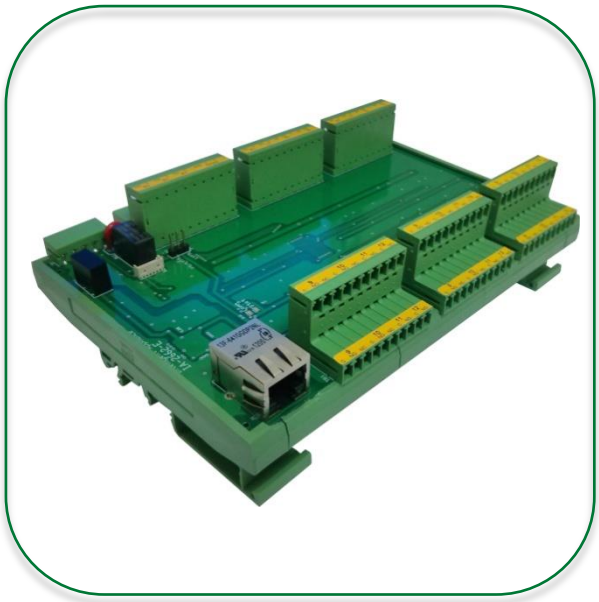
User Manual

IA-2662-E

96-ch digital I/O

TCP/IP Controlled

30VDC / TTL / LVTTL I/O Range



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Feedback

We at Intelligent-Appliance highly value your opinion. Please feel free to contact us with your impression on any subject, or with any question or comment you may have.

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Introduction

The IA-2662-E is an Isolated TCP/IP port Digital I/O Controller with 96 TTL/LVTTL Channels, and Pluggable Screw Terminals for easy wiring and testing.

The IA-2662-E Digital Outputs are capable of sinking or sourcing 8mA at its 'T' version, while at 'O' version they are capable of sinking 300mA on each output.

The IA-2662-E is capable of handling both Positive and Negative Logic Input signals, while the input pull-ups might be switched to Positive or GND in order to fit customers sourcing circuit. Input protection circuits enable secure operation on wide voltage range of over +/- 30Volts.

The IA-2662-E internal circuits may be operated on 5V supply or 3.3V supply in order to best fit customer's needs. Both supplies are on board, ready to run.

The on board Pluggable Screw Terminal blocks includes 8 signal bits each, providing an easy wiring, easy rewiring, easy interchanging and most efficient space management without the need for extra wiring boards.

The IA-2662-E software support includes DOT.net library, open source examples and software utilities for fast system integration.

Features

- Isolated TCP/IP port
- 96 Digital I/O channels
- TTL/LVTTL signal handling
- 5V or 3.3V selected supply
- High current output
- Positive/Negative Logic
- Selectable Input pull-ups source
- Onboard watchdog protection
- High noise immunity
- Din-Rail mounting ready

Specifications

Communication Port	
COM version	Isolated TCP/IP
COM Speed	10/100 base-T
Default IP	10.1.1.22
Default port	23
Digital Output	
Channels	48
Rated Current	'N' Suffix: -300mA 'T' Suffix: +/-24mA 'R' Suffix: Resistor limited
Rated Voltage	'N' Suffix: 0 – 32VDC 'T' Suffix: 3.3V / 5V
Digital Inputs	
Channels	48
Input Voltage Range	3.3V / 5V / 32VDC
Pull-up Resistor	22K OHM
Pull-up Source	+5V / GND / External
General	
Supply Voltage	24VDC
Supply Current	0.2Amp
Operation Temp.	0-60° @ 10M
Storage Temp.	-20-70°
I/O Connector	Pluggable Terminal Blocks
Module Size	170x115x45 mm
Weight	300gr

Ordering Information

- IA-2662-EN:

  96-ch digital I/O

  TCP/IP Controlled

  30VDC / TTL / LVTTL I/O Range

  Output Current: **-300mA Sink**

- IA-2662-ET:

  96-ch digital I/O

  TCP/IP Controlled

  30VDC / TTL / LVTTL I/O Range

  Output Current: **+/-24mA**

- IA-2662-ER:

  96-ch digital I/O

  TCP/IP Controlled

  30VDC / TTL / LVTTL I/O Range

  Output Current: **Resistor Limited**

⚠ Warning & Safety

Intelligent Appliance products are NOT authorized for use as components in life support devices or systems.

