

UE3300_W

100 m 5 Gbps Dual-Host Switching USB 3.2 Multi-Port Extender

User Manual | Version: V1.0

For industrial cameras, PTZ systems, conference rooms, test benches, remote USB peripherals, and professional system integration.

Model Number	UE3300_W
Product Positioning	100 m USB 3.2 Gen 1 multi-port extender (TX + RX)
Key Features	5 Gbps, dual-host selection, 3 TX + 4 RX USB device ports, CAT6a F/FTP, RS-232 / FSYNC, 24V PoC

Table of Contents

1. Safety Reminders
2. Product Introduction
3. Key Features
4. Technical Specifications
5. Package Contents
6. Panel Layout & Port Description
7. Installation & Operation
8. Advanced Control & API Commands
9. Troubleshooting & Notes
10. Warranty Service

1. Safety Reminders

Thank you for choosing the PANIO UE3300_W 100 m 5 Gbps Dual-Host Switching USB 3.2 Multi-Port Extender. Read this manual before installation and observe all safety procedures during mounting, cabling, operation, and maintenance.

Safety Instructions

- Properly ground the equipment and associated systems. Disconnect external power before installation, relocation, wiring changes, or cleaning.
- Use only the specified DC 24V/3.75A locking power adapter. Bidirectional PoC allows power to be supplied at either the TX or RX end; do not mix incompatible power supplies.
- Connect TX to RX using a single shielded CAT6a F/FTP cable wired straight-through (T568B to T568B). Do not use a crossover cable.
- The HDBT-USB3 RJ45 port is a dedicated USB extension link. Never connect it to an ordinary Ethernet switch, router, or unrelated network device.
- Avoid installation in environments with excessive heat, condensation, dust, oil fumes, corrosive or flammable gases, vibration, impact, or strong electromagnetic interference.
- Keep metal fragments, screws, and loose wire strands out of ventilation openings. Do not obstruct airflow or stack heavy objects on the units.
- Power off before attaching or removing USB, CAT6a, RS-232, FSYNC, or power cables; do not touch exposed terminals while live.
- Only qualified technical personnel should perform repair, disassembly, or firmware upgrades to prevent electric shock, hardware damage, or lost settings.
- Dispose of electrical equipment and electronic components in accordance with local recycling regulations; do not burn or discard them as ordinary household waste.

2. Product Introduction

PANIO UE3300_W is a professional USB 3.2 Gen 1 high-speed extension system that carries USB traffic for up to 100 m (328 ft) over one shielded CAT6a F/FTP cable. The USB interface supports a theoretical maximum signaling rate of 5 Gbps and is backward compatible with USB 2.0 and USB 1.1. The kit comprises one transmitter (TX) and one receiver (RX).

The transmitter offers two upstream host connections: HOST 1 (USB-C) and HOST 2 (USB-B). Select one host by automatic switching, the TX front-panel button, or RS-232 ASCII API commands. TX includes three local USB device ports and RX includes four remote USB device ports, for seven peripheral connections in total. Common applications include keyboards, mice, industrial and PTZ cameras, microphones, storage devices, scanners, and touchscreen interfaces.

Integrated features include RS-232 pass-through and device control, FSYNC GPIO signal pass-through, USB-C SERVICE ports for firmware maintenance, and bidirectional DC 24V Power over Cable (PoC). The dual-host design selects one host at a time: it does not enable two computers to operate the same USB peripherals simultaneously. The seven device ports are distributed between TX and RX, not all located at the receiver.

