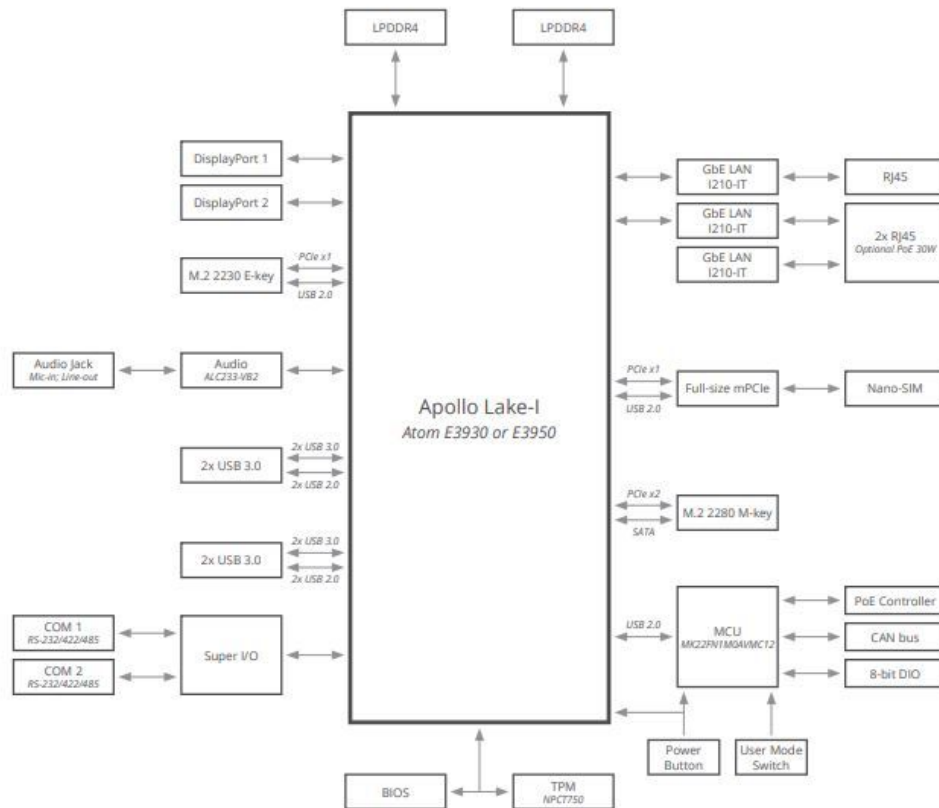


1.3.3 - Side I/O



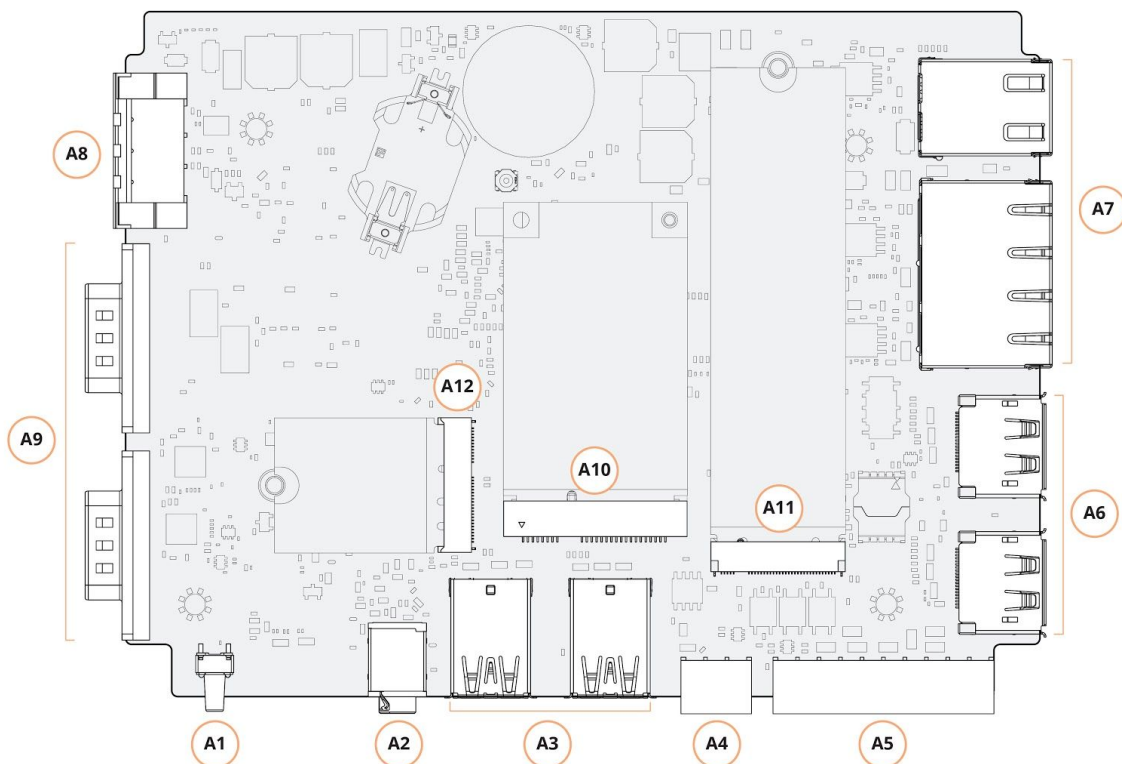
1.4 - Motherboard Overview

1.4.1 - System Block Diagram



| System | Memory | Manufacturer | Part Number | Quantity | Total Capacity |
|----------------|--------|--------------|----------------|----------|----------------|
| K300-E3950-8-P | LPDDR4 | Samsung | K4FBE3D4HMMGCJ | 2 | 8 GB |

1.4.2 - Motherboard Features

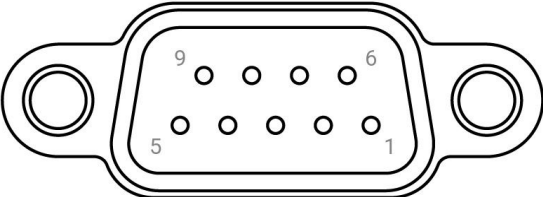


| Item | Function Description |
|------|--|
| A1 | Power button |
| A2 | 3.5 mm Audio jack |
| A3 | 4 x USB 3.0 Type A ports |
| A4 | 3-pin CAN bus |
| A5 | 8-bit isolated DIO (10-pin) |
