

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

GE 90-30 SERIES PLC

IC693MDL645F

16-POINT 24 V DC INPUT MODULE

Used with the applicable Series 90-30 discrete I/O configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: GE official manufacturer documentation

24 Volt DC Positive/Negative Logic Input, 16 Point IC693MDL645

The **24 volt DC Positive/Negative Logic Input** module for the Series 90-30 Programmable Logic Controller provides 16 input points in one group with a common power input terminal. This input module is designed to have either positive logic or negative logic characteristics. Input characteristics are compatible with a wide range of user-supplied input devices, such as pushbuttons, limit switches, and electronic proximity switches. Current into an input point results in a logic 1 in the input status table (%I). Power to operate the field devices can be supplied by the user, or an Isolated +24 VDC supply on the power supply (+24V OUT and 0V OUT terminals) can power a limited number of inputs.

LED indicators which provide the ON/OFF status of each point are located at the top of the module. This LED block has two horizontal rows with eight green LEDs in each row; the top row labeled A1 through 8 (points 1 through 8) and the bottom row labeled B1 through 8 (points 9 through 16). An insert goes between the inside and outside surface of the hinged door. The surface towards the inside of the module (when the hinged door is closed) has circuit wiring information, and circuit identification information can be recorded on the outside surface. The outside left edge of the insert is color-coded blue to indicate a low-voltage module. This module can be installed in any I/O slot of a 5 or 10-slot baseplate in a Series 90-30 PLC system.

Table 6-7. Specifications for IC693MDL645

Rated Voltage	24 volts DC
Input Voltage Range	0 to +30 volts DC
Inputs per Module	16 (one group with a single common)
Isolation	1500 volts between field side and logic side
Input Current	7 mA (typical) at rated voltage
Input Characteristics	
On-state Voltage	11.5 to 30 volts DC
Off-state Voltage	0 to +5 volts DC
On-state Current	3.2 mA minimum
Off-state Current	1.1 mA maximum
On response Time	7 ms typical
Off response Time	7 ms typical
Power Consumption: 5V	80 mA (all inputs on) from 5 volt bus on backplane
Power Consumption: 24V	125 mA from the Isolated 24 volt backplane bus or from user supplied power

Refer to Appendix B for product standards and general specifications.

IC693MDL645 Input Module Field Wiring Information

The following figure provides wiring information for connecting user supplied input devices and power source to the 24 volt DC positive/negative logic input module.

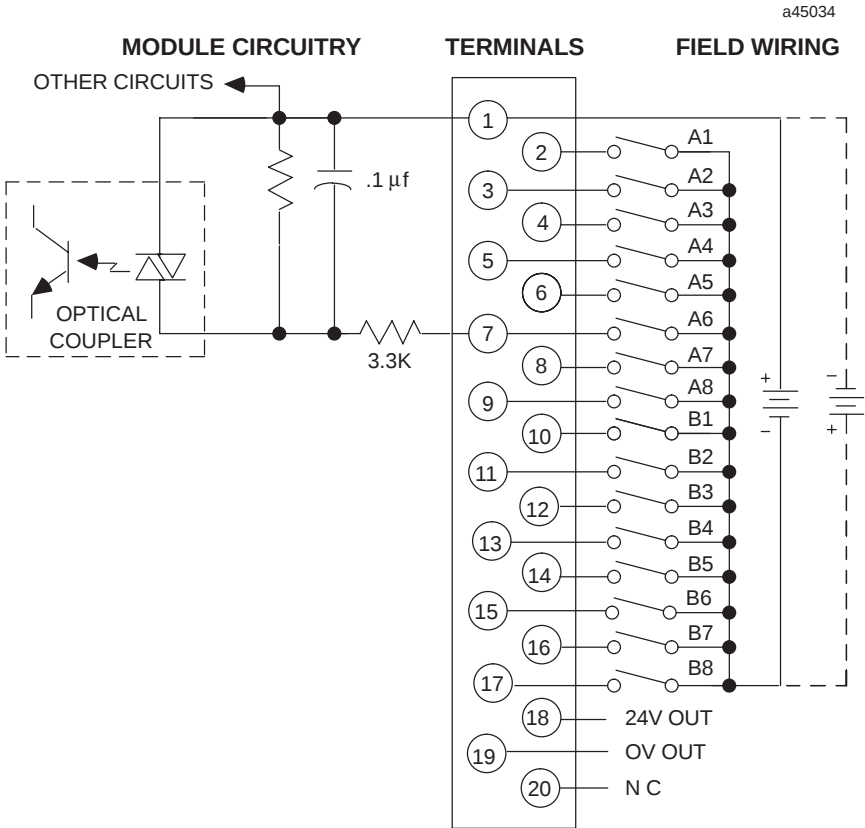


Figure 6-11. Field Wiring - 24 Volt DC Positive/Negative Logic Input Module - IC693MDL645