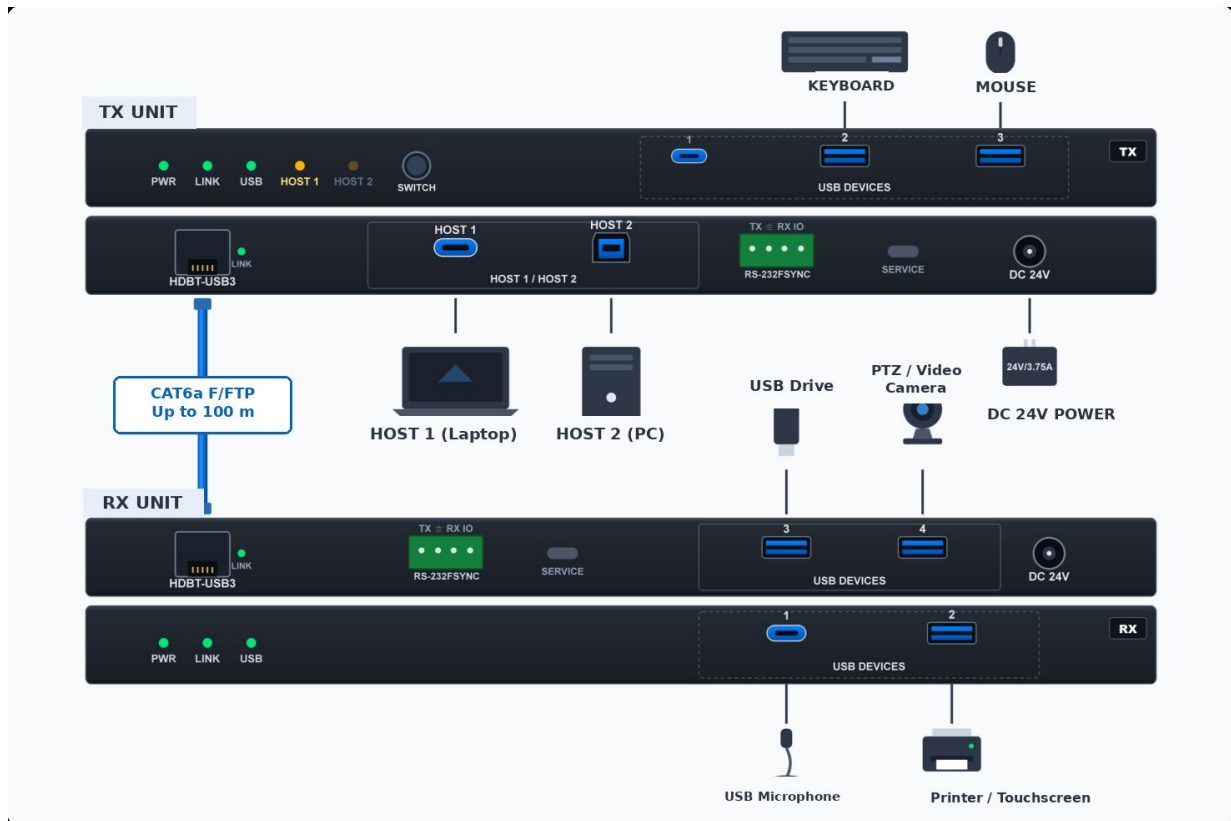


Figure 1. UE3300_W typical deployment: dual host selection, 100 m CAT6a link, and local/remote USB devices.

3. Key Features

- High-speed USB 3.2 Gen 1 interface with a theoretical 5 Gbps maximum rate and backward compatibility with USB 2.0 / USB 1.1.
- Extends USB over a single straight-through CAT6a F/FTP shielded cable for distances up to 100 m (328 ft).
- Dual-host selectable operation: USB-C HOST 1 or USB-B HOST 2; supports automatic host detection, manual front-panel selection, and ASCII API switching.
- Seven USB device ports distributed across both ends: TX has 1 × USB-C + 2 × USB-A; RX has 1 × USB-C + 3 × USB-A.
- Configurable per-port power behavior through API commands for the TX/RX USB device interfaces.
- Hardware acceleration supports efficient high-speed data synchronization and bulk transfer applications.
- RS-232 signal pass-through and ASCII API commands support control systems and industrial automation.
- TX-to-RX FSYNC GPIO pass-through for industrial-camera synchronization; default signal level 0–5 V.
- Bidirectional 24 V PoC: power either the transmitter or receiver to supply the other unit through the extension link.

- USB-C SERVICE port for maintenance, internal diagnostics, and firmware updates; normal USB extension is plug-and-play without a proprietary driver.

