



## Technical Bulletin

Bulletin No: TB-0045-22-086-FS    Effective Date: 03-27-2022    Type: Installation

**Subject: FlexSCADA™ Q5 in a 48-volt DC positive-ground configuration**

### Scope

This Technical Bulletin outlines the installation and use of the FlexSCADA™ Q5 in a 48-volt DC positive-ground system.

### Background

A 48 VDC positive-ground system provides numerous benefits to the end user. The first being that it is the highest, safe voltage that can be obtained utilizing batteries. Higher voltage means less amps are required to move energy through the wires. This in turn allows for the use of smaller diameter wires (AWG).

Another reason for the use of a 48 VDC (positive ground) system is related to bonding characteristics. When grounding through the negative lead, the bond will become an “anode” in electrolysis terms. When grounding through the positive lead, the bond will act as a “cathode.” This is known as cathodic protection and it provides a site so wired with built-in protection from corrosion that occurs when dissimilar metals come into contact with one another. However, this reaction creates a challenge for devices that are designed with a negative ground (typical) setup, such as the FlexSCADA™ Q5 device.

### Installation requirements

While the FlexSCADA™ Q5 can operate in a 9-60 VDC environment, it was designed to utilize a negative ground setup. While the Q5 can also operate in a positive ground system, steps are required to prevent issues with operation of the ethernet port. When connecting an ethernet cable to the Q5 device from another device, most users use shielded cable. In a positive ground 48V setup, connection of a shielded ethernet cable to the Q5 will cause erroneous grounds. It can also potentially cause the device case to become energized, creating a path to ground throughout the entire case assembly (instead of just the defined ports).

The simplest solution for this issue is to use a non-shielded ethernet cable, which eliminates the path to ground from the system into the unit. While the desire to use shielded cable is preferred, there is no harm in using a non-shielded cable for the FlexSCADA™ Q5 only. Connection of shielded cable from a device into a coupler just prior to the Q5, and then unshielded from the coupler into the Q5 would be acceptable as well. Because of the design of the unit, there is no way to change out the ethernet port, as it provides surge protection for the device as well.

For more information please contact Mission Critical Energy at (716) 276-8465 or visit us at [www.flexscadafusion.com](http://www.flexscadafusion.com).