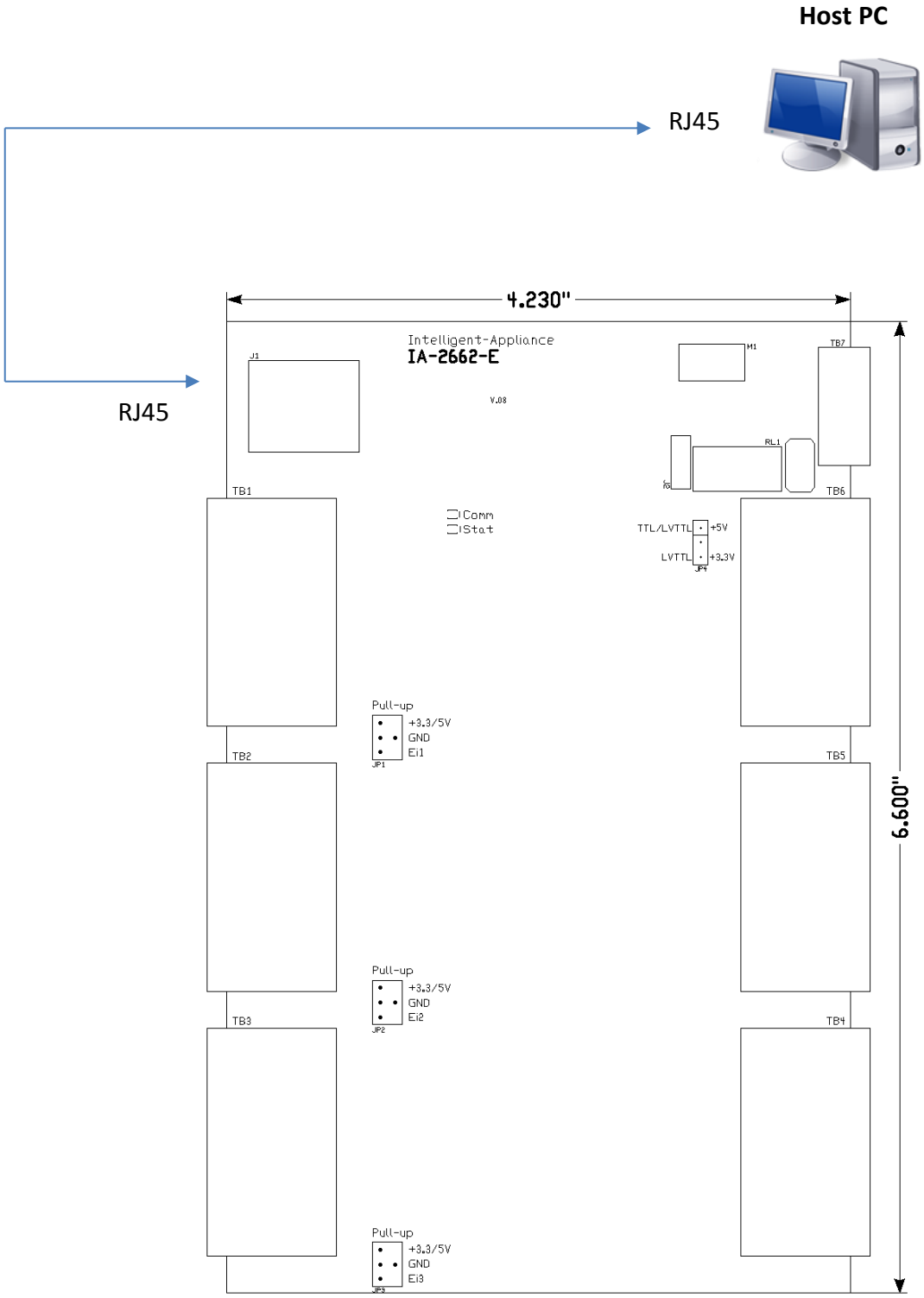
Do not operate the device in a manner not specified in the documentation. Misuse of the device may result in injury and/or damage equipment.