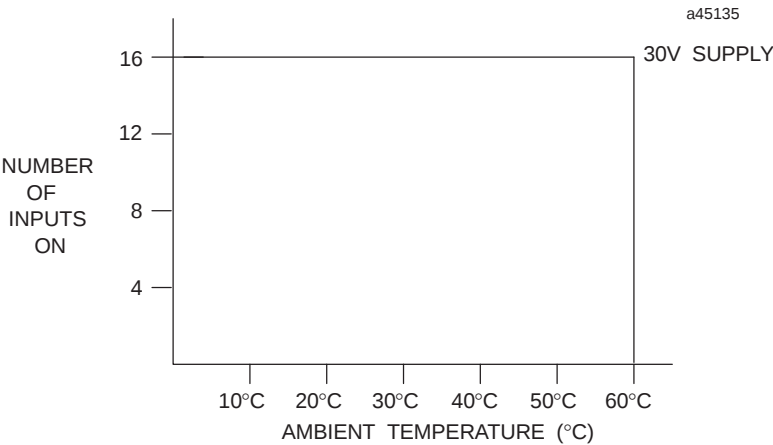


Figure 6-12. Input Points vs. Temperature for IC693MDL645

TBQC Components for 16-Point Modules

Installing a 16 point module typically takes 2 1/2 hours to wire from a PLC to a terminal blocks or strip. With the TBQC, you simply snap the terminal block onto a DIN rail, remove the I/O module's terminal assembly, snap in the I/O faceplate, and connect the cable. This reduces wiring time to about two minutes, reducing wiring costs and errors. TBQC components consist of terminal blocks, I/O Face Plates, and cables.

Terminal Blocks

Terminal blocks have three rows of terminals, arranged in three levels, as shown in Figure J-1. These terminal blocks feature an easy to use captive-screw, "rising cage" type connection system. Catalog numbers for the terminal blocks and the modules they can be used with are listed below.

Table C-1. TBQC Terminal Block Selection Table

Catalog Number	Use With These Modules	Module Description
IC693ACC329¹	IC693MDL240 IC693MDL645 IC693MDL646	Input, 120 VAC – 16 points Input, 24 VDC Pos./Neg Logic– 16 points Input, 24 VDC Pos./Neg, Logic, FAST – 16 points
IC693ACC330	IC693MDL740 IC693MDL742	Output, 12/24 VDC Pos Logic, 0.5A – 16 points Output, 12/24 VDC Pos Logic ESCP, 1A– 16 points
IC693ACC331	IC693MDL741	Output, 12/24 VDC Neg Logic, 0.5A– 16 points
IC693ACC332	IC693MDL940	Output, Relay, N.O. – 16 points
IC693ACC333	IC693MDL340	Output, 120 VAC, 0.5A – 16 points

- 1 This Terminal Block may be used with most I/O modules that have up to 16 I/O points (can not be used with 32 point modules). Jumpers may have to be added; for details of required wiring connections, refer to module specifications in this manual.

Cable Current Rating

Each conductor in these 24-conductor cables has a current rating of 1.2 Amps. If using these cables with a 16-point Output module with a higher output current rating, you must use the lower value of 1.2 Amps for the maximum load current rating. If you have field devices that require more than 1.2 Amps, do not use a TBQC assembly – use the standard Terminal Board that comes with the module instead.

