

User Manual



IA-2104-U

USB
4 Relays
Controlled Module

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Warning

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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.

Isolated or disconnect if access by using a tool to hazardous live parts is permitted

Protection impairment if used in a manner not specified by the manufacturer

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Introduction

The IA-2104-U is a USB Relay controller module, powered and controlled by a USB port, it includes 4 SPDT Power Relays, with contact rating of 8 amp both at 30VDC and 240VAC. The IA-2104-U is software compatible to the Intelligent Appliance IA-3000 Series.

Specifications

Control Port

Communication Method.....	USB
Default BR.....	19200,8,1,N

Communication

Relay Type.....	SPDT, Form C
Contact Rating.....	8A @ 240 VAC 8A @ 30 VDC
Relay ON Time.....	5 ms
Relay OFF Time.....	5 ms
Channels.....	4

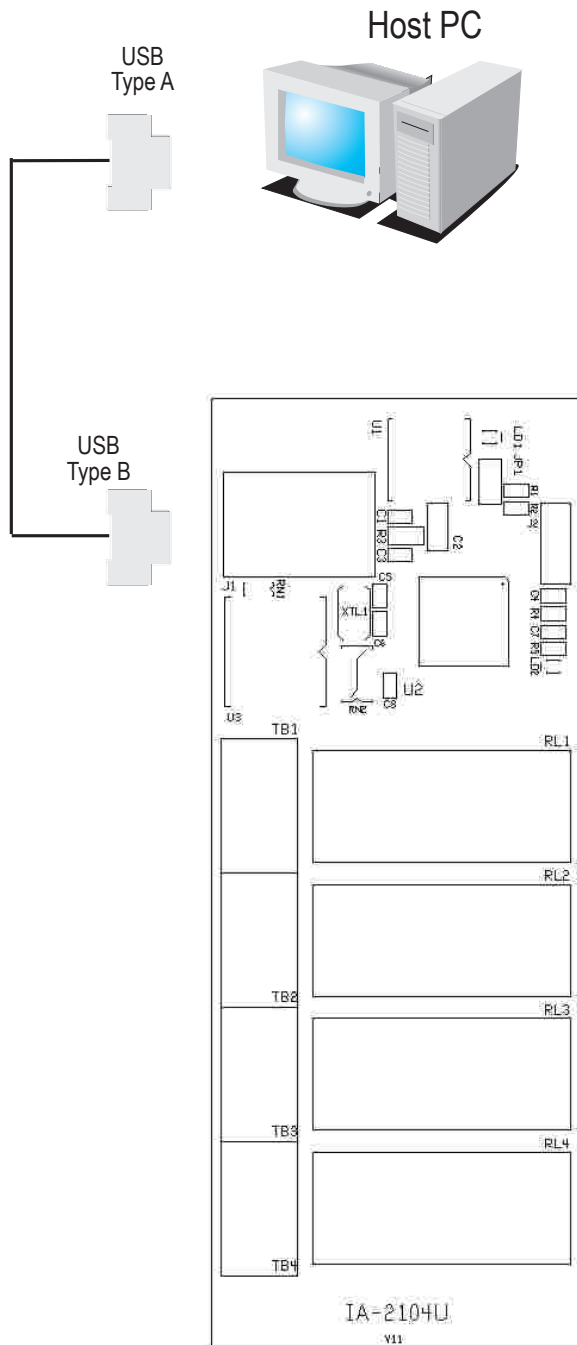
General

Supply Voltage.....	USB Powered
Environment.....	0-60°C
Dimensions.....	110x45x20
Dimensions for DIN RAIL.....	110x45x45
Weight.....	125 gr
Operating temperature range.....	0-60°C

IA-2104-U *USB 4 Relays Controlled Module*



System Wiring



Pin Assignment

J1 - INPUT - USB

JP1 - User Defined Jumper

LED LD1 - User Defined LED & USB Connection LED

LED LD2 - Option

TB1- Relays 1-4 Terminals

NC - Normally Close

NO - Normally Open

C - Common

1	C	Relay 1
2	NO	
3	NC	

4	C	Relay 2
5	N	
6	NC	

7	C	Relay 3
8	NO	
9	NC	

10	C	Relay 4
11	NO	
12	NC	

Ordering Information

IA-2104-U

Tiny 4 Relays, USB powered & Controlled and USB cable.