4. Technical Specifications

4.1 System Specifications

Item	Specification
Model Number	UE3300_W
System Architecture	USB 3.2 Gen 1 extender (1 × TX + 1 × RX); selects one of two host inputs
USB Standard	USB 3.2 Gen 1; backward compatible with USB 2.0 and USB 1.1
Maximum Data Rate	Up to 5 Gbps (theoretical USB 3.2 Gen 1 interface signaling rate)
Extension Distance	Up to 100 m (328 ft) via CAT6a F/FTP; local USB patch cable: 1.5 m
Extension Link	1 × dedicated HDBT-USB3 RJ45 link (TX ↔ RX), supports 24 V PoC
Host Switching	Automatic detection, TX front-panel switch button, or RS-232 API
ESD Protection	IEC 61000-4-2: ±8 kV air discharge / ±4 kV contact discharge

4.2 USB Interface & Power Specifications

Item	Specification
TX Host Inputs	HOST 1: 1 × USB-C female (24-pin); HOST 2: 1 × USB-B female (9-pin)
TX USB Device Ports	1 × USB-C (Device 1); 2 × USB-A (Devices 2–3)
RX USB Device Ports	1 × USB-C (Device 1); 3 × USB-A (Devices 2–4)
TX Device Port Power	Device 1 (USB-C): 5 V / 1 A; Devices 2–3 (USB-A): 5 V / 1 A each
RX Device Port Power	Devices 1 (USB-C) and 2 (USB-A): 5 V / 1 A each; Devices 3–4 (USB-A): 5 V / 1.5 A each
PoC Power	Bidirectional 24 V PoC; connect the power supply to either TX or RX
Power Adapter	AC 100–240 V, 50/60 Hz input; locking DC 24 V / 3.75 A output
Maximum Power Consumption	TX: 23 W; RX: 35 W

4.3 Control & Terminal Interfaces

Item	Specification
TX Control Ports	1 × RS-232 (3-pin, 3.5 mm Phoenix); 1 × FSYNC (1-pin, 3.5 mm Phoenix); 1 × SERVICE USB-C
RX Control Ports	1 × RS-232 (3-pin, 3.5 mm Phoenix); 1 × FSYNC (1-pin, 3.5 mm Phoenix); 1 × SERVICE USB-C
RS-232	Pass-through and ASCII API control; configurable 4800–115200 bps; 8 data bits, 1 stop bit, no parity

Item	Specification
SERVICE	USB-C virtual serial/debug port, fixed 115200 bps, 8N1; USB 2.0 used for firmware updates
FSYNC	TX → RX GPIO synchronization pass-through; default voltage level 0–5 V

4.4 Mechanical & Environmental Specifications

Item	Specification
Housing / Color	Metal enclosure / Black
Dimensions (TX / RX)	140 × 75 × 23 mm (L × W × H) for each unit
Net Weight	TX: approx. 313 g; RX: approx. 318 g
Operating Temperature	0–40 °C (32–104 °F)
Storage Temperature	–20–60 °C (–4–140 °F)
Operating Humidity	20–80% RH, non-condensing
Storage Humidity	10–90% RH, non-condensing

4.5 CAT6a Straight-Through Wiring

The HDBT-USB3 ports on TX and RX require a straight-through cable, with the same T568B conductor order at both ends. Do not use crossover wiring. A certified CAT6a F/FTP shielded twisted-pair cable is recommended for the full extension distance.

Important: HDBT-USB3 is a proprietary TX-to-RX USB extension link. It is NOT an Ethernet LAN port and must not be connected to a network switch.

5. Package Contents

Verify that all units and accessories are present and undamaged before installation. Contents may vary according to the shipping configuration and confirmed sales order.

5.1 Standard Packing List

Item	Qty.	Unit
UE3300_W USB 3.2 Gen 1 transmitter (TX)	1	pc
UE3300_W USB 3.2 Gen 1 receiver (RX)	1	pc
DC 24 V / 3.75 A locking power adapter	1	pc
4-pin 3.5 mm Phoenix male connector	2	pcs
Mounting ear	4	pcs
Machine screw (KM3 × 4)	8	pcs
User manual	1	pc

