This Datasheet for the

IC697BEM761

Series 90-70 I/O Interface (Used with Series Six Plus PLC)

http://www.qualitrol.com/shop/p-14758-ic697bem761.aspx

Provides the wiring diagrams and installation guidelines for this GE Series 90-30 module.

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I/O Interface Module for the IC600 PLC

Features

- Interfaces IC697 I/O modules to the I/O bus of an IC600 programmable controller
- Rack-dependent I/O references
- Supports up to eight racks per I/O system

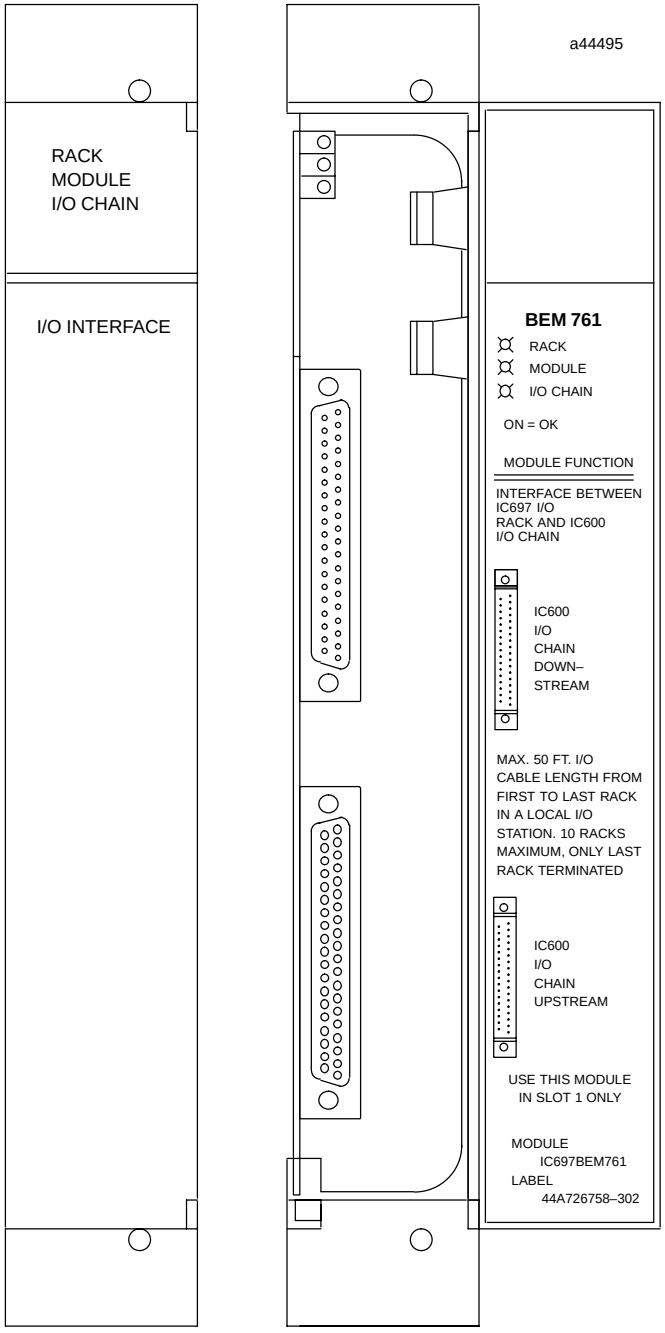
Functions

The **I/O Interface Module** to the IC600 programmable control provides an interface between the IC600 I/O bus and IC697 I/O modules. The I/O Interface Module resides in an IC697 rack and has two 37-pin connectors identical to those used on the IC600 I/O Receiver for interconnection to the IC600 I/O bus.

IC600 PLC systems may be configured to include IC600I/O, IC697 I/O, and IC660 I/O. Both IC600 and IC697 I/O racks may be included on a single I/O chain.

Each IC697 I/O rack is assigned 128 (five-slot rack) or 256 (nine-slot rack) I/O references. Up to eight such racks may be used in a system, providing up to 2000 addressable points. Any point can be used for an input or an output.

