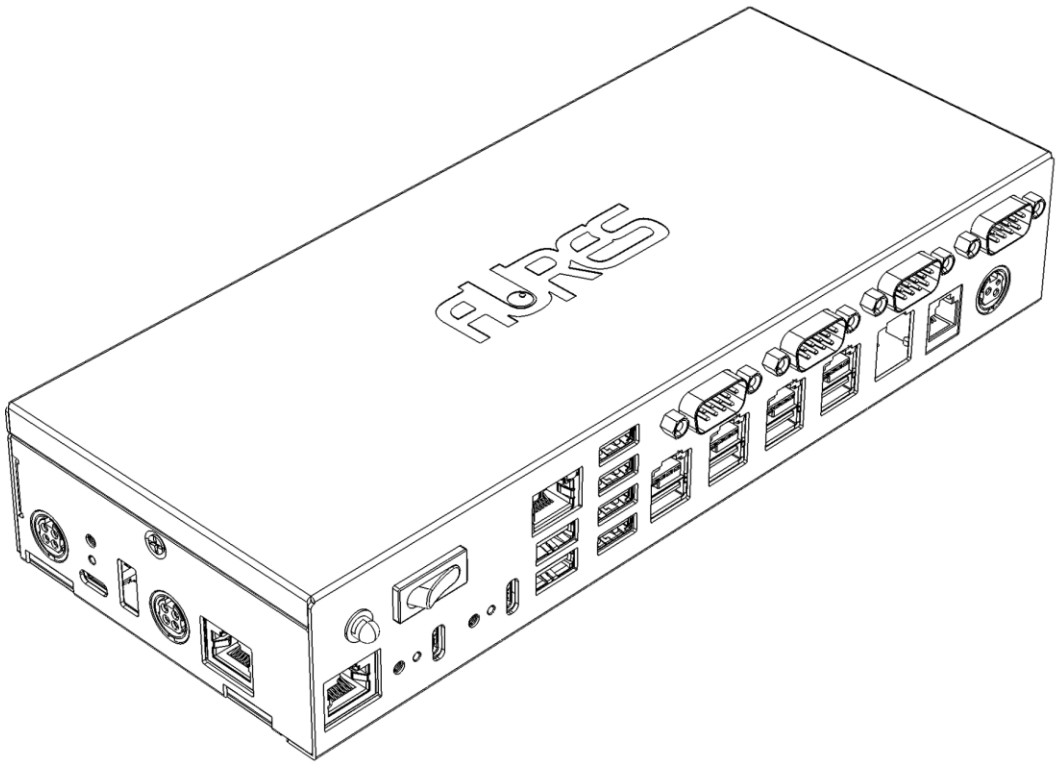
Aures HUB-X

Technical Manual



January 2024

Change History
January 18, 2024: Draft Outline
January 29, 2024: Version 1.0 Draft Release

Contents

Overview

The Aures POS HUB-X significantly expands the I/O capabilities of virtually any Aures POS System, incorporating PoweredUSB ports. This expansion enables the remote location of I/O ports from the POS system, with a maximum distance of 3 meters. Newer Aures systems connect to the HUB-X using a single USB-C cable, whereas older models, such as the YUNO, utilize a tri-functional cable that simultaneously supplies power and facilitates all I/O connections to the POS system. Centralizing all POS systems I/O under the counter not only streamlines installations but also simplifies maintenance.

The HUB-X addresses the contemporary demands for the KL18 and KL20 hubs. It is compatible with the Aures 3-in-1 cable, currently employed by the YUNO and YUNO B models. For the YUNO II, JAZZ, JAZZ Pole, and Twist models, the HUB-X functions with a solitary USB-C cable, up to 3 meters in length. In such configurations, neither an additional I/O module nor a power adapter is necessary for the POS, as the HUB-X manages both power and I/O.

A novel feature in the HUB-X design is the integration of a circuit dedicated to monitoring total power consumption. This includes not only the overall unit consumption but also the power usage of individual power buses, extending to track total lifetime power usage. This innovative feature, unique to Aures, has been incorporated into all new Aures designs. It facilitates detailed monitoring of the carbon footprint associated with the Point of Sale (POS) system, offering a more comprehensive insight into energy efficiency.

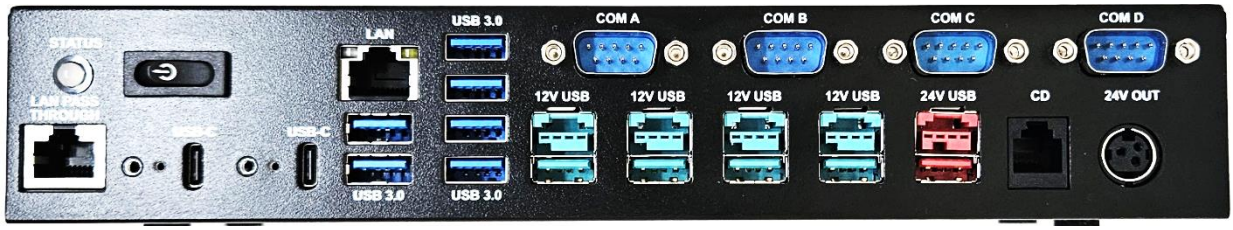
The POS HUB's design is universally applicable, accommodating most Windows-based systems or Android Tablets that support a USB-C interface and at least USB 2.0.

HUB-X

POS HUB-X I/O Ports

I/O Ports Real Panel	#
PoweredUSB +12V	4
PoweredUSB +24V	1
USB 3.0 Ports	6
USB-C Ports, one with Alt Mode video, +5V power 3A	2
Serial Port with optional +5V or +12V port, Software Configurable, DB9	4
Gigabit Ethernet with WOL	1
LAN Pass through, passive connection for 3 in 1 cable	1
Cash Drawer for +12V or +24V drawer, dual drawer support with Y Cable	1
+24V out for printer	1
Status LED for Power, Standby, Sleep and Faults	1
Remote Power Switch for Aures's USB-C based products	1
I/O Ports Side Panel	
USB-C POS connection, with DP 5V/9V/15V/20V 3 amps, data and ALT video	1
Power +19V out for POS for 3 in on cable	1
LAN Pass through, passive connection for 3 in 1 cable	1
USB 3.0 in, for USB 2.0 or 3.0 to POS system for 3 in 1 cable	1
Power in +24V 180W (or 230W)	1

Rear I/O Panel



Side I/O

Connection to Host POS Computer

There are two methods to connect the HUB-X to a host POS computer:

1. The most common method is using an Aures custom USB-C cable.
2. For legacy products, a "3 in 1" cable is utilized.

All connections to the host POS computer are made via the side connectors on the HUB-X. The Power In port for the HUB-X is also located on this side.

The HUB-X features a generic design but incorporates Power Delivery Vendor Defined Messages for specific functionalities unique to Aures Processor Module POS systems. Although these enhanced features are incompatible with older or non-Aures POS systems, the HUB-X remains broadly compatible with most POS systems, PCs, or tablets

Side Connections HUB-X

Android Tablets

The USB-C HUB-X is compatible with most Android tablets. It provides power to the tablet, maintaining its charge, and offers a wired Ethernet connection and video support through USB-C Alt Mode. Generally, an Android device will automatically install the necessary drivers for the Ethernet controller and USB ports. The installation of serial port drivers may vary depending on the device connected to the hub. For USB to serial controller compatibility, drivers are available on the Google Play Store. Apple iPads can also function with the HUB-X, provided the appropriate drivers, which are available for these devices.

Rear Panel IO

PoweredUSB Ports

The HUB-X features five PoweredUSB ports: four are rated at +12V and one at +24V. These ports are fully compliant with the PoweredUSB specification. You can download the specification here: PoweredUSB Specification. The +24V power supply is capable of managing the high peak currents typical of thermal and dot matrix printers that usually connect to the +24V port. The normal maximum sustained current is 1.5A for the +12V ports and 2.3A for the +24V port. For information on the combined load capacity of powered ports, please refer to the power budget section. All ports enter a power-down state in G2 (S5) standby mode, except for the +24V port, which remains powered. It's important to note that when not operating as PoweredUSB ports, these ports can function as standard USB 2.0 ports.