| A6 | 2 x Full-size DisplayPort |
| A7 | 1 x RJ45 GbE LAN port |
| | 2 x RJ45 GbE LAN ports with optional PoE (30W total) |
| A8 | 3-pin power input (9 ~ 36 VDC) |
| A9 | 2 x Serial RS-232/422/485 ports |
| A10 | Full-size mPCIe |
| A11 | M.2 2280 M-key for NVMe or SATA storage |
| A12 | M.2 2230 E-key for Wi-Fi or WAN card |

2 - I/O Definitions

2.1 - Serial Ports

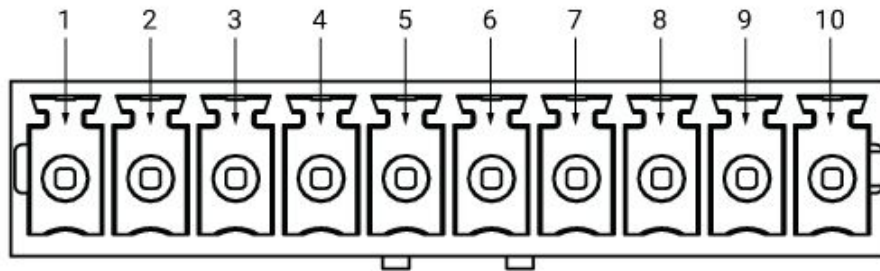
The serial port mode and voltage between Off/5V/12V on Pin 9 on IGN200 can be selected in the BIOS configuration. The serial ports support RS-232, RS-422, and RS-485 configurations. Refer to the BIOS manual for configuration instructions.

