24-Port RS-485 DIN-Rail Isolated Hub

Model: FCC-1600-D1D24

FCC-1600-R1D24

1-channel uplink · 24 isolated RS-485 branches

FPGA filtering · Separate isolated grounds

Dual DC 9–70 V · 6 kV surge protection



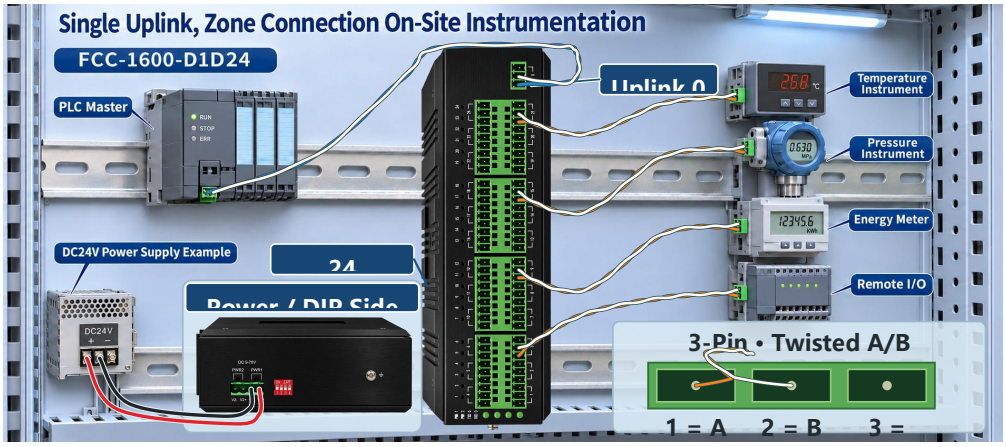
Product Overview

- Expands one PLC/host serial port into 24 RS-485 branches with independent transceivers, for zoned instrument and field-device wiring.
- Protocol-independent transparent forwarding for Modbus and other serial data. D1 uses an RS-485 uplink; R1 uses RS-232, avoiding an external converter.
- Each of the 24 RS-485 branches has a separate shield/reference ground, with 2.5 kV isolation between grounds and isolation from power ground to reduce interference and fault propagation.

Key Features

- **Networking** 1-line uplink connects 24 branches, facilitating on-site zoning wiring.
- **Filtering** Common-mode inductors and differential filtering plus FPGA digital filtering to suppress glitches.
- **Auto Direction** Precise switching of RS-485 transmission/reception based on transmitted data, with transparent transmission.
- **Surge Protection** Each channel RS-485 and RS-232 uplink as well as power supply have 6 kV protection.
- **Dual Power** Dual redundant DC 9–70 V inputs with overload and reverse-polarity protection.

Typical application: PLC zone connection for field instruments.

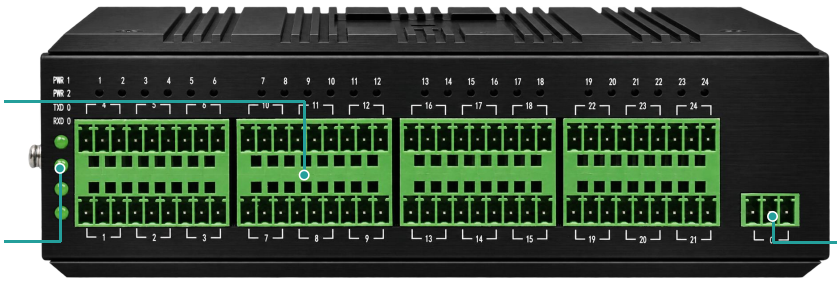


Example for D1 model: 1=A, 2=B, 3=GND for each channel; twisted pair connects A/B; enlarged display of PWR1 power supply and DIP on the side inside the scene.

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Interfaces and Installation

Front: Uplink 0 and 24 RS-485 Branches



Side: Dual Power, DIP Switch and Protective Earth



Rear: DIN Clip and Wall-Mount Holes



Interface	Connection and usage instructions
24 RS-485 Branches	Ports 1–24 are RS-485. Each 3-pin port: 1=A (TX+), 2=B (TX−), 3=GND. Connect twisted pair to 1/2. Each port has a separate shield/reference ground; do not interconnect grounds.
Uplink Port 0	3-pin uplink terminal. D1 (RS-485): 1=A, 2=B, 3=GND. R1 (RS-232): RXD/TXD/GND. Wire for the selected model.
Dual power supply	4-pin, 5.08 mm pluggable power terminal. Left to right: V2−, V2+, V1−, V1+ (PWR2, then PWR1). Apply DC 9–70 V with correct polarity.

