

JDAM-9000

Digital series

USER'S MANUAL (V1.0)

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1.1 Overview

The *JDAM-9000* DIO modules is a set of intelligent sensor to computer interface modules containing built-in microprocessor. They provide data comparison, and digital communication functions. Some modules provide digital I/O lines for controlling relays and TTL devices.

1.2 Module Compatibility

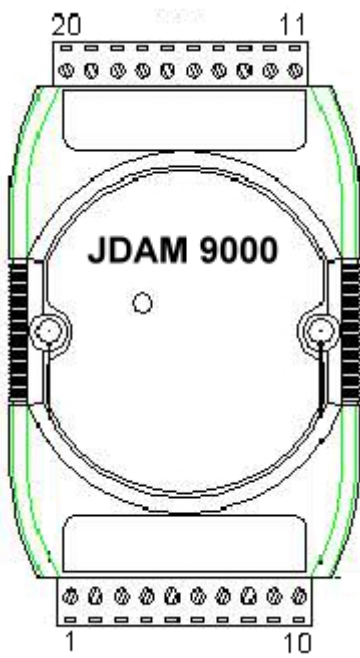
The *JDAM-9000* series are fully compatible to Advantech® ADAM-4000 series, ADlink® NμDAM-6000 series and ICP® I-7000 series by Command “~AA2X01V” .(Ref. sec. 4.6)

1.3 Communication and Programming

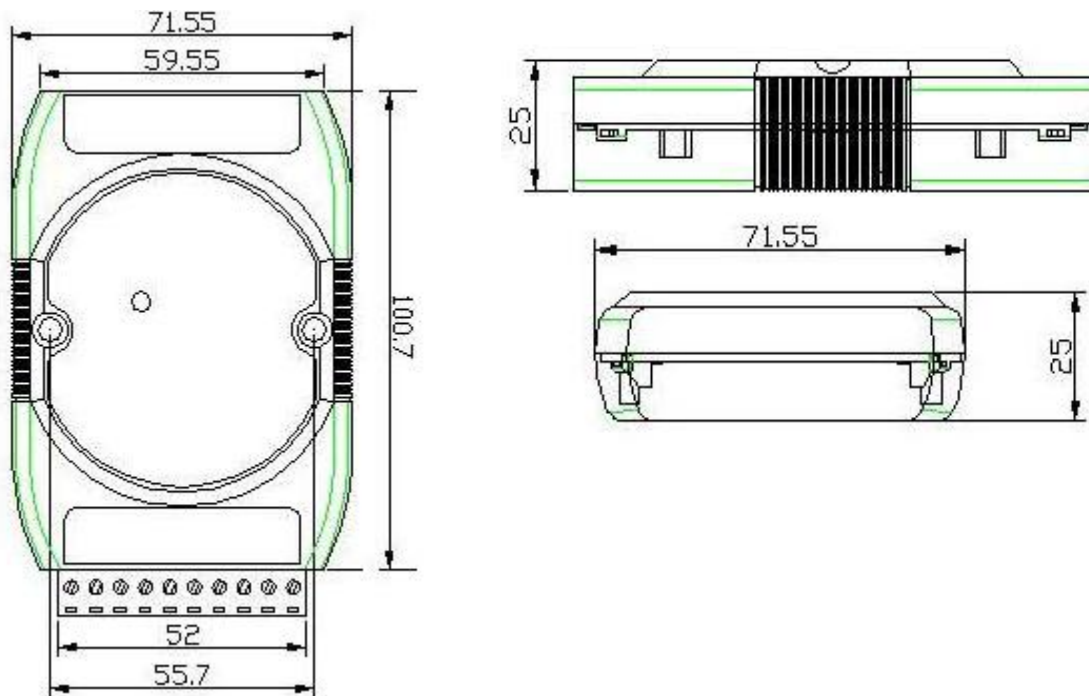
JDAM modules can connect to and communicate with all computers and terminals. They use RS-485 transmission standards, and communicate with ASCII format commands. All communications to and from the module are performed in ASCII, which means that JDAM modules can be programmed in virtually any high-level language.

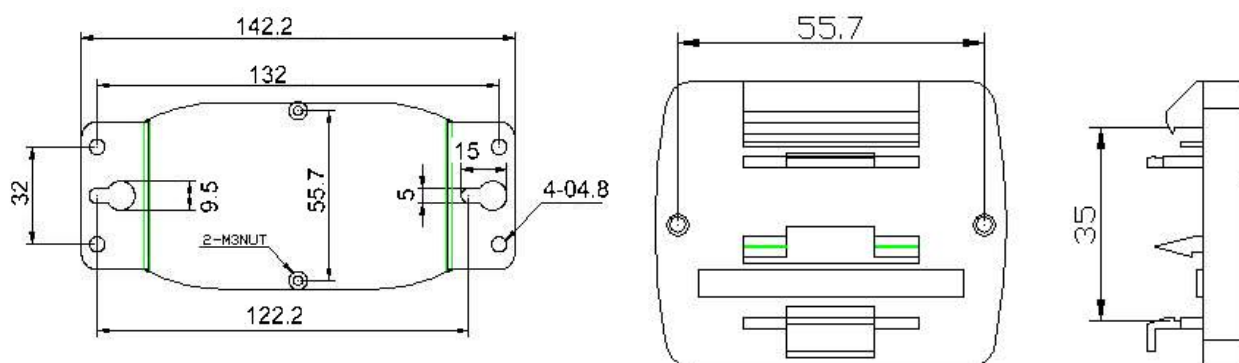
Up to 256 JDAM modules may be connected to an RS-485 multi-drop network by using the JDAM RS-485 repeater, extending the maximum communication distance to 4,000 ft.

