

Troubleshooting Guide

Troubleshooting Communications

With the SilverLode product powered up, start QuickControl and the polling routine should automatically find the device. If QuickControl is already running and the device is powered up, press the “Scan Network” button to find the device on the network. If “No Devices Found” appears in the Device Status Monitor, either the device has been initialized with something other than the Factory Defaults (listed in the Hardware Requirements section of this chapter) or QuickControl is not set up to communicate with the device in its present communications state. Some things to check if this happens are:

- Verify the COM port being used to connect to the device.
- Under Setup, select Comm Port / Comm Channels and ensure the baud rate and protocol are set to Factory Defaults (57600 and 8 bit ASCII respectively). Also, confirm the Enable checkbox is checked and the COM Channel enabled is the one device is connected to.
- Verify there are no other programs using the port (only one program can control a COM Port at any given time). These can include other motion control drivers or programs used for communication devices (e.g. Palm Pilot, HyperTerminal etc.). If these programs do not relinquish control of the port, QuickControl will report “Could Not Open select COM Port” and “Access is denied.” errors in the Status Log. Under Setup, select Register Devices and ensure all six devices have the Auto Reg checkbox checked.
- Run Tools ⇒ Unknown Device Wizard (only works with one device connected at a time)
- If networking multiple devices, QuickControl can only register six at a time for viewing.
- If networking multiple devices, each has to be initialized with the Initialization Wizard with a unique ID.
- Under Setup, select Options and make sure the Autoscan ID range encompasses the ID of the units desired.
- Reduce Baud Rate. If you are occasionally losing communications with the device, try reducing the baud rate. Remember to change both the PC's baud rate (Setup->Comm Port) and the device's (Init Wizard->Communications->Baud Rate).

After verifying the integrity of the COM Port and making any necessary changes, try a quick communication test. Stop the QuickControl polling routine (if it is running), and press the red hand icon (STOP) button on the QC toolbar. The red LED on the back of device should flash briefly as it receives and processes the Halt command sent to it each time the STOP button is pushed. This simple test can be done at any time to verify that the device is receiving commands.

It is also good to verify that the Windows PC can communicate through the serial port without QuickControl. Programs like HyperTerminal can accomplish this (see Technical Document QCI-TD024 8 Bit ASCII Protocol Using HyperTerminal). If communication is successful with the third party terminal program, then QuickControl should be able to operate correctly.

SilverLode Indicator LEDs

There are two indicator light emitting diodes (LEDs) on the back of every SilverLode product, one red and one green. These LEDs provide the user some basic information about the current operational state. When the device is first powered up the green LED should be on (on the SilverNugget, the red LED flashes on momentarily at power up as well). The red LED is the communication/program done indicator.

If the red LED is on solid (dim glow), then no program is running and the device is not communicating. When the device receives the start of a transmission, the red LED will shine extra bright. When the transmission is processed, the red LED will return to its original state. Sending the device a number of commands in succession (e.g. the QuickControl polling routine) will induce a flickering of the red LED. This flickering can occur in regular intervals or as random blinks depending on the communication scheme.

If the red LED is out completely, then a program is running from an internal program in the Program Buffer (and, in the absence of flashes, no communications is taking place).

The green LED is normally used to indicate motor torque, it starts out a middle brightness, glows brighter for positive torque and darker for negative torque. Its function changes if the Enable Done Low or Enable Done High command has been set; in this state, bright indicates that the motion is complete and the error is within set limits, while off indicates that the above are not true. The green LED is also used to flash error codes in the case of power low, over temperature, etc. according to the user and/or initialization program loaded. This is done by disabling the driver, setting open loop mode, and then setting the “torque” high and low (though with the motor drive disabled, only the LED is affected).

Green LED Flash Code

Number of Flashes	Fault
1	Startup Recovery Program Kill Motor Condition occurred at startup.
2	Kill Motor Recovery Program Kill Motor Condition occurred after startup as a result of a condition in the KMC or KMX command.
3	Initialization Wizard needs to be run.
4	I-Grade Motor Memory Read Error
5	I-Grade Motor Memory Version is Not Compatible
6	I-Grade Motor Miss-Match. Attached motor does not match with device. Re-run Initialization Wizard
7	I-Grade Motor Memory Checksum Fault

The SilverDust IG and IGB also have a third yellow LED. This yellow LED lights to indicate that the encoder signals are not at valid levels indicating shorts, opens, or otherwise invalid levels. A bit in the Internal Status 2 (IS2) word indicates this state, and may be used to trigger a kill motor via the KMX command. (See IS2 and KMX).

