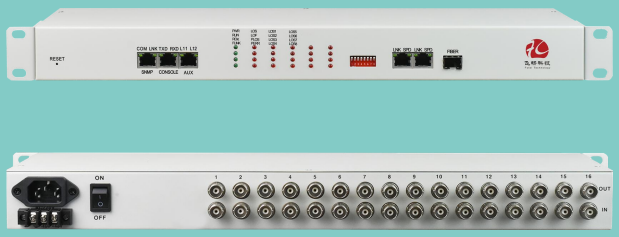
16E1 over IP Circuit Emulation Gateway

Model: FCT-1700-E16G2Q1

16 E1 circuits · Point-to-point or multipoint IP



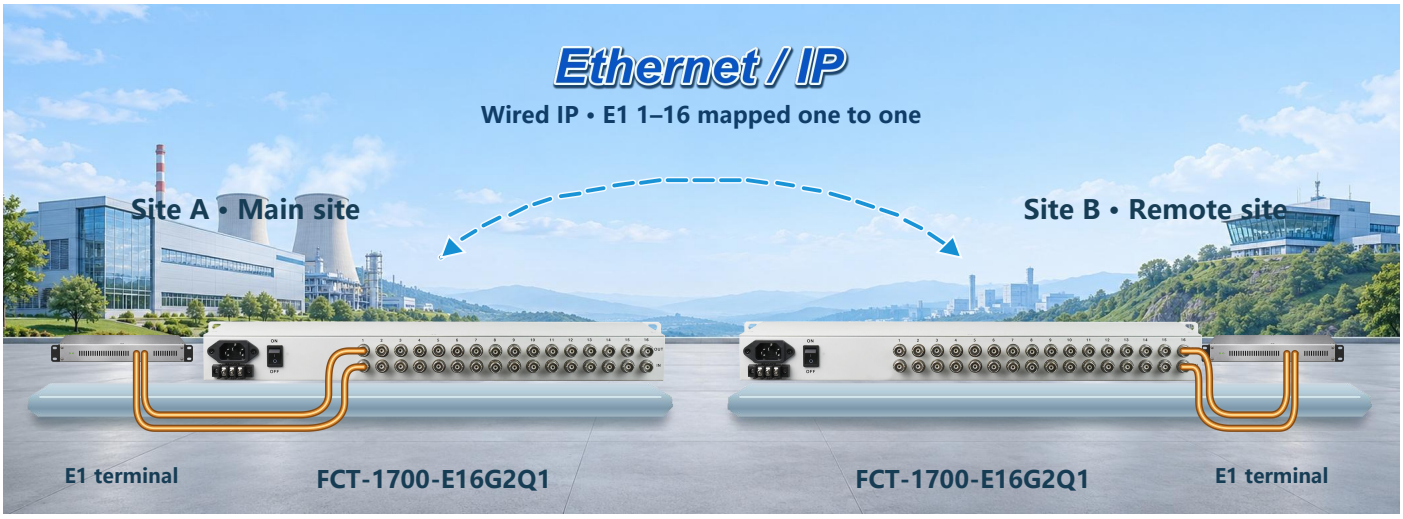
Product overview

- Carry 16 E1 circuits over IP for existing PBX, base stations, SS7 signaling and voice systems.
- Each E1 is packetized separately. Remote gateways recover the E1 signal and timing. Pair with the same model or aggregate compatible 1E1 and 4E1 units.
- The 1U gateway extends E1 circuits between sites and aggregates branch links.

Key features

- **Mapping** Set a remote IP address and UDP port for each circuit.
- **Uplinks** Two Gigabit copper ports and one 100M/1G SFP.
- **Timing** Adjustable frame length and jitter buffer. VLAN support.
- **Service** Web and console access, packet-loss indication and loopback

Typical application • Point-to-point E1 extension



The gateways extend all 16 E1 circuits across a reachable IP network. Dashed blue lines show logical IP paths. Orange lines show local E1 connections.

