Installation Instructions

GuardPLC 2000 Controller

(Catalog number 1755-L1)

The 1755-L1 controller provides both the central CPU and the communication functions of the GuardPLC™ system. The controller contains all functions of the system: running the application (user program), reading and writing the inputs and outputs, data communication with other external systems, executing self tests including the watchdog and tests of inputs and outputs.

Package Contents

This package contains:

- GuardPLC 2000 controller 1755-L1
- 2 mounting screws
- installation instructions

Publication 1755-IN002B-EN-P - March 2002

Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of this control equipment must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards.

The illustrations, charts, sample programs and layout examples shown in this guide are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Allen-Bradley does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Allen-Bradley publication SGI-1.1, *Safety Guidelines for the Application, Installation and Maintenance of Solid-State Control* (available from your local Allen-Bradley office), describes some important differences between solid-state equipment and electromechanical devices that should be taken into consideration when applying products such as those described in this publication.

Throughout this manual we use notes to make you aware of safety considerations:

ATTENTION

Identifies information about practices or circumstances that can lead to personal injury or death, property damage or economic loss

Attention statements help you to:

- identify a hazard
- avoid a hazard
- recognize the consequences

IMPORTANT

Identifies information that is critical for successful application and understanding of the product.

European Communities (EC) Directive Compliance

If this product has the CE mark it is approved for installation within the European Union and EEA regions. It has been designed and tested to meet the following directives.

EMC Directive

This product is tested to meet the Council Directive 89/336/EEC Electromagnetic Compatibility (EMC) by applying the following standards, in whole or in part:

- EN 50081-2 EMC — Generic Emission Standard, Part 2 — Industrial Environment
- EN 50082-2 EMC — Generic Immunity Standard, Part 2 — Industrial Environment
- EN 61131-2 — Programmable Controllers, Part 2 — Equipment Requirements and Tests
- EN 61000-6-2 EMC — Part 6–2, Generic Standards — Immunity for Industrial Environments

This product is intended for use in an industrial environment.

Low Voltage Directive

This product is not required to meet Council Directive 73/23/EEC Low Voltage because it is rated less than 50V ac and 75V dc.

General Safety

Open style devices must be provided with environmental and safety protection by proper mounting in enclosures designed for specific application conditions. See NEMA Standards publication 250 and IEC publication 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosure.

Rockwell Automation Technical Support

If you need any assistance with the information found in this Quick Start, first call your local Rockwell Automation representative, then:

- Post-sales Technical Support, 440.646.5800
- Web Links: http://www.ab.com — as a registered member, open to http://www.ab.com/mem/technotes/techmain.htm

Inserting the Controller

These procedures assume that you have installed the GuardPLC 2000 Chassis (1755-A6) and Power Supply Module (1755-PB720). If you have not done so, see the installation instructions for these modules, 1755-IN001 and 1755-IN002, respectively.

IMPORTANT For planning information, see the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

ATTENTION

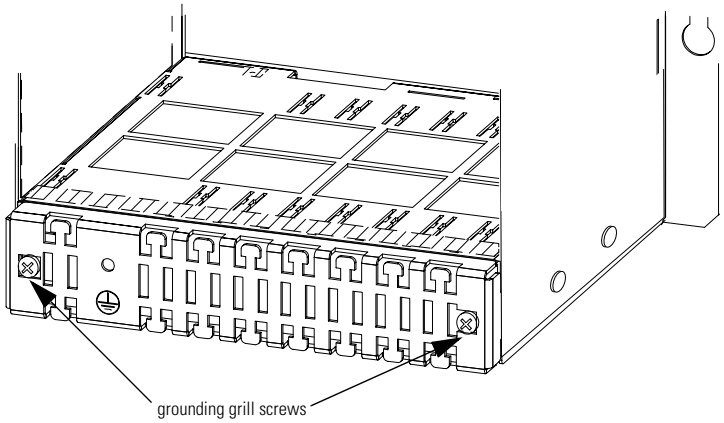
Electrostatic discharge can damage integrated circuits or semiconductors if you touch backplane connector pins. Follow these guidelines when you handle the controller:

- Touch a grounded object to discharge static potential.
- Wear an approved wrist-strap grounding device.
- Do not touch the backplane connector or connector pins.
- Do not touch circuit components inside the controller.
- If available, use a static-safe work station.
- When not in use, keep the controller in its static-shield box.

