

Modicon E984-685 Programmable Controller

GI-0984-685 Rev. B

Congratulations on your purchase of a E984-685 controller. This unit, like all Modicon products, is designed to provide you with years of reliable, trouble-free service.

For complete instructions regarding this unit, including specifications, please obtain a copy of *Modicon's System Planning and Installation Guide for PC-984E-X8X Models E, D, & K* (GM-0984-EDK) or *Modicon's System Planning and Installation Guide for Model PC-E984-685 & PC-E984-785* (GM-0984-601) from your distributor or local Modicon office.

The minimum prom revision levels for the E984-685 slot-mount controller option cards are:

Option	Exec Part Number	Rev. Level	Min. Prom Number
S908	AS-E908-131	H	1007
S911	AS-S911-801		
	Exec (AS-9490-022)	G	1006
S985	AS-S985-800	D	1004

The minimum revision levels for programming software diskettes are:

Option	Part Number	Version	Description
PC			
Disks	SW-MS(X)D-9SA	2.0	Modsoft 2.0
	AS-D984-210	C	Hot Standby
	(CN-0000-260)	2.0	Loadable Module

The minimum levels may no longer be current so you should check with Modicon customer service, your distributor, or local Modicon office.

Information regarding the Model 685E controller in connection with a Modbus Plus™ network, and network system configuration, is found in GM-MBPL-001 *Modicon Modbus Plus Network Planning and Installation Guide*.

984-685E Programmable Controller

Model 685E can support 16 RI/O drops (using the Executive Cartridge AS-E908-016 on the S908) with each drop having 1Kin/1Kout maximum. It can also support 31 RI/O drops (using the Executive Cartridge AS-E908-131 on the S908) with each drop having a maximum 512in/512out. Please note that local I/O is still 1Kin/1Kout even with this option. Maximum discrete I/O is 8192in/8192out regardless which executive cartridge is used on the S908. The S908 Remote I/O Processor comes in two versions: a single cable (AS-S908-110), or dual cable (AS-S908-120). Please refer to GM-0984-RIO *Modicon Remote I/O Cable System Planning Guide*.

Shown in Figure 1, the shielded backplane provides for internal communications within each module housing (sometimes referred to as an enclosure). The 984-685E is one and one-half wide slots, that includes a built-in power supply. The 685E controller operates in the left most slot.

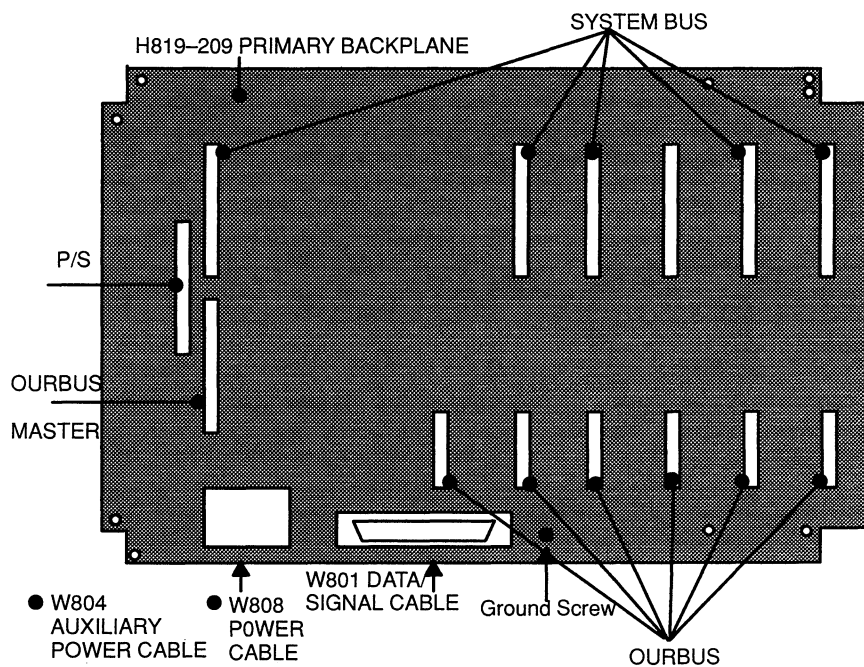


Figure 1 984-685E Primary Housing Backplane (H819-209)

Power Supply Function (AC and DC)

The power supply resident in the controller module provides 60 Watts of power available for the CPU and I/O modules in the primary housing. The I/O Capacity is 8 Amps maximum.