2.1 Outline of JDAM DIO modules



2.2 Module Dimension



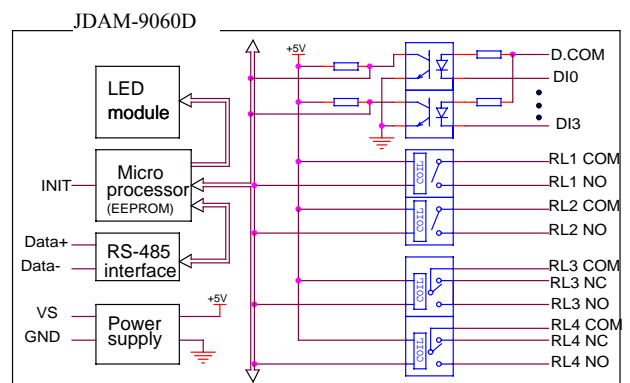
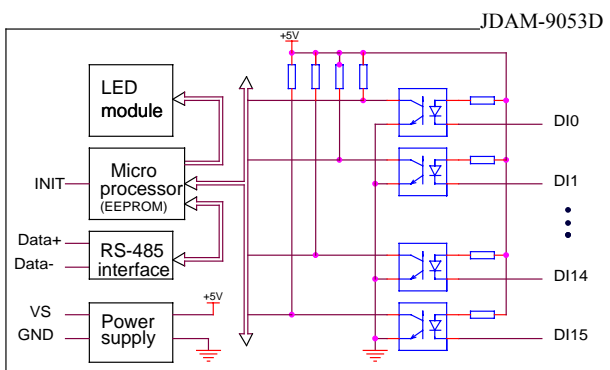
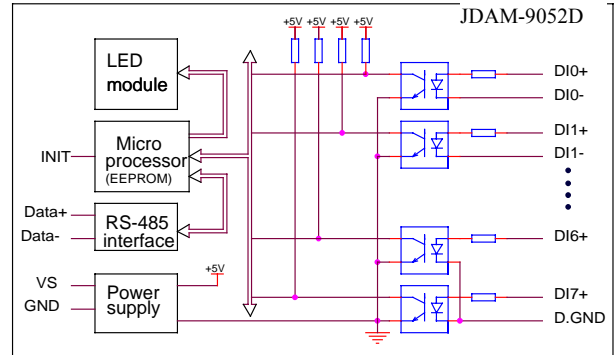
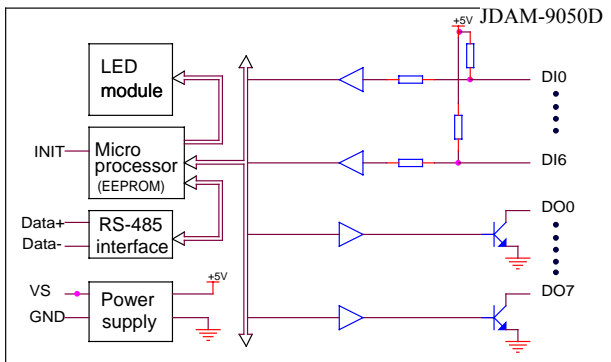
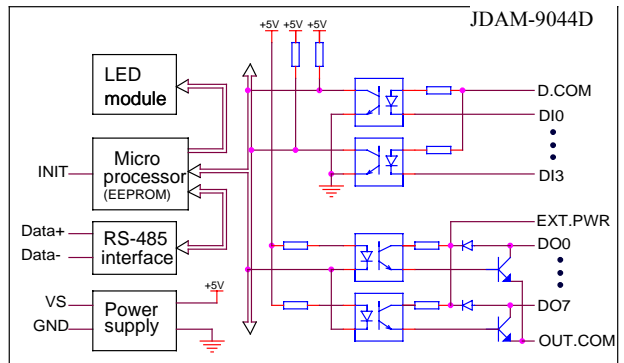
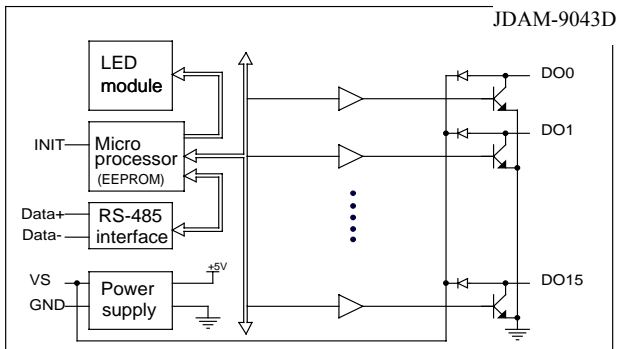
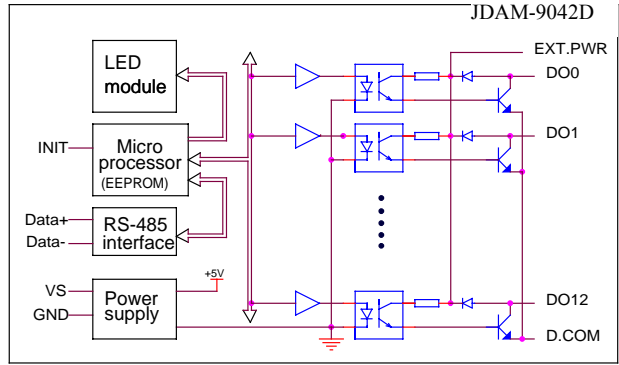
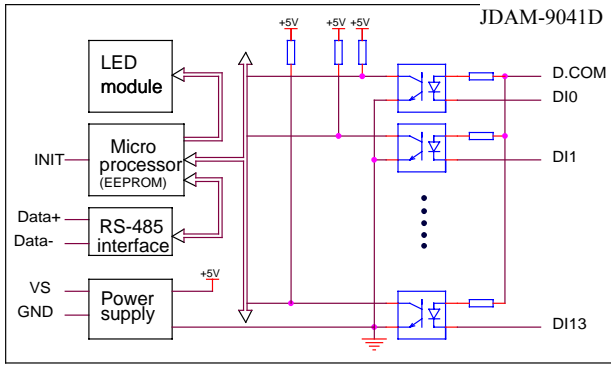


