QD-CT Series Multi-Channel AC Current Acquisition Modules: Frequently Asked Questions

Comprehensive FAQ Guide

Document Number	QD-CT
Revision	V2.6
Date	2026-10-30

Disclaimer: This document is for reference only. Specifications are subject to change without prior notice. For the latest information, please contact our sales team.

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Revision History

Revision	Date	Description	Author

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Rev. A	V2.6	Initial Release	Technical Documentation Team

Part 1: Pre-Sales FAQ

1.1 Product Selection & Specifications

Q: How do I choose the correct QD-CT model for my application? A: Selection depends on the number of circuits you need to monitor simultaneously. The QD-CT Series offers four channel configurations: * **QD-CT-4:** 4 Channels * **QD-CT-8:** 8 Channels * **QD-CT-12:** 12 Channels * **QD-CT-16:** 16 Channels All models share identical electrical specifications; only the physical length and channel count differ.

Q: What is the measurement range, and is it suitable for my load? A: All QD-CT modules have a measurement range of **AC 0~50A** with a resolution of **0.1A**. If your primary current exceeds 50A, you must use an external Current Transformer (CT) with a secondary output scaled to fit within the 0-50A input range of the module.

Q: What is the aperture size of the internal CT? A: The aperture (CT hole) for all QD-CT models is **10mm**. Ensure your busbar or wire diameter fits comfortably within this dimension without bending the conductor excessively.

Q: What accuracy can I expect from these modules? A: The basic error is **±0.5%FS** (Full Scale). With a 50A range, the maximum error is ±0.25A. The module utilizes a high-precision true RMS measurement chip, ensuring accuracy even with non-sinusoidal waveforms.

Q: Does the module support synchronous sampling? A: Yes. All channels perform synchronous sampling but operate independently. The sampling period is **50ms**, providing near real-time data updates.

Q: What are the power supply requirements? A: The modules require **DC 24V** (acceptable range: 20-28V). Maximum ripple voltage must not exceed **5%**. Power consumption is **max 100mA** per module.

Q: What are the operating environmental limits? A: * **Temperature:** -10°C to +50°C * **Humidity:** 35% to 85% (non-condensing) * **Mounting:** Standard 35mm DIN rail

Q: How do the physical dimensions vary by model? A: All modules share a height of 92mm and depth of 42mm. Length varies by channel count:

Model	Channels	Dimensions (L x W x H)
QD-CT-4	4	98 x 92 x 42 mm
QD-CT-8	8	148 x 92 x 42 mm
QD-CT-12	12	168 x 92 x 42 mm
QD-CT-16	16	198 x 92 x 42 mm

1.2 Technical Compatibility

Q: Is the QD-CT series compatible with Siemens, Mitsubishi, or Allen-Bradley PLCs? A: Yes. The module uses a standard **RS-485 bus interface** with the **MODBUS-RTU protocol**. Any PLC or controller supporting Modbus RTU master functionality can integrate with the QD-CT series.

Q: Can I integrate this into my existing SCADA or DCS system? A: Yes. Provided your SCADA/DCS system supports Modbus RTU over RS-485, you can map the QD-CT registers (0x0000~0x000F for data) directly into your database tags.

Q: What are the RS-485 cabling requirements? A: We recommend using shielded twisted-pair cable (e.g., Belden 9841 or equivalent). * **Max Bus Length:** Typically 1200m at 9600 baud (dependent on cable quality and EMI). * **Topology:** Daisy-chain (bus) topology only. Star topology is not supported. * **Termination:** 120Ω termination resistors are required at both ends of the bus for long distances.

Q: How many nodes can be on a single RS-485 bus? A: The standard RS-485 transceiver supports up to **32 nodes** per segment without repeaters. Using repeaters or high-impedance transceivers can extend this limit.

Q: Are there EMI/EMC considerations? A: The module features **three-terminal isolation** (Power, Input, Output) with **1.5KV isolation voltage**. However, for high-noise environments: 1. Use shielded RS-485 cables. 2. Ground the shield at one end only (or via a capacitor at both). 3. Keep signal cables separated from high-voltage power cables.

1.3 Ordering & Customization

Q: What is the Minimum Order Quantity (MOQ)? A: Standard MOQ is [To Be Confirmed]. Please contact sales for sample orders or project-based pricing.

Q: Can I customize the communication parameters or housing? A: Communication parameters (Address, Baud Rate, Parity) are user-configurable via Modbus registers. Custom housing or OEM branding requires a separate engineering review; please contact our sales team for feasibility.

Q: Are samples available? A: Yes, samples are available for evaluation. Please contact your regional sales representative.

1.4 Certifications & Compliance

Q: Is the QD-CT series CE marked? A: [To Be Confirmed]. Please refer to the Declaration of Conformity provided with the product or request it from sales.

Q: Is the product RoHS compliant? A: Yes, all QD-CT modules are manufactured using RoHS-compliant materials and processes.

