User Manual

IA-3126-2

16 Relays
16-ch Wide-Range inputs
IA Daisy-chain Series

FC CE

Version 0213

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Warning

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.

Contents

Introduction

The IA-3126-2 is an indutrial intelligent 16-ch Relay Control Board, with 16-ch Digital Input and multi-drop operation capability, in the original IA-3131 foot print.

The IA-3126-2 is an Industrial grade relay controller, easy operated, supported by a simple, yet, powerful command set. Rich software support, including open source code samples and setting utility makes it fast and easy adaptable device.

The IA-3126S is an inductive load supporting version of the original IA-3126 Controller, that includ voltage suppressors across its Relay contacts. This version is limited to 56VDC and 40VAC load voltage operation range.

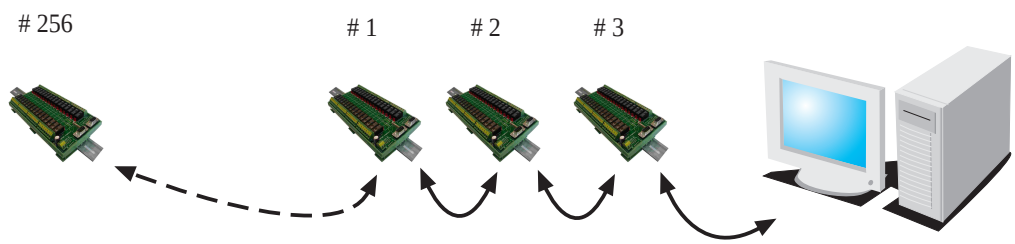
COM Port Settings

Communication port settings can be changed and are set at the factory as:

Baud rate 19200, No Parity, 1 Stop bit, 8 Data bits.

Device Addresses

There are total of 256 available addresses in range 00-FF (Hexadecimal). All addresses are operational, but it is advised not to use the factory default address 0x00 and the special device error address - 0xFF. The present address displyed on a 7 segment dual led display.



Specifications

16 Relays

Contact current	1AMP @24 VDC 0.5AMP@120VAC
Contact method	SPST (Form A)