IC693ACC329 TBQC Terminal Block (for 16-Point Modules)

Use with the following 16-point I/O modules:

IC693MDL240

IC693MDL645

IC693MDL646

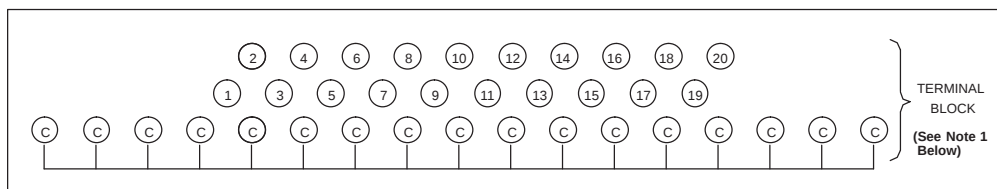
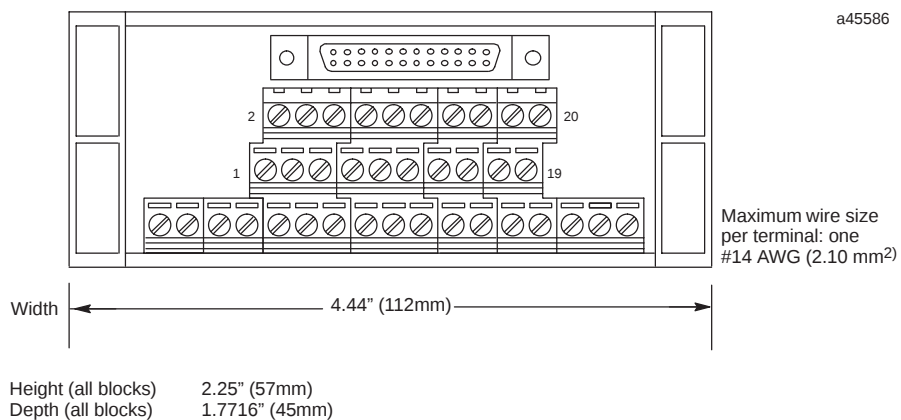


Figure C-3. IC693ACC329 TBQC Terminal Block

Note

The common row terminals (labeled with the letter C) are provided for wiring convenience. Their use is optional. They are electrically isolated from the numbered terminals. You may use them as is, or jumper them to a numbered terminal. Refer to the applicable chapter in this manual for module wiring diagrams.

Mounting

These terminal blocks are mounted on a standard, user-supplied 35 mm DIN-rail.

B

- Backplane
 - Baseplate, 3-14
 - Definition, 3-3
- Backup battery, 4-24
- Baseplate adapter bracket
 - for 10-slot baseplate, 2-10, 3-22
 - installation, 2-11, 3-22
- Baseplate installation, 3-18
 - mounting requirements, model 311/313/323, 3-18
- Baseplate, remote, figure, 3-10
- Baseplate
 - adapter bracket, 2-10, 3-22
 - Common features, 3-1
 - Comparison table, 3-24
 - dimensions for mounting, 10-slot, 3-20
 - dimensions for mounting, 5-slot, 3-18
 - Embedded CPU dimensions, 3-18
 - Expansion and Remote in same system, 3-13
 - expansion dimensions, 3-19
 - Expansion, features, 3-8
 - Grounding, 2-14
 - Modular CPU dimensions, 3-19
 - Mounting, 2-10
 - Mounting dimensions, 3-18
 - mounting in 19" rack, 2-11, 3-23
 - power supply location, 4-2
 - remote 10-slot, 3-11
 - remote 5-slot, 3-10
 - remote dimensions, 3-19
 - Remote, features, 3-10
 - Serial number location, 3-2
 - Sizes, 3-2
 - Terminology, 3-3
 - Types, 3-1
- Baseplates, dimensions for mounting, 10-slot, 3-19
- Battery, Memory backup, 4-24
- Blown fuse status, output modules, 1-2
- Bracket, adapter, 2-10, 3-22