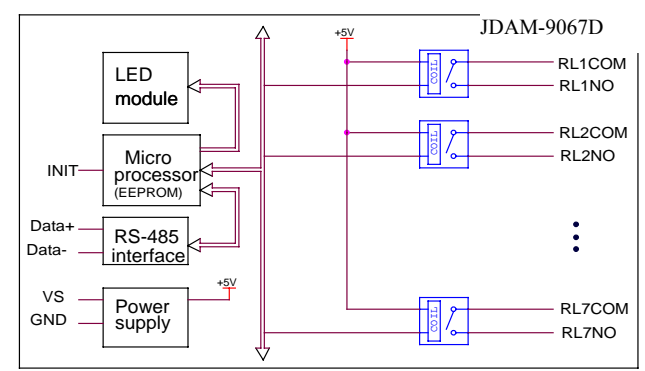
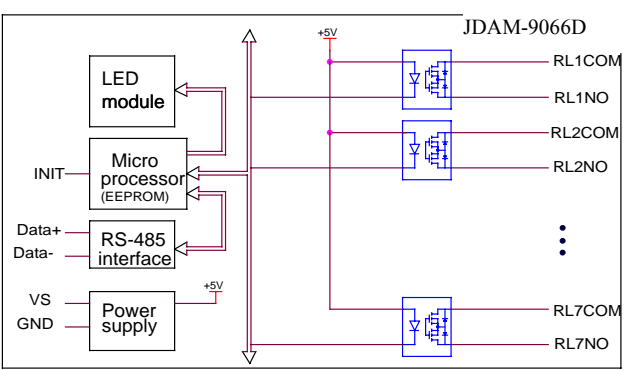
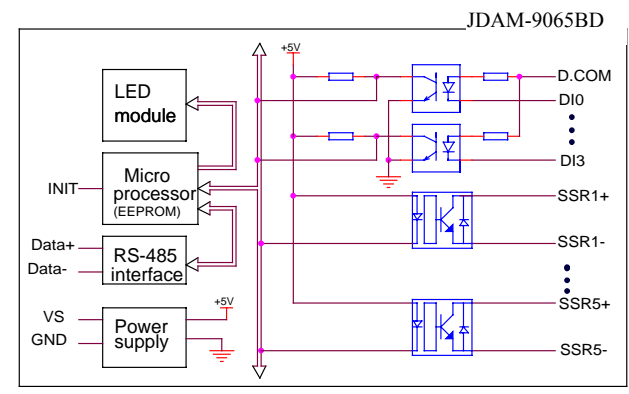
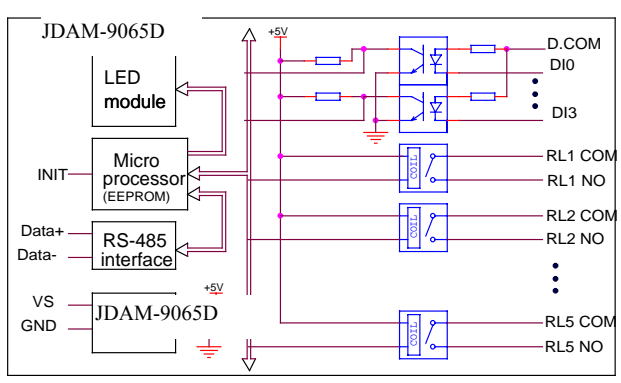
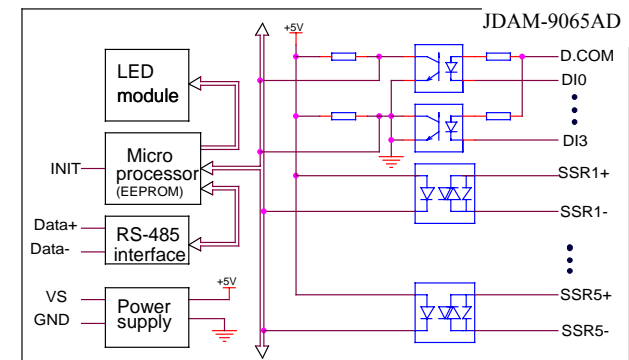
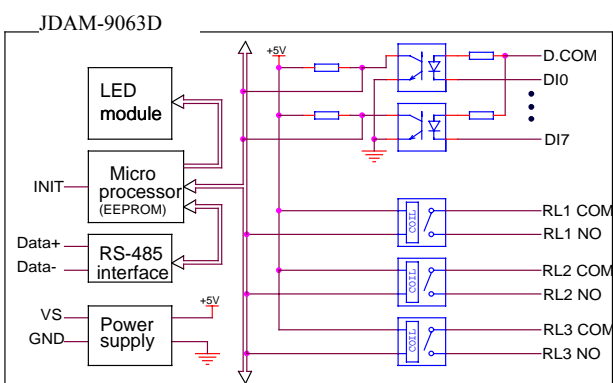
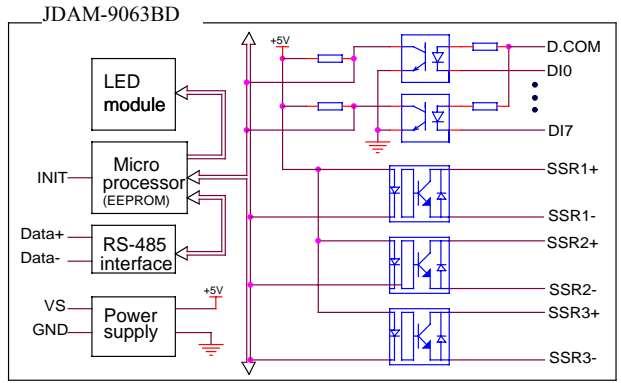
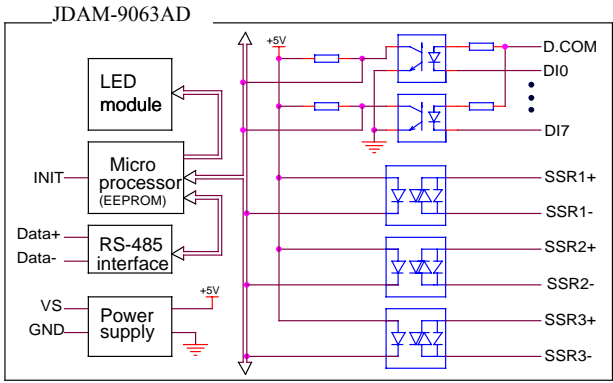
2.3 JDAM DIO modules

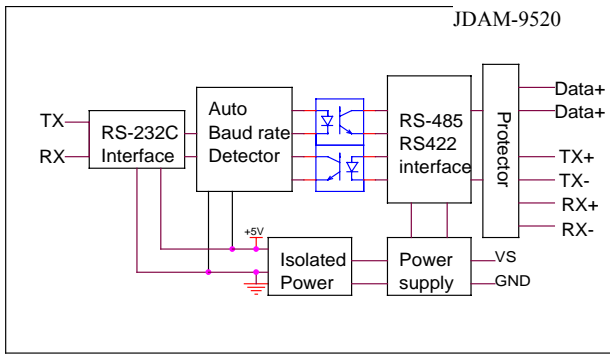
The JDAM provides a series of digital input or output modules to sense the digital signal or to control the remote devices.

JDAM-9520 :	Isolated RS-232 to RS-422/485 converter
JDAM-9041D :	14-channel isolated digital input module
JDAM-9042D:	13-channel isolated digital output module
JDAM-9043D:	16 channel digital output module
JDAM-9044D :	8-out/ 4-in channel isolated digital I/O module
JDAM-9050D :	8-out/ 7-in Digital I/O module
JDAM-9052D :	8-channel Isolated digital input module
JDAM-9053D :	16-channel digital input module
JDAM-9060D :	4-channel isolated digital input and 4 - channel relay output module
JDAM-9063D :	8-channel isolated digital inputs and 3 channel relay outputs module
JDAM-9063AD :	8-channel isolated digital inputs and 3 channel AC-SSR outputs module
JDAM-9063BD :	8-channel isolated digital inputs and 3 channel DC-SSR outputs module
JDAM-9065D :	4 channel isolated digital inputs and 5 channel relay outputs
JDAM-9065AD :	4 channel isolated digital inputs and 5 channel AC-SSR outputs
JDAM-9065BD :	4 channel isolated digital inputs and 5 channel DC-SSR outputs
JDAM-9066D :	8 channel Photo-MOS relay outputs
JDAM-9067D :	8 channel relay outputs