6. Panel Layout & Port Description

6.1 Transmitter (TX) - Front & Rear Panels

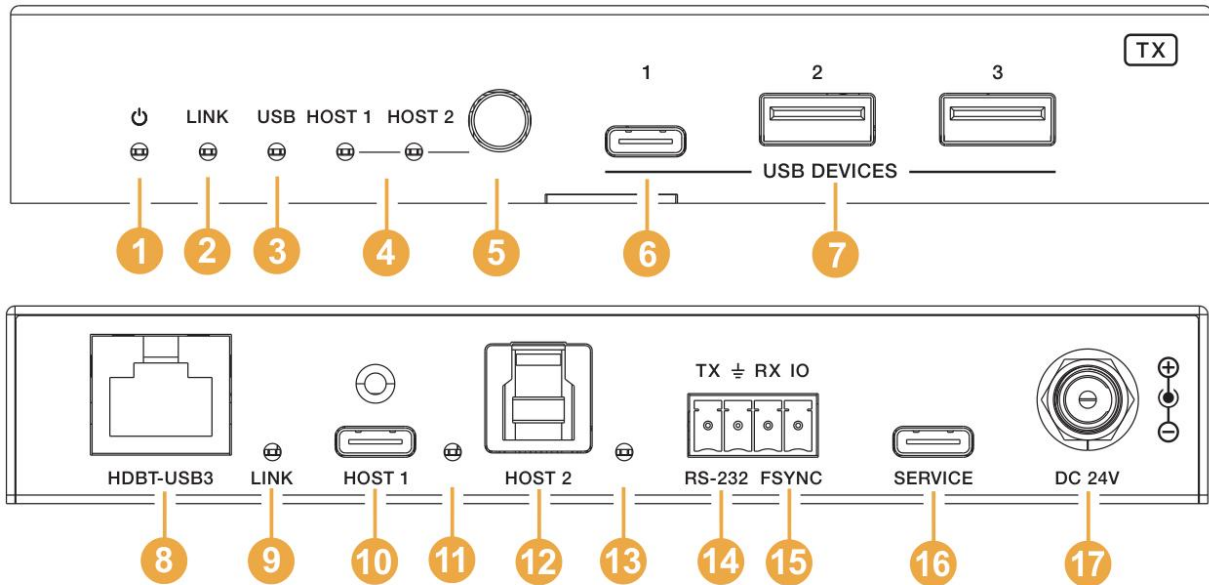


Figure 2. UE3300_W transmitter (TX), numbered front/rear panel connections 1–17.

Name / No.	Function Description
1 POWER LED	Steady on when the transmitter is powered.
2 LINK LED	On: TX and RX are linked and signals are present; Off: no extension link.
3 USB LED	On: USB 3.x detected; flashing: USB 2.0 detected; Off: no USB signal.
4 HOST 1 / 2 LED	The indicator for the currently selected host illuminates.
5 HOST Switch	Press to select HOST 1 or HOST 2. This button can be enabled or disabled via API.
6 USB DEVICES 1	Front-panel USB-C downstream device port; maximum 5 V / 1 A.
7 USB DEVICES 2–3	Two front-panel USB-A device ports; maximum 5 V / 1 A per port.
8 HDBT-USB3	Dedicated RJ45 link; connect directly to RX HDBT-USB3 via CAT6a straight-through cable.
9 LINK LED (rear)	Rear-panel extension status. On: connected / signals present; Off: no link.
10 HOST 1	USB-C upstream host interface for a PC; also usable for USB hub firmware update.
11 HOST 1 LED	Illuminates when HOST 1 carries USB traffic.
12 HOST 2	USB-B upstream host interface for a PC; also usable for USB hub firmware update.
13 HOST 2 LED	Illuminates when HOST 2 carries USB traffic.
14 RS-232	3-pin Phoenix terminal for RS-232 pass-through and ASCII control.
15 FSYNC	GPIO synchronization port; passes a TX signal to RX, default 0–5 V.

Name / No.	Function Description
16 SERVICE	USB-C maintenance / internal debug / firmware port, USB 2.0.
17 DC 24V	Locking DC 24 V / 3.75 A power input.