Q: Do you have ISO quality management certification? A: Yes, our manufacturing facility operates under ISO 9001 quality management standards.

Part 2: In-Sales FAQ

2.1 Installation & Wiring

Q: How do I install the module on a DIN rail? A: 1. Hook the top edge of the module onto the 35mm DIN rail. 2. Press the bottom of the module against the rail until the spring-loaded clip snaps into place. 3. To remove, insert a flat-head screwdriver into the release slot and pull the bottom outward.

Q: What is the correct wiring sequence? A: Refer to the terminal label on the module side: * **Terminal 1:** DC +24V * **Terminal 2:** DC 0V * **Terminal 3:** RS-485 A (+) * **Terminal 4:** RS-485 B (-) * **Terminals 5+:** C1, C2... Cn (Current Transformer Inputs)

Q: How do I install the Current Transformers (CTs)? A: The CTs are built-in through-hole types. Pass the AC conductor through the **10mm aperture**. Ensure the conductor is centered and does not touch the internal core. Direction matters for phase-sensitive applications; ensure consistent orientation (P1 to P2) across all channels.

Q: How should I wire the RS-485 bus? A: * Connect **Terminal 3 (A)** to the A+ line of the bus. * Connect **Terminal 4 (B)** to the B- line of the bus. * **WARNING:** Reversing A and B will prevent communication. If communication fails, try swapping the wires. * Do not daisy-chain power through the RS-485 terminals.

Q: Is grounding required? A: While the module has 1.5KV isolation, it is best practice to ground the RS-485 cable shield at the master side or use a grounding bus bar to prevent common-mode voltage buildup. Do not ground the signal terminals directly unless specified by your system integrator.

2.2 Power Supply Requirements

Q: Can I use an AC power supply? A: NO. The QD-CT series requires **DC 24V**. Connecting AC voltage will permanently damage the module.

Q: How do I calculate power supply capacity? A: Each module consumes max **100mA**. * *Example:* 10 modules × 100mA = 1A. * *Recommendation:* Select a power supply with at least 20% headroom (e.g., 1.5A supply for 10 modules).

Q: What happens if the power supply ripples too much? A: If ripple exceeds **5%**, measurement accuracy may degrade, or the module may reset intermittently. Use a regulated switching power supply with adequate filtering.

Q: Is there reverse polarity protection? A: [To Be Confirmed]. *Caution:* Always verify polarity before applying power. Reverse polarity may void the warranty.

2.3 Communication Setup

Q: What are the default communication settings? A: * **Address:** 1 * **Baud Rate:** 9600 bps * **Parity:** None * **Data Bits:** 8 * **Stop Bits:** 1

Q: How do I change the Slave Address? A: Write to register **0x0200**. Range: 1-255. * *Note:* You must power cycle the module or restart the host software for the new address to take effect.

Q: How do I change the Baud Rate? A: Write to register **0x0201**. * 0: 2400, 1: 4800, 2: 9600 (Default), 3: 19200, etc. [Refer to Datasheet for full table]. * *Note:* Requires power cycle to take effect.

Q: How do I read current data? A: Read holding registers starting at **0x0000**. * **0x0000:** Channel 1 * **0x0001:** Channel 2 * ... * **0x000F:** Channel 16 (QD-CT-16 only) * **Data Format:** Unsigned Integer. **Multiplier = 0.1A**. * *Example:* Register value `150` = 15.0A.

Q: How do I check the firmware version? A: Read registers **0xF600** (Low Byte) and **0xF601** (High Byte).

2.4 Configuration & Commissioning

Q: What do the LED indicators mean? A: * **POW:** Steady ON = Normal Power. OFF = No Power. * **RUN:** Blinking = Normal Operation. Steady ON/Off = Firmware/Watchdog Error. * **RX:** Blinks on RS-485 Receive. * **TX:** Blinks on RS-485 Transmit.

Q: My module is powered but RUN LED is not blinking. What should I do? A: This indicates a firmware or internal fault. 1. Power cycle the module. 2. If the issue persists, check for EMI interference on the power line. 3. Contact Technical Support for RMA.

Q: First-time startup checklist? A: 1. Verify 24V DC polarity. 2. Confirm POW LED is steady. 3. Confirm RUN LED is blinking. 4. Connect RS-485 (A to A, B to B). 5. Poll Address 1 at 9600 baud. 6. Read 0x0000; value should be 0 (or ambient noise floor) if no CT is connected.

Part 3: After-Sales FAQ

3.1 Product Quality & Warranty

Q: What is the warranty period? A: [To Be Confirmed] from the date of shipment.

Q: What does the warranty cover? A: Defects in materials and workmanship under normal use and service.

Q: What is NOT covered? A: Damage from over-voltage, reverse polarity, lightning/surges, physical abuse, unauthorized modification, or operation outside environmental specs (-10°C to +50°C).