When wiring the device disconnect it from the power source and turn OFF all connected devices.

Not doing so may result in electric shock, injury and/or damage your equipment.

Installation

System Wiring



Pin Assignment

J1 – Main Port (RJ45)

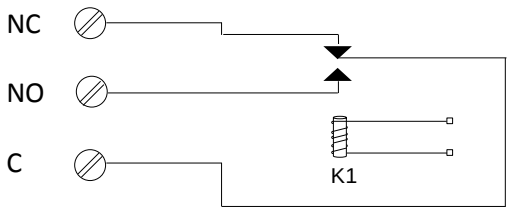
TB1, TB2, TB3 - Digital input signals

TB4, TB5, TB6 - Digital Output signals

TB7 – Power Supply and Relay

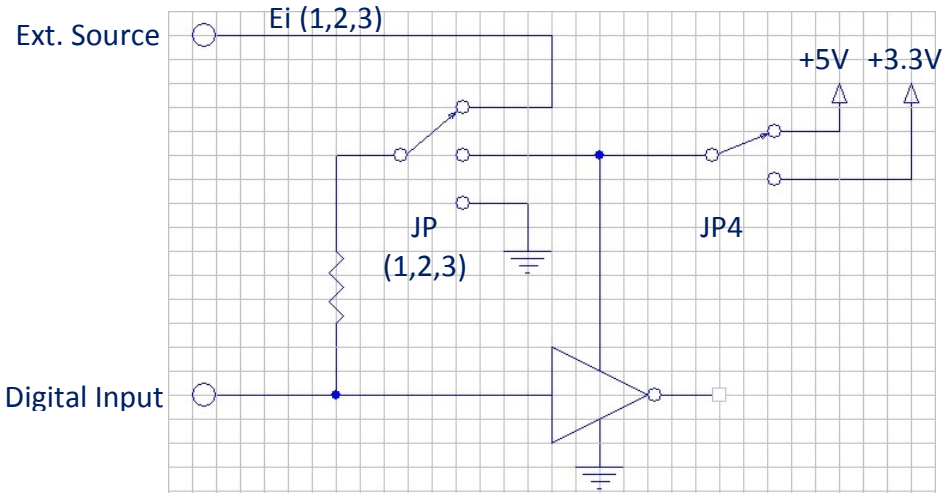
Relay Layout

SPDT, Form C



Jumper Settings

IA-2662-E(N/T/R) , Digital Inputs



Jumper #1 to #3 – Input Circuit Pull-up Source Selectors

Each Pull-up Source Selector handles 16 Digital Input lines, enabling an independent selection to each group.