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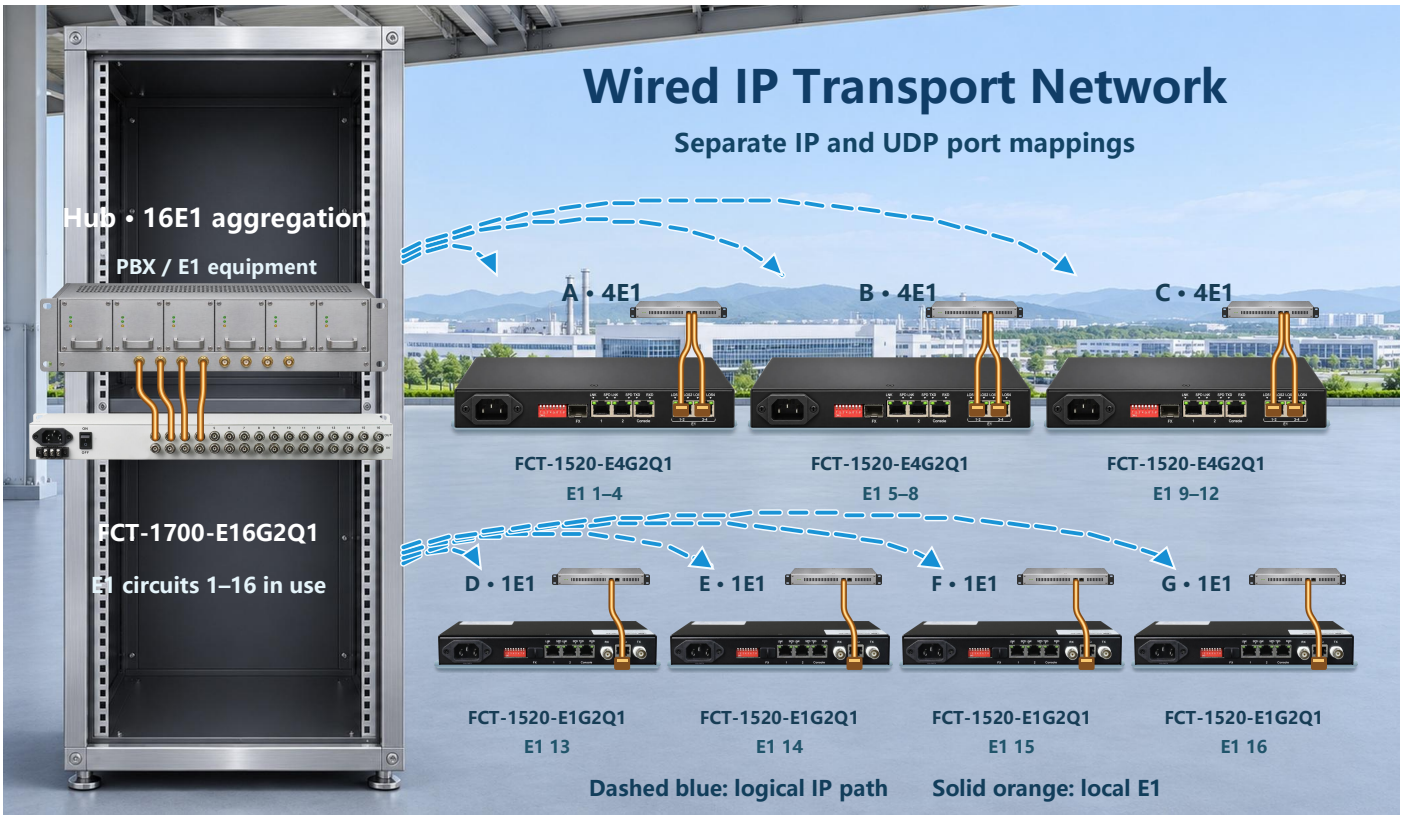
Typical application • Mixed 1E1 and 4E1 aggregation



All 16 E1 circuits at the hub serve three 4E1 and four 1E1 gateways. Each site connects to a reachable IP network.