2.4 Block diagram of modules



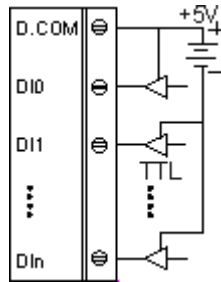




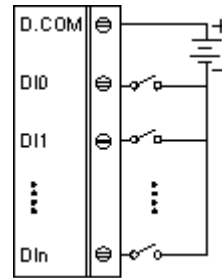
2.5 Wire connection

■ JDAM-9041D/44D/60D/63D/65D/65AD/65BD

TTL/COMS Signal input

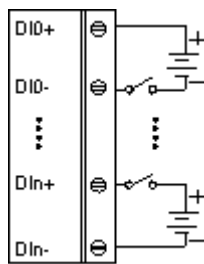


Dry/Contact Signal input

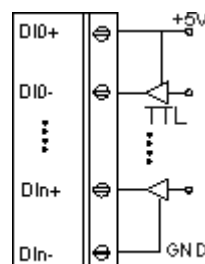


■ JDAM-9050D/53D

Dry/Contact Signal input



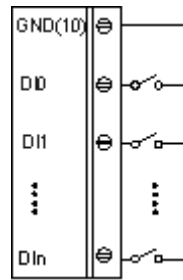
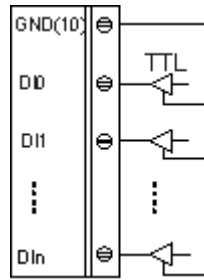
TTL/COMS Signal input



■ JDAM-9050D/53D

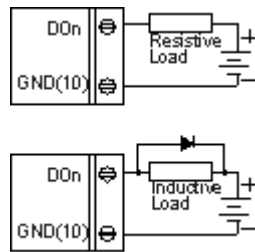
TTL/COMS Signal input

Dry/Contact Signal input



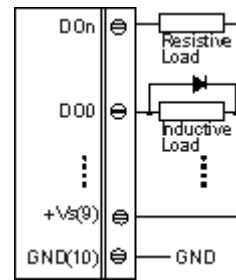
■ JDAM-9050D

Open collector output



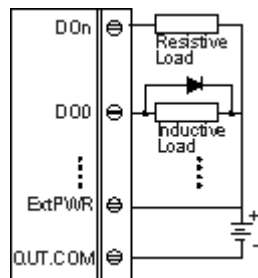
■ JDAM-9043D

Open collector output



■ JDAM-9042D

Open collector output



2.6 JDAM specification

2.6.1 JDAM-9520 module

JDAM-9520 is an isolated RS-232 to RS-422/RS-485 converter, it converts the RS-232 signal to the RS-422/RS-485 signals. The JDAM-9520 equips a “*Autot baud rate detector*” inside, it can detect the baud rate and data format and control the direction of the RS-485 network automatically

Specifications:

- ◆ Input Interface : standard RS-232 9 pin female D-type connector
- ◆ Output Interface :RS-485, differential, 2 half-duplex wires
RS-422, differential, 4 full-duplex wires
- ◆ Max RS-485 network distance : 4000 ft. (1200m)
- ◆ Speed (bps) : auto switching baud rate
- ◆ Isolation voltage : 3000 Vrms
- ◆ Max loading : 128 JDAMs on a RS-485 network
- ◆ Power supply : +10V to +30V, 0.95 W

Pin Definitions

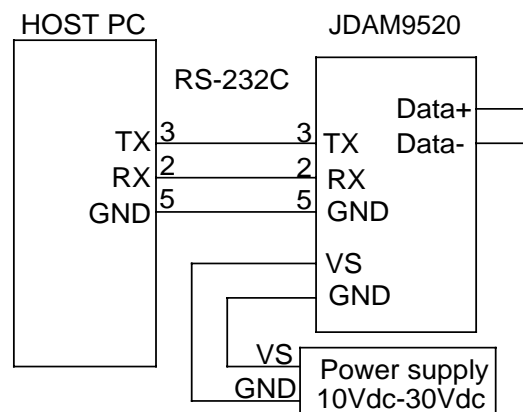
- ◆ RS-232 connector (9-pin D-type female)

Pin	Name	Description
1	N.C	No used
2	RXD	Receiver
3	TXD	Transmitter
4	N.C	No used
5	GND	Ground
6	N.C	No used
7	N.C	No used
8	N.C	No used
9	N.C	No used

◆ RS-422/485 terminal (10-pin plug-in screw terminal block)

Pin	Name	Description
1	DATA+	RS-485 transmission line, positive
2	DATA-	RS-485 transmission line, negative
3	N.C	No used
4	TX+	RS-422 transmission line, positive
5	TX-	RS-422 transmission line, negative
6	RX+	receiving line, positive
7	RX-	receiving line, negative
8	N.C	No used
9	+Vs	power supply +10V~+30V
10	GND	Power GND

◆ Connection Between Host and JDAM-9520



◆ RS-422/RS-485 settings

The switch called “S1” inside the module is used to set the JDAM-9520 to be RS-422 or RS-485 operating mode.

Pin1	Pin2	Pin3	Pin4	Operating mode
off	off	off	off	RS-422
on	on	on	off	RS-485

2.6.2 JDAM-9041D module

JDAM-9041D provides 14 isolated digital input channels and all channels are single-ended with common ground. The isolation voltage is up to 3750 Vrms.

Specifications

- ◆ Interface : RS-485, 2 wires
- ◆ Speed : 1200, 2400, 4900, 9600, 19.2K, 38.4K, 57.6K, 115.2K
- ◆ Channel numbers : 14 isolated single ended with common source
- ◆ Isolation Voltage: 3750Vrms
- ◆ Logical level 0 : +1V Max.
- ◆ Logical level 1: +4.0V ~ +30V
- ◆ Input impedance: 3K ohms
- ◆ LED: 14 digital input status LED
- ◆ Power input : +10V to +30VDC
- ◆ Power Consumption : 1.2W

Pin Definitions

Pin	Name	Description	Pin	Name	Description
1	DI10	Digital input 10+	11	DI0	Digital input 0+
2	DI11	Digital input 11+	12	DI1	Digital input 1+
3	DI12	Digital input 12+	13	DI2	Digital input 2+
4	DI13	Digital input 13+	14	DI3	Digital input 3+
5	D.COM	Digital COMMON	15	DI4	Digital input 4+
6	INIT*	Initial	16	DI5	Digital input 5+
7	DATA+	RS-485 +	17	DI6	Digital input 6+
8	DATA-	RS-485 -	18	DI7	Digital input 7+
9	+Vs	+10V~+30V	19	DI8	Digital input 8+
10	GND	Power GND	20	DI9	Digital input 9+

2.6.3 JDAM-9042D module

JDAM-9042D provides 13 isolated digital output(open collector) channels and all channels are single-ended with common ground. The isolation voltage is up to 3750 Vrms.