PoweredUSB Ports

USB 3.0 Port

The HUB-X includes six USB 3.0 ports. These ports operate as full USB 3.0 ports when connected to a host POS computer that supports USB 3.0, or when a USB-C cable is used. If the host POS computer does not support USB 3.0, the ports function as USB 2.0 ports. Regardless of the mode, each port can support a maximum of +5V at 900mA. For details on the combined load capacity of these ports, please consult the power budget section. Similar to the PoweredUSB ports, these USB 3.0 ports also power down in G2 (S5) standby mode.

USB 3.0 Ports

USB-C Ports

The I/O back panel of the device includes two USB-C ports. When connected using the 3-in-1 cable, these USB-C ports will only support USB 2.0. However, if connected to the host computer with a standard USB-C cable, they function as full USB-C ports. The first port supports Alt Mode Video. The maximum current output for each port is +5V at 3A. For information regarding the combined load capacity on powered ports, please refer to the power budget section. These ports power down in G2 (S5) standby mode.

Video support through the USB-C ports is available via the alternate mode, provided the host computer is compatible with this feature. Aures products are designed to support this functionality. It's important to note that only two lanes of DisplayPort video are supported, meaning adapters requiring four lanes will not be compatible. This configuration supports Ultra High Definition (UHD). The port is versatile, accommodating a wide range of video formats through USB-C video adapters/cables, including HDMI, DisplayPort, DVI, VGA, among others.

USB-C Ports

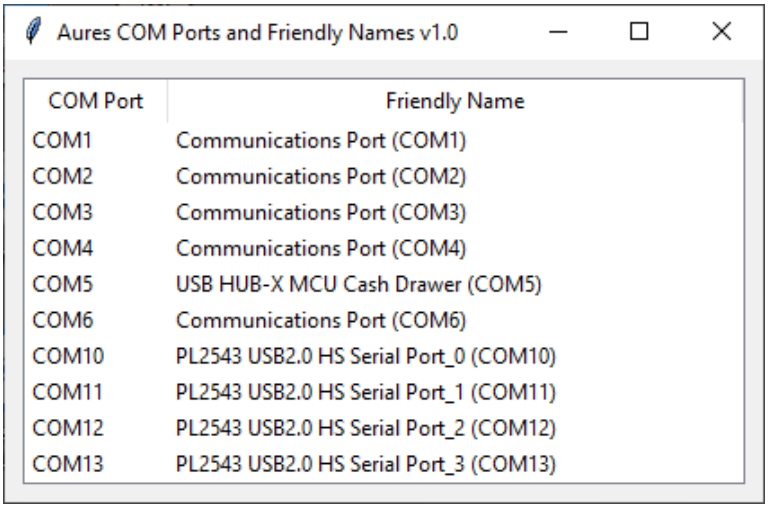
Serial I/O Ports

The HUB-X has four DB9 serial COM ports with Pin 9 programmable for +5V (up to 500mA) or +12V (up to 1A) power delivery. Managed by the onboard MCU, these settings are configurable via software and retained post power-off, resuming on power-up. For load details, see the power budget section. These ports power down in G2 (S5) standby. On Windows, they're mapped as COM 10 to COM 13, corresponding to COM A to COM D on the HUB-X. The PL2543 Windows driver is required for correct mapping.

DB9 Pin Out

DB9	Signal
Pin 1	DCD/+5V
Pin 6	DSR
Pin 2	RD
Pin 7	RTS
Pin 3	SD
Pin 8	CTS
Pin 4	DTR
Pin 5	GND
Pin 9	RI/+5V/+12V

Yuno B Mapping

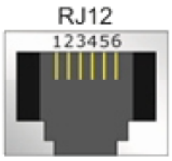


Serail Ports

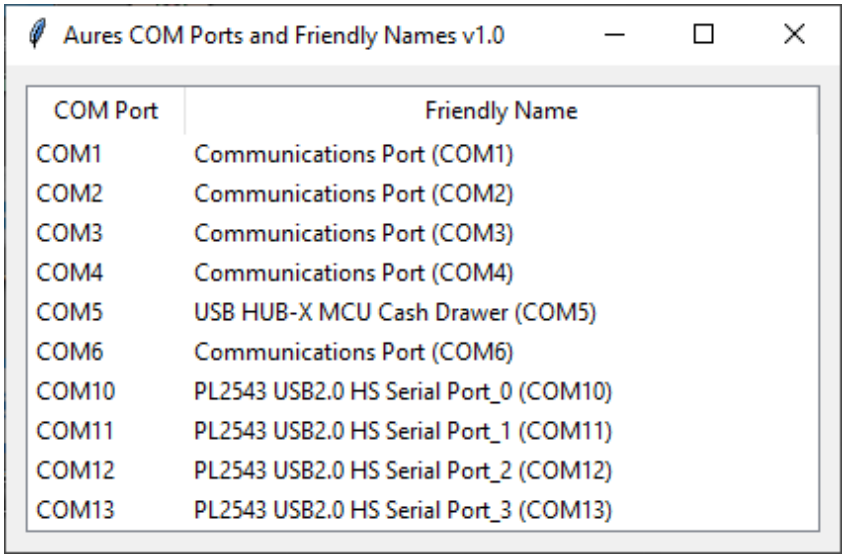
Cash Drawer Port

The cash drawer is designed to support both +12V and +24V configurations. Control functionality is provided by the onboard microcontroller unit (MCU), ensuring software compatibility with KL18.1, KL20, Yuno II, and CDA cash drawer circuits. Operational commands for the cash drawer are transmitted to the serial ports mapped by the MCU. The pulse width modulation for these drawers is adjustable through these commands. For detailed information on these commands, refer to the software section of this document.

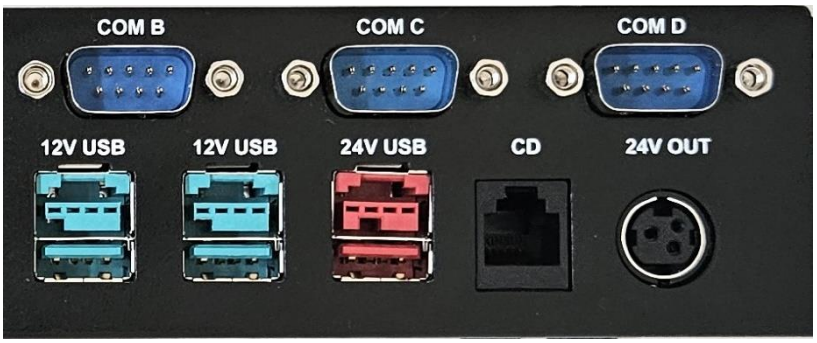
PIN	Description
1	Ground
2	Drawer 1 Solenoid
3	Drawer Status
4	+24V
5	Drawer 1 Solenoid
6	Ground



Yuno B Mapping



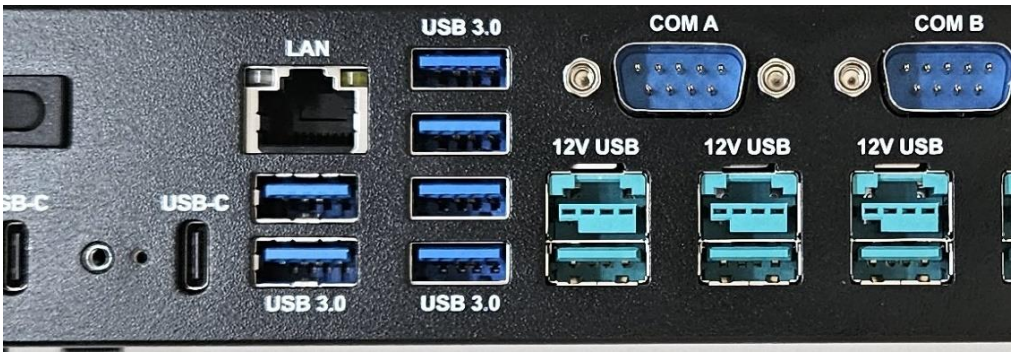
Cash Drawer Port, marked CD



Ethernet Port

The HUB-X is equipped with the ASIX AX88179A Gigabit Ethernet USB 3.0 SuperSpeed controller, supporting Wake-on-LAN functionality. This controller remains operational even with a USB 2.0 connection. While the Ethernet port is typically not used when employing the 3-in-1 cable, due to the preference for the LAN Pass Through connection, it can be utilized as a secondary Ethernet port if needed.