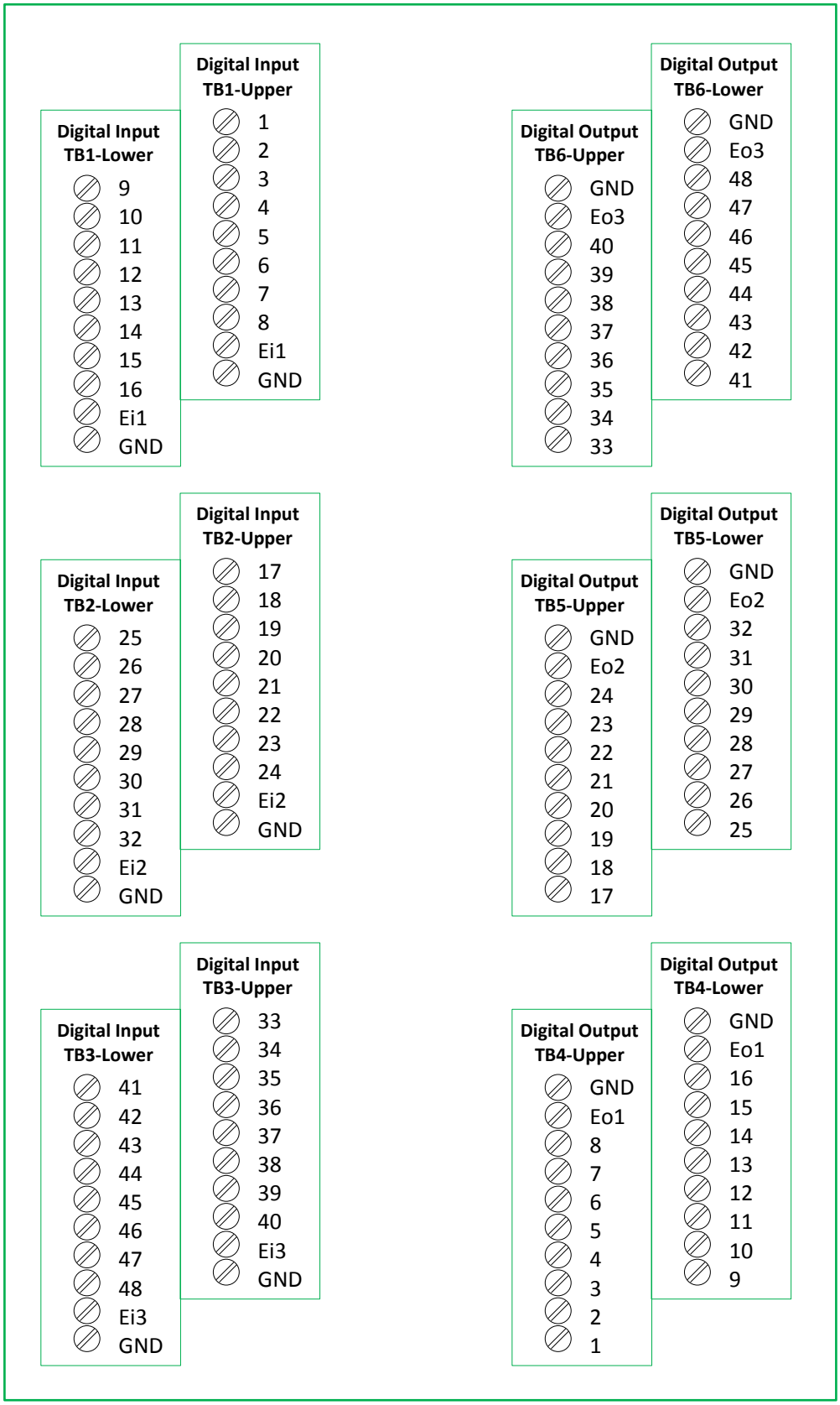
The selection option includes internal +5V/3.3V, Local GND level and External 0V to 30VDC source, provided by the customer through Pin #9, named “EiX”. (Ei1, Ei2 and Ei3).

Choosing a Positive Pull-up Source will define a Negative Logic Operation, while choosing a GND Pull-up Source will define a Positive Logic operation.