Software Installation

USB Port setup

1. Connect USB A/B Cable between the IA-2104-U to the host computer.
2. The computer informs on locating a new USB device, and asks for S/W drivers.
3. Kindly choose the USB-Drivers directory on the IA-3000 CD and complete the task by pressing 'Next' and 'Finish' while asked for.
4. Job done will be accomplished by a steady lighting of the USB led on the IA-2104-U unit, and by a creation of new Serial COM that can be easily found on the Device Manager screen.
5. At this stage you can easily control the IA-2104-U relays by either any serial control software, or by the IA-3000 Utility, provided in the IA-3000 CD.

Locating the new COM port

1. 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).
2. 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)'.
3. This line inform us that we should refer to COM4, in this case, in order to control the IA-2104-U while connected to this computer through its USB port.

Setup IA-3000 Utility

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

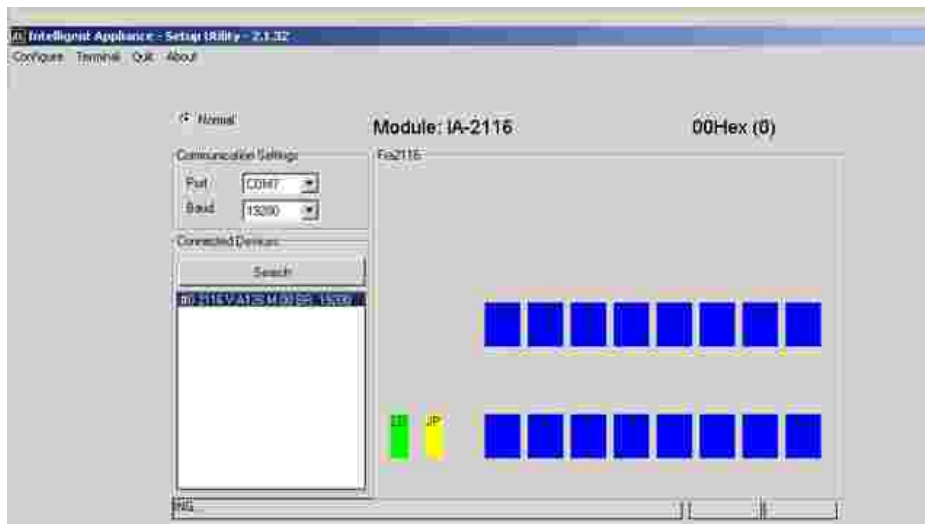
Handling IA-3000 Utility

1. Start the IA-3000 Utility by pressing 'Start' on the computer's main screen, select 'All Programs', and finally 'IA-3000'.
2. Select 'COM4' to fit into the right of the 'Port' label (in case that this is the COM shown on item 2 of 'Locating the new COM port', earlier at this page).
3. Select '19200' to fit into the right of the 'Baud' label (in case that the IA-2104-U is at its default setting stage).
4. Press the 'Search' button and wait for the utility to list all chained items.
5. As soon as all items are listed, you may press the 'Stop Search' button, or you can let the software finish its search by itself.
6. Select the desired device out of the items' list that appears beneath the 'Search' button.
7. Once the device is selected, its form will be shown in the right hand of the screen.
8. Left clicking the buttons will activate or disactivate the appropriate relay.

Software Installation

Address Configuration

1. Start IA-3000 Utility.
2. Search then Select the desired IA-2104-U module.
3. Choose 'Config' at the upper left screen location.
4. Define the desired address right to the 'Address' label.
5. Update the module using the 'Update' button.
6. 'Update OK' message indicates a successful updating (old software versions indicates 'Fail' while successfully updating the module).
7. Check the updated address by closing the 'Configuration' screen, and running a new 'Search'.