Digital Inputs

Voltage Range	5V to 30VDC
Channels	16
Also supported	Dry contact

Communication

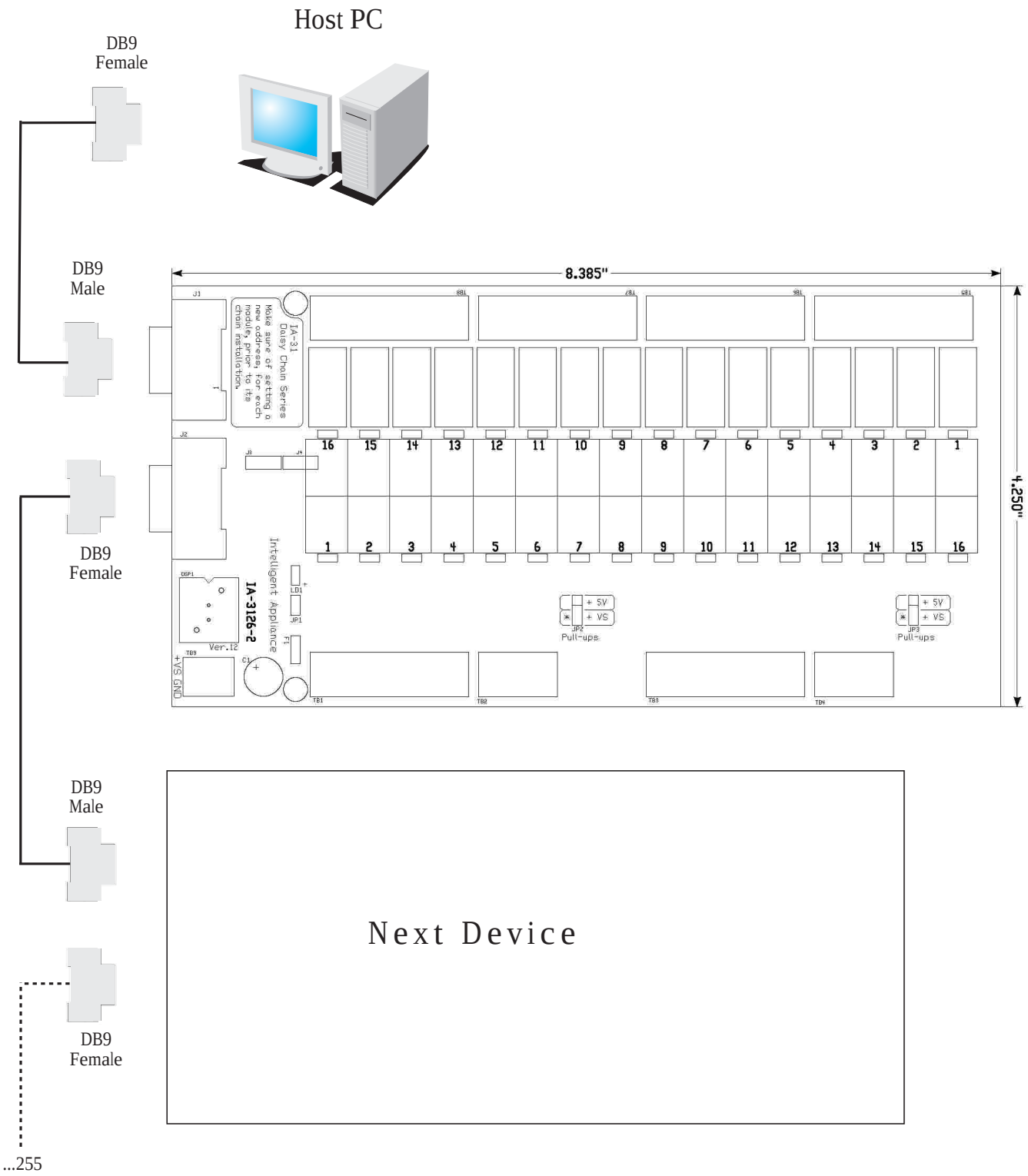
COM Method	RS-232C
COM expand	Daisy-chain
Default BR	19200,8,n,1
COM input	DB9 Female
COM output	DB9 Male
Host / Module cable	DB9 M/F pin-to-pin 3 wires, pin2, 3 and 5 up to 15m long
Module / Module cable	DB9 M/F pin-to-pin 3 wires, pin2, 3 and 5 up to 15m long

General

Power supply	24 VDC, 0.3 AMP
Module size	205x115x45
Weight	420 gr

Includes Watch-dog timer

System Wiring



Pin Assignment

J1 - INPUT COM (DB9, Female)

PIN #	FUNCTION
2	Tx
3	Rx
5	GND

J2 - OUTPUT COM (DB9, Male)

PIN #	FUNCTION
2	Rx
3	Tx
5	GND

RS-232C Interface

Baud Rate: 19200 (Default)
Data Bits: 8
Stop Bits: 1
Parity: None

LD1 - User general use LED

TB9 - Power Supply Input Terminal

TB1, TB3 - Digital Input Terminals

TB2, TB4 - GND

TB5-TB8 - Relays 1-16 Terminals
A - Normally Open
B - Common

Jumpers Settings

JP1 - User general use Jumper

JP2 - Pull up for Inputs 1-8 (+5V or +VS)

JP3 - Pull up for Inputs 9-16 (+5V or +VS)

Ordering Information

- IA-3126-2 :
  RS-232 Controlled,
  16-Ch Relay, 16-Ch DI

- IA-3126S-2:
  IA-3126-2 with Voltage Supressors
  on Relays Contact
  **Limited to 56VDC / 40VAC Load Voltage

Digital Input

The IA-3126 Relays controller includes 16 Wide-Range Digital Inputs that might be used as Dry Contact Inputs.

Two Jumpers, JP2and JP3, each controls input voltage range of correspondenly inputs 1-8 and 9-16 should be set to one of the two options: +5VDC or Source voltage which connects to TB9.

Dry contact connection alows you to use GND connection (TB2 , TB4) as COMMON.

Please feel free to contact our support team on any question or any comment.

Relays

The IA-3126 includes 16 relays . Each of them capable of handling up to 1 Amp on 24VDC and 0.5Amp on 120VAC.

Software Installation

IA-3000 Utility

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 the appropriate COM
3. Select '19200' to fit into the right of the 'Baud' label (in case that the IA-3126-2 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. Se lect 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.

Address Configuration

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.