| | Pin | RS-232 | RS-422 | RS-485 |
|--|-----|--------|--------|---------|
|  | 1 | DCD | TX- | TX-/RX- |
| | 2 | RX | TX+ | TX+/RX+ |
| | 3 | TX | RX+ | NC |
| | 4 | DTR | RX- | NC |
| | 5 | GND | NC | NC |
| | 6 | DSR | NC | NC |
| | 7 | RTS | NC | NC |
| | 8 | CTS | NC | NC |
| | 9 | RI/PWR | NC/PWR | NC/PWR |

NC = Not Connected

2.2 - DIO

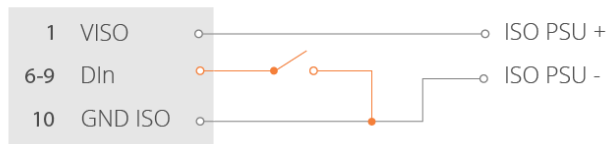
The IGN200 DIO terminals are optically isolated. This means that the terminal is separated from other motherboard features for protection. In addition, the DIO requires external power from a 9-36VDC source through Pin 1 to function.



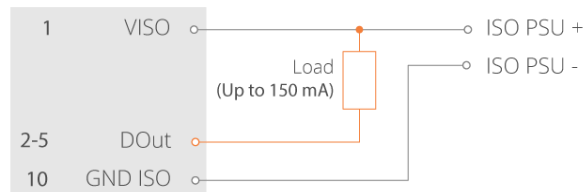
| Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 | Pin 10 |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| GND | In 4 | In 3 | In 2 | In 1 | Out 4 | Out 3 | Out 2 | Out 1 | Power |