6.2 Receiver (RX) - Front & Rear Panels

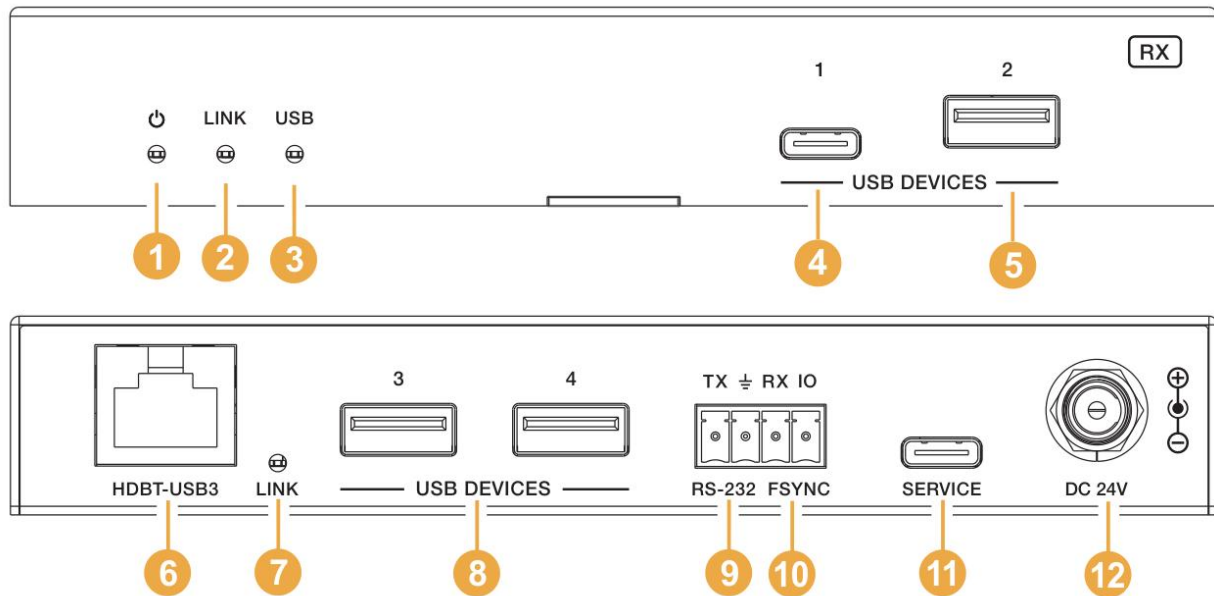


Figure 3. UE3300_W receiver (RX), numbered front/rear panel connections 1–12.

Name / No.	Function Description
1 POWER LED	Steady on when the receiver is powered.
2 LINK LED	On: TX and RX are linked and signals are present; Off: no link.
3 USB LED	On: USB 3.x detected; flashing: USB 2.0 detected; Off: no USB signal.
4 USB DEVICES 1	Front-panel USB-C device port; maximum 5 V / 1 A.
5 USB DEVICES 2	Front-panel USB-A device port; maximum 5 V / 1 A.
6 HDBT-USB3	Dedicated RJ45 link; connect directly to TX via CAT6a straight-through cable.
7 LINK LED (rear)	Rear-panel TX/RX extension link status indicator.
8 USB DEVICES 3–4	Two rear-panel USB-A device ports; maximum 5 V / 1.5 A per port.
9 RS-232	3-pin Phoenix terminal for RS-232 pass-through / control-system connection.
10 FSYNC	GPIO synchronization port; receives the TX FSYNC signal, default 0–5 V.
11 SERVICE	USB-C maintenance / internal debug / firmware port, USB 2.0.
12 DC 24V	DC 24 V / 3.75 A input; can power TX through bidirectional PoC.

7. Installation & Operation

7.1 Standard Connection

- With both units powered off, run a single straight-through CAT6a F/FTP cable from TX HDBT-USB3 to RX HDBT-USB3 (maximum 100 m).
- Connect computer A to TX HOST 1 (USB-C) using an appropriate USB cable. Optionally connect computer B to HOST 2 (USB-B).
- Connect local peripherals, such as a keyboard or mouse, to TX USB DEVICES 1–3. Connect remote cameras, microphones, or other peripherals to RX USB DEVICES 1–4.
- If serial control or industrial synchronization is needed, wire the relevant RS-232 and/or FSYNC terminal connections.
- Connect the supplied DC 24 V / 3.75 A adapter to either TX or RX, then check the POWER and LINK indicators.
- Choose HOST 1 or HOST 2 using the TX front-panel button, ASCII commands, or enabled automatic switching.
- Verify that the active computer enumerates all connected USB devices, then test their functions and the available port power.

7.2 Host Selection

Switching Method	Description
Manual Switching	Press the TX HOST button to toggle between HOST 1 (USB-C) and HOST 2 (USB-B).
Automatic Switching	Detects the 5 V presence signal at the USB host input; enable or disable via API.
API Switching	Send set input 1 or set input 2 through the RS-232 control interface to select the host.
Operating Limitation	Only one host controls the USB peripherals at any given time; this is not simultaneous multi-host control.

