User Manual

IA-3127-U2I

24-ch Relay

24-ch Digital Input

USB or RS-232 Controlled

IA Daisy-Chain Series

Version 0418

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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-3127S-U2I is a 48-ch I/O Industrial Controller with 24 Relays, handling 5 Amp each and 24 Digital Inputs, handling a wide Voltage input range of up to 30VDC.

This IA-3127S-U2i I/O Controller include a Transient Voltage Suppressor on each relay contact, and a low pass filter on each Digital Input, making it a better solution to deal with Factory Floor RFI/EMI Noisy environment.

The IA-3127-U2I includes an Isolated USB Port that isolates the Host Computer from the IA-3127-U2I I/O lines and from its power supply. In this way the Host Computer is actually isolated from the Factory Floor, the Building wiring net etc., while the IA-3000 Series product may be transparently chained, sharing the same Power-Supply, providing latency free efficient Monitor and Control System.

Features

- 24-ch Relay
- 24-ch Digital Input
- Isolated USB port
- Transient Voltage Suppressors
- Low pass Filters
- Up to 30V Digital Input Range
- Supports wet and “Dry-Contact”
- Dual Watchdog Protection
- Inductive Load Protected
- Din-Rail and Wall Mount Ready

Specifications

Relays

Channels	24
Switching Current	5 Amp
Hold Time	8 mSec Max
Release Time	5 mSec Max
Type	SPST, Form A
Protection	Transient Suppressors

Digital Inputs

Channels	24
Supports	“Dry-Contact”, “Wet-Contact”
Voltage Range	0 to 30 VDC
Logic '0'	0 to 1 VDC
Logic '1'	3.5 to 30 VDC
Protection	Low Pass Filter

Communication

Main COM Port	Isolated USB
Secondary Port	RS-232, DB9 Female
COM Rate	1200 to 115Kbps
Default BR	19200Kbps
COM Setup	8bit, n, 1
Expansion Port	RS-232, DB9 male
Host Wiring	USB A/B (included)
Expansion Wiring	DB9 M/F, pin-to-pin 3 wires, pin 2, 3, 5

General

Power Supply	24 VDC
Power Consumption	0.4Amp
Module Size	182x115x45 mm
Weight	280gr

Ordering Information

- **IA-3127-U2I:**

  24-ch Relay

  24-ch Noise Digital Input

  Isolated USB Port

  USB or RS-232 Controlled

  24VDC Powered

- **IA-3127S-U2I:**

  24-ch Relay

  Transient Suppressors

  24-ch Digital Input

  Isolated USB Port

  USB or RS-232 Controlled

  24VDC Powered

⚠ 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.

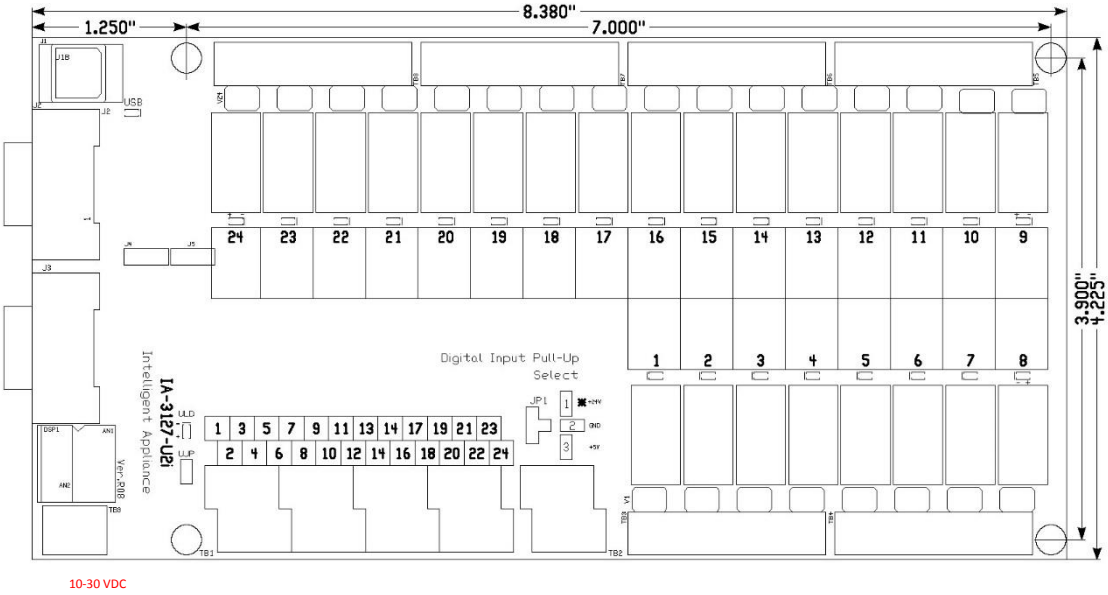
Not doing so may result in electric shock, injury and/or damage your equipment.