Circuit Mapping and Operation

Site	E1 circuit mapping	Hub UDP ports	Remote IP / UDP ports
Site A	Hub 1–4 ↔ Remote 1–4	30000–30003	192.0.2.21 / 30000–30003
Site B	Hub 5–8 ↔ Remote 1–4	30004–30007	192.0.2.22 / 30000–30003
Site C	Hub 9–12 ↔ Remote 1–4	30008–30011	192.0.2.23 / 30000–30003
Site D	Hub 13 ↔ Remote 1	30012	192.0.2.24 / 30000
Site E	Hub 14 ↔ Remote 1	30013	192.0.2.25 / 30000
Site F	Hub 15 ↔ Remote 1	30014	192.0.2.26 / 30000
Site G	Hub 16 ↔ Remote 1	30015	192.0.2.27 / 30000

Example hub IP: 192.0.2.10. Ports follow the circuit order in each row. Remote sites send traffic to the corresponding hub ports. The addresses and ports are examples.

The sender encapsulates E1 data per circuit and sends it to the specified UDP port. The receive buffer absorbs variation in packet arrival and the gateway recovers the E1 bit stream and clock. Check ports, frame length and timeslots in both directions. A deeper buffer or longer frame increases delay.

E1 encapsulation
Packetize each E1 circuit

→

IP forwarding
Destination IP and UDP port

→

Decapsulation and timing
Buffer jitter and recover E1

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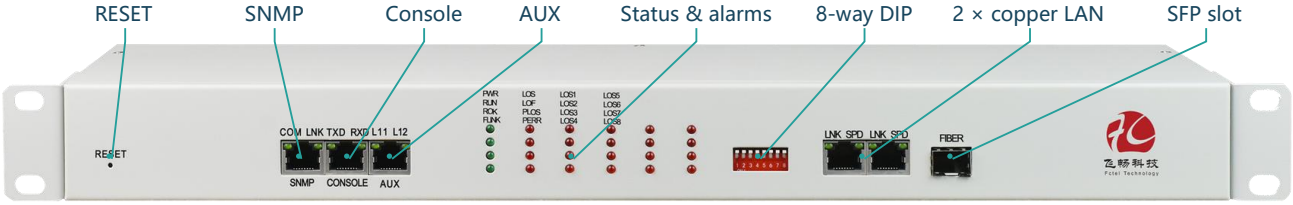
Interfaces and Rack Installation

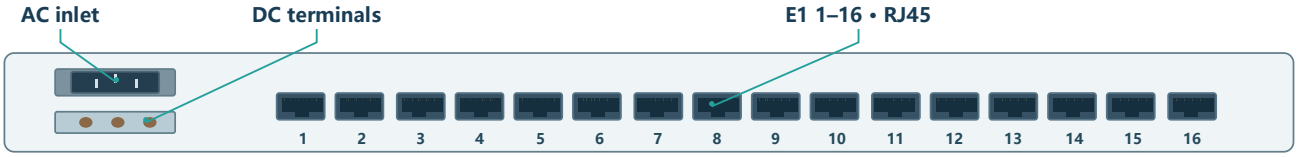
Front • Management, indicators and IP ports



Rear • 75 Ω BNC hardware



Rear • 120 Ω RJ45 (layout from the manual)



Side • 1U rack mounting and ventilation



Check the ordered power and E1 version. The unbalanced 75 Ω model uses BNC. The balanced 120 Ω model uses RJ45.

E1 Interfaces and Timing

Item	Specification
E1 service ports	16 × 2.048 Mbit/s ±50 ppm with HDB3 coding and ITU-T G.703 electrical interfaces. Enable each circuit individually.
Impedance and wiring	75 Ω unbalanced BNC: connect IN to the external TX and OUT to the external RX. 120 Ω balanced RJ45: follow the supplied pinout. The 75 Ω coaxial adapter works with 75-2/3 coaxial cable.
Jitter and reception	E1 jitter conforms to G.742 and G.823. Permitted E1 input line attenuation is 0–6 dB. See G.823, G.824 and G.8261 for jitter and wander in clock recovery.
Loopback	Local and remote E1 loopback. Set DIP 6 to ON for local RX → TX loopback. DIP 1–5 and 7–8 are reserved.

