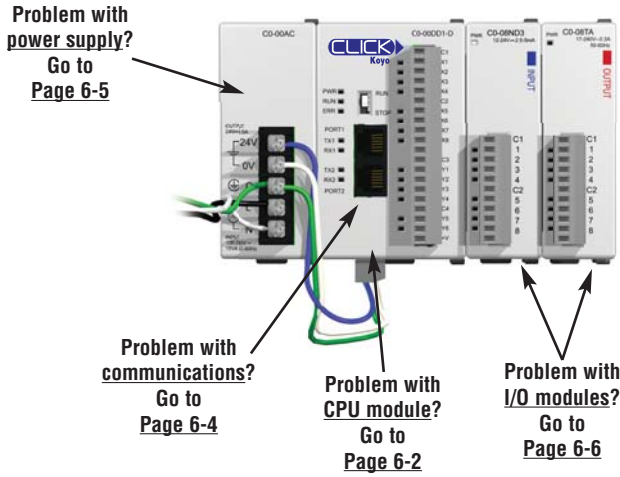


TROUBLESHOOTING



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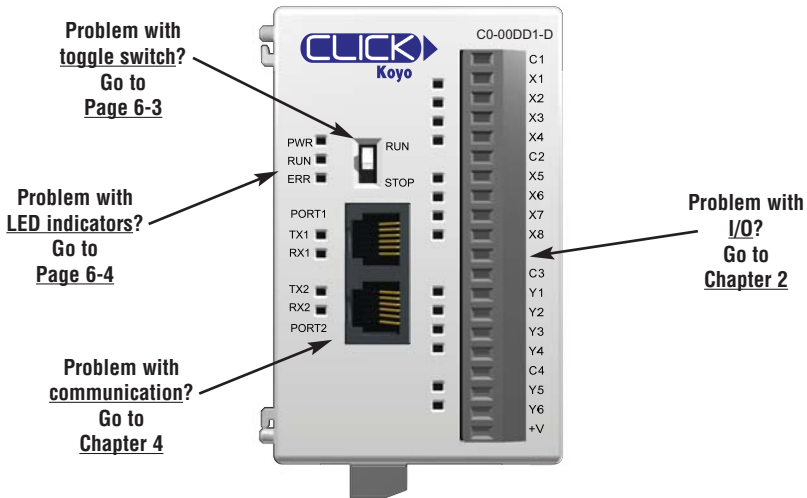


Troubleshooting Direction

Use this section to figure out where to start when troubleshooting CLICK PLC problems.

CPU Module Troubleshooting

CPU module issues are grouped according to their function. Use the illustration below to find the appropriate document page numbers for issues with different CPU module functions.



Toggle Switch

Switch is in RUN position

When the toggle switch is in the RUN position, the CPU module should normally be in Run mode (indicated by the RUN LED being ON), unless the PLC has been placed in Stop mode by a peripheral device through one of the communication ports. To put the CPU module in Run mode, move the toggle switch to the STOP position and then switch it back again to the RUN position. If the RUN LED then remains off, check the PWR and ERR LED indicators per the chart shown below.

LED	Status*	Necessary action
PWR	OFF	There is insufficient power for the CPU module. Check the power cable and input voltage.
ERR	ON	There is a fatal error in the CPU module. Connect the CLICK programming software to read the error information. Refer to the "Error Codes" section of this chapter for error message instructions.

** If you see LED indications different from the ones shown in this table, refer to the "LED Indicators Troubleshooting" section for further explanations.*

Switch is in STOP position

When the toggle switch is in STOP position, the CPU module should be in Stop mode (indicated by the RUN LED being OFF). Cycle power to the PLC. If the CPU module starts up in Run mode, it means the CPU module does not recognize the toggle switch position correctly. Please replace the CPU module.

LED Indicators

The CLICK PLC performs many pre-defined diagnostic routines with every CPU scan, using onboard diagnostics that can detect various errors or failures in the PLC.