IMPORTANT Disconnect the power supply module, 1755-PB720, from the 24V dc supply voltage before you insert the controller.

1. Before you insert the controller, you must detach the grounding grill. To do this, remove the grounding grill screws (see figure below).

2. Remove the lower panel of the chassis and disconnect the fans.



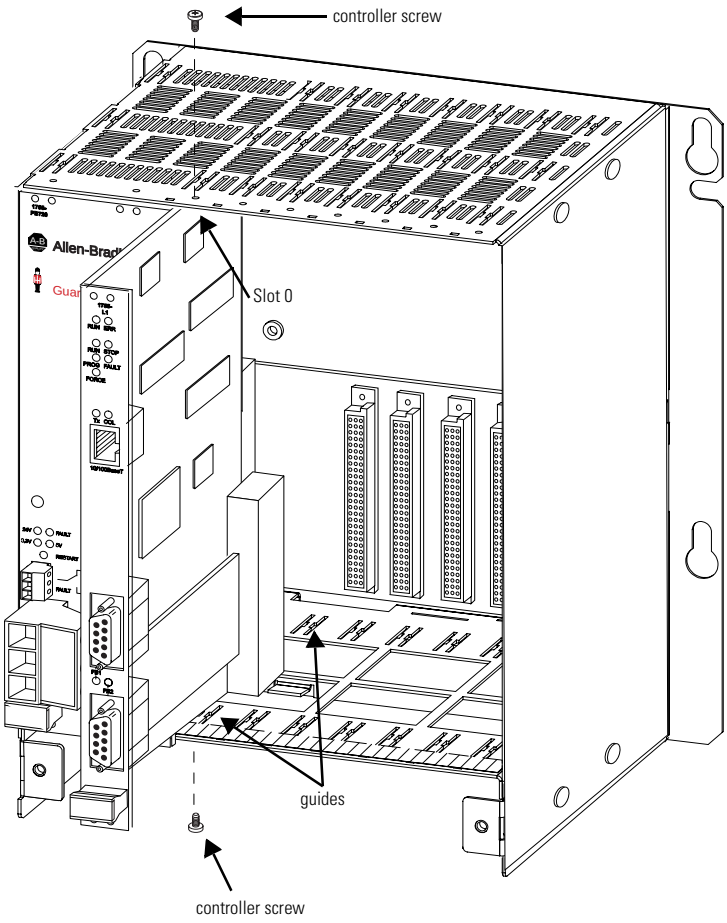
3. Insert the controller into the slot directly to the right of the power supply module (slot 0). Keep the controller in line with the guides so the controller runs smoothly in the track (see figure on page 6).

4. Begin pushing the module into the chassis.

   If there is resistance when you push the module into the backplane, do not force the module because the pins will bend. Remove the module and start again at step 3.

5. Continue pushing the module into the chassis until the front of the module is flush with the other modules in the chassis.

6. Secure the controller with the controller screws on the top and bottom of the controller (see figure on page 6).



TIP

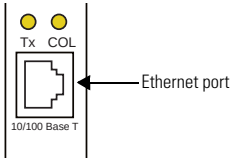
If you are installing other GuardPLC 2000 modules, follow their Installation Instructions up to this point before you complete the next 3 steps.

7. Reconnect the fans.
8. Replace the lower panel of the chassis, sliding it over the tabs on the sides of the chassis and under the tabs on the back of the chassis.
9. Use the grounding grill screws to attach the grounding grill.