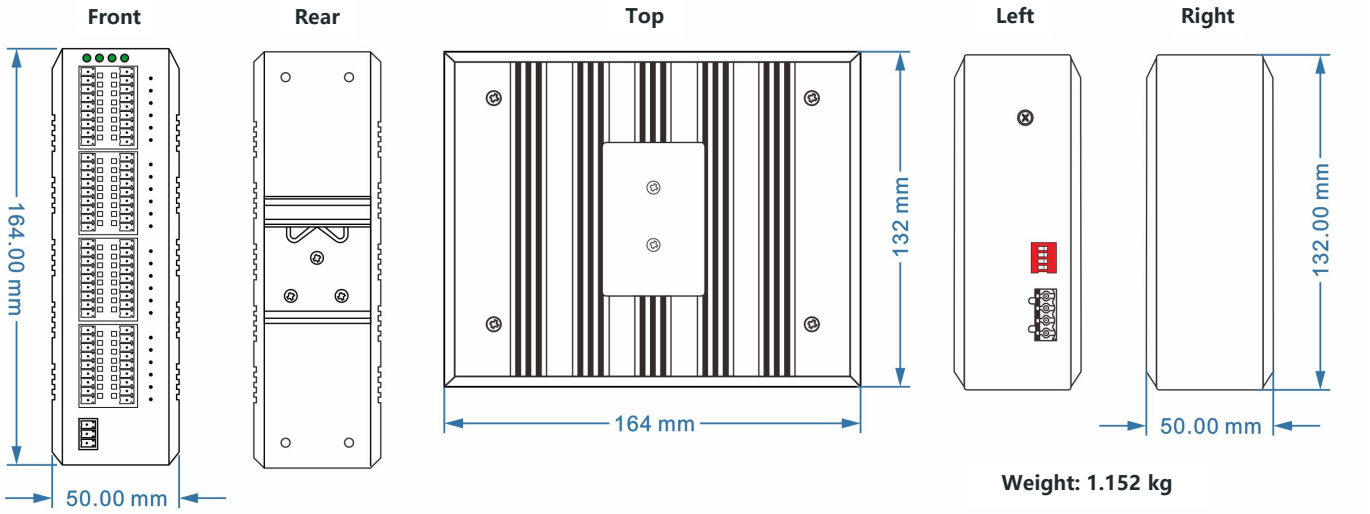
Communication, digital filtering, and DIP switches

Item	Technical specifications and settings
Interface standard	RS-232: EIA/TIA-232 (ITU-T V.28); RS-485: EIA/TIA-485. The uplink interface standard is distinguished by complete model specifications.
Communication mechanism	Each channel has an independent RS-485 transceiver and LED transmission indicator; transparent, protocol-independent message forwarding; low transmission delay; precise transmission switching enable signals generated automatically based on transmitted data.
Rate and Nodes	Maximum: 200 kbps; higher baud rate versions available on request. Each RS-485 channel can support at least 32 standard nodes or 128 enhanced nodes.

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Item	Technical specifications and settings
Double filtering	Common-mode inductors and differential filtering + FPGA digital filtering to suppress line glitches and enhance anti-interference capability.
DIP-1 OFF	Default: all RS-485 digital filters off, maximum 200 kbps.
DIP-1 ON	Enable RS-485 digital filtering for all channels, up to 38400 bps; selected according to communication rate and line interference.
DIP-2/3/4	Reserved, not used as a switch for other optional functions.

Dimensions and Power Supply Environment



Body size 164 × 132 × 50 mm; weight 1.152 kg. Units: mm. Full five-view drawings and mounting structure as above, rail or wall-mounted installation.

Item	Technical Specifications
Power	Redundant dual-channel DC 9–70 V, internal isolation; power consumption <10 W. Supports overload protection, reverse-polarity protection, and redundant protection
Structure and Heat Dissipation	Black anodized brushed aluminum alloy casing, IP40; fanless high-efficiency heat dissipation, reducing maintenance effort. Supports rail or wall-mounted installation.
Temperature and humidity	Operating temperature: −40 to +85 °C; Storage temperature: −40 to +85 °C; Operating humidity: 0–95% RH, no condensation.
Reliability	MTBF >100,000 hours; 100% burn-in tested for all models; meets Industrial Level 4 EMC requirements.

Isolation per line and surge protection

Item	Specifications/Conditions	Protection Notes
RS-485 surge protection	6 kV per channel	All 24 RS-485 lines have surge protection and surge resistance, suppressing induced high voltages and line transient impacts.
Uplink and power supply	RS-232 uplink and 6 kV power supply	Reduce the risk of lightning-induced surges and switch operation surges being transmitted through the uplink or power supply line.
Optical isolation	Each channel RS-485 2.5 kV	High-speed optical isolation communication signal, limits impact range in branch failure.
Independent shielded line ground	24-channel 2.5 kV electrical isolation between grounds	Each RS-485 channel has a separate shield/reference ground; grounds for channels 1–24 are isolated from each other, and the power supply ground is isolated from the grounds of 24 RS-485 channels.

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Item	Specifications/Conditions	Protection Notes
AC Misconnection Protection	AC 220 V/AC 380 V misconnection fault	If one RS-485 port is accidentally connected to the AC voltage specified above, isolation protects other serial devices on the isolated side. This is fault protection, not a normal operating input voltage; it does not guarantee that the misconnected port is undamaged or can still communicate.

Ordering Information

FCC-	1600-	D1/R1	D24
Product type prefix.	Industrial DIN-rail series.	1-channel standard model	24-channel RS-485 isolation downstream link

NO	Code	Definition
1	FCC	Feichang serial communication isolation hub product prefix.
2	1600	This industrial DIN-rail 24-port hub series.
3	D1/R1	D1 is a 1-channel RS-485 uplink; R1 is a 1-channel RS-232 uplink. All uplinks have 3-pin terminals; order according to the full model.
4	D24	24-channel independent RS-485 isolation downstream link, each channel as A/B/GND three-wire terminals

Full Model Code	Configuration instructions for order request
FCC-1600-D1D24	1-channel RS-485 uplink + 24 isolated RS-485 downlinks, dual-channel DC 9–70 V, IP40 anodized brushed aluminum alloy casing.
FCC-1600-R1D24	1-channel RS-232 uplink + 24-channel isolated RS-485 downlink, dual DC 9–70 V, IP40 black anodized brushed aluminum alloy casing.

Specify baud rate and rail/wall mounting accessories in the order request; higher-speed versions require confirmation via customization.

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