The CPU module has 3 LED indicators (PWR, RUN and ERR) to indicate the status of the CPU module.

The CPU module also has other LED indicators, which are discussed in other sections of this chapter.

- TX1/RX1/TX2/RX2 – Chapter 2
- LED indicators for I/O – Chapter 2

LED	Status	Meaning	Necessary action
PWR	On	The PLC is powered correctly.	No action is necessary.
	Blinking	The PLC input power is not sufficient.	Check the voltage on the terminal located on the bottom of the CPU. The input voltage should be 20-28 VDC. Also check the power input wiring & terminal connections. The power supply may need to be replaced.
	Off	There is no power to the PLC.	Check the voltage on the terminal located on the bottom of the CPU. The input voltage should be 20-28 VDC. Also check the power input wiring & terminal connections. The power supply may need to be replaced.
RUN	On	The CPU is in RUN mode.	If the toggle switch next to the LED indicators is in RUN position, no action is necessary. If the toggle switch is in STOP position, cycle power the PLC. If the CPU module starts up in Run mode, it means that the CPU module does not recognize the toggle switch position correctly, and the CPU module must be replaced.
	Off	The CPU is in STOP mode.	If the toggle switch next to the LED indicators is in STOP position, no action is necessary. If the switch is in RUN position and you want to put the CPU module in Run mode, toggle the switch to STOP position and then back to RUN position. If the RUN LED stays off, connect the CLICK programming software to read the error information. See error message instructions later in this section.
ERR	On	There is a fatal error.	Connect the CLICK programming software to check the error. See error message instructions later in this section.
	Blinking	There is a non-fatal error.	Non-fatal errors do not prevent the CPU module from running. However, you should check what non-fatal errors are active. Connect the CLICK programming software to read the error information. See error message instructions later in this section.
	Off	There is no error.	No action is necessary.

Fatal Errors (ERR LED on) – Errors which may cause the system to function improperly, perhaps causing a safety problem.

The CPU will automatically switch from RUN Mode to STOP Mode. (In STOP Mode all outputs are turned off.) If the CPU is already in STOP Mode when the fatal error is detected, the CPU will not allow a transition to RUN Mode until the error has been corrected. Examples of fatal errors:

- Power supply failure
- Parity error or CPU malfunction
- CPU does not have firmware
- Particular programming errors

Non-fatal Errors (ERR LED blinking) – Errors that require attention, but do not cause improper operation. They do not cause or prevent any CPU mode transitions. The application program can use special relay contacts to detect non-fatal errors, and even take the system to an orderly shutdown or switch the CPU to STOP Mode if desired. Examples of Non-fatal errors:

- Certain programming errors. The programming devices will notify you of an error if one occurs while online.
- The CLICK programming software provides the error number and an error message.

Power Supply Troubleshooting

When the PWR LED indicator on the CLICK PLC is on, the PLC is receiving enough power for operation. However, you can measure the power input voltage at the bottom connector on the CPU module. To run the CLICK PLC correctly, the input voltage needs to be 20-28 VDC.

The input voltage measures less than 20VDC

Remove the bottom connector from the CPU module and measure the voltage again. If the voltage at the connector then measures more than 20 VDC, the power supply cannot provide enough current for the CLICK PLC. Replace the power supply with a higher output current power supply. Check the power budget to determine the current required from the power supply (see below).

If the voltage still measures less than 20 VDC with the connector removed from the CPU, and the power supply voltage is not adjustable, then the power supply cannot be used for the CLICK PLC. Replace the power supply with another one.

The input voltage measures greater than 28 VDC

If the output current of the power supply is adjustable, decrease the output voltage. If the output voltage cannot be lowered to less than 28 VDC, replace the power supply with another one.

How to check the power budget

You can use the programming software to check the power budget of the CLICK PLC.

- Connect the PLC to a computer running the CLICK programming software.
- From the software menus, connect the software to the PLC by selecting PLC and Connect...
- From the software menus, select Setup and System Configuration...
- The System Configuration Setup window opens, and displays the Power Budget in mA required by the PLC system. The PLC power supply must be capable of providing more current than the Power Budget amount.