As shown in Figure 2, the 984–685E runs on 115 or 230VAC (47 to 63 Hertz) and/or 24VDC. The AC input, primary power variable is selected by means of a customer installed jumper. The primary power input connector is located at the front, left side of the unit and shown on the drawing as “115V operation jumper.” Once connected, AC or DC POWER is switched ON/OFF with a front panel rocker switch.

The CPU will also operate on 24VDC, either continuously as its only source or from a power supply or battery as part of a backup power supply system. Note the DC primary power input connector for customer supplied 24VDC power. Once connected, an auto-switching DC backup feature is enabled by setting the DC toggle switch (shown) to ON.

Primary Power Cable (AC/DC)



Note Factory and earth grounds often have different potentials; e.g., building steel versus grounding rods.

Your DC input source must be capable of providing 24VDC \pm 15%, at 10A for the turn-on surge and 3.5A continuous.

Figure 2 shows the detail for your primary power (AC/DC) cable connectors. For AC power, use AWG 14 stranded, 3-wire power cord and make your connection to the jack which comes pre-mounted to primary power terminal strip. The 115 VAC jumper illustrated is customer installable. Use No. 14 AWG stranded copper wire for the jumper. For DC primary power input, use AWG 14 also. The CPU's input power should come on a separate line directly from the power source and not involve your I/O.