Ethernet LAN Port



Ethernet Pass Through Ports

The HUB-X features two Ethernet pass-through ports, designed to facilitate the connection of the Ethernet network via the 3-in-1 cable. These ports are entirely passive, containing no active components, and serve solely to link the external Ethernet network cable to the host POS controller cable.

Typically, these pass-through ports are not utilized when connecting via the USB-C cable, as the HUB-X's built-in Ethernet controller is preferred. This configuration allows for a single-cable connection to the host POS computer.

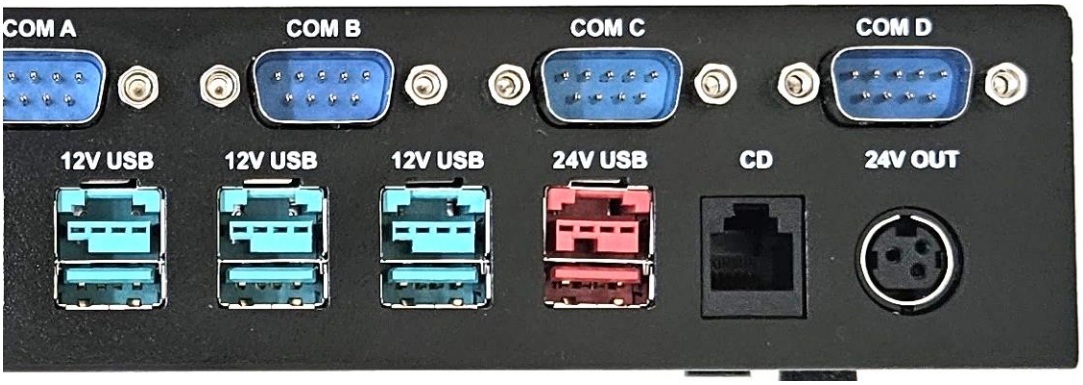
In specific setups, such as with a Yuno II equipped with an i5 processor module where vPro support is needed, the LAN Pass-Through is used. In such scenarios, a LAN cable would connect the Yuno II's AD LAN controller, which supports vPro with the i5 processor, to the network.

Ethernet Pass Through Ports

24V Out Port

The +24V out port on the device provides power to POS printers that are not equipped with PoweredUSB. It features a 3-pin DIN connector, which is standard for most POS printers. This port can be utilized simultaneously with the +24V PoweredUSB port.

24V Out



Status LED

The Status LED on the HUB-X is an RGB LED designed to indicate various statuses of the HUB beyond just power and operational states.

Status LED Color

Status	3 in 1 Cable	USB-C Cable
Not Powered	Off	Off
Powered, Standby	Red Steady	Amber Steady
Powered Up, HUB-X Connected	Green Steady	Blue Steady
Powered, Sleep Mode	Green Steady	Blue Flashing
Over Current detected +24V Supply	Flashing Yellow	Flashing Yellow
Over current detached +12VSupply	Flashing Amber	Flashing Amber
Over Current detected +19V Supply	Flashing Red	Flashing Red

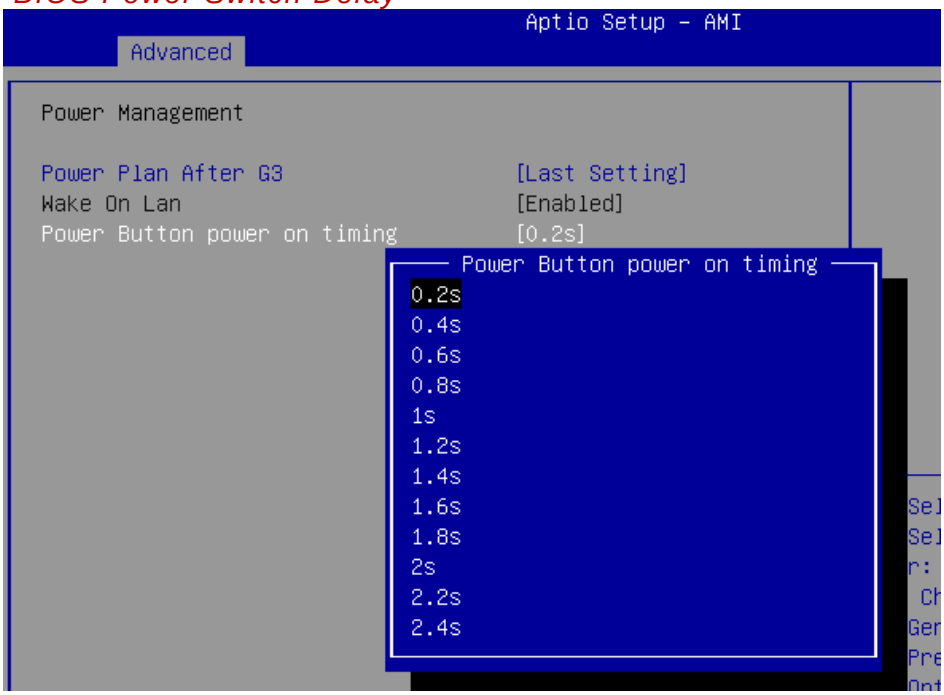
Status LED

Remote Power Switch

When connected to an Aures POS system via a USB-C cable, the HUB-X allows for the system to be powered on and off using a remote power switch. This switch functions identically to those found on the processor module and the Yuno II AD board, allowing either switch to be used for powering up or shutting down the unit. Note that this switch is not utilized when employing the 3-in-1 cable.

The remote power switch on the HUB-X operates in accordance with the BIOS settings for the processor module's power button, as detailed below. By default, the switch requires a minimum press duration of 0.2 seconds to activate. Holding the power button down for ten seconds triggers a hard reset of the processor module.

BIOS Power Switch Delay



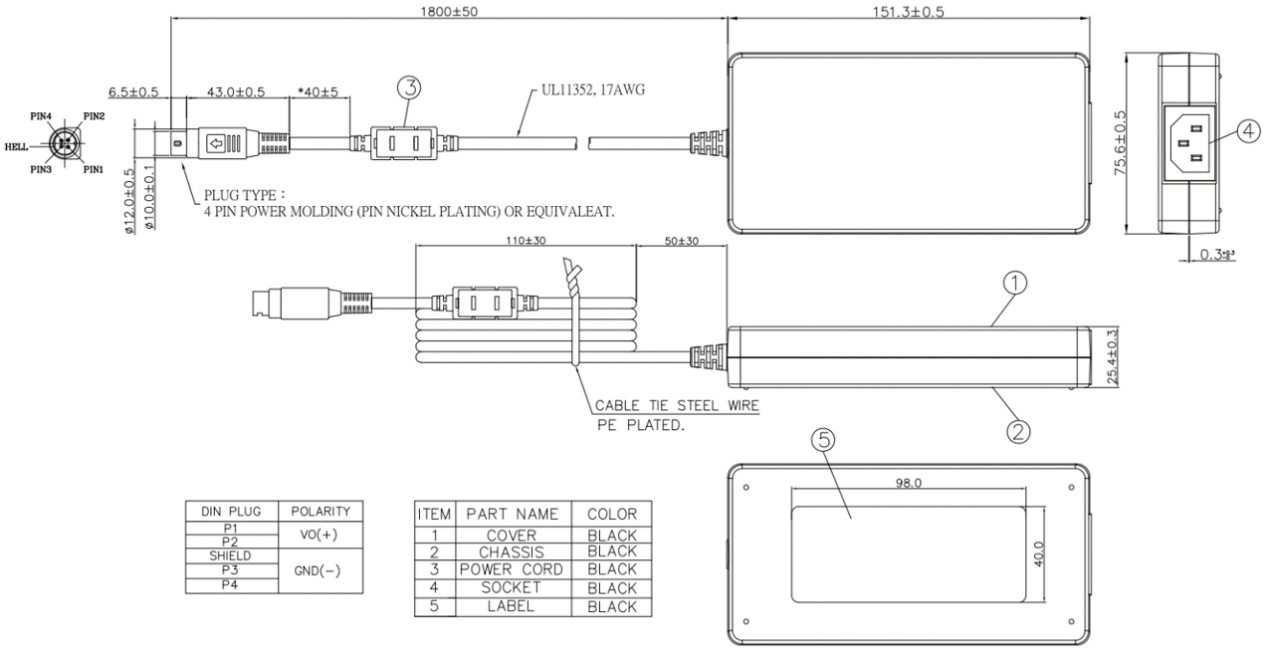
Remote Power Switch

Power IN +24V

The Aures POS HUB-X is powered by an external 180W power supply adapter, which connects to the HUB-X via a locking connector at the side's +24V in port. This adapter utilizes a C14 power cord and supports a 100-240V input rating. It meets all standard safety requirements and is FCC Class B certified.