2.2.1 - DIO Connection Diagram

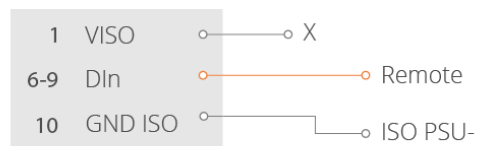
Karbon 300



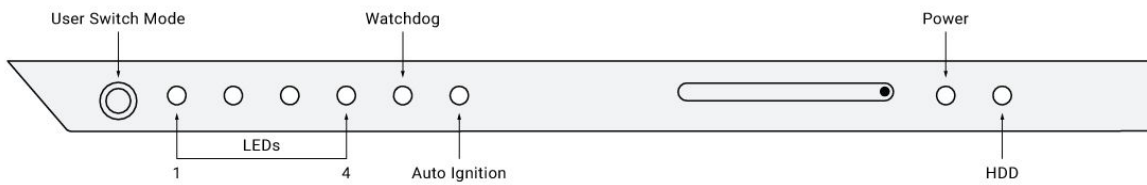
Karbon 300



Karbon 300



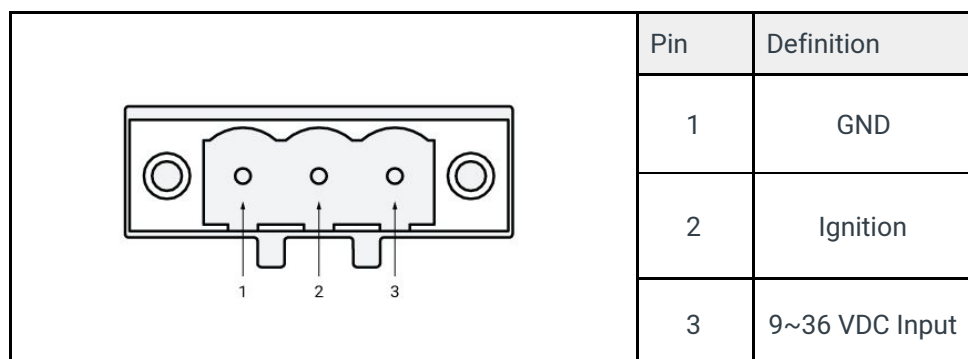
2.3 - LEDs



| LED | On | Off | Blink | Pulse |
|----------------------------|--|--|---------------------------------|--------------------------------------|
| HDD | - | - | Internal storage drive activity | - |
| Power | Device is on | Device is off | Device is asleep | - |
| Automotive Ignition | Ignition input to device is on | Ignition input to device is off | - | - |
| Watchdog | Internal MCU is not functioning normally | Internal MCU is not functioning normally | Firmware bootloader is active | Internal MCU is functioning normally |
| LEDs 1-4 | Currently selected user mode | Currently selected user mode | - | - |

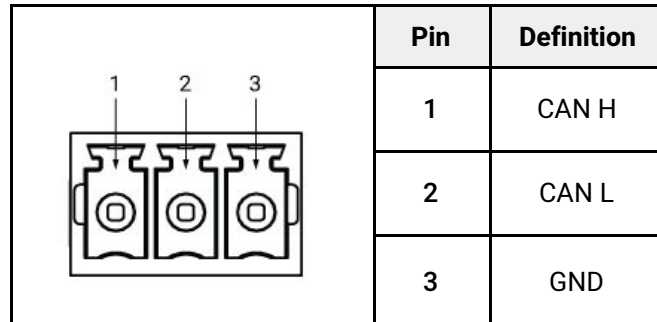
2.4 - Automotive Ignition Power Sensing (IGN)

The IGN200 3-pin power input terminal offers automotive ignition sensing. The ignition sensing timing for power on and off delays can be modified through OnLogic's microcontroller (MCU) using serial commands. These commands allow setting the delay on startup after ignition is detected, the delay until soft and hard shutdown when ignition is lost, and enabling/disabling ignition sensing. For more information on ignition power sensing, and instructions on using these serial commands from Windows or Linux, visit our [Karbon series technical support site](#).

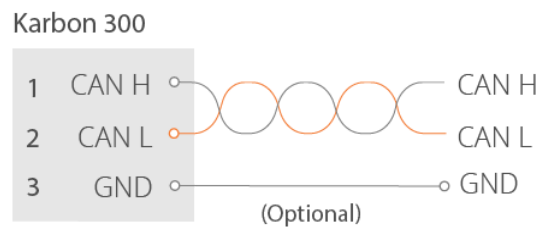


2.5 - CAN Bus

See Section 4 for information on how to drive the CAN bus.

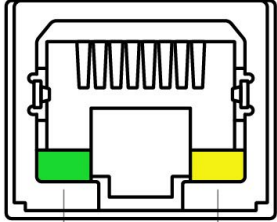


2.5.1 - CAN Bus Connection Diagram



2.6 - LAN

The single LAN ports on all IGN200 models are standard GbE ports.

| | LED | Color | State | Condition |
|---|--------|-------|---------------------|-----------------------------|
|  Link LED (Green) Speed LED (Green/Yellow) | Link | - | Off | LAN link is not established |
| | | Green | On | LAN link is established |
| | | | Blinking | LAN activity occurring |
| Speed | - | Off | 10 Mb/s data rate | |
| | Green | On | 100 Mb/s data rate | |
| | Yellow | On | 1000 Mb/s data rate | |