C

- Cable
 - 32-point I/O, C-16, C-19
 - Building 32-point, C-28
 - Extension for I/O module, C-13
 - I/O bus expansion, C-2
 - I/O for 32-point modules, C-15
 - I/O interface, C-23, C-26
- Cable for Series 90-30 installations
 - extension cable for 32 point modules, C-13, C-23, C-31
 - I/O cable for 32 point modules, C-15
 - I/O interface cable for 32 point I/O modules, C-16, C-19, C-26
 - wye cable wiring diagram, earlier version baseplates, C-9
- Cable for Series 90-30 Installations, shield treatment, C-6
- Cables
 - building I/O Bus Expansion, C-2
 - I/O Expansion Bus, 3-12
 - replacing obsolete TBQC, D-3
 - TBQC, D-3
 - TBQC 32-point
 - cross-reference, D-12
 - current rating, D-12
- Calculations for power supply loads, examples, 4-28
- Catalog number location, Baseplate, 3-2
- Catalog numbers, I/O modules
 - IC693ACC300, 6-17
 - IC693ALG220, 10-1
 - IC693ALG221, 10-5
 - IC693ALG222, 10-9
 - IC693ALG223, 10-27
 - IC693ALG390, 11-1
 - IC693ALG391, 11-5
 - IC693ALG392, 11-11
 - IC693ALG442, 12-1
 - IC693DVM300, 7-1
 - IC693MAR590, 8-1
 - IC693MDL230, 6-1
 - IC693MDL231, 6-3
 - IC693MDL240, 6-5
 - IC693MDL241, 6-7
 - IC693MDL310, 7-4
 - IC693MDL330, 7-6
 - IC693MDL340, 7-8
 - IC693MDL390, 7-10
 - IC693MDL632, 6-9
 - IC693MDL634, 6-11
 - IC693MDL645, 6-13
 - IC693MDL646, 6-15
 - IC693MDL653, 6-19
 - IC693MDL654, 6-21
 - IC693MDL655, 6-26
 - IC693MDL730, 7-12

- E2 COMMREQ example, 12-21
- Embedded CPU baseplates, 3-4
 - Features (figure), 3-5
- Equation values for analog modules, 9-7
- Expansion
 - baseplates, 3-8
 - bus termination, 3-13, C-5
 - extension cables, description of, C-13, C-23, C-31
 - port pin assignments, C-5
- Expansion baseplate
 - defined, 3-3
 - IC693CHS392 figure, 3-9
 - IC693CHS398 figure, 3-8
- Expansion system
 - example, 3-16
 - remote connections, 3-17, C-12
- Extension cables, I/O, C-13, C-23, C-31

F

- Faceplate, I/O, TBQC, D-3
- Fax Link system, 13-9
- Field wiring, to AC/DC power supplies, 2-38
- Field wiring connections
 - IC693ALG220, 10-4
 - IC693ALG221, 10-8
 - IC693ALG222, 10-13
 - IC693ALG223, 10-39
 - IC693ALG390, 11-4
 - IC693ALG392, 11-14
 - IC693ALG442, 12-9
 - IC693MAR590, 8-3
 - IC693MDL230, 6-2
 - IC693MDL231, 6-4
 - IC693MDL240, 6-6
 - IC693MDL241, 6-8
 - IC693MDL310, 7-5
 - IC693MDL330, 7-7
 - IC693MDL340, 7-9
 - IC693MDL390, 7-11
 - IC693MDL632, 6-10
 - IC693MDL634, 6-12
 - IC693MDL645, 6-14
 - IC693MDL646, 6-16
 - IC693MDL653, 6-20
 - IC693MDL654, 6-23
 - IC693MDL655, 6-28
 - IC693MDL730, 7-13

- IC693MDL731, 7-16
- IC693MDL732, 7-19
- IC693MDL733, 7-21
- IC693MDL734, 7-23
- IC693MDL740, 7-25
- IC693MDL741, 7-27
- IC693MDL742, 7-29
- IC693MDL750, 7-40
- IC693MDL751, 7-42
- IC693MDL752, 7-45
- IC693MDL753, 7-51
- IC693MDL930, 7-31
- IC693MDL931, 7-34
- IC693MDL940, 7-37
- IC693MDR390, 8-7
 - to dc input power supply, 4-19
 - to standard ac/dc power supply, 4-5
- Field wiring work sheet
 - IC693MDL654, 6-24
 - IC693MDL655, 6-29
 - IC693MDL752, 7-47
 - IC693MDL753, 7-52

- Floating neutral (IT) systems, 2-40

- Fuse, table of, 13-6

G

- Ground conductor installation, 2-13
- Ground connections
 - equipment, 2-14
 - programming device, 2-15
 - safety and reference, 2-14
 - shield ground, 2-16
- Grounding procedures, 2-13
 - Baseplate, 2-14
 - Module shield, 2-16
 - System, 2-13
- Grounding procedures, Programmer, 2-15
- Guide to page location for:
 - analog I/O module specifications, 9-1
 - discrete I/O module specifications, 5-1

H

- Hardware, load requirements, 4-25
- Hardware description, analog modules, 9-4
- Heat, dissipation calculations, F-1
- Heat dissipation, calculating, F-1