Jumper #4 - 5V/3.3V – Operation Voltage Selector

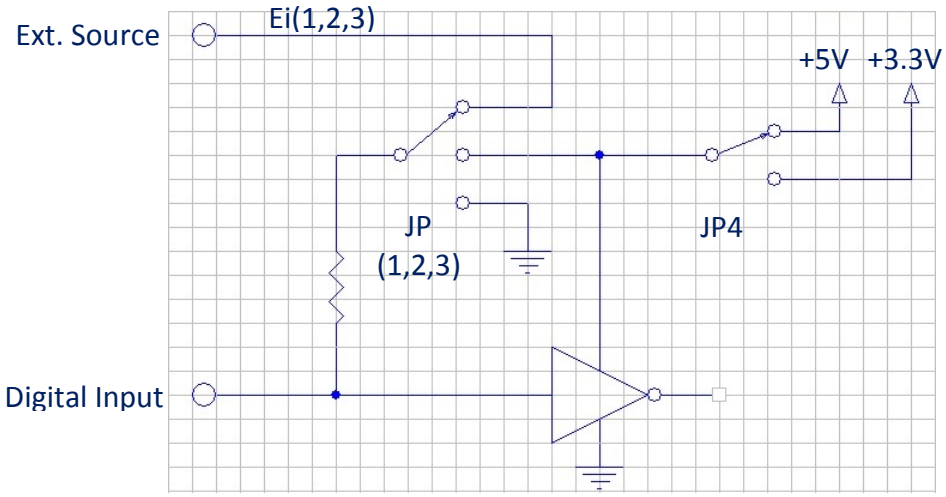
- This Jumper affects both Input and Output Voltage!
- This Jumper should be set while No Power is applied to the IA-2662-E Module!

Digital Input / Output Terminal Block



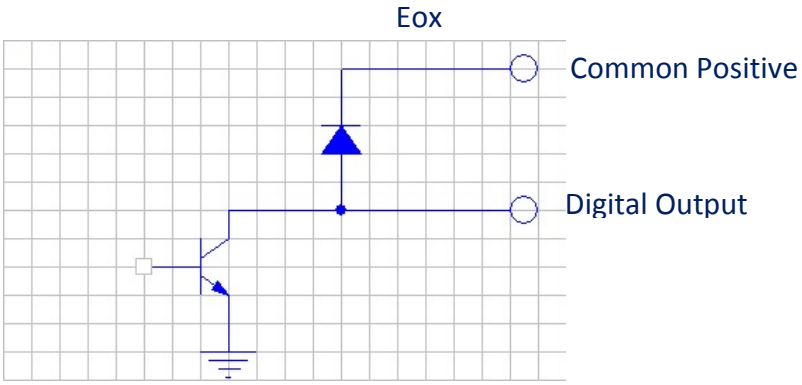
Internal Circuits

IA-2662-E(N/T/R) , Digital Inputs



The IA-2662-E module includes 3 different product versions. Each product version includes a different Digital Output Stage.

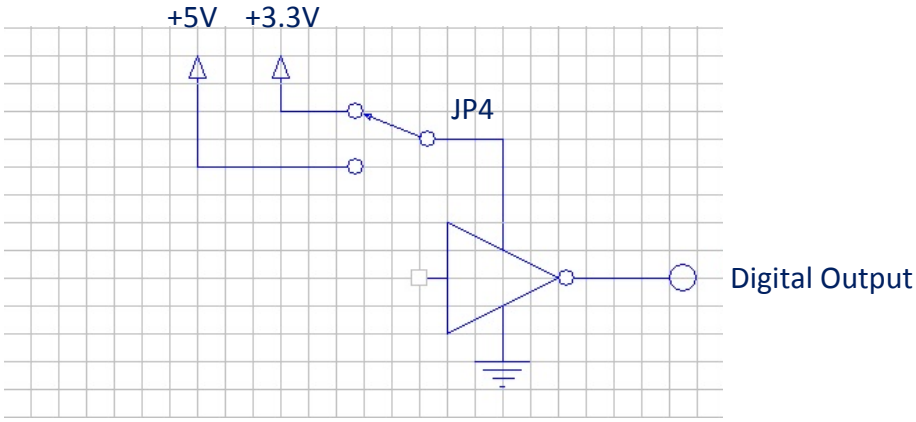
IA-2662-EN, Open Collector 300mA Sink



The IA-2662-EN includes a Darlington Open Collector output stage with a maximum Sink Current of 300mA per a single channel and 100mA for all 8 channels at 100% duty cycle. Each IA-2662-EN module includes 6 Stages while each stage is built of 8 channels as described above.