Installation

System Wiring

USB
Or
RS-232 (DB9 Female)

USB
Or
RS-232



DB9
Female

DB9
Male

Chaining Device
IA-31XX

DB9
Female

...255

Pin Assignment

J1 – Main Port, Isolated USB

J2 – Secondary Port, RS-232 (DB9 Female)

J3 – Expansion Port, RS-232 (DB9 Male)

Pin	Function
#2	Rx
#3	Tx
#5	GND

TB1 – Digital input signals (1-24)

TB2 – GND (6 Pins)

TB3 ~ TB8 – Relay Contacts (A [1] B), (A [2] B) ~ (A [24] B)

TB9 – Power In

User Defined Jumpers & Led

UJP Jumper – User defined jumper

ULD Led – User defined led

JP1 – Pull-ups Source Selector Jumper

Software Installation

USB Port setup

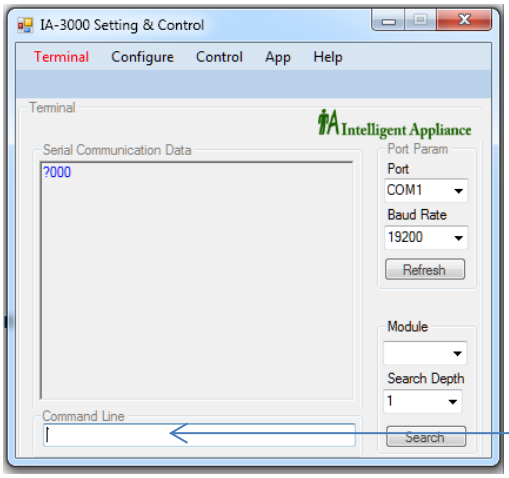
Connect USB A/B Cable between the IA-3127-U2I to the host computer.

The computer informs on locating a new USB device, and asks for S/W drivers.

Kindly choose the USB-Drivers directory on the IA-3000 CD or from our website: www.intelligent-appliance.com, and complete the task by pressing 'Next' and 'Finish' while asked for.

Job done will be accomplished by a steady lilting of the USB led on the IA-3127-U2I unit, and by a creation of new Serial COM that can be easily found on the Device Manager screen.

At this stage you can easily control the IA-3127-U2I I/O's by either any serial control software, or by the IA3000Util Utility, provided in the IA-3000 CD (see next page).



IA3000Util Command Line

Locating the new COM port

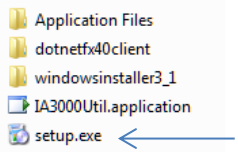
Start the 'Device Manager' utility. (Usually by selecting 'My Computer', Right Clicking the mouse button, choosing manage, Left Clicking and then double Left clicking on the Device Manager will list hardware items).

Select the '+' character to the left of the 'Ports (COM&LPT)', and you'll get a line that will define for example: 'USB Serial Port (COM4)'.

This line informs us that we should refer to COM4, in this case, in order to control the IA-3127-U2I while connected to this computer through its USB port.