Troubleshooting Frequently Asked Questions

- ***Why do I get a Driver Enable Error/Temperature Fault when I start up?***

Most of our controllers require a jumper between CLAMP+ and DRV ENA. This is done differently on each of our controllers.

IG: Jump pins 17 and 19 on the Auxiliary Connection.

IGB: This is found at the top of the controller.

IGC/IG8: Two jumper are needed. CLMP with ENA+ and ENA- with V-.

SilverNugget N3: Break out the SMI Port and jump pins 1 and 7.

- ***How do I know what my 3rd party hardware/software is sending to the controller?***

QuickControl has a function called 'Data Monitor' which shows all of the transmitted and received data in the controller. This can be accessed by clicking on Tools->Data Monitor.

- ***How can I check the value of my registers while the program is running?***

Click on the Tools tab in the toolbar and scroll down to Register Watch. This will open a dialog box that will allow you to see any register by clicking on the button Add Register. Another dialog box will appear with the list of all registers on the current device. Select the appropriate data format.

- ***How can I see all Internal Status registers and the data it currently contains?***

QuickControl has a function called 'Diagnostics' which shows all of the registers contained within the controller and their corresponding data. This can be accessed by clicking on Tools->Diagnostics.

Common Issues

Controller

<p>Controller doesn't power up (No lights)</p>	<p>No power to the controller (+12V to</p>	<p>Check the following are securely fastened:</p> <ul style="list-style-type: none"> • SMI cable & breakout boards
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	+48V)	<p>Ensure that the Processor switch is turned on, if equipped.</p>
		<p>Verify that 12 to 48 volts is applied to Input Power and Power Ground</p> <ul style="list-style-type: none"> • SilverLode Multi-Function Interface (SMI) <ul style="list-style-type: none"> V (+): Pins 1 or 7 V (-) : Pins 6 or 11 • SilverNugget N3 <ul style="list-style-type: none"> ○ Apply 12 to 48 volts to Pin 1 (SMI) to enable the driver ○ Apply 12 to 48 volts to Pin 7 (SMI) to power the processor ○ Apply 12 to 48 volts to the DB3 connector to power the driver ○ Ensure the clamp module's Power LED is on
	Unit was hot-plugged	Contact QCI Support.

<p>Controller doesn't communicate with PC, HMI, PLC, etc.</p> <p>(Power and/or Status LEDs flash)</p>	<p>Communication wiring is incorrect</p>	<p>Verify that serial cable is a straight through cable (pin to pin) and NOT a crossover cable nor a null modem cable.</p> <ul style="list-style-type: none"> • Pin 2 → Rx • Pin 3 → Tx • Pin 5 → Logic Ground <p>Try swap communications lines:</p> <ul style="list-style-type: none"> • Rx --> Tx • Tx --> Rx • A --> B • B --> A <p>RS485 signals are reversed between SilverNugget and SilverDust.</p> <p>Remove RS485 termination if communicating in RS-232.</p>
	<p>Incorrect COMM port selected in QuickControl</p>	<p>Go to Setup → COMM Port to modify COMM. port number.</p>
	<p>Unknown Device Wizard succeeds but Initialization Wizard does not. "Download Fail"</p>	<p>More than one unit is connected to the communication network. Isolate the controller.</p> <p>QuickControl doesn't have the current motor's parameters. Update devAux.txt file or update QuickControl version.</p> <p>Upgrade QuickControl to latest version.</p>

	<p>Unknown Device Wizard → No Devices Found</p>	<p>Verify that only one unit is connected to the PC.</p> <p>Verify that no other devices (HMI, PLC, etc) are connected to the communication lines.</p> <p>SilverNugget does NOT support Polling/Debugging with QuickControl setup for MODBUS.</p> <ul style="list-style-type: none"> • Change COM port to 8-bit ASCII to communicate with controller → Unknown Device Wiz
	<p>Communications parameters don't match</p>	<p>Set COMM Port in QuickControl to the following defaults:</p> <p style="text-align: center;">8-Bit ASCII, 2 Stop bits/ No Parity</p> <p>Run the Unknown Device Wizard, Verify COMM light flashes.</p> <p>Run the Initialization Wizard and verify communication parameters between PC and controller match.</p>
	<p>COMM port number out of range</p>	<p>QuickControl 5.xx and back, only support single digit COMM ports (1 → 9).</p> <p>Refer to Windows documentation to change COMM port number.</p>