Command Set

The following table is a quick reference table for the IA-2104U , A host computer / PLC may control the IA-2104 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 return character. All commands must use UPPER CASE characters

Command	Description
?aa0.....	Get Device Name
?aa1.....	Get Device Firmware Version
?aa2.....	Get Digital Output status
?aa5.....	Get Device Mode
?aaID.....	Get Serial Number
?aaS.....	Get User Defined Jumper Setting
!aa2dd.....	Set Digital Status
!aa3dd.....	Activate Relay N
!aa4dd.....	Deactivate Relay N
!aa5dd.....	Set Device Mode
!aa6bb.....	Set Baud Rate
!aa7aa.....	Set Module's Address
!aaEdd.....	Set Default State
!aaSdd.....	Set User Defined LED

?aa0(cr)

Function	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) ? <input type="checkbox"/> Delimiter character aa <input type="checkbox"/> Hexadecimal address of the device 0 <input type="checkbox"/> Get device Model command (cr) <input type="checkbox"/> Carriage Return - End of command
Response	_NNNN(cr) if the command was valid _ <input type="checkbox"/> Response delimiter NNNN <input type="checkbox"/> A string containing the device name (cr) <input type="checkbox"/> Carriage Return - end of response
Example	Command: ?010(cr) Response: _2104(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-2104

?aa1(cr)

Function 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: _A104(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 (cr)

Function	Get Relays Status
Description	Read relays present status.
Syntax	?aa2(cr) ? <input type="checkbox"/> Delimiter character aa <input type="checkbox"/> Hexadecimal address of the device 2 <input type="checkbox"/> Read relays status (cr) <input type="checkbox"/> Carriage Return - End of command
Response	_DDDD(cr) If the command was valid _ <input type="checkbox"/> Delimiter character D <input type="checkbox"/> Output Command: <input type="checkbox"/> 8 Nibbles in hex format each nibble represents 4 relays. Most left nibble is the most significant one. Most right is the least significant one.
Example	Command: ?002(cr) Response: _0001 (cr) All the relays are off except #1.

?aa5(cr)

Function	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
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(cr)

Function	Get Device ID
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 (cr)
Example	Command: ?00ID(cr) Response: _ID 00412534 (cr) In this example we read S/N of device #00.

?aaS (cr)

Function Get User Defined Jumper Setting

Description Read Jumper Setting

Syntax ?aaS(cr)
?□ Delimiter character
aa□ Hexadecimal address of the device
S□ Read Jumper Setting
(cr)□ Carriage Return - End of command

Response _DD(cr) If the command was valid

Example Command: ?00S(cr)
Response: _01(cr)

In this example the jumper JP1 setting is “close”.

!aa2dd(cr)

Function Set Relays Status

Description This command define's module's output state.
!aa2dd (cr)

Syntax

- ! Delimiter character
- aa Hexadecimal address of the device
- 2 System control command
- dd Relay output activation command data for each nibble in hex format.
- (cr) Carriage Return - End of command

Response |dd(cr) if the command was valid and if FB messages are enabled.

Example Command: !00205(cr)
Response: | 05(cr)

This command will activate relays #1 and #3.

!aa3dd(cr)

Function Activate Relay N

Description This command activate a single relay.

Syntax !aa3dd(cr)
! Delimiter character
aa Hexadecimal address of the module
3 Single relay activation command
d N Relay ID in hex format
d N Relay ID in hex format
(cr) Carriage Return - End of command

Response |Sdd(cr) if the command valid

Example Command: !00301(cr)
 Response: |S01(cr)

This command will activate relay #2 only (!) all other relays will be not changed.

!aa4dd (cr)

Function De Activate Relay N

Description This command De activate a single relay.