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IP Ports and Optical Modules

Item	Specification
Copper Ethernet	2 × 10/100/1000 Mbit/s RJ45 with auto-negotiation and Auto-MDIX. IEEE 802.3 and 802.3az, IEEE 802.1Q VLAN, and 4,096 MAC entries.
Optical Ethernet	1 × 100M/1G SFP with LC. Gigabit module line rate: 1.25 Gbit/s. Single-mode or multimode, single-fiber or dual-fiber modules are available.
Optical matching	Multimode: 850 or 1310 nm. Single-mode: 1310 or 1550 nm. A matched single-fiber pair may use 1490 nm. On dual fiber, connect TX to the opposite RX.
Optical link budget	Reference single-mode reach without repeaters: 20–120 km. Typical TX power: ≥ −9 dBm for 1310/1550 nm single-mode, −18 dBm at 850 nm and −25 dBm at 1310 nm multimode. Reference RX sensitivity: −28 to −40 dBm. Calculate reach from the module specifications, fiber and connector losses.

Operation and Diagnostics

Item	Specification
Circuit configuration	One-to-one or multiple destination IP addresses and UDP ports. Set frame length, jitter buffer and E1 circuits through the web interface. Buffer depth: 1–15 levels, depending on firmware. Supports long packets.
Transport requirements	Reserve capacity for IP encapsulation and Ethernet overhead. Full raw E1 payload: 16 × 2.048 = 32.768 Mbit/s per direction. Check two-way reachability, delay, jitter and packet loss. In typical optimized configurations, bandwidth efficiency can reach 90%, depending on frame length and encapsulation.
Management	Web and console (9600 bit/s, 8N1, no flow control). The version in the manual supports Telnet and SNMP configuration. Confirm the supplied management features. Local and remote web upgrades are available. Follow the maintenance manual.
LED indicators	PWR: power. RUN: operation/test. ROK: remote connection. FLINK: optical link. PLOS: no packets received. PERR: packet errors or loss. LOS1–16: steady for E1 loss, flashing when the IP circuit is down, off for normal or disabled. Global LOS/LOF are reserved.
Custom AUX port	L1 uses pins 1–4 and L2 pins 5–8. Signal roles, pinout and availability depend on the delivered configuration.

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Power, Enclosure and Environment

Item	Specification
Power and consumption	AC 180–260 V or optional DC −48 V / +24 V. Consumption ≤10 W. Follow DC polarity and chassis grounding markings. DC models include reverse-polarity protection.
Mounting and weight	485 × 140 × 44.5 mm (W × D × H), 1U rackmount, approximately 2.3 kg. Anodized aluminum alloy enclosure, IP40.
Temperature and humidity	Operating: −10 to +60 °C. Storage: −40 to +85 °C. Operating humidity: 0–95% RH, non-condensing.
Reliability and service	MTBF >100,000 h. Three-year warranty subject to the applicable service terms.

Dimensions and Installation Clearance

FCT-1700-E16G2Q1

Units: mm

Front • Rack ears, management, LEDs, 2 × Gigabit RJ45 and 1 × SFP



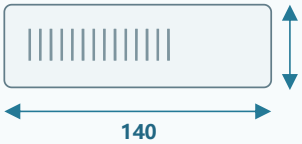
Rear • 75 Ω BNC (OUT above IN)



Rear • 120 Ω RJ45 (manual layout)



Side • 1U enclosure 44.5



120 Ω power: AC inlet / DC terminals

485 × 140 × 44.5 mm

Width × depth × height

Allow clearance to plug, bend and service power, E1 and fiber cables. For 120 Ω, follow the supplied panel labels and wiring diagram.

Model Codes and Ordering Examples

FCT-	1700-	E16	G2	Q1	Impedance suffix
FCTELE / type	Rackmount series	16 E1 circuits	2 Gigabit RJ45	1 × 100M/1G SFP	75 or 120

Model / option	Ordering configuration
FCT-1700-E16G2Q1-75	75 Ω unbalanced BNC, with independent IN and OUT connections on each of the 16 E1 circuits.
FCT-1700-E16G2Q1-120	120 Ω balanced, with one RJ45 on each of the 16 E1 circuits.
Power and optics	Specify AC 180–260 V, DC −48 V or DC +24 V. For SFP, state the speed, single or dual fiber, fiber type, wavelength and optical budget.
Remote units	For point-to-point, specify the model, impedance and active E1 count at both ends. For aggregation, specify the number of 1E1 and 4E1 units by site, matching encapsulation and link parameters.
FCT-1700-E16G2Q1 is the base model. The suffix identifies the E1 impedance. Power and optical modules are specified separately.	

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