Connecting the Controller

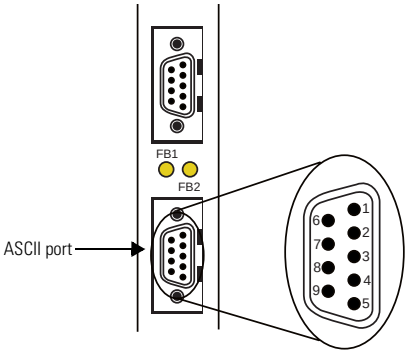
Ethernet Port

To configure/program the GuardPLC system, the controller must be connected on an Ethernet network to the RSLogix Guard™ programming terminal.



RS-232 ASCII Port

Connect the ASCII port (FB2) to any RS-232 device that has the capability to send ASCII command strings to the controller. The controller replies with a data variable string. See the user manual (1755-UM001) for more information.



pin	function
1	none
2	send data
3	receive data
4	none
5	ground
6	none
7	control signal out
8	control signal in
9	none

Additional Functions of the Controller

Tests

In addition to the tests for safety, the controller tests the following:

- **Operating Voltages** – The supply voltage (24V dc) is monitored, and alarms and system shut down are controlled according to the voltage levels listed below:

voltage level	system condition
19.3 to 28.8V dc	normal
< 19.3V dc	alarm state 1 (internal variable are written)
< 15.4V dc	alarm state 2 (prepares for shut down)
< 13.0V dc	shuts down

- **Temperature** – The temperature of the GuardPLC 2000 modules is tested, and the cooling fans and alarms are controlled according to the temperatures listed below:

for this module:	fans turn to high speed at:	fans return to normal speed at:	alarm on at:	alarm off when temperature returns to:
1755-IF8	no temperature testing due to low current levels			
1755-OF8	48°C (118.4°F)	43°C (109.4°F)	75°C (167°F)	71°C (159.8°F)
1755-IB24XOB16	54°C (129.2°F)	47°C (116.6°F)	66°C (150.8°F)	62°C (143.6°F)
1755-HSC	54°C (129.2°F)	47°C (116.6°F)	66°C (150.8°F)	62°C (143.6°F)
1755-PB720	50°C (122°F)	44°C (111.2°F)	60°C (140°F)	55°C (131°F)
1755-L1	54°C (129.2°F)	47°C (116.6°F)	66°C (150.8°F)	62°C (143.6°F)

- **Watchdog** – The watchdog monitors the function of the processors of the controller. In case of certain faults, the watchdog switches all outputs to the de-energized state. The watchdog is also tested by the controller.

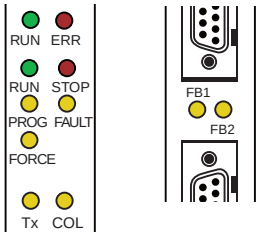
Communication

All communication of the GuardPLC 2000 is handled on the controller card. For example, the commands START, STOP and LOAD transmitted from RSLogix Guard are received by the communication section and transferred to the controller.

Troubleshooting with the Indicators

This controller has the following indicators:

- controller status indicators (RUN, ERR)
- routine indicators (RUN, STOP, PROG, FAULT, FORCE)
- Ethernet communication indicators (Tx, COL)
- RS-232 ASCII port status indicators (FB1, FB2)



Controller Status Indicators

LED	Indication	Status
RUN	on	This is the normal status of the controller (RUN or STOP mode). The controller processes input and output signals, carries out communication and performs hardware and software tests.
	blink	Downloading an Operating System
	off	The controller is in ERRORSTOP (see LED ERR below), or there is no power supply.
ERR	on	The controller is in the ERRORSTOP state and the execution of the routine is halted. All system outputs will be reset and the controller ceases all hardware and software tests. The Operating System loader has found a flash error (FAULT is blinking).
	blink	The boot loader has found an error in the Operating System in the flash (if all other LEDs are ON); the download of a new Operating System is awaited.
	off	No errors are detected.