Syntax !aa4dd(cr)
!
aa Hexadecimal address of the module
4 De activate relay N command
d Relay ID hex format
d Relay ID hex format
(cr) Carriage Return - End of command

Response |Cdd(cr) if the command valid

Example Command: !00402(cr)
Response: |C02(cr)

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

!aa5dd(cr)

Function	Set Device Mode										
Description	This command sets the power-up mode and enables/disables error messages										
Syntax	<p>!aa5dd(cr)</p> <ul style="list-style-type: none">!<input type="checkbox"/> Delimiter characteraa<input type="checkbox"/> Hexadecimal address of the device5<input type="checkbox"/> System Mode commanddd<input type="checkbox"/> 8 mode control bits (00-FF)<input type="checkbox"/> <table><thead><tr><th>Bit#<input type="checkbox"/></th><th>Function<input type="checkbox"/></th></tr></thead><tbody><tr><td>1<input type="checkbox"/></td><td>Enable Error Messages<input type="checkbox"/></td></tr><tr><td>6<input type="checkbox"/></td><td>Disable Feedback messages on “!AA2” & “!AAM” Commands if BIT 7 is cleared. <input type="checkbox"/></td></tr><tr><td>7<input type="checkbox"/></td><td>Enable BR change<input type="checkbox"/></td></tr><tr><td></td><td>*Other bits are for future use <input type="checkbox"/></td></tr></tbody></table> <p>(cr)<input type="checkbox"/> Carriage Return - End of command</p>	Bit# <input type="checkbox"/>	Function <input type="checkbox"/>	1 <input type="checkbox"/>	Enable Error Messages <input type="checkbox"/>	6 <input type="checkbox"/>	Disable Feedback messages on “!AA2” & “!AAM” Commands if BIT 7 is cleared. <input type="checkbox"/>	7 <input type="checkbox"/>	Enable BR change <input type="checkbox"/>		*Other bits are for future use <input type="checkbox"/>
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	*Other bits are for future use <input type="checkbox"/>										
Response	dd EE OK if the command was valid										
Example	Command: !00502 (cr) Response: 02 EE OK										

This command will enable the device error messages (error messages are sent in response to invalid commands) and will disable baud rate by mistake.

!aa6bb(cr)

Function Set Baud Rate

Description For compatibility with existing devices the IA-2104 can be set to other standard baud rates

Syntax !aa6BB(cr)

- ! Delimiter character
- aa Hexadecimal address of the device
- 6 Change device baud rate command
- BB Two characters representing the desired baud rate:
 - 12 1200
 - 24 2400
 - 48 4800
 - 96 9600
 - 19 19200 (default)
 - 38 38400
 - 57 57600
 - 11 115200
 - 23 230400

Response (cr) Carriage Return - End of command

|BB(cr) if the command was valid

- | Response delimiter
- BB 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

Notes:

1. BIT 7 of the device mode must be set first.
2. Changes will take effect after the next power up.

!aa7aa(cr)

Function	Set module's address
Description	Each device must have a unique network address. This command defines a module's address. Factory default is 00Hex.
Syntax	<code>!aa7aa(cr)</code> ! <code>□</code> Delimiter character <code>aa□</code> Hexadecimal address of the device <code>7□</code> Get device Version command <code>aa□</code> New Hexadecimal address <code>(cr)□</code> Carriage Return - End of command
Response	<code> aa(cr)</code> if the command was valid
Example	Command: <code>!00701(cr)</code> Response: <code> 01(cr)</code>

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

NOTE: Factory default address is "00" and it should be change **before** installing it into a present operation net.
Kindly make sure that each module is set to a different address!

!aaEdd(cr)

Function Set State

Description This command defines relays state on power-up.

Syntax !aaEdd(cr)
!
aa Hexadecimal address of the device
E System control command
dd Relay output activation command data for each nibble in hex format.
(cr) Carriage Return - End of command

Response |Edd (cr) if the command was valid

Example Command: !00E03(cr)
Response: |E03(cr)

This command will define the initiate state of relays #2 and #1 as "Active".

!aaSdd(cr)

Function Set User Defined LED

Description This command defines user LED activation.
!aaSdd (cr)

Syntax

- ! Delimiter character
- aa Hexadecimal address of the device
- S Set User Defined LED
- dd LED Activation Command.
- (cr) Carriage Return - End of command

Response |dd(cr) if the command was valid.

Example Command: !00S01(cr)
Response: |01(cr)

This command will activate LD1.
For LD1 deactivation the command should be !00S00(cr).