I/O Module Troubleshooting

First, check the status of the PWR LED indicators on the I/O modules. If the PWR LED on the CPU module is on, but there are I/O modules which have PWR LEDs that are off, check the connections between the modules. If the I/O module PWR LEDs remain off, replace those modules.

Troubleshooting input modules is slightly different from troubleshooting output modules. Please refer to the proper subsection.

- DC/AC input module troubleshooting
- DC output module troubleshooting

DC/AC Input Module Troubleshooting

The input modules (including the CPU built-in inputs) can have the following symptoms:

Symptom	Necessary Action
Input signal is on, but the LED indicator on the module is off.	Check the external power input voltage on the terminal block.
	Check whether the terminal block is attached correctly.
	If the input voltage is correct but the LED indicator is still off, replace the input module.
The LED indicator is on, but the PLC does not work as expected.	Check whether the CPU module RUN LED is ON. If not, put the CPU in RUN mode.
	Check the I/O configuration with the programming software. (See “Troubleshooting with Programming Software” later in this section for instructions.)
	Connect the programming software and check the X bit related to the input point that is on. (See online help files for instructions.) If the X bit is off, replace the input module. (See Chapter 2: Specifications)

DC Output Module Troubleshooting

The output modules (including the CPU built-in outputs) can have the following symptoms:

Symptom	Necessary Action
The module LED indicator is ON, but there is no output.	Check the external power input voltage on the terminal block.
	Check whether the terminal block is attached correctly.
	If it is a DC sinking, relay, or AC output, check the voltage between the output and the common. If the output is working correctly, the voltage should be close to zero.
	If it is a sourcing output, check the voltage between the output and the 24 VDC input. If the output is working correctly, the voltage should be close to zero.
	Check whether the terminal block is attached correctly.
The module LED indicator is OFF, even though the output status bit (Y---) is supposed to be ON.	If the LED indicator is ON, but the output voltage is not correct, replace the output module. (See Chapter 2: Specifications for instructions.)
	Check whether the CPU module RUN LED is ON. If not, put the CPU in RUN mode.
	Check the I/O configuration with the programming software. (See "Troubleshooting with Programming Software" later in this section for instructions.)
	Connect the programming software and check whether the Y bit related to the output point is ON. If the Y bit is not actually ON, use the override feature to manually turn the Y bit ON. (See online help files for instructions.) If the Y bit is ON, but the output is OFF, replace the output module. (See Chapter 2: Specifications for instructions.)
The module LED indicator is OFF, but the output is sending an ON signal to the field device.	Leakage current can be a problem when connecting field devices to I/O modules. False input signals can be generated when the leakage current of the output point is great enough to turn on the connected input device. To correct this issue, install a resistor in parallel with the input or output of the circuit. The value of this resistor will depend on the amount of leakage current and the voltage applied, but usually a 10k to 20k Ohm resistor will work. Ensure that the wattage rating of the resistor is correct for your application.

How to Check the I/O Configuration

You can use the CLICK programming software to check the I/O configuration that the CPU is recognizing.

Checking I/O configuration with programming software

- Connect the PLC to a computer running the CLICK programming software.
- From the software menus, connect the software to the PLC by selecting PLC and Connect...
- From the software menus, select Setup and System Configuration...
- The System Configuration Setup window opens, and displays all of the CLICK module types the CPU recognizes that are connected in the PLC system.