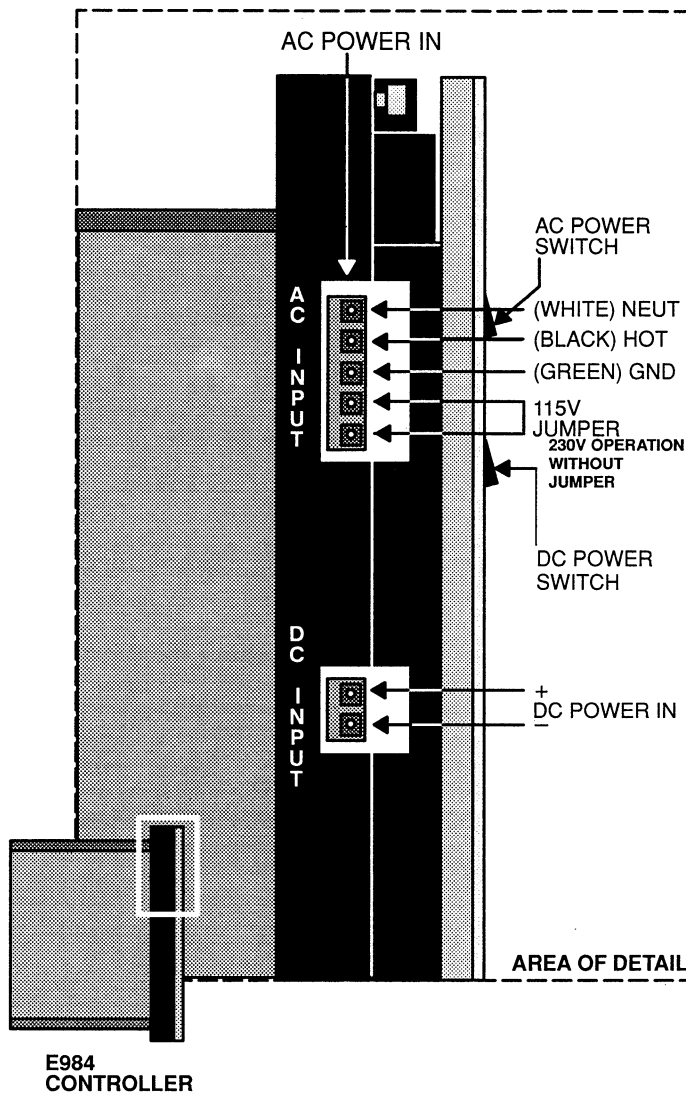


Figure 2 PC-E984-685 Primary Power Input Connections

Memory Function

A Memory fixture that contains both RAM and NVRAM is attached to the CPU mother board and is not accessible to users. The NVRAM contains the executive program used to provide optional CPU functions such as, expanded instruction set. The memory contains the version number, revision level and other information, all of which is accessible via the Modbus or Modbus Plus communication ports. The Software Version can be taken from the data from memory page F location 4020 or from the Modsoft "Login" configuration screen. The major release is represented by the value in the high byte and sub-release is indicated by the value in the low byte. Executive code changes are implemented by downline loading using a special loader program. The overall parameters are:

Table 1 685E Memory Configuration

Total Memory Bytes	User Memory* Words	State RAM** Words	Max 0x or 1x Discretes	Max 3x + 4x Registers
256K	16K	12.5K	8192	9999K

* Includes space for User Logic, Traffic Cop, Configuration Table, etc.

** Includes storage for the 0X, 1X, 3X, and 4X reference types.



Note In Hot Standby operation, the software revision must be the same in both controllers.

Communications Processing Function

The Model 685E has two Modbus ports and one Modbus Plus port. Through these ports, communication processing on the CPU board links the controller to multiple supervisory and programming devices such as a host computer or Modicon's programmer. The two integral Modbus ports permit a 984–685E user to schedule more than one Modbus device to be serviced per scan.

Figure 3 shows the Modbus Plus node address parameter selection switches and the Communications defaults switch. Access to the DIP switches is through the bottom of the module casing.

How to Configure Modbus Port 1 Manually

Modbus Ports 1 and 2 are software configurable, but through-the-chassis, user accessible DIP switch has been provided to manually configure Modbus Port 1 on the 984 CPU. The second port is software configurable only.

The MEM (software) DIP switch (default) is enabled (even while operational) using a slide switch located on the controller side panel

The DIP switch used for Modbus Port 1 fixed defaults is selected by opening (off) or closing (on) **DIP switch 8**.