Specifications

- ◆ Interface : RS-485, 2 wires
- ◆ Speed : 1200, 2400, 4900, 9600, 19.2K, 38.4K, 57.6K,115.2K
- ◆ Channel numbers: 13 isolated single end with common power
- ◆ Output characteristic: open collector transistor
- ◆ Isolation Voltage: 3750Vrms
- ◆ Max. Load Voltage: +30Vdc
- ◆ Maximum current sink: 100mA
- ◆ LED: 13 digital output status LED
- ◆ Power input : +10V to +30VDC
- ◆ Power Consumption : 1.6W

Pin Definitions

Pin	Name	Description	Pin	Name	Description
1	DO 10	Digital output 10+	11	DO0	Digital output 0+
2	DO 11	Digital output 11+	12	DO1	Digital output 1+
3	DO 12	Digital output 12+	13	DO2	Digital output 2+
4	Ext.Pwr	Ext. power	14	DO3	Digital output 3+
5	D.COM	Digital COMMON	15	DO4	Digital output 4+
6	INIT*	Initial	16	DO5	Digital output 5+
7	DATA+	RS-485 +	17	DO6	Digital output 6+
8	DATA-	RS-485 -	18	DO7	Digital output 7+
9	+Vs	+10V~+30V	19	DO8	Digital output 8+
10	GND	Power GND	20	DO9	Digital output 9+

2.6.4 JDAM-9043D module

JDAM-9043D provides 16 non-isolated digital output(open collector) channels and all channels are single-ended with common ground.

Specifications

- ◆ Interface : RS-485, 2 wires
- ◆ Speed : 1200, 2400, 4900, 9600, 19.2K, 38.4K, 57.6K, 115.2K
- ◆ Channel numbers : 16 non-isolated single ended
- ◆ Output characteristic: open collector transistor
- ◆ Max Load voltage: 30 Vdc
- ◆ Maximum current sink: 100mA
- ◆ LED: 16 digital output status LED
- ◆ Power input : +10V to +30VDC
- ◆ Power Consumption : 1.2W

Pin Definitions

Pin	Name	Description	Pin	Name	Description
1	DO 10	Digital output 10+	11	DO0	Digital output 0+
2	DO 11	Digital output 11+	12	DO1	Digital output 1+
3	DO 12	Digital output 12+	13	DO2	Digital output 2+
4	DO 13	Digital output 13+	14	DO3	Digital output 3+
5	DO 14	Digital output 14+	15	DO4	Digital output 4+
6	INIT/DO15	INIT* or DO15*	16	DO5	Digital output 5+
7	DATA+	RS-485 +	17	DO6	Digital output 6+
8	DATA-	RS-485 -	18	DO7	Digital output 7+
9	+Vs	+10V~+30V	19	DO8	Digital output 8+
10	GND	Power GND	20	DO9	Digital output 9+

* : Pin-6 are jumper selectable to INIT* or DO15(Ref. Sec 3.8)

2.6.5 JDAM-9044D module

JDAM-9044D provides 8 isolated digital output(open collector) channels and 4 isolated digital input channels. All output channels are single-ended with common power.

Specifications

- ◆ Interface : RS-485, 2 wires
- ◆ Speed : 1200, 2400, 4900, 9600, 19.2K, 38.4K, 57.6K,115.2K
- ◆ Output channels : 8 isolated output channels
- ◆ Isolation Voltage: 3750Vrms
- ◆ Output characteristic: open collector transistor
- ◆ Max output Load voltage: 30 Vdc
- ◆ Maximum output current sink: 375mA
- ◆ Input channels : 4 isolated input channels with common source
- ◆ Input impedance: 3K ohms
- ◆ Logical level 0 : +1V Max., Logical level 1: +4.0V ~ +30Vdc
- ◆ LED: 12 digital input/output status LED
- ◆ Power input : +10V to +30VDC Power Consumption : 1.8W

Pin Definitions

Pin	Name	Description	Pin	Name	Description
1	DI 3	Digital input 3+	11	Ext.Pwr	Ext. power
2	DI 2	Digital input 2+	12	Out.COM	OUT COM
3	DI 1	Digital input 1+	13	DO0	Digital output 0+
4	DI 0	Digital input 0+	14	DO1	Digital output 1+
5	D.COM	Digital COM	15	DO2	Digital output 2+
6	INIT*	Initial	16	DO3	Digital output 3+
7	DATA+	RS-485 +	17	DO4	Digital output 4+
8	DATA-	RS-485 -	18	DO5	Digital output 5+
9	+Vs	+10V~+30V	19	DO6	Digital output 6+
10	GND	Power GND	20	DO7	Digital output 7+

2.6.6 JDAM-9050D module

JDAM-9050D provides 8 non-isolated digital output(open collector) channels and 7 non-isolated digital input channels. All input/output channels are single-ended with common ground.

Specifications

- ◆ Interface : RS-485, 2 wires
- ◆ Speed : 1200, 2400, 4900, 9600, 19.2K, 38.4K, 57.6K,115.2K
- ◆ Output channels : 8 non-isolated output channels
- ◆ Output characteristic: open collector transistor
- ◆ Max output Load voltage: 30 Vdc
- ◆ Maximum output current sink: 30mA
- ◆ Input channels : 7 non-isolated input channels
- ◆ Logical level 0 : +1V Max, Logical level 1: +3.5V ~ +30V
- ◆ LED: 15 digital input/output status LED
- ◆ Power input : +10V to +30VDC
- ◆ Power Consumption : 1.2W

Pin Definitions

Pin	Name	Description	Pin	Name	Description
1	DO7	Digital output 7+	11	DO2	Digital output 2+
2	DO6	Digital output 6+	12	DO1	Digital output 1+
3	DO5	Digital output 5+	13	DO0	Digital output 0+
4	DO4	Digital output 4+	14	DI 0	Digital input 0+
5	DO3	Digital output 3+	15	DI 1	Digital input 1+
6	INIT*	Initial	16	DI 2	Digital input 2+
7	DATA+	RS-485 +	17	DI 3	Digital input 3+
8	DATA-	RS-485 -	18	DI 4	Digital input 4+
9	+Vs	+10V~+30V	19	DI 5	Digital input 5+
10	GND	Power GND	20	DI 6	Digital input 6+

2.6.7 JDAM-9052D module

JDAM-9052D provides 6 isolated differential digital input channels and 2 isolated single end with common ground digital input channels.