1. Start IA-3000 Utility.
2. Search then Select the desired IA-3126-2 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-3126 command set.

A host computer / PLC may control the IA-3126 by simply sending ASCII commands through a standard COM port

Each command includes a delimiter character, modules address, command character, data if any, and a carriage return character.

All commands must be use UPPER CASE characters.

Command	Description
? a a 0	Get Device Name
? a a 1	Get Device Firmware Version
? a a 2	Get Relays status
? a a 5	Get Device Mode
? a a I D	Get Modules ID Number
? a a S	Get Special Bit Status
! a a 2 d d d d	Set Relays Status
! a a 3 d d	Activate Relay N
! a a 4 d d	De Activate Relay N
! a a 5 d d	Set Device Mode
! a a 6 B B	Set Baud Rate
! a a 7 A A	Set Module's Address
! a a E d d d d d d	Set Initial State
! a a S d d	Set User Defined LED
^ ^ E	Force Initial State at all Modules

?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)

?	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: _3126(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-3126

?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: _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 A1.25

?aa2 (cr)

Function

Get I/O Status

Description

Read I/O 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

_ Delimiter character

A 1st input nibble
B 2nd input nibble
C 3rd input nible
D 4th input nible
E 1st output nible
F 2nd output nible
G 3rd output nible
H 4th output nible

Input

3	2	1	0	3	2	1	0	3	2	1	0	3	2	1	0
D16	D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1
A				B				C				D			

Output

3	2	1	0	3	2	1	0	3	2	1	0	3	2	1	0
R16	R15	R14	R13	R12	R11	R10	R9	R8	R7	R6	R5	R4	R3	R2	R1
E				F				G				H			

Example

Command:?002(cr)

Response: _00018001(cr)

Input #1 is Active and both relays #1 and #16 are activated

?aaS(cr)

Function

Get Jumper & LED Status

Description

This command reads the stauts 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, where D is:

_	Delimiter character
D	Output Digits:

The right D is:

- 1 when the LED is ON.
- 0 when the LED is OFF.

The left D is:

- 1 when JP1 is close.
- 0 when JP1 is open.

Example

Command: ?00S(cr)
Response: _11 (cr)

The LED is ON and JP1 is close.

?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.

!aa2DDDD(cr)

Function

Set Relays Status

Description

This command define's moudule's output state.
!aa2DDDD (cr)

Syntax

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

Response

|DDDD(cr) if the command was valid and if FB messages are enabled

Example

Command: !0021111(cr)
Response: | 1111(cr)

This command will activate relay #1, #5, #9, #13

!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
DD	N Relay ID in hex format
(cr)	Carriage Return - End of command

Response |SDD(cr) if the command valid

Example

Command: !00302(cr)
Response: |S02(cr)

This command will activate relay #3 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)

!	Delimiter character
aa	Hexadecimal address of the module
4	De activate relay N command
DD	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 !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

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 changed by mistake.

!aa6BB(cr)

Function Set Baud Rate

Description For compatibility with existing devices the IA-3126 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)
(cr)	Carriage Return - End of command

Response |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. Mode must be set to “80” first. !00580
2. Changes will take effect after the next power up. Power off

!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 !aa7AA(cr)

!	Delimiter character
aa	Hexadecimal address of the device
7	Get device Version command
AA	New Hexadecimal address
(cr)	Carriage Return - End of command

Response | AA(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)

!aaEDDDD(cr)

Function Set intiate state

Description This command defines relays state at POWER-UP.

Syntax

!aaEDDDD(cr)

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

Response |EDDDD(cr) if the command was valid

Example

Command: !00EFFFF(cr)
Response: |EFFFF(cr)

This command will define the initiate state of all relays and will activate it for user's verification.
Default state is !00E0000 (All relays are OFF)

!aaS0D(cr)

Function Set LED Status

Description This command turnes ON or turnes OFF the LED

Syntax

!aaSDD(cr)

!	Delimiter character
aa	Hexadecimal address of the device
S	Set LED Status
D	LED Status:
	1 On
	0 Off
(cr)	Carriage Return - End of command

Response |0D if the command was valid

Example

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

This command will turn on the LED.

Note:
The default LED status is ON.

^^E(cr)

Function Force Initiate 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	Force initiate state command.
(cr)	Carriage Return - End of command

Response No FB message

Example

Command: ^^E (cr)
Response: No FB message