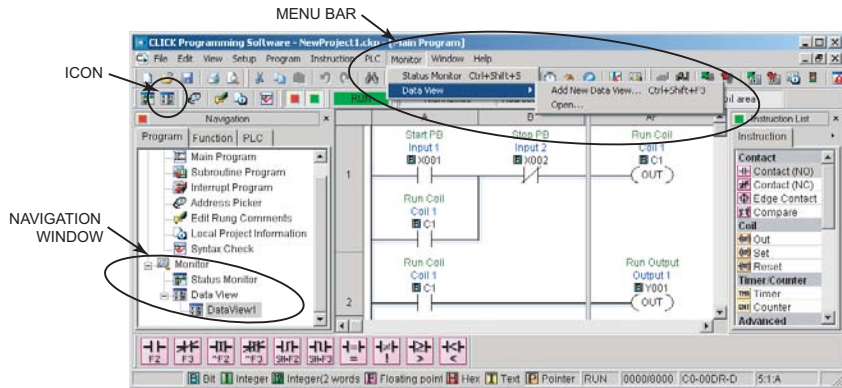
How to Check the I/O Status

You can use a CLICK programming software Data View to check the I/O status in the CPU module.



Warning: Only authorized personnel fully familiar with all aspects of the application should make changes to the program. Make sure that you thoroughly consider the impact of any changes to minimize the risk of personal injury or damage to equipment. Specifically, forcing inputs and outputs to their on state will cause externally connected equipment to operate.

- Open or create a data view window by selecting Monitor and Data View from either the menu bar, the Navigation window, or the Data View icon.



- To add new memory addresses to a Data View window:
 - Click on an empty Address field to bring up a small browser button.
 - Click the browser button to open the Address Picker window,
 - From the Address Picker window, click the Pickup Mode button, select the desired I/O or memory location, and then click OK to add that address into the data view.

No.	Address	Nickname	Current Value	New Value	Write	Viewing Format
001	X001	Input 1	Off			Bit
002	X002	Input 2	Off			Bit
003	SC7	1sec. Clock	On			Bit
004	C1	Coil 1	Off	On Off	ON OFF	Bit
005	Y001	Output 1	Off	On Off	ON OFF	Bit
006	Y002	Output 2	On	On Off	ON OFF	Bit

- To troubleshoot I/O from the Data View window:
 - Connect to PLC
 - Force outputs on/off, then check actual outputs to see whether they are actually on or off.
 - Edit, Write All New Values, or double click individual output Write icon.
 - Externally turn inputs on or off, then check their status in data view. Inputs cannot be forced from Data View.

Replacement of I/O modules



Warning: The CLICK PLC does not have hot swap capability. Do not disconnect or replace any I/O modules without first shutting off power to the PLC CPU unit.

Before replacing an I/O module, please consider the cause of the module problem. If you suspect that another device may have caused the failure in the module, that device may also cause the same failure in the replacement module. As a precaution, you may want to check power supplies or other devices connected to the failed module before replacing it.

Troubleshooting Electrical Noise Problems

Electrical Noise Problems

Noise is one of the most difficult problems to diagnose. Electrical noise can enter a system in many different ways and can fall into one of two categories, conducted noise or radiated noise. It may be difficult to determine how the noise is entering the system, but the corrective actions are similar for both types of noise problems.

- Conducted noise is electrical interference introduced into the system by way of an attached wire, panel connection, etc. The interference may enter through an I/O circuit, a power supply connection, the communication ground connection, or the chassis ground connection.
- Radiated noise is electrical interference introduced into the system without a direct electrical connection, much in the same manner as radio waves.

Reducing Electrical Noise

Although electrical noise cannot be completely eliminated, it can be reduced to a level that will not adversely affect the system.

- Most noise problems result from improper grounding of the system. A good earth ground can be the single most effective way to correct noise problems. If a ground is not available, install a ground rod as close to the system as possible. Ensure that all ground wires are single point grounds, and are not daisy chained from one device to another. Ground other metal enclosures near the system. A loose wire can act as a large antenna, introducing noise into the system; so, tighten all connections in your system. Loose ground wires are more susceptible to noise than the other wires in your system. Review Chapter 3: Installation and Wiring, if you have questions regarding how to ground your system.
- Electrical noise can enter the system through the power source for the PLC and I/O circuits. Installing an isolation transformer for all AC sources can correct this problem. DC sources should be well-grounded, good quality power supplies.
- Separate input wiring from output wiring. Never run low-voltage I/O wiring close to high voltage wiring.