POWER IN +24V

Power Supply Dimension



USB-C to Host POS Port

Using a USB-C cable to connect the HUB-X to the host POS system simplifies setup, as only one cable is required. This cable efficiently transmits power, data, and video signals without loss of quality for lengths up to 3 meters.

The port delivers up to 60W of power to the POS system, adhering to the standard USB-C Power Delivery (PD) protocol. Initially powering up at 5V, it negotiates the PD requirements of the connected device, typically achieving 20V at 3 amps (60W) with an Aures processor module. The PD controller supports various PD voltages: +5V, +9V, +15V, and +20V, all at 3 amps. Additionally, this port is capable of receiving DisplayPort (DP) video data via Alt Video Mode, supporting two lanes of DP data at the first USB-C port on the rear I/O panel.

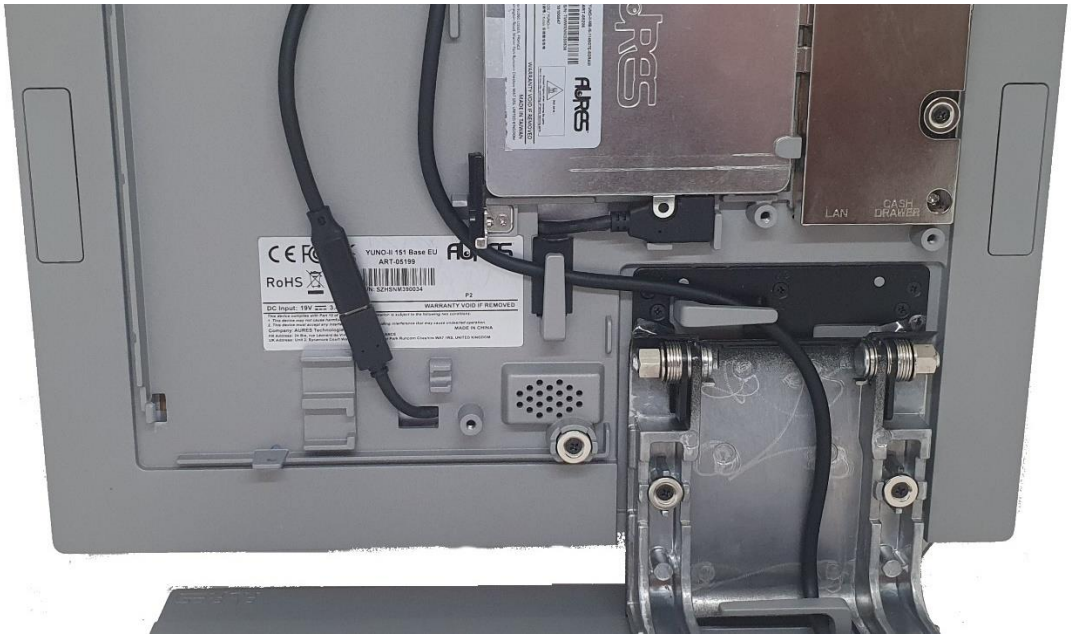
The USB-C connector is compatible with standard USB-C cables, including those with a standard locking mechanism featuring a #2 threaded hole, as well as the Aures heavy-duty locking connector with a #3 thread screw hole.

Aures Heavy Duty USB-C Connector

A custom 1.8-meter (6ft) cable has been designed for connecting the Aures POS HUB to Aures POS computers, including the Yuno II, Jazz, Jazz Pole, and Twist models. When using this cable, neither the I/O module nor the power supply adapter is needed for these computers, as the single USB-C cable suffices for all connections to the POS.

The cable designed for the HUB-X is an extension type, featuring a receptacle (female) connector for the computer side and a plug (male) connector for the hub side. On the computer end, the existing cable, typically used for connecting to the I/O module, plugs into this extension cable.

Connection to YUNO II



The HUB-X is universally compatible with any standard USB-C cable, facilitating connections to a wide range of tablets and computers equipped with a USB-C interface. It is capable of powering and charging Android tablets or Windows-based notebooks in many instances. While some tablets might only offer USB 2.0 functionality over their USB-C connections, limiting the HUB to USB 2.0 speeds, the majority of devices are compatible with USB 3.0 speeds. Video support, if available on the connected device, is also accessible via the HUB. For devices lacking USB-C compatibility, connections can still be established using USB 3.0, USB 2.0, or micro-USB cables to USB-C.

3 in 1 Cable

The 3-in-1 cable, an upgraded version of the one used for the KL18.1 and KL20 HUBs, measures 1.8 meters (6 feet) in length. It comprises three distinct cables:

- +19V Power Cable
- CAT 7 Ethernet Cable
- USB 2.0 cable with Type A connectors at both ends

3 in 1 Cable

Power Budget

Power Budget Spread Sheet

In the majority of cases, calculating a power budget for the HUB-X with a POS system is not necessary, as these systems are typically not heavily loaded and most POS peripherals consume minimal power. The 180W power supply is generally sufficient for most configurations. However, for systems under heavy load, it is prudent to verify the power requirements. A valuable tool for this purpose is the Aures HUB-X Data Logger program. This program provides real-time data on the power consumption of the HUB-X. To facilitate easy calculation of the power budget, this spreadsheet has been provided.

Typical Max Loading

Supply	Ports or Device	Number of Ports	Voltage	Max Amps	Used Amps	Typical Max Watts	Loads
+24V In	PoweredUSB +24V	1	24	2.30	2.30	55.20	Printer
+24V to +19V	USB-C	0	19	3.20	1.80	0.00	YUNO II POS System
	Power POS +19.5	1	19	3.40	1.80	34.20	YUNO B POS System
24V to +12V	PoweredUSB +12V	4	12	1.50	1.00	48.00	4 X 12V PoweredUSB Devices
	Serial Ports	4	12	1.00	0.25	12.00	4 X 12V Power COM Ports Devices
24V to +5V	USB 3.0	6	5	0.90	0.20	6.00	6 X USB 3.0 Devices
	USB-C	2	5	3.00	0.20	2.00	2 X USB-C Devices
	Electronics	1	5	3.00	3.00	15.00	Interanl Electroins
Total						172.40	Watts Used

Typical POS System

Supply	Ports or Device	Number of Ports	Voltage	Max Amps	Used Amps	Typical Max Watts	Loads
+24V In	PoweredUSB +24V	1	24	2.30	2.30	55.20	Printer
+24V to +19V	USB-C	0	19	3.20	1.80	0.00	YUNO II POS System
	Power POS +19.5	1	19	3.40	1.00	19.00	YUNO B POS System
24V to +12V	PoweredUSB +12V	2	12	1.50	0.75	18.00	2 X 12V PoweredUSB Devices
	Serial Ports	1	12	1.00	0.25	3.00	1 X 12V Power COM Ports Devices
24V to +5V	USB 3.0	3	5	0.90	0.20	3.00	6 X USB 3.0 Devices
	USB-C	1	5	3.00	0.20	1.00	2 X USB-C Devices
	Electronics	1	5	3.00	3.00	15.00	Interanl Electroins
Total						114.20	Watts Used

Current/Volage/Power Monitoring

A significant enhancement to the HUB-X is the addition of a hardware-based Current/Voltage/Power monitoring capability. This feature serves as an effective tool for detecting and troubleshooting hardware issues, both locally and remotely. Furthermore, it provides detailed insights into the total carbon footprint of the Point of Sale (POS) system. For comprehensive information on the data accessible through this feature, please refer to the sections discussing software commands and the HUB-X Data Logger later in this manual.

Software Commands

The HUB-X is equipped with commands that manage various functions, including controlling cash drawer operations, setting the COM port voltage supply (when utilized), and accessing power monitoring statistics and values. These commands are accessible through a virtual serial port interfacing with the HUB-X's MCU.