Specifications

- ◆ Interface : RS-485, 2 wires
- ◆ Speed : 1200, 2400, 4900, 9600, 19.2K, 38.4K, 57.6K, 115.2K
- ◆ Input channels: 6 isolated differential input channels and 2 single end with common ground input channels
- ◆ Isolation Voltage: 5000Vrms
- ◆ Input impedance : 3K ohms
- ◆ Logical level 0 : +1V Max., Logical level 1: +4.0V ~ +30V
- ◆ LED: 8 digital input status LED
- ◆ Power input : +10V to +30VDC
- ◆ Power Consumption : 0.7W

Pin Definitions

Pin	Name	Description	Pin	Name	Description
1	DI5+	Digital input 5+	11	DI0+	Digital input 0+
2	DI5-	Digital input 5-	12	DI0-	Digital input 0-
3	DI6+	Digital input 6+	13	DI1+	Digital input 1+
4	D.GND	Digital Input GND	14	DI1-	Digital input 1-
5	DI7+	Digital input 7+	15	DI2+	Digital input 2+
6	INIT*	Initial	16	DI2-	Digital input 2-
7	DATA+	RS-485 +	17	DI3+	Digital input 3+
8	DATA-	RS-485 -	18	DI3-	Digital input 3-
9	+Vs	+10V~+30V	19	DI4+	Digital input 4+
10	GND	Power GND	20	DI4-	Digital input 4-

2.6.8 JDAM-9053D module

JDAM-9053D provides 16 non-isolated digital input channels and all channels are single-ended with common ground.

Specifications

- ◆ Interface : RS-485, 2 wires
- ◆ Speed : 1200, 2400, 4900, 9600, 19.2K, 38.4K, 57.6K, 115.2K
- ◆ Channel numbers : 16 non-isolated single ended
- ◆ Input impedance : 820 ohms
- ◆ Logical level 0 : +2V Max.
- ◆ Logical level 1: +4.0V ~ +30V
- ◆ LED: 16 digital input status LED
- ◆ Power input : +10V to +30VDC
- ◆ Power Consumption : 1.1W

Pin Definitions

Pin	Name	Description	Pin	Name	Description
1	DI10	Digital input 10+	11	DI0	Digital input 0+
2	DI11	Digital input 11+	12	DI1	Digital input 1+
3	DI12	Digital input 12+	13	DI2	Digital input 2+
4	DI13	Digital input 13+	14	DI3	Digital input 3+
5	DI14	Digital input 14+	15	DI4	Digital input 4+
6	INIT*/DI15	INIT or Input 15+	16	DI5	Digital input 5+
7	DATA+	RS-485 +	17	DI6	Digital input 6+
8	DATA-	RS-485 -	18	DI7	Digital input 7+
9	+Vs	+10V~+30V	19	DI8	Digital input 8+
10	GND	Power GND	20	DI9	Digital input 9+

* Signal assignment of Pin-6 is jumper selectable by setting JP1 in module (Ref. Sec 3.8)

2.6.9 JDAM-9060D module

JDAM-9060D provides 4 isolated digital input channels and 4 relay output channels. all relay output channels are differential with individually common .

Specifications

- ◆ Interface : RS-485, 2 wires
- ◆ Speed : 1200, 2400, 4900, 9600, 19.2K, 38.4K, 57.6K,115.2K
- ◆ Output channels :4 relay output channels
- ◆ Relay contact rating :0.6A/125Vac, 2A/30Vdc
- ◆ Surge strength: 500V
- ◆ Operate Time: 3mS,
- ◆ Release Time: 2mS, Min Life: 5*10⁵ ops.
- ◆ Input channels : 4 isolated input channels with common source
- ◆ Isolation Voltage: 3750Vrms. Input impedance: 3K ohms
- ◆ Input logical level 0 : +1V Max., logical level 1: +4.0V ~ +30V
- ◆ LED: 8 digital input/output status LED
- ◆ Power input : +10V to +30VDC Power Consumption : 1.8W

Pin Definitions

Pin	Name	Description	Pin	Name	Description
1	DI3	Digital input 3+	11	RL1 NO	Relay 1 (NO)
2	DI2	Digital input 2+	12	RL1 COM	Relay 1 COM
3	DI1	Digital input 1+	13	RL2 NO	Relay 2 (NO)
4	DI0	Digital input 0+	14	RL2 COM	Relay 2 COM
5	D.COM	Digital COM	15	RL3 NO	Relay 3 (NO)
6	INIT*	Initial	16	RL3 NC	Relay 3 (NC)
7	DATA+	RS-485 +	17	RL3 COM	Relay 3 COM
8	DATA-	RS-485 -	18	RL4 NO	Relay 4 (NO)
9	+Vs	+10V~+30V	19	RL4 NC	Relay 4 (NC)
10	GND	Power GND	20	RL4 COM	Relay 4 COM

NO: Normal open, NC: Normal Close

2.6.10 JDAM-9063D module

JDAM-9063D provides 8 isolated digital input channels and 3 relay output channels. All input channels are single ended with common source and all relay output channels are differential with individually common .

Specifications

- ◆ Interface : RS-485, 2 wires
- ◆ Speed : 1200, 2400, 4900, 9600, 19.2K, 38.4K, 57.6K,115.2K
- ◆ Output channels :3 relay output channels
- ◆ Surge strength: 4000V
- ◆ Relay contact rating : 5A/250Vac, 5A/30Vdc
- ◆ Operate Time: 6mS
- ◆ Release Time: 3mS, Min Life: 10⁵ ops.
- ◆ Input channels : 8 isolated input channels with common source
- ◆ Isolation Voltage: 3750Vrms . Input impedance: 3K ohms
- ◆ Input logical level 0 : +1V Max., logical level 1: +4.0V ~ +30V
- ◆ LED: 11 digital input/output status LED
- ◆ Power input: +10V to +30VDC . Power Consumption : 1.8W

Pin Definitions

Pin	Name	Description	Pin	Name	Description
1	DI3	Digital input 3+	11	RL1 NO	Relay 1 (NO)
2	DI2	Digital input 2+	12	RL1 COM	Relay 1 COM
3	DI1	Digital input 1+	13	RL2 NO	Relay 2 (NO)
4	DI0	Digital input 0+	14	RL2 COM	Relay 2 COM
5	D.COM	Digital Input COM	15	RL3 NO	Relay 3 (NO)
6	INIT*	Initial	16	RL3 COM	Relay 3 COM
7	DATA+	RS-485 +	17	DI7	Digital input 7+
8	DATA-	RS-485 -	18	DI6	Digital input 6+
9	+Vs	+10V~+30V	19	DI5	Digital input 5+
10	GND	Power GND	20	DI4	Digital input 4+

NO: Normal open, NC: Normal Close

2.6.11 JDAM-9063AD module

JDAM-9063AD provides 8 isolated digital input channels and 3 AC-SSR output channels.