Error Codes

When there is an error or warning, the error code is stored in the system data register SD1.

PLC Error Codes					
Error Code	SC bit*	Error Name	Category	Causes	Solutions
0101	SC20	I/O Module Error	Error	There are more than 8 I/O modules.	A CLICK PLC system can support up to 8 I/O modules. Remove any excessive I/O modules.
				At least one I/O module was added to the CLICK PLC during operation.	Power off the CLICK PLC and check the connection of the I/O modules. Then power on the CLICK PLC again. If the problem remains, connect the CLICK software to the PLC and check the System Configuration. If there is any I/O module that is not shown in the System Configuration, replace it.
				An I/O module has failed.	Connect the CLICK software to the CLICK PLC and check the system configuration. If there is any I/O module that is used in the PLC system but not shown in the System Configuration window, replace the I/O module.
0102	SC21	System Config Error	Error	The current system configuration does not match the configuration saved in the project file.	Connect the CLICK software to the CLICK PLC and open the System Configuration window. Modify the current configuration of the CLICK PLC to match the configuration in the project file, or uncheck the 'Start-up I/O Config Check' option if you want to use the current configuration.
0103	SC22	I/O Config Error	Error	At least one I/O module was removed from the CLICK PLC during operation.	Power off the CLICK PLC and check the connection of the I/O modules. Then power on the CLICK PLC again. If the problem remains, connect the CLICK software to the PLC and check the System Configuration. If there is any I/O module that is not shown in the System Configuration, replace it.
				The CPU module can not access one or more I/O modules.	Connect the CLICK software to the CLICK PLC and open the System Configuration window. If there is any I/O module that is used in the PLC system but not shown in the System Configuration window, replace the I/O module.
0104	SC23	Memory Check Error	Error	There is a memory check error.	Power cycle the CLICK PLC. If the same error occurs again, download the project again and/or try the 'Reset to Factory Default' command. If the same error still occurs, replace the CPU module.
0105	SC24	Project File Error	Error	There is no project file in the CLICK PLC.	Download a project file into the CLICK PLC.
				The project file stored in the CLICK PLC is corrupted.	Download the project file into the CLICK PLC again.
0106	SC25	Firmware Version Error	Error	The project file was written on a newer version of CLICK software. The firmware in the CLICK PLC is too old to execute the project.	Connect the CLICK software to the CLICK PLC and update the firmware of the CPU module.
0107	SC26	Watchdog Timer Error	Error	The PLC scan time exceeded the watchdog timer setup.	Connect the CLICK software to the PLC and check the maximum PLC scan time and the watchdog timer setup.

* The SC bits are turned ON when the related errors occur.

Error codes continued on next page.

Error Codes (cont'd)

PLC Error Codes					
Error Code	SC bit*	Error Name	Category	Causes	Solutions
0201	SC27	Lost SRAM Data	Warning	The data in the SRAM was lost while the CLICK PLC was powered off.	The CLICK CPU module does not have a battery back-up, but it has a capacitor that will hold memory for a few days. The data in the SRAM is lost if the CLICK PLC is powered off for long enough for the capacitor to discharge. In this case, the CLICK PLC initializes the data in the SRAM automatically.
0202	SC28	Battery Low Voltage	Warning	Battery voltage is too low to retain data in the SRAM.	Replace the battery (ADC part #: D2-BAT-1). Also, set the new battery installation date and the anticipated replacement date in the CLICK programming software if the Battery Replacement Notification option is selected. (Pull-down menu: Setup > Battery Backup Setup)
0203	SC29	Battery Replacement	Warning	The anticipated battery replacement date has passed.	Replace the battery (ADC part #: D2-BAT-1). Also, set the new battery installation date and the anticipated replacement date in the CLICK programming software. (Pull-down menu: Setup > Battery Backup Setup)

* The SC bits are turned ON when the related errors occur.