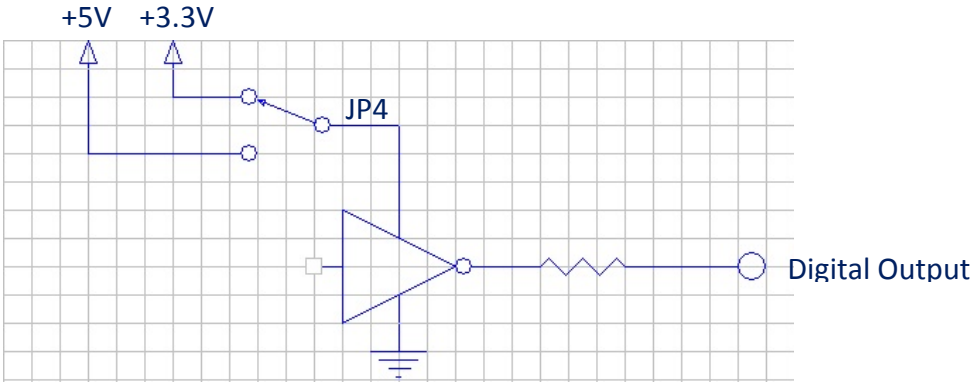
While operating Inductive Loads special care should be taken to eliminate the induction EMI/RFI noise caused at Load switching off moment, while using the IA-2662-EN built in Protection Diodes.

IA-2662-ET, TTL Output



The IA-2662-ET includes a TTL output stage with a current Sink/Source capacity of +/-24mA. Total Sink current is limited to 1Amp. Total Source current is limited to 0.25Amp.

IA-2662-ER, Resistor Output



The IA-2662-ER includes Limiting/Protection Serial Resistors on each Digital Output channel. These resistors differ from each case to case according to the specific application they serve.

Standard available versions include 470 OHM and 1K series resistors. Other values might be specially ordered in certain lots at no extra fee.

Command Set

The following table is a quick reference table for the IA-2662-E, A host computer / PLC may control the IA-2662-E by simply sending ASCII commands though a standard COM port. Each command is structured from a delimiter character, modules address, command character, data if any, carriage returns character. All commands must use UPPER CASE characters.

?aa0 – Get device name

Description Request the Device model name. Can be used to identify the connected module type at the specified address.

Syntax ?aa0<CR>

?	Delimiter character
aa	Hexadecimal address of the device
0	Get device Model command
<CR>	Carriage Return - End of command

Response _nnnn<CR> if the command was valid

_	Response delimiter
nnnn	A string containing the device name
<CR>	Carriage Return - end of response

Example Command: ?010<CR>
Response: _2662<CR>

Request the device at address 01Hex to send its model name.
The response indicates that the command was successful and that the device at this address is IA-2662-E

?aa1 – Get device firmware version

Description Request the Device version

Syntax ?aa1<CR>

?	Delimiter character
aa	Hexadecimal address of the device
1	Get device Version command
<CR>	Carriage Return - End of command

Response _nnnn<CR> if the command was valid

_	Response delimiter
nnnn	A string containing the device version
<CR>	Carriage Return - end of response

Example Command: ?001<CR>
Response: _A125<CR>

Request the device at address 00 Hex to send its version.
The response indicates that the command was successful and that the device version at this address is A1.04

?aa2 – Get Digital output status

Description Read Digital outputs present status

Syntax ?aa2<CR>

?	Delimiter character
aa	Hexadecimal address of the device
2	Read outputs status
<CR>	Carriage Return - End of command