Specifications

- ◆ Interface : RS-485, 2 wires
- ◆ Speed : 1200, 2400, 4900, 9600, 19.2K, 38.4K, 57.6K, 115.2K
- ◆ Output channels : 3 AC-SSR output channels with Normal Open
- ◆ Output voltage rating : 24 to 265 Vrms
- ◆ Output current rating : 1.0 Arms, Leakage current: 1.5mArms
- ◆ Min. Operate Time: 1mS, Min. Release Time: 1.5mS
- ◆ Dielectric Strength : 2500Vrms
- ◆ Input channels : 8 isolated input channels with common source
- ◆ Isolation Voltage: 3750Vrms
- ◆ Input impedance: 3K ohms
- ◆ Input logical level 0 : +1V Max., logical level 1: +4.0V ~ +30V
- ◆ LED: 11 digital input/output status LED
- ◆ Power input: +10V to +30VDC Power Consumption : 1.6W

Pin Definitions

Pin	Name	Description	Pin	Name	Description
1	DI3	Digital input 3+	11	SSR1-	SSR 1-
2	DI2	Digital input 2+	12	SSR1+	SSR 1+
3	DI1	Digital input 1+	13	SSR2-	SSR 2-
4	DI0	Digital input 0+	14	SSR2+	SSR 2 +
5	D.COM	Digital Input COM	15	SSR3-	SSR 3-
6	INIT*	Initial	16	SSR3+	SSR 3 +
7	DATA+	RS-485 +	17	DI7	Digital input 7+
8	DATA-	RS-485 -	18	DI6	Digital input 6+
9	+Vs	+10V~+30V	19	DI5	Digital input 5+
10	GND	Power GND	20	DI4	Digital input 4+

2.6.12 JDAM-9063BD module

JDAM-9063BD provides 8 isolated digital input channels and 3 DC-SSR output channels. All input channels are single ended with common source and all SSR output channels are differential with individually common .

Specifications

- ◆ Interface : RS-485, 2 wires
- ◆ Speed : 1200, 2400, 4900, 9600, 19.2K, 38.4K, 57.6K,115.2K
- ◆ Output channels :3 DC-SSR output channels with Normal Open
- ◆ Output voltage rating : 3 to 30 Vdc
- ◆ Output current rating : 1.0 A, Leakage current: 0.1mA
- ◆ Min. Operate Time: 1mS, Min. Release Time: 1mS
- ◆ Dielectric Strength : 2500Vrms . Isolation Voltage: 3750Vrms
- ◆ Input channels : 8 isolated input channels with common source
- ◆ Input impedance: 3K ohms
- ◆ Input logical level 0 : +1V Max., logical level 1: +4.0V ~ +30V
- ◆ LED: 11 digital input/output status LED
- ◆ Power input : +10V to +30VDC . Power Consumption : 1.6W

Pin Definitions

Pin	Name	Description	Pin	Name	Description
1	DI3	Digital input 3+	11	SSR1-	SSR 1-
2	DI2	Digital input 2+	12	SSR1+	SSR 1+
3	DI1	Digital input 1+	13	SSR2-	SSR 2-
4	DI0	Digital input 0+	14	SSR2+	SSR 2 +
5	D.COM	Digital Input COM	15	SSR3-	SSR 3-
6	INIT*	Initial	16	SSR3+	SSR 3 +
7	DATA+	RS-485 +	17	DI7	Digital input 7+
8	DATA-	RS-485 -	18	DI6	Digital input 6+
9	+Vs	+10V~+30V	19	DI5	Digital input 5+
10	GND	Power GND	20	DI4	Digital input 4+

2.6.13 JDAM-9065D module

JDAM-9065D provides 4 isolated digital input channels and 5 relay output channels. All input channels are single ended with common source and all relay output channels are differential with individually common .

Specifications

- ◆ Interface : RS-485, 2 wires
- ◆ Speed : 1200, 2400, 4900, 9600, 19.2K, 38.4K, 57.6K,115.2K
- ◆ Output channels : 5 relay output channels
- ◆ Relay contact rating :5A/250Vac, 5A/30Vdc
- ◆ Surge strength: 4000V
- ◆ Operate Time: 6mS, Release Time: 3mS, Min Life: 10⁵ ops
- ◆ Input channels : 4 isolated input channels with common source
- ◆ Isolation Voltage: 3750Vrms
- ◆ Input impedance: 3K ohms
- ◆ Input logical level 0: +1V Max., Logical level 1: +4.0V ~ +30V
- ◆ LED: 9 digital input/output status LED
- ◆ Power input : +10V to +30VDC . Power Consumption : 2.4W

Pin Definitions

Pin	Name	Description	Pin	Name	Description
1	DI3	Digital input 3+	11	RL1 NO	Relay 1 (NO)
2	DI2	Digital input 2+	12	RL1 COM	Relay 1 COM
3	DI1	Digital input 1+	13	RL2 NO	Relay 2 (NO)
4	DI0	Digital input 0+	14	RL2 COM	Relay 2 COM
5	D.COM	Digital input COM	15	RL3 NO	Relay 3 (NO)
6	INIT*	Initial	16	RL3 COM	Relay 3 COM
7	DATA+	RS-485 +	17	RL4 NO	Relay 4 (NO)
8	DATA-	RS-485 -	18	RL4 COM	Relay 4 COM
9	+Vs	+10V~+30V	19	RL5 NO	Relay 5 (NO)
10	GND	Power GND	20	RL5 COM	Relay 5 COM

NO: Normal open, NC: Normal Close

2.6.14 JDAM-9065AD module

JDAM-9065A provides 4 isolated digital input channels and 5 AC-SSR output channels. All input channels are single ended with common source.

Specifications

- ◆ Interface : RS-485, 2 wires
- ◆ Speed : 1200, 2400, 4900, 9600, 19.2K, 38.4K, 57.6K, 115.2K
- ◆ Output channels : 5 AC-SSR output channels with Normal Open
- ◆ Output voltage rating : 24 to 265 Vrms
- ◆ Dielectric Strength : 2500Vrms
- ◆ Output current rating : 1.0 Arms, Leakage current: 1.5mArms
- ◆ Min. Operate Time: 1mS, Min. Release Time: 1.5mS
- ◆ Input channels : 4 isolated input channels with common source
- ◆ Isolation Voltage: 3750Vrms
- ◆ Input impedance: 3K ohms
- ◆ Input logical level 0 : +1V Max., Logical level 1: +4.0V ~ +30V
- ◆ LED: 9 digital input/output status LED
- ◆ Power input : +10V to +30VDC Power Consumption : 1.7W

Pin Definitions

Pin	Name	Description	Pin	Name	Description
1	DI3	Digital input 3+	11	SSR1-	SSR 1 -
2	DI2	Digital input 2+	12	SSR1+	SSR 1 +
3	DI1	Digital input 1+	13	SSR2-	SSR 2 -
4	DI0	Digital input 0+	14	SSR2+	SSR 2+
5	D.COM	Digital Input COM	15	SSR3-	SSR 3-
6	INIT*	Initial	16	SSR3+	SSR 3+
7	DATA+	RS-485 +	17	SSR4-	SSR 4-
8	DATA-	RS-485 -	18	SSR4+	SSR 4+
9	+Vs	+10V~+30V	19	SSR5-	SSR 5-
10	GND	Power GND	20	SSR5+	SSR 5+

2.6.15 JDAM-9065BD module

JDAM-9065BD provides 4 isolated digital input channels and 5 DC-SSR output channels.