	<p>COMM port is blown – Most likely unit was hot-plugged.</p>	<p>Measure impedance between Tx and Logic GND & Rx and Logic GND</p> <p>Both should be within the range of 23KΩ & 26KΩ</p>
	<p>RS-485 under powered</p>	<p>Increase voltage to the RS-485 module, QCI-RS485. Up to 50V max.</p>
	<p>Un-configured, bad or blown COMM port</p>	<p>Restart computer.</p> <p>If available, try a different COMM port and/or computer.</p> <p>If using a USB-to-RS232/RS485, verify the latest manufacture's drivers are properly configured.</p>
	<p>Power supply intermittent</p>	<p>Power supply set for 220VAC</p> <p>Change to 110VAC</p>

Controller not responding as expected.	No Device Found “DIF” command not valid Driver not enabled.	Early firmware revisions don't support newer commands. Downgrade to QuickControl 4.2 and delete any commands not supported.
	Device busy or not responding Product line mismatch.	QuickControl version doesn't support device. Download appropriate version.
Controller starts up with “Driver Disabled”	Underrated power supply.	Connect a higher rated power supply.

QuickControl Software

Issue	Cause	Action
Motor doesn't move to commanded position or at commanded Velocity/Acceleration	Motion parameters are initialized with wrong data format.	Double-click register write commands ((WRP) and select proper data format. If communicating from a Host, verify that the transmitted data is in SilverLode units.
	Motion parameters request for a slow motion.	Verify units in Register Watch Tools → Diagnostics → IOS tab → Bit #3:Trajectory Generator <ul style="list-style-type: none"> If Bit #3 is ACTIVE(1), the motor is processing a motion.

<p>“Prog Stop” & “NO COMM” rapidly flashes under the device status monitor.</p>	<p>QuickControl is attempting to access a register read from an invalid location.</p>	<p>In the Register Watch window remove any invalid registers.</p> <p>SilverMax/SilverNugget valid registers</p> <ul style="list-style-type: none"> • 0 through 40 • 200 through 233 <p>SilverDust/SilverSterling valid registers</p> <ul style="list-style-type: none"> • 0 through 255 • 64000 64016 <p>SilverSterling valid registers</p> <ul style="list-style-type: none"> • 0 through 255 • 64000 through 64016 • 50000 through 50511
<p>QuickControl cannot open COM port</p>	<p>Windows 7 compatibility issue</p>	<p>Configure QuickControl to run as Windows XP in compability mode</p> <p>Go to QuickControl root directory (C:Program Files/QuickControl).</p> <p>Right-click on the QuickControl application. Click on the Compatibility tab. Check “Run this program in compatibility mode for” checkbox and select “Windows XP Service Pack 3”.</p>

Motor

Issue	Cause	Action
<p>Motor doesn't rotate (No holding torque present)</p>	<p>Motor is disconnected.</p>	<p>Check the motor cable is securely fastened.</p>
	<p>Bad/damaged motor</p>	

	cable (s)	Swap motor cables.
	Controller is not initialized via the Initialization Wizard or is initialize with for a different motor.	Run the Initialization Wizard. Refer to the Green Status LED Flash Code
Erratic behavior (Holding torque present)	Motor Oscillates	May require tuning. Default tuning parameters are good for 10:1 inertial mismatch.
	Motor faults/kills at the start of a move	<ul style="list-style-type: none"> • Motor underrated. Not enough torque to complete move. • Acceleration parameter too high • Power supply underrated. Verify power supply can provide enough power to the motor(s).
	Index phase is not aligned	On an N3 controller run the Initialization Wizard → Click Options → Check Index Phase Alignment
	Damaged encoder	<p>Open-Loop Test</p> <p>Open the Initialization Wizard. Click the <i>Open</i> button and select the "Factory Default Initialization - Open Loop.qcp". If necessary, correct the motor cable length and click <i>Download File to Device</i>.</p> <ul style="list-style-type: none"> • The controller will ignore the encoder and all accumulated position error counts. Open the <i>Control Panel</i> and begin to jog the motor. If the motor spins, there's an issue with the encoder: <ol style="list-style-type: none"> 1. A pushed-in shaft can damage the encoder 2. Hot-plugging can damage the encoder and/or encoder flex.

	Loose coupling	Check couplers are tightly secured.
	Bad driver	Blown driver(s)