IA-3000 Utility

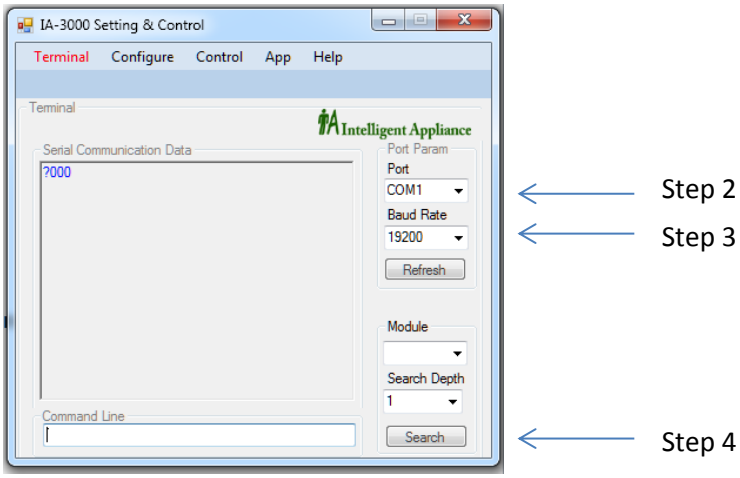
Install the IA3000Util Utility in your computer by clicking on the 'Setup' icon in the 'IA-Utility' directory, on the IA-3000 CD.



Or download it from our online Knowledge Base. (www.intelligent-appliance.com)

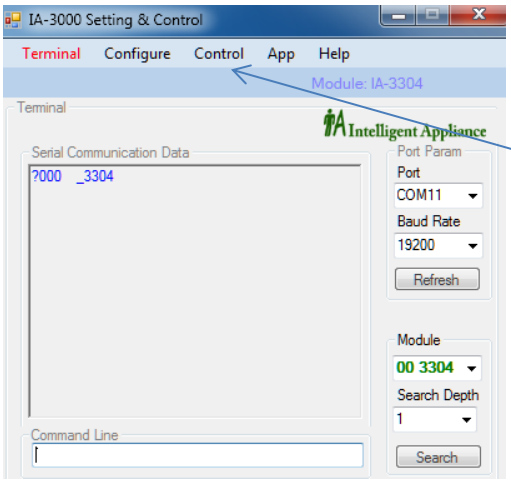
Handling IA-3000 Utility

1. Start the IA3000Util Utility by pressing 'Start Manu' on the computer's main screen, select 'All Programs', and finally 'IA3000Util'.
2. Select the appropriate COM

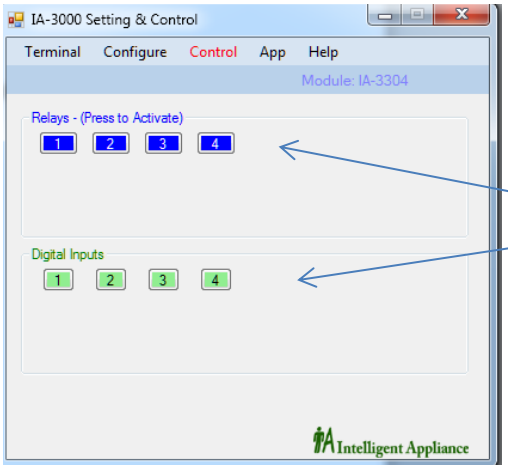


3. Select '19200' to fit into the right of the 'Baud' label (in case that the IA-3127-U2I is at its default setting stage).
4. Press the 'Search' button and wait for the utility to list all chained items.
5. Select the desired device out of the Module list that appears above the 'Search' button.