A minimum of 8K registers in the IC600 PLC are required for operation of the I/O Interface Module.



GFK-0096F
July 1995

Operation of the Module

The I/O Interface Module is an intelligent module that allows IC697 I/O racks to interface to the IC600 I/O chain. In operation, the I/O Interface Module reads/writes data to each I/O module in the rack. It exchanges this data with the IC600 CPU via the I/O bus.

An I/O chain may include up to eight IC697 I/O racks, as well as additional IC600 racks. Each IC697 rack has nine or five slots - one for the I/O Interface Module, and eight or four for the I/O modules. Although IC697 I/O modules themselves may have 16 or 32 points, each of the eight available I/O slots in the IC697 rack is assigned 32 discrete points. Thus a nine-slot rack fully populated with 32 point modules will have 256 points (128 for a five-slot rack), giving a maximum system size of 2000 points (896 for a five-slot rack). Table 1 shows I/O mapping by rack and slot.

The I/O Interface Module must be inserted in slot 1 (next to the Power Supply slot) with slots 2 through 9 reserved for I/O modules.

Table 1. I/O Mapping by Rack and Slot

Addressing		Rack No.	Slot Number							
			2	3	4	5	6	7	8	9
I/O	Standard	0	1- 32	33- 64	65- 96	97-128	129-160	161-192	193-224	225- 256
		1	257-288	289-320	321-352	353-384	385-416	417-448	449-480	481- 512
		2	513-544	545-576	577-608	609-640	641-672	673-704	705-736	737- 768
		3	769-800	801-832	833-864	865-896	897-928	929-960	961-992	*993-1000
	Complementary	4	1- 32	33- 64	65- 96	97-128	129-160	161-192	193-224	225- 256
		5	257-288	289-320	321-352	353-384	385-416	417-448	449-480	481- 512
		6	513-544	545-576	577-608	609-640	641-672	673-704	705-736	737- 768
		7	769-800	801-832	833-864	865-896	897-928	929-960	961-992	*993-1000
AI AO	Standard	8	1- 32	33- 64	65- 96	97-128	129-160	161-192	193-224	225- 256
		9	257-288	289-320	321-352	353-384	385-416	417-448	449-480	481- 512
		10	513-544	545-576	577-608	609-640	641-672	673-704	705-736	737- 768
		11	769-800	801-832	833-864	865-896	897-928	929-960	961-992	*993-1000
	Complementary	12	1- 32	33- 64	65- 96	97-128	129-160	161-192	193-224	225- 256
		13	257-288	289-320	321-352	353-384	385-416	417-448	449-480	481- 512
		14	513-544	545-576	577-608	609-640	641-672	673-704	705-736	737- 768
		15	769-800	801-832	833-864	865-896	897-928	929-960	961-992	*993-1000

* Do not use these I/O points if this rack contains an Advanced I/O Receiver. Refer to GFK-0152, the IC600 PLC to IC697 I/O User's Manual for further details.

Rack Number

The 2000 I/O points are mapped into the Main I/O table (I/O 0001-I/O 1000) and the Auxiliary I/O table (AI/AO 0001-AI/AO 1000). The rack number is set by configuring a group of jumpers located on the rack backplane directly behind the power supply.

This number determines the location in the Main I/O table or Auxiliary I/O table to which I/O points for that rack will mapped. Racks 0, 1, 2, and 3 are mapped into the Main I/O Table and racks 8, 9, 10, and 11 are mapped into the Auxiliary I/O table. Racks 4 through 7 and 12 through 15 are used only for complementary I/O addressing, which is explained later.

I/O Interface Module for the IC600 PLC

GFK-0096F
July 1995

Setting the Rack Number

The rack number is set by jumpers on the backplane behind the power supply. Jumper positions are set so that the sum of those digits with the jumper in the "1" position is the desired rack number.

For example, rack number 2 would have the 2 jumper in the **1** position and the 1, 4, and 8 jumpers in the **2** position.