Routine Indicators

LED	Indication	Status
RUN	on	The controller is in the RUN or FREEZE operating mode.
	off	The controller is in ERRORSTOP.
STOP	on	The controller is in STOP mode and is not executing a routine, but continues to perform hardware and software tests. All system outputs are reset. STOP mode can be triggered by setting the system variable "SYSTEM Logic emergency off" to TRUE in the routine, by direct command from RSLogix Guard.
PROG	on	The download of a new controller configuration is in progress.
	blink	The download of a new Operating System into the Flash ROM is in progress.
	off	No download of controller configuration or Operating System in progress.
FAULT	on	• The routine (user program) has caused an error. • The controller configuration is faulty. • The download of a new Operating System was not successful and the Operating System is corrupted.
	blink	• An error has occurred during a Flash ROM write cycle. • At least one I/O module error is present.
	off	No errors have been detected.
FORCE	on	The controller is executing a routine (RUN) and one or more inputs and/or outputs may be forced by the user.
	blink	The controller is in STOP, but one or more inputs and/or outputs have been prepared for forcing and will be activated as soon as the controller is started.
	off	No inputs and/or outputs are forced or are prepared to be forced.

Ethernet Communication Indicators

LED	Indication	Status
Tx	on	Data is transmitting via Ethernet by the communication processor.
COL	on	A collision on Ethernet is detected.

Fieldbus Status Indicators

LED	Indication	Status
FB1	on	port no. 1 is active (Software not yet implemented – module necessary)
FB2	on	port no. 2 is active (serial interface module)

Replacing the Controller

ATTENTION

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- Touch a grounded object to discharge static potential.
- Wear an approved wrist-strap grounding device.
- Do not touch the backplane connector or connector pins.
- Do not touch circuit components inside the controller.
- If available, use a static-safe work station.
- When not in use, keep the controller in its static-shield box.

IMPORTANT Disconnect the power supply controller, 1755-PB720, from the 24V dc supply voltage before you replace the controller.

If you need to replace the controller, complete the following steps:

1. Remove all connectors.
2. Detach the grounding grill, by removing the grounding grill screws.
3. Remove the lower panel of the chassis and disconnect the fans.
4. Remove the controller screws.
5. Remove the controller by pulling the handle on the bottom of the controller.
6. Insert a new controller as described in the Inserting the Controller section on page 4.
7. Reinsert all connectors.
8. Send the removed controller to your nearest Rockwell Service Center for inspection and repair.

Specifications

1755-L1 Specifications	
User Memory	500 KB application code memory 500 KB application data memory
Operating voltages	3.3V dc 5V dc
Current consumptions	3.3V / 1.5A 5V / 0.1A
Front connectors	1 Ethernet connector for RSLogix Guard 2 ASCII connectors (RS-232)
Operating temperature	0°C to +60°C (+32°F to +140°F)
Storage temperature	-40°C to +85°C (-40°F to 185°F)
Weight	280g (0.62 lb)
Agency Certifications (when product is marked)	UL Listed Industrial Control Equipment UL Listed Industrial Control Equipment for use in Canada Marked for all applicable directives Functional Safety 1oo2D (AK 1–6, SIL 1–3, according to DIN V 19250 and IEC 61508 respectively) Marked for all applicable acts N223

www.rockwellautomation.com

Corporate Headquarters
Rockwell Automation, 777 East Wisconsin Avenue, Suite 1400, Milwaukee, WI, 53202-5302 USA, Tel: (1) 414.212.5200, Fax: (1) 414.212.5201

Headquarters for Allen-Bradley Products, Rockwell Software Products and Global Manufacturing Solutions
Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444
Europe: Rockwell Automation SA/NV, Vorstlaan/Boulevard du Souverain 36-BP 3A/B, 1170 Brussels, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640
Asia Pacific: Rockwell Automation, 27/F Citicorp Centre, 18 Whitfield Road, Causeway Bay, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

Headquarters for Dodge and Reliance Electric Products
Americas: Rockwell Automation, 6040 Ponders Court, Greenville, SC 29615-4617 USA, Tel: (1) 864.297.4800, Fax: (1) 864.281.2433
Europe: Rockwell Automation, Brühlstraße 22, D-74834 Elztal-Dallau, Germany, Tel: (49) 6261 9410, Fax: (49) 6261 17741
Asia Pacific: Rockwell Automation, 55 Newton Road, #11-01/02 Revenue House, Singapore 307987, Tel: (65) 351 6723, Fax: (65) 355 1733

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