Function, HUB-X MCU	Serial Commands	Return	Action
Read S/N (nonvolatile)	0x1B 0x78 0x01	<13 characters>	Read serial number
Read FW Version	0x1D 0x41 0x30	JE210041	Read 8-bytes version
CD Open	0x1B 0x70 0x00 T1 T2		Open Cash Drawer 1
CD Open	0x1B 0x70 0x30 T1 T2		Open Cash Drawer 1
CD Open	0x1B 0x70 0x01 T1 T2		Open Cash Drawer 2
CD Open	0x1B 0x70 0x31 T1 T2		Open Cash Drawer 2
Enable ASB	0x1D 0x61 0x01		disable Cash Drawer 1 Auto Status Back
Disable ASB	0x1D 0x61 0x00		enable Cash Drawer 1 Auto Status Back
Read ASB status	0x1D 0x62 0x00	0 or 1	read CD1 ASB state
CD Read Status	0x1D 0x72 0x02	0 or 1	Read I_CD_STST
CD Read Status	0x1D 0x72 0x32	0 or 1	Read I_CD_STST
Set Serial Voltage	0x1B 0x71 0x00	C15V	Set Serial A to +5V
Set Serial Voltage	0x1B 0x71 0x01	C112	Set Serial A to +12V
Set Serial Voltage	0x1B 0x71 0x02	C1RI	Set Serial A to RI
Read Serial Voltage	0x1B 0x71 0x0F	C15V/C112/C1RI	Read Status Serial A
Set Serial Voltage	0x1B 0x72 0x00	C25V	Set Serial B to +5V
Set Serial Voltage	0x1B 0x72 0x01	C212	Set Serial B to +12V
Set Serial Voltage	0x1B 0x72 0x02	C2RI	Set Serial B to RI
Read Serial Voltage	0x1B 0x72 0x0F	C25V/C212/C2RI	Read Status Serial B
Set Serial Voltage	0x1B 0x73 0x00	C35V	Set Serial C to +5V
Set Serial Voltage	0x1B 0x73 0x01	C312	Set Serial C to +12V
Set Serial Voltage	0x1B 0x73 0x02	C3RI	Set Serial C to RI
Read Serial Voltage	0x1B 0x73 0x0F	C35V/C312/C3RI	Read Status Serial C
Set Serial Voltage	0x1B 0x74 0x00	C45V	Set Serial D to +5V
Set Serial Voltage	0x1B 0x74 0x01	C412	Set Serial D to +12V
Set Serial Voltage	0x1B 0x74 0x02	C4RI	Set Serial D to RI
Read Serial Voltage	0x1B 0x74 0x0F	C45V/C412/C4RI	Read Status Serial D
RESET Energy ACCs	0x1B 0x76 0xFF		Reset Energy Accumulators of all measured Channels
Read +24V IN Power	0x1B 0x75 0x00	xxx.ddd	Read +24V IN Power, Total System Power
Read +12V OUT Power	0x1B 0x75 0x01	xxx.ddd	Read +12V OUT Power
Read +24V OUT Power	0x1B 0x75 0x02	xxx.ddd	Read +24V OUT Power
Read +19V OUT Power	0x1B 0x75 0x03	xxx.ddd	Read +19V OUT Power
Read +24V IN Whrs	0x1B 0x76 0x00	xxxxxxx.ddd	Read the accumulated Whrs of +24V IN
Read +12V OUT Whrs	0x1B 0x76 0x01	xxxxxxx.ddd	Read the accumulated Whrs of +12V OUT
Read +24V OUT Whrs	0x1B 0x76 0x02	xxxxxxx.ddd	Read the accumulated Whrs of +24V OUT
Read +19V OUT Whrs	0x1B 0x76 0x03	xxxxxxx.ddd	Read the accumulated Whrs of +19V OUT
Read +24V IN Voltage	0x1B 0x77 0x00	xxx.ddd	Read +24V IN Voltage
Read +12V OUT Voltage	0x1B 0x77 0x01	xxx.ddd	Read +12V OUT Voltage
Read +24V OUT Voltage	0x1B 0x77 0x02	xxx.ddd	Read +24V OUT Voltage
Read +19V OUT Voltage	0x1B 0x77 0x03	xxx.ddd	Read +19V OUT Voltage
Power On Times(nonvolatile)	0x1B 0x76 0xFB	xxxxxx	Read the Power On Times
Power On Hours(nonvolatile)	0x1B 0x76 0xFC	xxxxxh xxm	Read the Power On Hours
Read +24V IN Whrs(nonvolatile)	0x1B 0x76 0xFD	xxxxxxx.ddd	Read the accumulated Whrs of +24V IN (nonvolatile)
Read All V,PWR,Wh	0x1B 0x76 0xFE	<V>*4,<PWR>*4,<WH>*4	Real all voltage, Power, Whrs data in sequence

The commands mentioned above are typically utilized by utilities provided by Aures and are not normally directly used by the user unless they integrate some of these functions into their own software. The software provided by Aures includes the following, with further details available later in this document:

- OPOS drivers, the same as those used on the Yuno II, KL18.1, KL20 HUB, CDM, and JEOS.
- HUB-X Configuration/Test Utility for conducting CD tests and managing COM port power.
- HUB-X Data Logger.

Read Firmware Version

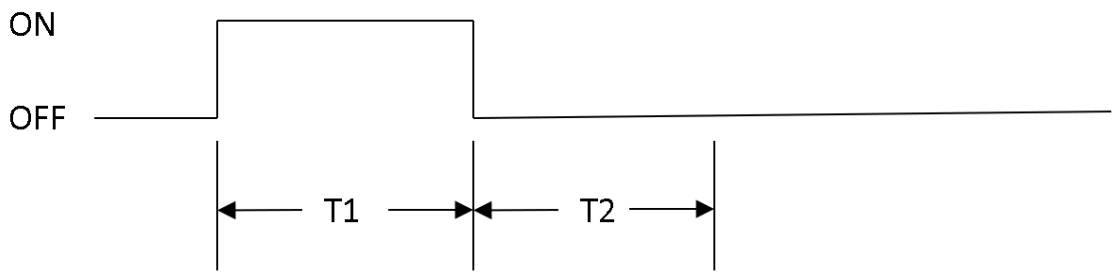
Read Firmware Version	0x1D	0x41	0X30

This command retrieves the current firmware version of the MCU, returning it as an ASCII string.

Open Cash Drawer

Open Cash Drawer 1	0x1B	0x70	0X00	T1	T2
Open Cash Drawer 2	0x1B	0x70	0X01	T1	T2

The command triggers the solenoid to open cash drawer one (pin 2) or two (pin 5) on the RJ12. Pulse timing, controlled by the command's last two characters, follows the formula TX x 2ms (e.g., 0x7D = 250ms). This timing works for most drawers. To protect the solenoid, the MCU limits activation to once every two seconds, ignoring any subsequent commands within 1.5 seconds.



This command is designed to be compatible with the cash drawer commands of many POS printers in the market. This compatibility ensures that if a POS application already implements these commands, they will function seamlessly when mapped to the correct serial port.

Read Cash Drawer Open Status

Read Cash Drawer Open Stats	0x1D	0x72	0X02

Once this command is issued, the MCU will transmit a single ASCII character to indicate the status of the drawer open switch. Please note that if two drawers are connected via a 'Y' cable, the status will indicate 'open' if either drawer is open. The status signal is shared.

Drawer Open	0x01
Drawer Closed	0x00

This command is compatible with the cash drawer commands of many POS printers on the market. This ensures that if a POS application already has these commands implemented, it will function seamlessly when mapped to the correct serial port.

Automatic Status Back (ABS)

Enable ASB	0x1D	0x61	0X01
Disable ASB	0x1D	0x61	0X00

When ASB (Automatic Status Back) is enabled, the MCU will transmit an ASCII string whenever the cash drawer's open switch changes status. ASB is disabled by default upon power-up and must be enabled after each power cycle to be operational.

ASB transmits a 4-byte ASCII string message whenever there is a change in the drawer's status.

ASB Message Drawer Opened	0x10	0x00	0X00	0x0F
ASB Message Drawer Closed	0x14	0x00	0x00	0x0F

This is an old legacy command and is not recommended for use in new software.

Read Status Serial Port Power Configuration

Read Status Serial A	0x1B	0x71	0x0F
Read Status Serial B	0x1B	0x72	0x0F
Read Status Serial C	0x1B	0x73	0x0F
Read Status Serial D	0x1B	0x74	0x0F

The command retrieves the status of the HUB's serial ports power configuration and returns a 4-byte ASCII string.