6. Once the device is selected, its form will be shown on the control panel label.



7. Left clicking the buttons will activate or dis-activate the appropriate I/O.



Command Set

The following table is a quick reference table for the IA-3127-U2I, A host computer / PLC may control the IA-3127-U2I 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: ?000<CR>
Response: _3124<CR>

Request the device at address 00Hex to send its model name.
The response indicates that the command was successful and that the device at this address is IA-3127-U2I

?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 Inputs and Outputs status

Description Read digital inputs and Digital Outputs present status

Syntax ?aa2<CR>

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

Response _ABCDEFGH<CR> if the command was valid

A	1st Input nibble
B	2nd Input nibble
C	3rd Input nibble
D	4th Input nibble
E	5th Input nibble
F	6th Input nibble
G	1st Output nibble
H	2nd Output nibble
I	3rd Output nibble
J	4th Output nibble
K	5th Output nibble
L	6th Output nibble

Input

3	2	1	0	3	2	1	0	3	2	1	0	3	2	1	0	3	2	1	0	3	2	1	0
DI 24	DI 23	DI 22	DI 21	DI 20	DI 19	DI 18	DI 17	DI 16	DI 15	DI 14	DI 13	DI 12	DI 11	DI 10	DI 9	DI 8	DI 7	DI 6	DI 5	DI 4	DI 3	DI 2	DI 1
A				B				C				D				E				F			

Output

3	2	1	0	3	2	1	0	3	2	1	0	3	2	1	0	3	2	1	0	3	2	1	0
DO 24	DO 23	DO 22	DO 21	DO 20	DO 19	DO 18	DO 17	DO 16	DO 15	DO 14	DO 13	DO 12	DO 11	DO 10	DO 9	DO 8	DO 7	DO 6	DO 5	DO 4	DO 3	DO 2	DO 1
G				H				I				J				K				L			

Example Command: ?002<CR>
Response: _000001008001<CR>

Input #1 is Active and both Digital Outputs #1 and #16 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.

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

SLD=1 LED is ON
SLD=2 SJP jumper is CLOSED

Example Command: ?00S<CR>
Response: _11<CR>

In this example the LED is ON and JP1 is CLOSE

!aa2dddd – Set Digital Outputs status

Description This command defines module's output state.

Syntax !aa2dddd <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 |dddd
if the command was valid and if FB messages are enabled

Example Command: !002801111<CR>
Response: |801111<CR>

This command will activate Digital Output #1, #5, #9, #13, #24

!aa3dd – Activate Digital Output N

Description This command activates a single Digital Output.

Syntax !aa3dd <CR>

!	Delimiter character
aa	Hexadecimal address of the device
3	Single Digital Output activation command
dd	N Digital Output 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 Digital Output #3 only (!) all other Digital Outputs will be not changed.

!aa4dd – De activate Digital Output N

Description This command De activates a single Digital Output.

Syntax !aa4dd <CR>

!	Delimiter character
aa	Hexadecimal address of the device
4	De activate Digital Output N command
dd	N Digital Output 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 Digital Output #3 only (!) all other Digital Outputs 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-3127-U2I 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

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

Warning

Note!

In case of operating two or more devices in a single chain,

One must make sure that each device has its own unique address!

Never install two devices, of the same address, in the same chain

Note!

All items are set to same default address ('00') while delivered

!aaEdddd – Set initial state

Description This command defines Digital Outputs state at POWER-UP

Syntax !aaEdddd <CR>

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

Response |Edddd<CR> if the command was valid

Example Command: !00EFFFFFF<CR>
Response: |EFFFFFF<CR>

This command will define the initiate state of all Digital outputs and will activate it for user's verification.

Note Default state is !00E000000 (All Digital outputs are OFF at power up)

!aaSdd – Set user defined led

Description This command turns ON or turns OFF the SLD LED

Syntax !aaSdd <CR>

!	Delimiter character
aa	Hexadecimal address of the device
S	Set Led status
0d	LED status:
	01 On
	00 Off
<CR>	Carriage Return - End of command

Response |0d<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.

^^E – Force initial state at all modules

Description This command forces all modules of this net into their pre-defined initiate state.

Syntax ^^E<CR>

^^	Delimiter character
E	Hexadecimal address of the device
<CR>	Carriage Return - End of command

Response No FB massage

Example Command: ^^E<CR>
Response: No FB massage