7.3 Indicator Status

Indicator	Meaning
POWER	Illuminated when power input is normal.
LINK	On: TX/RX connected with link activity; Off: extension link not established.
USB	Steady: USB 3.x; flashing: USB 2.0; Off: no USB detected.
HOST 1 / HOST 2	Selected HOST LED illuminates; its corresponding upstream-status LED indicates traffic.

7.4 USB Port Power & Industrial Signals

UE3300_W supports API configuration of each TX/RX USB device port. The port can be forced off, made to follow the selected USB host power state, or forced on. Check each peripheral's consumption against the electrical rating of its specific device port before changing this setting.

The RS-232 terminal supports serial pass-through and control-system integration. FSYNC passes GPIO timing signals from TX to RX at a default 0–5 V level. Verify the target industrial camera's trigger threshold, polarity, direction, and timing requirements before applying a synchronization signal.

8. Advanced Control & API Commands

UE3300_W accepts ASCII text commands through the RS-232 terminal or the USB-C SERVICE virtual serial interface. Use a serial terminal utility and terminate each command with CR+LF (carriage return plus line feed). Do not append "!" to the command. Commands used by other PANIO models may follow different syntax.

8.1 Serial Port Parameters

Interface / Parameter	Setting
SERVICE USB-C	Virtual serial / diagnostic interface: fixed 115200 bps, 8 data bits, 1 stop bit, no parity (8N1), CR+LF termination.
RS-232 Terminal	Configurable 4800–115200 bps; 8 data bits, 1 stop bit, no parity (8N1); CR+LF termination.
Selectable RS-232 Rates	4800 / 9600 / 19200 / 38400 / 57600 / 115200 bps
Default Baud Rate	115200 bps

8.2 System Management & Query Commands

ASCII Command	Function / Parameters	Example / Response
?	List all available commands.	?
help	List all available commands.	help
get fw version	Query TX/RX firmware versions.	Example: 1.0.0
set reboot	Restart the system.	Reboot... / System Initializing... / Initialization Finished!
set reset	Restore factory defaults; enter Yes when the confirmation prompt is displayed.	Sure to RESET to default settings?
get status	Report device state, selected host, panel key, baud rate, and port power.	See Section 8.5.
set key on / off	Enable or disable the TX front-panel host switch (default: on).	set key on → Set key on
get key	Query whether the panel switch is enabled.	Key on
set baud x	Set RS-232 baud rate: 1=4800; 2=9600; 3=19200; 4=38400; 5=57600; 6=115200.	set baud 6 → Set baud rate 115200
get baud	Query current RS-232 speed.	Baud rate 115200

8.3 Host Selection & Auto-Switch Commands

ASCII Command	Function / Parameters	Example / Response
set input x	Select USB HOST: x=1, USB-C HOST 1; x=2, USB-B HOST 2 (default: 1).	set input 1 → Set input USB host 1
get input	Query selected USB HOST.	Input USB host 1
get usb5v x	Read upstream host 5 V detection: x=0 both; x=1 HOST 1; x=2 HOST 2.	get usb5v 0 → USB host 1: 5V / USB host 2: none
set autoswitch on / off	Enable/disable host auto-switching based on 5 V detection (default: on).	set autoswitch on → Set autoswitch on
get autoswitch	Query auto-switch setting.	Autoswitch on

8.4 TX/RX Device Port Power & Firmware Commands

ASCII Command	Function / Parameters	Example / Response
set tx usbd x power y	TX port power: x=0 all; 1=USB-C; 2–3=USB-A. y=0 Force Off; 1 Follow Host; 2 Force On.	set tx usbd 0 power 1
get tx usbd x power	Read TX port power setting for x=0–3.	TX all USB device ports power follow USB host power
set rx usbd x power y	RX port power: x=0 all; 1=USB-C; 2–4=USB-A. y=0 Force Off; 1 Follow Host; 2 Force On.	set rx usbd 0 power 1
get rx usbd x power	Read RX port power setting for x=0–4.	RX all USB device ports power follow USB host power
set hdbt update	Switch SERVICE interface to HDBT UART update mode (qualified maintenance only).	set hdbt update → hdbt update

8.5 Example "get status" Output

Actual firmware versions and individual port states depend on device configuration. The following illustrates the information categories that may be returned.