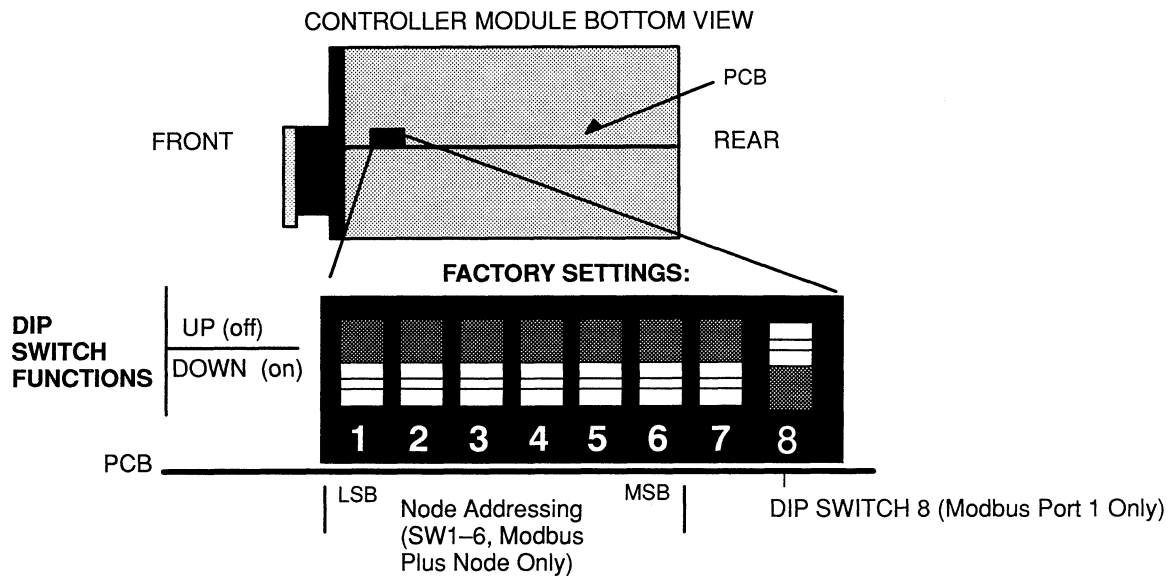


Figure 3 DIP Switch for Modbus Port 1 and Modbus Plus Node

The two settings available are:

RTU, 9600 baud, Even Parity, 1 Stop bit, (switch 8 in the position shown in Figure 3).

ASCII, 2400 baud, Even Parity, 1 Stop bit, (switch 8 position to “down”)



Note When the MEM/DIP enable toggle is returned to MEM position, Port 1 comm parameters and link address return to original memory configured values after a power cycle.

Modbus Plus Node Address Setting

Manual Node Address Change

These node address switches are the first 6 DIP switches as viewed from the bottom of the unit. Switch 7 is not used, switch 8 is the Modbus default select switch. Switches One through six can be set to the binary bit pattern 000000 through 111111 which are the equivalent of decimal 0 through 63 respectively. To derive the node address add “1” to the binary. The default shown in Figure 3 is the binary 0 which is node address 1. To change to an address of 2, place the LSB switch “UP” (000001) etc.,

User memory is protected for up to one year by the CPU's lithium backup battery that has a five-year shelf life.

A manually operated memory-protect switch prevents accidental access to the user's program, from a programming panel.

Controls & Status Indicators

There are two front panel controls available to the user; the first is an AC POWER ON/OFF switch; the second is a DC POWER ON/OFF switch. In addition, there are two slide switches mounted on the front side panel. The top switch allows you to "Protect" a program resident in memory from change, and a second slide switch which allows you to configure communications parameters from Memory via a programming panel setting or use either of two DIP switch settings. Ensure your DC lithium battery is properly installed to protect the memory. Status indicators on the unit are:

POWER OK	Green LED: Generated by power supply to indicate input power OK and voltage outputs OK.
READY	Amber LED: Controller passed power-up diagnostics. Remains ON in Unconfigured, Stopped and Run states as long as health status is OK. Indicator is OFF when an error condition is detected by diagnostics.
RUN	Green LED: Controller was started and is solving logic. This LED will Flash if the 984 has failed any of its confidence tests, or it has been put in the "kernel Mode", or has seen a Stop Code.
BATTERY LOW	Red LED: When ON, battery needs to be replaced (14 day holdup from initial indication).
COMM 1	Green LED: When ON, communication processor has unit address and communications are in progress.
COMM 2	Green LED: When ON, communication processor has unit address and communications are in progress.
MB PLUS ACTIVE	This LED displays a flashing repetitive pattern to indicate the node status: NORMAL flashes every 160 msec. MONITOR NETWORK flashes at one second intervals. Is in offline state receive only. NOT RECEIVING TOKEN flashes two times then is off for two seconds. SOLE STATION flashes three times then is off for 1.7 seconds. DUPLICATE NODE ADDRESS flashes four times then is off for 1.4 seconds.

Customer Service

From anywhere in North America dial 1-(800)-468-5342, Outside North America dial 1-(508)-794-0800

When calling the Modicon 800 telephone number, you will get a recording asking you to enter a one digit code for the type of service you request provided you use a *touch tone* telephone. The service categories and the extra digit responses for touch tone phones are:

- 1 – Hardware or software technical support
- 2 – Order entry, Return/exchange status inquiries
- 3 – MODFAX
- 4 – Training/course registration inquiries
- 5 – General information other than above

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