Response _ABCDEFGHIJKLMNOP<CR> if the command was valid

_	Delimiter character
A	1st output nibble
B	2nd output nibble
C	3rd output nibble
D	4th output nibble
E	5th output nibble
F	6th output nibble
G	7th output nibble
H	8th output nibble
I	9th output nibble
J	10th output nibble
K	11th output nibble
L	12th output nibble

Output Bit Table

3	2	1	0
47	46	45	44
A			

3	2	1	0
43	42	41	40
B			

• • •

3	2	1	0
3	2	1	0
L			

Note

Bit 0 refers to input Pin #1
Bit 47 refers to input Pin #48

Examples Command: ?002<CR>
Response: _ 100000000005<CR>

Input #1, #3 and #45 are activated.

?aa5 – Get Device mode

Description This command reads the module operation mode

Syntax ?aa5<CR>

?	Delimiter character
aa	Hexadecimal address of the device
5	System Mode command
<CR>	Carriage Return - End of command

Response _dd<CR> if the command was valid

dd	Mode (00-FF)
80	Enable BR change
02	Report on command errors
00	Normal
<CR>	Carriage Return - End of command

Example Command: ?005<CR>
Response: _82<CR>

In this example the module operation mode enables baud rate change.
It will also send error messages for invalid commands.

?aaI – Get Digital inputs status

Description Read Digital inputs present status

Syntax ?aa2<CR>

? Delimiter character
aa Hexadecimal address of the device
I Read inputs status
<CR> Carriage Return - End of command

Response _ABCDEFGHIJKLMNOP<CR> if the command was valid

_ Delimiter character
- A 1st inputs nibble
- B 2nd inputs nibble
- C 3rd inputs nibble
- D 4th inputs nibble
- E 5th inputs nibble
- F 6th inputs nibble
- G 7th inputs nibble
- H 8th inputs nibble
- I 9th inputs nibble
- J 10th inputs nibble
- K 11th inputs nibble
- L 12th inputs nibble

Output Bit Table

3	2	1	0
47	46	45	44
A			

3	2	1	0
43	42	41	40
B			

• • •

3	2	1	0
3	2	1	0
L			

Note

Bit 0 refers to input Pin #1
Bit 47 refers to input Pin #48

Examples Command: ?00I<CR>
Response: _ 100000000005<CR>

Input #1, #3 and #45 are activated.

?aaID – Get module's ID number

Description This command reads the Device ID

Syntax ?aaID<CR>

?	Delimiter character
aa	Hexadecimal address of the device
ID	Command for read ID
<CR>	Carriage Return - End of command

Response _ID nnnnnnnn

Example Command: ?00ID<CR>
Response: _ID 00412534<CR>

In this example we read S/N of device #00

?aaS – Get jumper & led status

Description This command reads the status of JP1 and the LED.

Syntax ?aaS<CR>

?	Delimiter character
aa	Hexadecimal address of the device
S	Read jumper & led status
<CR>	Carriage Return - End of command

Response _dd<CR> if the command was valid

_	Delimiter character
dd	Output digits
A	1st Input nibble
B	2nd Input nibble

0	0	0	0	RLY	0	0	SLD
D7	D6	D5	D4	D3	D2	D1	D0
A				B			

SLD=1 LED is ON

RLY=1 Relay is ON

Example Command: ?00S<CR>

Response: _09<CR>

In this example the LED and Relay are ON

!aa2ddddddddddddd – Set relay status

Description This command defines module's output state.

Syntax !aa2ddddddddddddd <CR>

!	Delimiter character
aa	Hexadecimal address of the device
2	System control command
d	Digital output activation command data for each nibble in hex format
<CR>	Carriage Return - End of command

Response | ddddddddddddd
if the command was valid and if FB messages are enabled

Example Command: !002100000000028<CR>
Response: |100000000028<CR>

This command will activate digital outputs #4, #6, #45

!aa3dd – Activate relay N

Description This command activates a single relay.