Response Category	Example State
Firmware / Device Type	Status Info 2-Port USB 3.2 Gen 1 Extender; TX/RX FW 1.0.0
Selected Host / Control	Source 01; Key On; Baud 115200; Autoswitch On
Host Input Detection	Input 01 = 5V; Input 02 = None
TX Device Ports	TX_01 = Follow_Input; TX_02 = Follow_Input; TX_03 = Follow_Input
RX Device Ports	RX_01 = Follow_Input; RX_02 = Follow_Input; RX_03 = Force_Off; RX_04 = Force_On

Note: The device-type wording in firmware status output is a generic platform description; it does not change the PANIO model designation UE3300_W.

9. Troubleshooting & Notes

9.1 Troubleshooting

Symptom	Possible Cause & Suggested Action
POWER LED off	Check the AC outlet, DC 24 V / 3.75 A adapter, and locking connector. PoC may be supplied at either TX or RX.
LINK LED off	Verify a single CAT6a F/FTP straight-through cable directly connects TX and RX; no Ethernet switch. Check RJ45 wiring and total cable length.
USB device not detected	Check HOST 1/2 selection, upstream USB cable seating, and device port power mode (not Force_Off). Reconnect the peripheral if needed.
Auto-switch not working	Use get autoswitch to check the feature and get usb5v 0 to inspect both upstream 5 V signals. Switch manually for diagnosis.
Unstable high-speed USB	Check peripheral compatibility and cable quality. 5 Gbps is a theoretical interface rate and all devices share the extension link.
High-power device disconnects	Compare device draw with the TX/RX USB port ratings; RX Devices 3 and 4 have higher 1.5 A port capacity.
No RS-232 response	Verify TX/RX wiring, 8N1, correct baud rate, and CR+LF termination. Do not use a "!" suffix from other models.
FSYNC not synchronized	Confirm TX → RX direction, connector pinout, 0–5 V level, and industrial-camera trigger specifications.
Firmware update error	Use only the designated SERVICE/HOST update interface, correct firmware file, and qualified service procedure.

9.2 Operating Notes

- HDBT-USB3 is a dedicated extension link, not a conventional Ethernet network interface.
- The 100 m rating is the maximum specified under appropriate cabling and site conditions; actual throughput depends on host hardware, peripherals, and cable quality.
- When switching hosts, the USB peripherals may need time to re-enumerate and be detected by the newly selected operating system.
- Follow individual USB port power limits: do not exceed 5 V / 1 A or 5 V / 1.5 A according to each labeled port.
- Do not open the enclosure or perform set reset or firmware upgrades without authorization; configuration loss or damage can result.
- Maintain ventilation, dry surroundings, and clean connectors. Periodically inspect CAT6a shielding, grounding, and cable integrity.

9.3 Safety & Information Symbols

Symbol / Notice	Meaning & Operation
Recycling	Waste electrical and electronic equipment must be collected separately and recycled in accordance with local rules.
Class A Product	In residential environments, this equipment may cause radio-frequency interference.

Symbol / Notice	Meaning & Operation
Electrical Hazard	Potentially dangerous uninsulated voltage may be present internally; risk of electric shock.
CAUTION	Do not open the enclosure. Servicing must be carried out by qualified personnel.
Information	Indicates important configuration, handling, or operational instructions.

10. Warranty Service

10.1 After-Sales Support

For installation, operation, firmware, or product problems, contact PANIO or your authorized sales/service representative. To help expedite support, provide the model UE3300_W, serial number, purchase and shipment details, cabling diagram, CAT6a cable information, LED status, API/status output, and a clear description of the fault.

10.2 Warranty Terms

The product carries a one-year warranty. Applicable service conditions and exclusions follow the official PANIO shipment documents, proof of purchase, and terms of the authorized reseller. Unauthorized disassembly or repair, improper power supplies, incorrect cabling, and impact damage may affect warranty eligibility. Contact your representative for the governing terms.

10.3 Environmental Protection & Disposal

- Recycle circuit boards and metal enclosures separately in accordance with applicable local and industrial waste regulations.
- Never incinerate electronic components or discard the unit with household waste. Electrolytic capacitors can be hazardous when exposed to high temperatures.
- This manual is a reference for installation and operation. Firmware and product improvements may result in specification or content changes; always consult the latest official documentation.

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