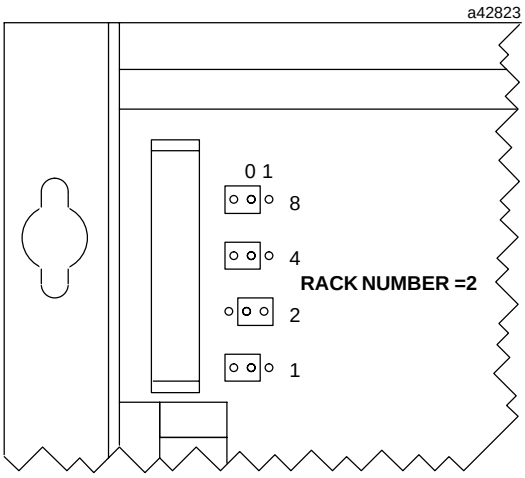


Figure 1. Example of Setting Rack Number

Reserved I/O References

Each IC697 rack uses a reserved I/O reference address (shown in table 2) as part of the communications scheme with the IC600 CPU. This reserved I/O reference address may *not* be used to address IC600 I/O or IC660 I/O if the corresponding IC697 rack is in use.

For example, if rack number 2 is used, addresses 529-536 may not be used for IC600 I/O or IC660 I/O references. It may, however, be used by other IC697 I/Oracks.

References 1001 to 1024 are reserved by the IC600 PLC for interrupts and system operation. Therefore, slot 9 in racks 3, 7, 11, and 15 should be unoccupied (see table 1).

Registers 8060 through 8074 and registers shown in Table 2 are reserved for control and status information. Use of these registers is described in the *IC600 PLC to IC697 I/O User's Manual (GFK-0152)*.

Table 2. I/O Rack Address Assignments and Reserved Addresses

Rack No.	IC600I/O Range	Reserved I/O Reference Addresses	Reserved Registers
0	I/O 1-256	513-520	R8075-R8077
1	I/O 257-512	521-528	R8078-R8080
2	I/O 513-768	529-536	R8081-R8083
3	I/O 769-1000	537-544	R8084-R8086
4	I/O 1-256	545-552	R8087-R8089
5	I/O 257-512	553-560	R8090-R8092
6	I/O 513-768	561-568	R8093-R8095
7	I/O 769-1000	569-576	R8096-R8098
8	AI/AO 1-256	577-584	R8099-R8101
9	AI/AO 257-512	585-592	R8102-R8104
10	AI/AO 513-768	593-600	R8105-R8107
11	AI/AO 769-1000	601-608	R8108-R8110
12	AI/AO 1-256	609-616	R8111-R8113
13	AI/AO 257-512	617-624	R8114-R8116
14	AI/AO 513-768	625-632	R8117-R8119
15	AI/AO 769-1000	633-640	R8120-R8122

GFK-0096F
July 1995

I/O Cable Connections

The I/O Interface Module provides two 37-pin connectors for interfacing to the IC600 I/O bus. The lower connector accepts the upstream cable from the IC600 local I/O chain. The upper connector accepts the downstream cable which goes to additional racks.

The I/O cable is connected to the I/O Interface Module as shown below.

Note

Some IC600 I/O cables are constructed so that the cable enters the connector from the top rather than the bottom as required by the I/O Interface Module. These cables can easily be modified by removing the connector shell, reversing the position of the D-connector housing, and reassembling the shell.

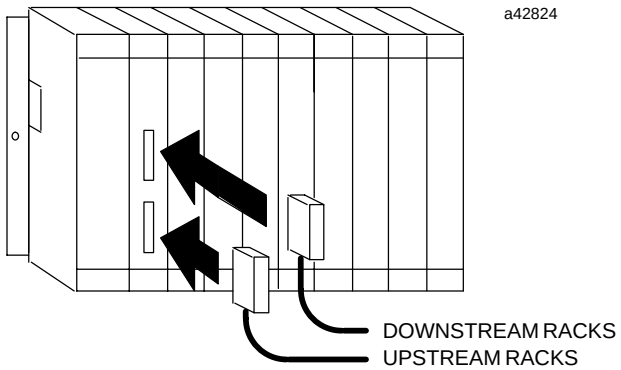


Figure 2. Cable Connections to I/O Interface Module

Termination Resistors

The I/O Interface Module includes line termination resistors which must be set correctly in each I/O Interface Module for proper operation. For I/O Interface Modules which are at the end of a chain, place the termination resistor packages in *position A* as shown below. For I/O Interface Modules at any other location in the chain, set the termination resistor packages to *position B*.