Syntax !aa3dd <CR>

!	Delimiter character
aa	Hexadecimal address of the device
3	Single relay activation command
dd	N Relay ID in hex format
<CR>	Carriage Return - End of command

Response |Sdd if the command was valid

Example Command: !00302<CR>
Response: |S02<CR>

This command will activate relay #3 only (!) all other relays will be not changed.

!aa4dd – De activate relay N

Description This command De activates a single relay.

Syntax !aa4dd <CR>

!	Delimiter character
aa	Hexadecimal address of the device
4	De activate relay N command
dd	N Relay ID in hex format
<CR>	Carriage Return - End of command

Response |Cdd if the command was valid

Example Command: !00402<CR>
Response: |C02<CR>

This command will De activate relay #3 only (!) all other relays state will not be changed.

!aa5dd – Set device mode

Description This command sets the power-up mode and enables/disables error messages.

Syntax !aa5dd <CR>

!	Delimiter character
aa	Hexadecimal address of the device
5	System mode command
dd	Mode (00-FF)
	80 Enable BR change
	02 Report on command errors
	00 Normal
<CR>	Carriage Return - End of command

Response |dd EE OK if the command was valid

Example Command: !00582<CR>
Response: |82 EE OK

This command will enable BR changing an enable the device error messages. (Error messages are sent in response to invalid commands) and will disable baud rate changed by mistake.
Make sure setting a normal mode like '00' or '02'' right after changing the BR to disable mistakenly done BR change.

!aa6dd – Set baud rate

Description For compatibility with existing devices the IA-2662-E can be set to other standard baud rates

Syntax !aa6dd <CR>

!	Delimiter character
aa	Hexadecimal address of the device
6	Change device baud rate command
dd	Two characters representing the desired baud rate:
	12 1200
	24 2400
	48 4800
	96 9600
	19 19200 (default)
	38 38400
	57 57600
	11 115200
<CR>	Carriage Return - End of command

Response |dd<CR> if the command was valid

|	Response delimiter
dd	New baud rate
<CR>	Carriage Return - End of response

Example Command: !01696<CR>
Response: |96<CR>

Change the baud rate of the device at address 01Hex to 9600

Note

1. Mode must be set to “82” first. (!00582)
2. Changes will take effect after the next power up. (Power off)
3. Make sure setting the mode back to normal right after changing the BR.

!aa7dd – Set module's address

Description Each device must have a unique network address. This command defines a module's address.

Syntax !aa7dd <CR>

!	Delimiter character
aa	Hexadecimal address of the device
7	Change device baud rate command
dd	New Hexadecimal address
<CR>	Carriage Return - End of command

Response |dd<CR> if the command was valid

Example Command: !00701<CR>
Response: |01<CR>

Change the address of the device at address 0(Hex) to 1(Hex)

Note

1. Factory default is 00Hex
2. In products chained system, each product must be set to a unique address.
3. The updated address is displayed on the boards 7 segment led display.

!aaSdd – Set user defined led

Description This command turns ON or turns OFF the SLD LED
Relay operation will be operational in PCB v.12.

Syntax !aaSdd <CR>

!	Delimiter character
aa	Hexadecimal address of the device
S	Set Led and Relay status
dd	LED and Relay status:
	08 Relay ON
	01 Led ON
<CR>	Carriage Return - End of command

Response |dd<CR> if the command was valid

Example Command: !00S01<CR>
Response: |01<CR>

This command will turn on the LED

Note The default LED status is ON.

NIBBLE 1				NIBBLE 2					
3	**2**	**1**	**0**	**3**	**2**	**1**	**0**	**RLY**	**SLD**
X	X	X	X	0	X	X	0	OFF	OFF
X	X	X	X	0	X	X	1	OFF	ON
X	X	X	X	1	X	X	0	ON	OFF
X	X	X	X	1	X	X	1	ON	ON

NIBBLE 1	NIBBLE 2	RLY	SLD
0	0	OFF	OFF
0	1	OFF	ON
0	8	ON	OFF
0	9	ON	ON