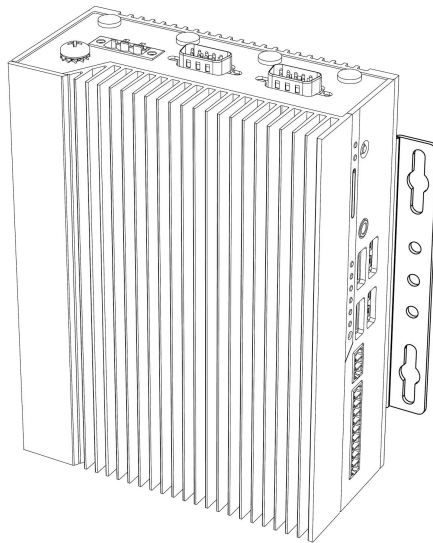
3 - Mounting Instructions

3.1 - Wall Mount

Step 1: Mark and prep holes in surface for mounting

Step 2: Attach wall mount brackets to chassis

Step 3: Fasten system to surface

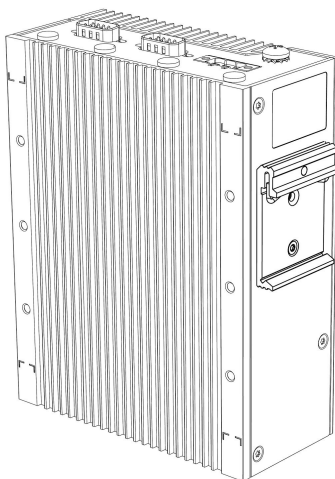


3.2 - DIN Rail Mounting

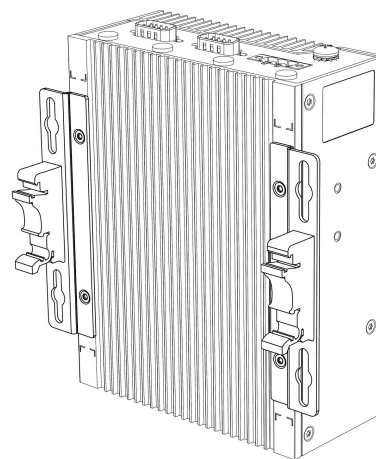
Step 1: Attach wall mounting brackets to the chassis