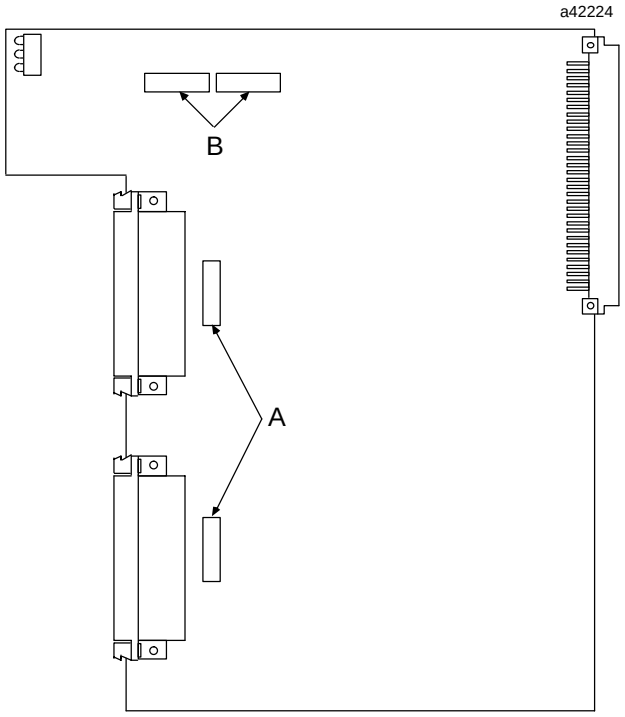


Figure 3. Location of Termination Resistors

LED Indicators

There are three LEDs on the front of the I/O Interface module:

- RACK: Indicates faults within the rack
- MODULE: Indicates faults in the I/O Interface Module
- I/O CHAIN: Indicates a downstream rack fault or I/O bus failure

The normal condition is for all LEDs to be on.

If any LED is off or if the system is not operating normally, refer to Table 3 for troubleshooting information.

If all three LEDs are off, look for a common fault, such as lack of AC input power or a faulty power supply.

If both the RACK and MODULE LEDs are off, the fault is probably located in the I/O Interface Module.

If only the RACK LED is off, the fault is probably in another module in the same rack, not the I/O Interface Module.

Table 3. Troubleshooting Using LEDs

LED Indicators					
Module	**Rack**	**I/O Chain**	**Failure Type**	**Possible Causes**	**Recommended Action**
OFF	OFF	OFF	Common fault	No AC power	Check AC power source
				Power supply failure	Check +5 VDC Bus LED on power supply
ON	OFF	ON	Rack fault	Output module fuse blown in the rack	Check fuse LEDs on output boards
ON	OFF	OFF		I/O module failure in the rack	Remove each I/O module in turn *Always Remove Power Before Removing or Inserting A Module*
OFF	OFF	ON	I/O Interface	Internal I/O Interface	Check I/O Interface Module seating
			Module fault	Module fault	Replace faulty module
ON	ON	OFF	Downstream I/O fault	Loss of communications to downstream racks	Check cabling to downstream racks
ON	OFF	OFF		Failure of downstream racks	Check operation of downstream racks