Byte 1 and 2 = Port #	**Byte 3 and 4 = Power State DB9 Pin 9**
C1 = Port 1 C2 = Port 2 C3 = Port 3 C4 = Port 4	RI = Pin 9 is Ring Indicator Signal Input 5V = Pin 9 supplies +5V power up to 1 amp 12 = Pin 9 supplies +12V power up to 1 amp

Set Serial Port Power Configuration

Set Serial A to +5V	0x1B	0x71	0x00
Set Serial A to +12V	0x1B	0x71	0x01
Set Serial A to RI	0x1B	0x71	0x02
Set Serial B to +5V	0x1B	0x72	0x00
Set Serial B to +12V	0x1B	0x72	0x01
Set Serial B to RI	0x1B	0x72	0x02
Set Serial C to +5V	0x1B	0x73	0x00
Set Serial C to +12V	0x1B	0x73	0x01
Set Serial C to RI	0x1B	0x73	0x02
Set Serial D to +5V	0x1B	0x74	0x00
Set Serial D to +12V	0x1B	0x74	0x01
Set Serial D to RI	0x1B	0x74	0x02

The command writes to the HUB's serial ports power configuration. Upon completion, it returns a 4-byte ASCII string indicating the new status.
.

Byte 1 and 2 = Port #	**Byte 3 and 4 = Power State DB9 Pin 9**
C1 = Port 1 C2 = Port 2 C3 = Port 3 C4 = Port 4	RI = Pin 9 is Ring Indicator Signal Input 5V = Pin 9 supplies +5V power up to 1 amp 12 = Pin 9 supplies +12V power up to 1 amp

Definitions

+24V IN
The +24V IN refers to the Voltage, Watts, and Watt-hours utilized by the HUB-X and any devices powered by the HUB-X, including the POS system.

+12V OUT
The +12V OUT denotes the Voltage, Watts, and Watt-hours consumed by the HUB-X and any devices connected to the HUB-X's +12V power bus. This includes devices attached to the +12V PoweredUSB ports, any COM port where the power is set to +12V, and the internal +5V power bus.

+24V OUT
The +24V OUT represents the Voltage, Watts, and Watt-hours utilized by the HUB-X and any devices powered by the HUB-X's +24V power bus. This encompasses the +24V PoweredUSB port, the +24V out connector, and the power supply for the USB-C ports.

+19V OUT
The +19V OUT indicates the Voltage, Watts, and Watt-hours used by the HUB-X specifically for the +19V output to the 3-in-1 cable.

Power On Times
This is the number of times AC power has been cycled during its lifetime. It exclusively counts the cycles of AC power and does not include the usage time of the POS system. This is a nonvolatile value.

Power On Hours
This indicates the total hours and minutes the HUB has been powered throughout its lifetime. The power status of the POS system has no impact on this value. It is a nonvolatile value.

+24V IN Whrs
This measures the total Watt-Hours consumed by the HUB-X over its lifetime. This is a nonvolatile value.

Read Current Voltage

Read +24V IN Voltage	0x1B 0x77 0x00
Read +12V OUT Voltage	0x1B 0x77 0x01
Read +24V OUT Voltage	0x1B 0x77 0x02
Read +19V OUT Voltage	0x1B 0x77 0x03

These commands retrieve the status of the HUB's voltage buses, presenting it in an ASCII string format as "xxx.ddd" followed by a carriage return character.

Read Current Power

Read +24V IN Power	0x1B 0x75 0x00
Read +12V OUT Power	0x1B 0x75 0x01
Read +24V OUT Power	0x1B 0x75 0x02
Read +19V OUT Power	0x1B 0x75 0x03

These commands retrieve the current power usage status of the HUB's voltage buses, presenting it as an ASCII string formatted as “xxx.ddd” followed by a carriage return character. The value represents power usage in Watts.

Read Accumulated Power Usage

Read +24V IN Whrs	0x1B 0x76 0x00
Read +12V OUT Whrs	0x1B 0x76 0x01
Read +24V OUT Whrs	0x1B 0x76 0x02
Read +19V OUT Whrs	0x1B 0x76 0x03

These commands retrieve the accumulated power usage status of the HUB's voltage buses, presenting it as an ASCII string formatted as “xxxxxxx.ddd” followed by a carriage return character. The value represents accumulated power usage. This value is cleared on any AC power cycle or if the RESET Energy ACC command is sent.

Read All V,PWR,Wh

Read All V,PWR,Wh	0x1B 0x76 0xFE

This command returns the same information as the aforementioned nine commands, but consolidates it into a single ASCII string followed by a carriage return character.

RESET Energy ACC's

RESET Energy ACCs	0x1B 0x76 0xFF

This command resets all accumulated power values, except for the total +24V IN Whrs. No value is returned upon execution.

Read +24V In Whrs (nonvolatile)

Read +24V IN Whrs (nonvolatile)	0x1B 0x76 0xFD

This command retrieves the total power used over the lifetime of the HUB-X, presenting the data as an ASCII string formatted as 'xxxxxxx.ddd', followed by a carriage return character.

Power On Times

Power On Times(nonvolatile)	0x1B 0x76 0xFB

This command retrieves the total number of AC power cycles experienced by the HUB-X over its lifetime, displaying the data as an ASCII string formatted as 'xxxxxx', followed by a carriage return character.
.

Power ON Hours

Power On Hours(nonvolatile)	0x1B 0x76 0xFC

This command retrieves the total number of hours and minutes the HUB-X has been powered on over its lifetime, displaying the data as an ASCII string formatted as 'xxxxxxh xxm', followed by a carriage return character.

Read S/N

Read S/N (nonvolatile)	0x1B 0x78 0x01

Reads the serial number of the unit, which is returned as a 13-byte ASCII string. This matches the serial number on the label located on the bottom of the unit.

Software Utilities

All these programs are available on the Aures support website under the HUB-X product listing.

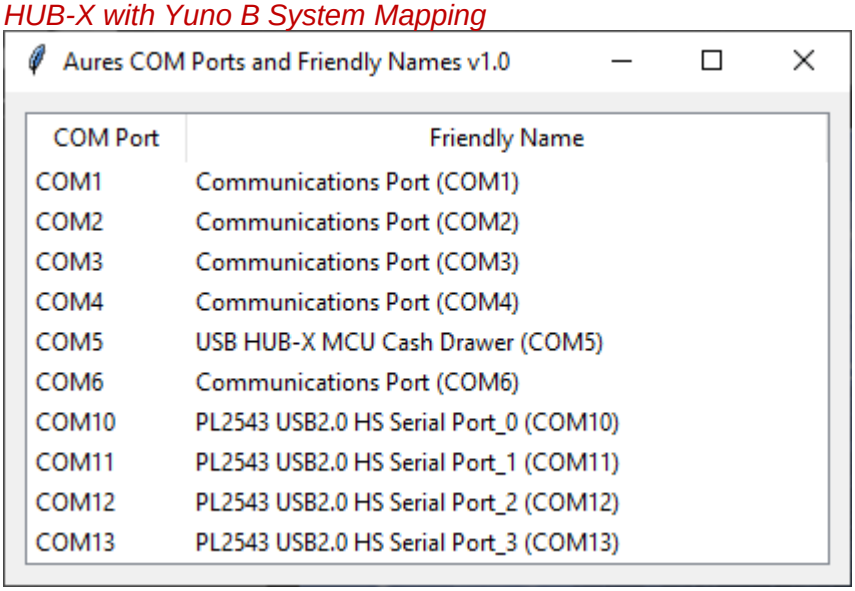
Display COM Ports

This is an Aures-supplied program utility to display all available COM ports in a Windows System. This program displays both the COM port number and the COM port's "Friendly Name," which is stored in the Windows registry. The name of the compiled Python program is “display-com-ports.exe”, supplied with all its dependent modules in standalone form. It does not require Python to be installed.

Windows is notorious for its handling of USB serial ports, often reassigning port numbers if a USB serial device is added and later removed. These unused ports prevent other COM ports from using previously assigned numbers. These ports can be viewed in the device manager by selecting “Show Hidden Devices”. Aures developed this program to help identify the ports to which Windows may have reassigned connections. This Python program is generic and will work on any Windows computer.