3.2 Fault Diagnosis & Repair

Q: POW LED is OFF, but I have 24V at the terminals. A: 1. Measure voltage directly at the terminal block with a multimeter. 2. Check for loose screws or broken wire strands. 3. If voltage is present but LED is off, the internal fuse or power stage has failed. **RMA Required.**

Q: Communication is intermittent. A: 1. Check RS-485 A/B wiring for shorts or reversals. 2. Verify termination resistors (120Ω) are present at both ends. 3. Check for ground loops; isolate the RS-485 shield. 4. Reduce baud rate to test stability.

Q: Readings are inaccurate or fluctuating. A: 1. Verify the conductor is centered in the 10mm aperture. 2. Check for high-frequency noise; ensure sampling period (50ms) is sufficient for your

application. 3. Verify the load frequency is within **20Hz - 1KHz**. 4. Compare with a calibrated clamp meter.

Q: The module smells burnt. A: IMMEDIATELY DISCONNECT POWER. Do not attempt to re-energize. This indicates catastrophic failure. Initiate RMA process and document the incident for safety review.

3.3 Return & Replacement (RMA)

Q: How do I initiate an RMA? A: Contact [Support Email/Portal] with: 1. Product Serial Number. 2. Description of failure. 3. Photos of wiring/installation (if relevant).

Q: How long does repair/replacement take? A: Standard turnaround is [To Be Confirmed] business days after receipt.

Q: Is there a restocking fee? A: [To Be Confirmed]. Defective units under warranty have no restocking fee.

3.4 Technical Support

Q: How can I reach technical support? A: Email: [To Be Confirmed] | Phone: [To Be Confirmed] | Hours: [To Be Confirmed].

Q: Do you provide Modbus driver files? A: Yes. We provide EDS/GSD files and Modbus Register Maps for common SCADA platforms. Visit our Download Center.

Part 4: Long-Term Usage FAQ

4.1 Calibration & Maintenance

Q: Does the QD-CT require periodic calibration? A: The module is factory-calibrated and sealed. For critical metering applications, we recommend verification every **2 years** using a calibrated reference standard.

Q: Can I perform self-calibration? A: No. Internal calibration constants are protected. Field calibration requires factory service or authorized service center adjustment.

Q: How do I clean the module? A: Use a dry, lint-free cloth. **Do not** use solvents, compressed air, or liquids, as they may damage the PCB coating or optical indicators.

4.2 Environmental Considerations

Q: Can I use this outdoors? A: The QD-CT is IP20 rated. It must be installed in a NEMA 4X or IP65 enclosure if exposed to rain, dust, or UV radiation. Direct sunlight may exceed the +50°C operating limit.

Q: What about high humidity? A: Rated for **35%-85% non-condensing**. If condensation is possible (e.g., rapid temperature cycling), install a heater or desiccant in the enclosure.

Q: Is it suitable for explosive atmospheres? A: NO. The QD-CT series is not ATEX or IECEx certified. Do not install in hazardous locations.

4.3 Product Lifespan & Obsolescence

Q: What is the expected lifespan? A: Designed for **10+ years** of continuous operation in specified environments. Electrolytic capacitors are not used in the signal path to ensure longevity.

Q: What is your obsolescence policy? A: We provide a minimum **12-month End-of-Life (EOL)** notice and a **2-year Last Time Buy (LTB)** window.

Q: Will future models be pin-compatible? A: We strive for mechanical and electrical backward compatibility. Any pin-out changes will be clearly documented in the new Datasheet.

4.4 Spare Parts & Consumables

Q: Can I replace the internal CTs? A: No. The CTs are integrated into the PCB assembly. If a CT fails, the entire module must be replaced.

Q: Are spare DIN rail clips available? A: No. The DIN rail mechanism is integral to the housing.

4.5 Best Practices & Tips

Q: What is the best practice for RS-485 wiring? A: 1. Use a **trunk line** topology. 2. Keep stub lengths < 30cm. 3. Use shielded twisted pair. 4. Ground shield at one end. 5. Add 120Ω termination at both physical ends.

Q: How can I optimize system polling speed? A: 1. Increase Baud Rate (e.g., to 19200 or 38400). 2. Poll only necessary registers (don't read 0x0000-0x000F if you only need Ch1). 3. Use "Read Multiple Registers" function code (0x03) to fetch all channels in a single frame.

Q: Common mistakes to avoid? A: * ❌ Connecting RS-485 A to B. * ❌ Using unshielded cable in VFD environments. * ❌ Exceeding 32 nodes without repeaters. * ❌ Ignoring the 50ms response time in high-speed control loops (this is a monitoring device, not a protection relay).

> **Reference Documents:** * QD-CT Series Datasheet * Quick Start Guide * Modbus Register Map * Troubleshooting Guide

For the latest updates, always refer to the official documentation portal.