Complementary Addressing

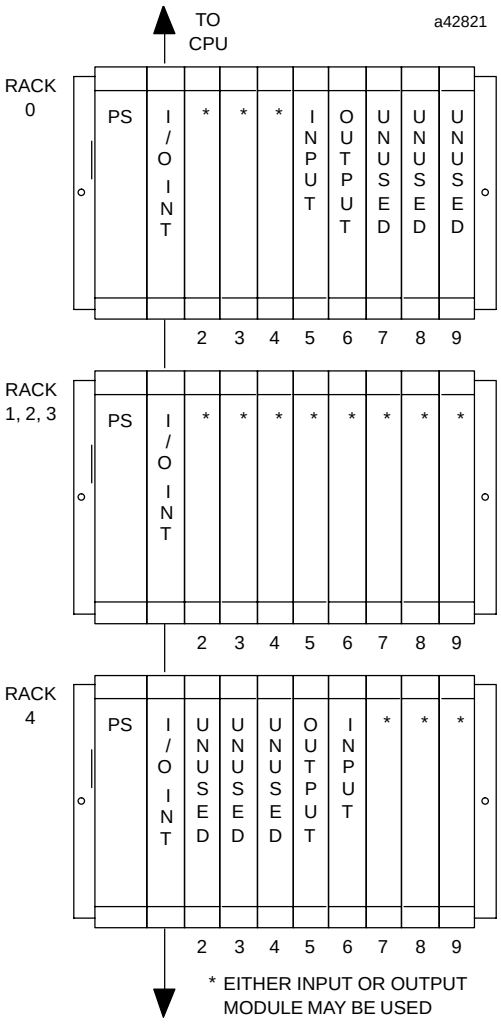
For applications requiring more than 2000 points, a complementary addressing technique may be used. Complementary addressing can extend the system capacity to a maximum of 2000 inputs and 2000 outputs.

The I/O references for each slot (2-9) are fixed for a given rack. Table 1 defines an address range of 32 points for each slot of 16 total racks. Note that for both the main and auxiliary I/O tables, a given I/O point is referenced twice. For example, point 1 is referenced in both rack 0 and rack 4.

If racks 0 and 4 are both used (as shown in the example) the I/O modules for a given slot must be complementary; that is, if an input module is installed in a slot then only an output module may be installed in the corresponding slot in its complementary rack.

In the following example of complementary addressing, slot 5 in rack 0 is occupied by an input module, so slot 5 in rack 4 (complementary to rack 0), must either be used for an output module or left vacant. The example also shows slot 6 in racks 0 and 4 using complementary modules (output module in rack 0 and input module in rack 4).

Additional racks (such as 1 and 5, 2 and 6) have similar complementary addressing.



* Either input or output module may be used.

Figure 4. Example of Complementary Addressing

Removing a Module

The instructions below should be followed when removing a module from its slot in a rack.

- Grasp the board firmly at the top and bottom of the board cover with your thumbs on the front of the cover and your fingers on the plastic clips on the back of the cover.
- Squeeze the rack clips on the back of the cover with your fingers to disengage the clip from the rack rail and pull the board firmly to remove it from the backplane connector.
- Slide the board along the card guide and remove it from the rack.

Note

Slot 9 in racks 3, 7, 11, and 15 not used. See Table 1 for details.

I/O Interface Module for the IC600 PLC

GFK-0096F
July 1995

Table 4. Specifications for IC697BEM761 †

Operational:‡	
Number of Racks:	8 maximum 16 with complementary addressing
I/O Points per Rack:	256 maximum
I/O Points per System:	2000 maximum 4000 with complementary addressing
Current Req. from 5V Bus:	1.3 amps
VME	System designed to support the VME standard C.1

† Refer to GFK-0867B, or later for product standards and general specifications.

‡ Excludes IC600I/O and IC660I/O; refer to the applicable users manual for specifications.

Table 5. Ordering Information

Description		Catalog Number
I/O Interface to IC600 PLC Module		IC697BEM761
I/O Cables:	2 feet	IC600WD002
	5 feet	IC600WD005
	10 feet	IC600WD010
	25 feet	IC600WD025
	50 feet	IC600WD050
	100 feet	IC600WD100
	200 feet	IC600WD200
	300 feet	IC600WD300
	400 feet	IC600WD400
	500 feet	IC600WD500