For the HUB-X, the COM A - COM D ports are hard-mapped to COM 10 – COM 13. If using an Aures-supplied Windows OS, this mapping should occur correctly. If creating a new Windows OS image, an AC hard reset may be needed for Windows to remap these ports correctly. The PL2543 driver must be installed for this functionality. The HUB-X MCU Cash Drawer port may vary depending on the OS image. This utility will assist in locating it. Normally, it will be mapped to COM5, but this port cannot be locked. Typically, this is not an issue with a standard OS image. Linux systems do not have these issues.

HUB-X with Yuno B System Mapping



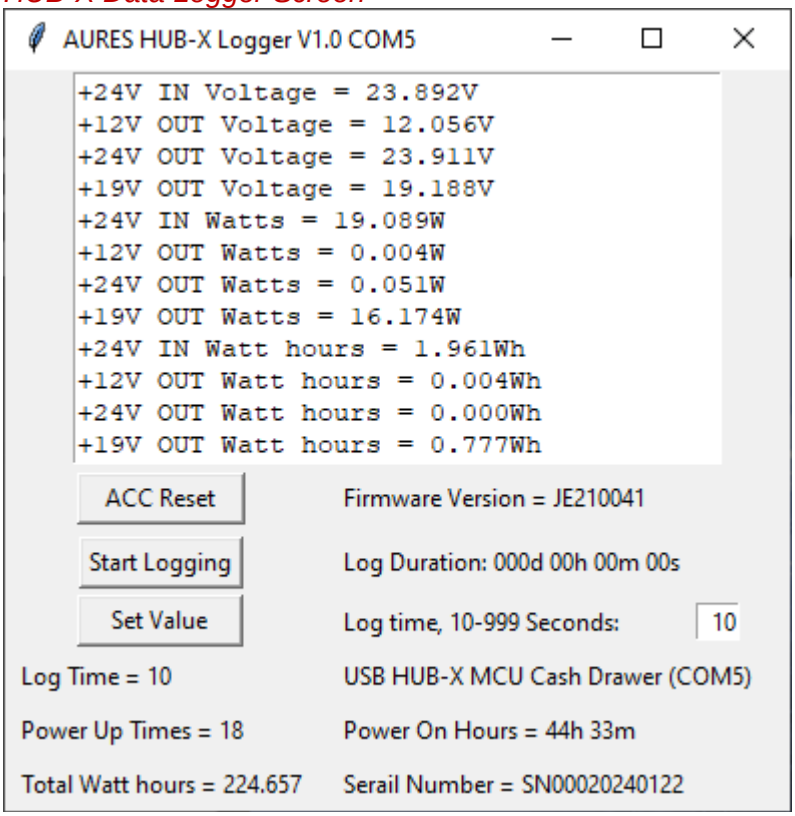
HUB-X Data Logger

The HUB-X Data Logger program, developed by Aures, provides sample code demonstrating how to access power consumption data from the HUB-X. This program, written in Python, is available both as source code and as a compiled Python program, “hub-x-data-logger-v1.0.exe”. It is supplied with all its dependent modules in standalone form and does not require Python to be installed.

When run, the program displays all current power data as shown in the screenshot below. There are three function buttons, with the following functions:

- **ACC Reset**: Clears all Watt-hour accumulators except the Total Watt-hours.
- **Start/Stop Logging**: Begins or ends the logging of data to a .csv file, which includes all display window data plus a timestamp.
- **Set Value**: Sets the logging/sample rate for reading the data. The range is 10-999 seconds.

HUB-X Data Logger Screen



Data Format .csv Log file

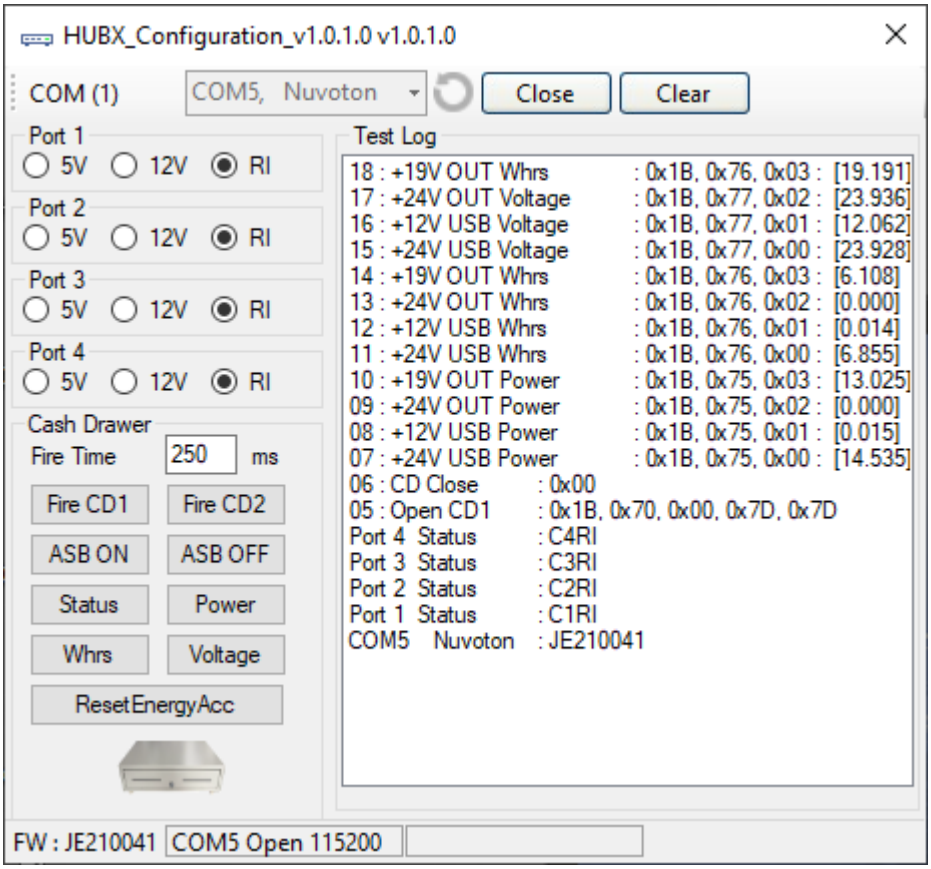
```
timestamp,+24V IN,+12V OUT,+24V OUT,+19V OUT,+24W IN,+12W OUT,+24W OUT,+19W OUT,+24Wh IN,+12Wh OUT,+24Wh OUT,+19Wh OUT
2024-01-26 15:42:51.096852,23.945,12.068,23.945,19.203,1.673,0.018,0.292,0.035,3.804,0.115,0.033,0.041
2024-01-26 15:43:01.413870,23.945,12.061,23.933,19.203,1.140,0.000,0.000,0.035,3.808,0.115,0.033,0.041
2024-01-26 15:43:11.743869,23.944,12.058,23.939,19.202,1.184,0.004,0.416,0.006,3.812,0.115,0.033,0.041
2024-01-26 15:43:22.063867,23.964,12.067,23.957,19.203,1.755,0.611,0.000,0.023,3.816,0.116,0.034,0.041
```

The .csv log data file is written in the folder where the logger program is located. Data is only written when “Stop Logging” is clicked. If logging is started again, a new file will be created upon stopping the logging. The interval between data recordings is controlled by the “Set Value” button.

The program automatically scans for the correct USB COM port used by the HUB-X MCU and then uses that COM port to access the data. The COM port's friendly name, along with the Firmware version and HUB-X serial number, are displayed in the data window.

HUB-X Configuration Utility

The HUBX Configuration Utility is utilized for setting the voltages of the COM ports, testing the Cash Drawer(s), and reading power statistics. To use this program, select the appropriate COM port from the drop-down menu, specifically the one associated with the JE21XXXX firmware.



Non-Aures Products

The HUB-X is engineered to be compatible not only with Aures's current product line but also with non-Aures products and future Aures offerings. This encompasses devices operating on various platforms, including Windows, Linux, Android, and Apple. Moreover, it seamlessly integrates with older Aures POS systems.

Compatible devices include:

- Android Tablets and Phones
- Windows Tablets and Notebooks
- Apple iPads
- Non-Aures POS systems

In our testing, the HUB-X demonstrated robust performance with several non-Aures products. The majority of these products were effectively managed in terms of I/O operations and secondary display functionalities. Additionally, the HUB-X efficiently powered and charged all tested USB-C devices.