Step 2: Attach DIN Rail mounting brackets to the chassis

Step 3: Clip system to the DIN Rail



DIN Rail Edge Mounting



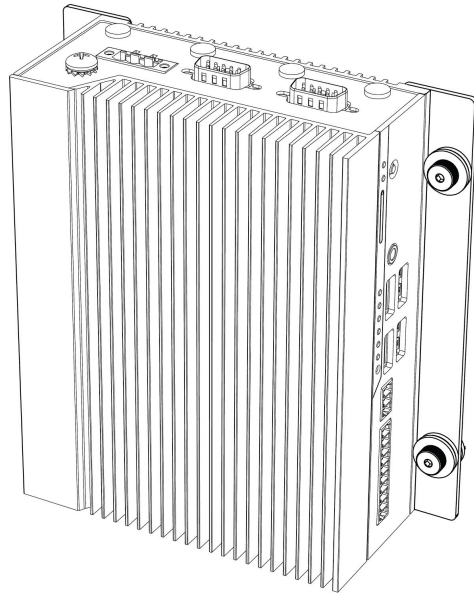
DIN Rail Back Mounting

3.3 - Wall (Shock and Vibration) Mounting

Step 1: Attach wall mounting brackets to the chassis

Step 2: Mark and prep holes in surface for mounting

Step 3: Fasten system to surface

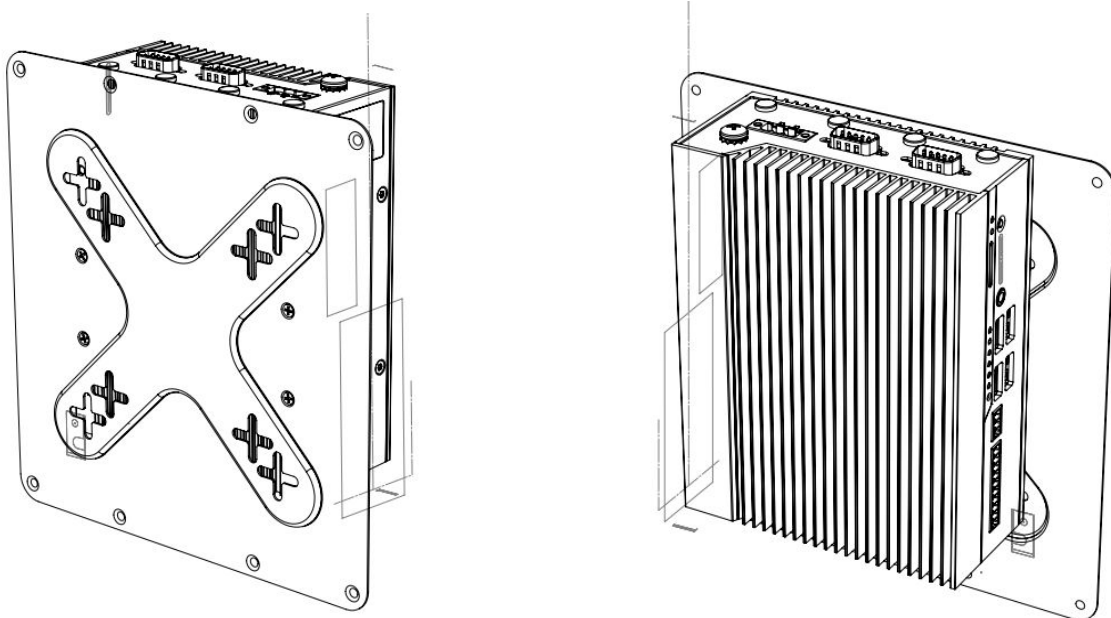


3.4 - VESA Mounting

Step 1: Install four VESA screws into the display/surface

Step 2: Attach VESA bracket to the chassis

Step 3: Hang combined system and bracket to the display/surface



4 - Microcontroller

4.1 - Overview

The microcontroller on IGN200 controls several systems, including:

- Automotive ignition power sensing
- CAN bus
- DIO
- Status LEDs
- Power management and wake-up
- DisplayPort CEC and persistent EDID

A segment is exposed for user control via two serial ports. By reading and writing to these serial ports, the user can send and receive CAN messages, read/set the DIO state, and select from a number of configuration options. One port is dedicated to IGN200's CAN bus, while another doubles as a serial terminal and the DIO interface. Any configuration settings may be saved to non-volatile memory. This means that upon a long power-off, the MCU settings will be retained.

To learn more about how to use the IGN200 series MCU and Pykarbon interface tools, visit our [Karbon Series technical support site](#).

5 - Power Management

5.1 - Wake-Up Events

IGN200 supports multiple power states. The wake-up events can be configured in the MCU and BIOS. This section describes the power management functions you can perform and gives information on protection circuitry for power adapters.

| Wake-Up Event | From ACPI State | Comments |
|---------------|-------------------------|--|
| Power Button | VR-Disabled, S5, S4, S3 | |
| Ignition | VR-Disabled, S5, S4, S3 | Must be enabled in MCU. |
| Digital Input | S5, S4, S3 | Must be enabled in MCU. Requires external reference power source. |
| LAN | S5, S4, S3 | Must be enabled per port and generally in BIOS. |
| USB | S3 | |
| RTC Alarm | S5 | Wake from S5 must be enabled in BIOS. |

5.2 - Protection Circuitry

| Parameter | Value |
|--|---------|
| Nominal operating voltage (Rated DC value of input) | 9~36VDC |
| Undervoltage protection trip DC level (system turns off) | 8.1V |
| Overvoltage protection trip DC level (system turns off) | 42.5V |
| Maximum safe DC voltage (system not damaged) | 50V |
| Minimum safe reverse voltage (system not damaged) | -40V |
| Ignition pin safe working voltage range (system not damaged) | -20~50V |

These DC levels specified are the absolute max values for the pins for function and safety of the system. The protection circuitry allows for brief transient voltages above these levels without the system turning off (transients up to 50V for <30 ms).

A TVS protection on the input allows protection for:

- 5000W peak pulse power capability at 10/1000 μ s waveform, repetition rate (duty cycles): .01%
- IEC-61000-4-2 ESD 30kV(Air), 30kV (Contact)
- EFT protection in accordance with IEC 61000-4-4