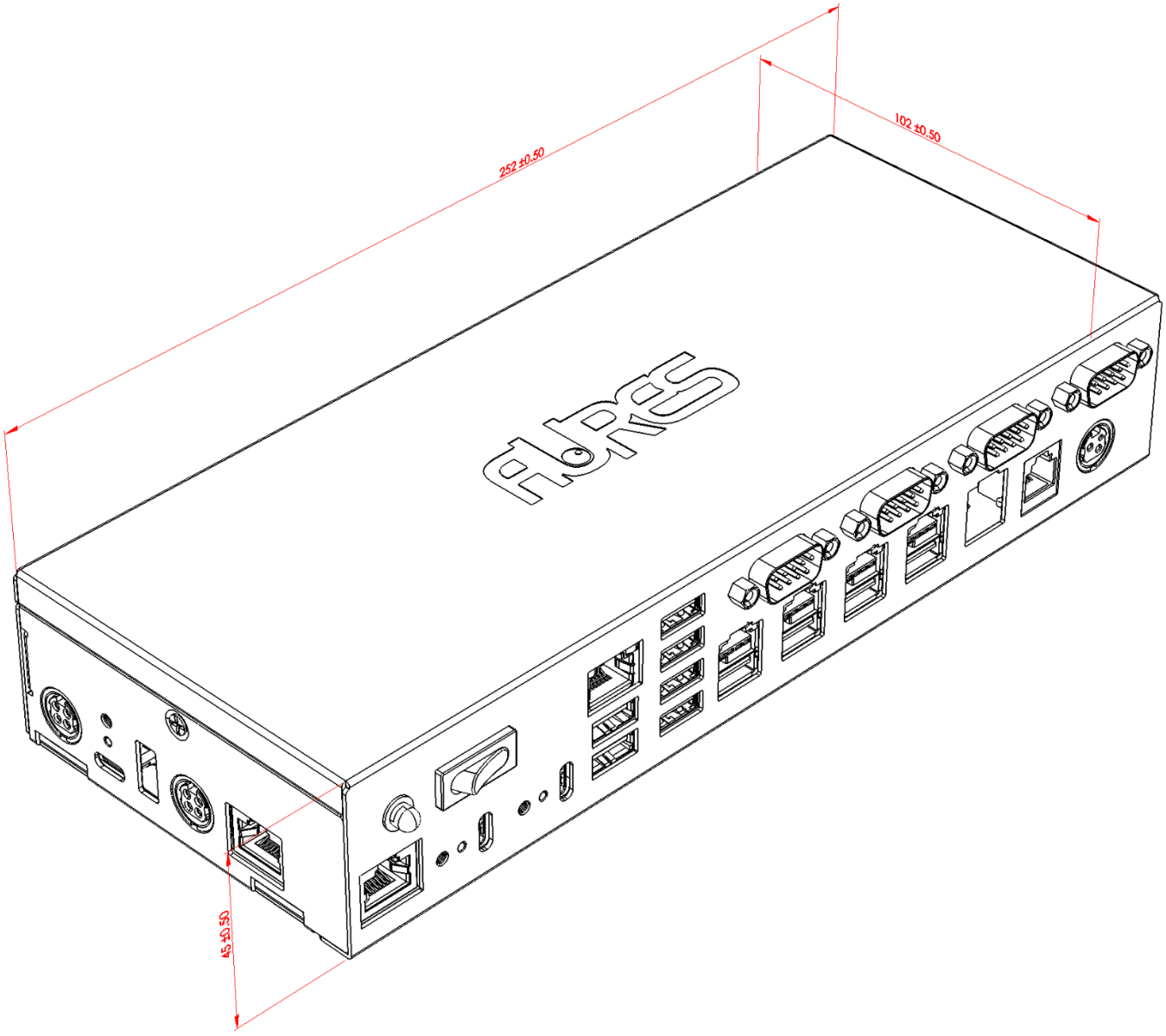
Other Ways to Connect the HUB-X

The HUB-X is versatile and can be connected to nearly any computer or POS system, even those that are self-powered. This can be accomplished using a USB 2.0 Type A to USB 2.0 Type A cable, linking the "USB IN" port of the HUB-X to a USB port on the target computer. For computers with a USB 3.X port, a USB-C to USB 3.X cable can be used, connecting to the HUB-X's USB-C POS port.
Essentially, any computer-based system with a USB 2.0 or USB 3.0 connection is compatible with the HUB-X. The cables required for these connections are readily available in the market.

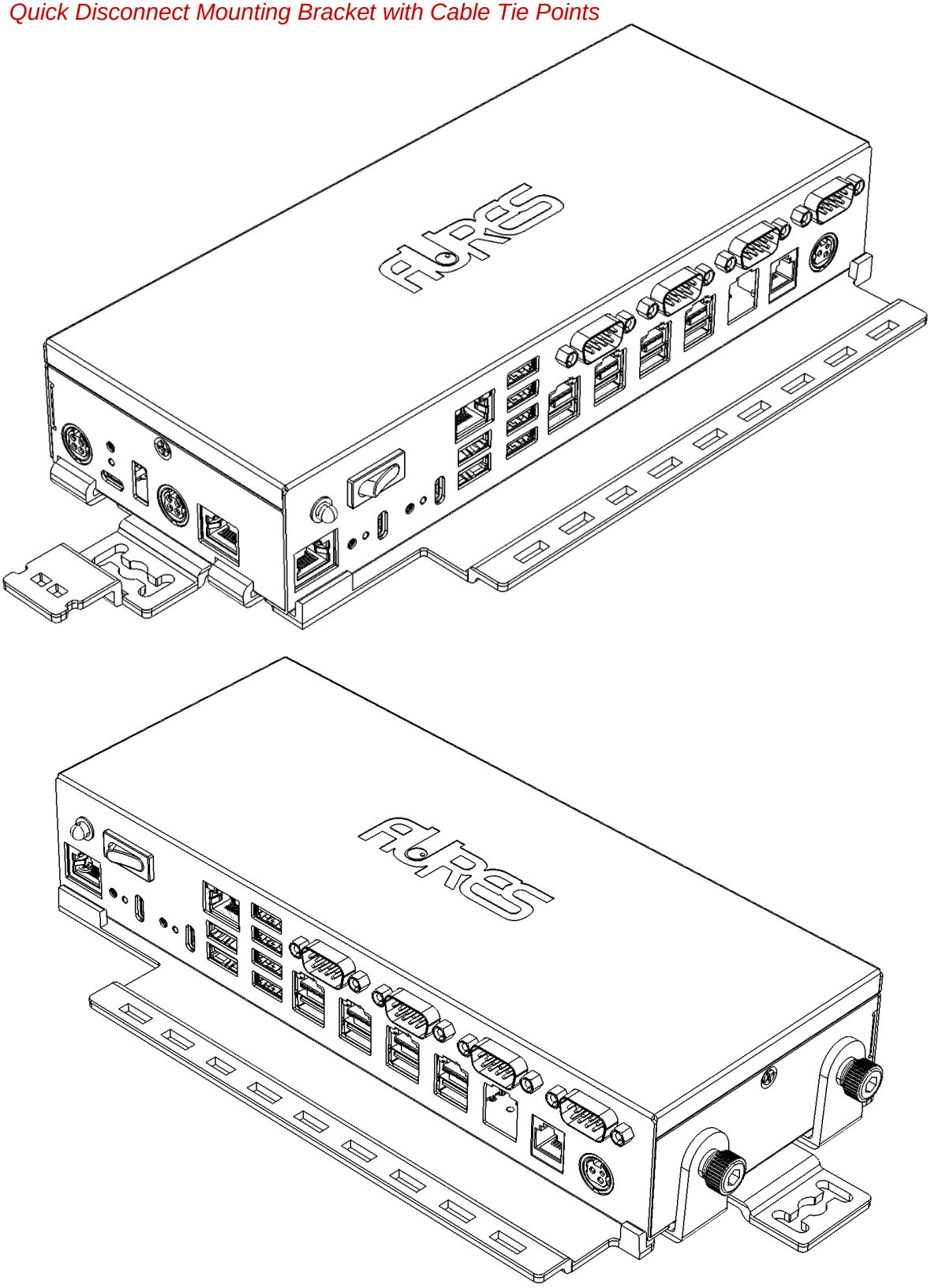
Mechanical

Should there be a need, 3D CAD files for the HUB-X are available upon request. These files can assist in addressing any mounting challenges that may arise.

Basic Dimensions



Quick Disconnect Mounting Bracket with Cable Tie Points



Mounting Bracket Hole Distance