Specifications

- ◆ Interface : RS-485, 2 wires
- ◆ Speed : 1200, 2400, 4900, 9600, 19.2K, 38.4K, 57.6K, 115.2K
- ◆ Output channels : 5 DC-SSR output channels with Normal Open
- ◆ Output voltage rating : 3 to 30 Vdc
- ◆ Output current rating : 1.0 A, Leakage current: 0.1mA
- ◆ Min. Operate Time: 1mS, Min. Release Time: 1mS
- ◆ Dielectric Strength : 2500Vrms
- ◆ Input channels : 4 isolated input channels with common source
- ◆ Isolation Voltage: 3750Vrms
- ◆ Input impedance: 3K ohms
- ◆ Input logical level 0 : +1V Max., Logical level 1: +4.0V ~ +30V
- ◆ LED: 9 digital input/output status LED
- ◆ Power input : +10V to +30VDC Power Consumption : 1.7W

Pin Definitions

Pin	Name	Description	Pin	Name	Description
1	DI3	Digital input 3+	11	SSR1-	SSR 1 -
2	DI2	Digital input 2+	12	SSR1+	SSR 1 +
3	DI1	Digital input 1+	13	SSR2-	SSR 2 -
4	DI0	Digital input 0+	14	SSR2+	SSR 2+
5	D.COM	Digital Input COM	15	SSR3-	SSR 3-
6	INIT*	Initial	16	SSR3+	SSR 3+
7	DATA+	RS-485 +	17	SSR4-	SSR 4-
8	DATA-	RS-485 -	18	SSR4+	SSR 4+
9	+Vs	+10V~+30V	19	SSR5-	SSR 5-
10	GND	Power GND	20	SSR5+	SSR 5+

NO: Normal open, NC: Normal Close

2.6.16 JDAM-9066D module

JDAM-9066D provides 8 channel PhotoMOS digital outputs. all output channels are differential with individually common .

Specifications

- ◆ Interface : RS-485, 2 wires
- ◆ Speed : 1200, 2400, 4900, 9600, 19.2K, 38.4K, 57.6K,115.2K
- ◆ Output channels : 8 PotoMOS output CH. with Normal Open
- ◆ Turn-On time: 0.7ms., Turn-Off time: 0.05ms.
- ◆ Out RES.: 23 ohms., I/O CAP. : 0.8pf (f=1Mhz)
- ◆ Output voltage rating : 350 V max (peak AC/DC)
- ◆ Output current rating :0.13 A (Peak AC/DC)
- ◆ Isolation Voltage: 5000VAC
- ◆ LED: 8 digital output status LED
- ◆ Power input : +10V to +30VDC
- ◆ Power Consumption : 1.0W

Pin Definitions

Pin	Name	Description	Pin	Name	Description
1	RL6 NO	MOS OUT 6	11	RL1 NO	MOS OUT 1
2	RL6 COM	MOS COM 6	12	RL1 COM	MOS COM 1
3	RL7 NO	MOS OUT 7	13	RL2 NO	MOS OUT 2
4	RL7 COM	MOS COM 7	14	RL2 COM	MOS COM 2
5	RL8 NO	MOS OUT 8	15	RL3 NO	MOS OUT 3
6	INIT/ COM8	Initial or COM8	16	RL3 COM	MOS COM 3
7	DATA+	RS-485 +	17	RL4 NO	MOS OUT 4
8	DATA-	RS-485 -	18	RL4 COM	MOS COM 4
9	+Vs	+10V~+30V	19	RL5 NO	MOS OUT 5
10	GND	Power GND	20	RL5 COM	MOS COM 5

* NO: Normal open, NC: Normal Close.

* Signal assignment of Pin-6 is jumper selectable by setting JP1 in module (Ref. Sec 3.8)

2.6.17 JDAM-9067D module

JDAM-9067D provides 8 channel relay outputs. all output channels are differential with individually common .

Specifications

- ◆ Interface : RS-485, 2 wires
- ◆ Speed : 1200, 2400, 4900, 9600, 19.2K, 38.4K, 57.6K,115.2K
- ◆ Output channels : 8 relay output channels
- ◆ Relay contact rating : 0.5A/120Vac, 1.0A/24Vdc
- ◆ Surge strength: 1500V
- ◆ Operate Time: 5mS
- ◆ Release Time: 2mS, Min Life: 10⁵ ops.
- ◆ LED: 8 digital output status LED
- ◆ Power input : +10V to +30VDC
- ◆ Power Consumption : 2.0W

Pin Definitions

Pin	Name	Description	Pin	Name	Description
1	RL6 NO	Relay OUT 6	11	RL1 NO	Relay OUT 1
2	RL6 COM	Relay COM 6	12	RL1 COM	Relay COM 1
3	RL7 NO	Relay OUT 7	13	RL2 NO	Relay OUT 2
4	RL7 COM	Relay COM 7	14	RL2 COM	Relay COM 2
5	RL8 NO	Relay OUT 8	15	RL3 NO	Relay OUT 3
6	INIT/ COM8	Initial or COM8	16	RL3 COM	Relay COM 3
7	DATA+	RS-485 +	17	RL4 NO	Relay OUT 4
8	DATA-	RS-485 -	18	RL4 COM	Relay COM 4
9	+Vs	+10V~+30V	19	RL5 NO	Relay OUT 5
10	GND	Power GND	20	RL5 COM	Relay COM 5

* NO: Normal open, NC: Normal Close.

* Signal assignment of Pin-6 is jumper selectable by setting JP1 in module (Ref. Sec 3.8)

This chapter provides guidelines to what is needed to set up and install an JDAM network. A quick hookup scheme is provided that lets you configure modules before they are installed in a network.

To help you to connect JDAM modules with sensor inputs, several wiring examples are provided. Finally, you will find at the end of this chapter a programming example using the JDAM command set.

Be sure to carefully plan the layout and configuration of your network before you start. Guidelines regarding layout are given in Appendix E: RS-485 Network.

NOTICE: Except for changing JDAM to other compatible modules, which have on-board switches for their baud rate setting, JDAM modules should not be opened. There is no need to open the JDAM modules: all configuration is done remotely and there are no user serviceable parts inside. Opening the cover will therefore void the warranty.

3.1 Set up an JDAM network

The following list gives an overview of what is needed to setup, install and configure an JDAM environment.

- A host computer that can output ASCII characters with an RS-232C or RS-485 port.
- Power supply for the JDAM modules (+10 to +30 VDC)
- JDAM Series Utility software

3.2 JDAM modules

The JDAM module which you are going to install

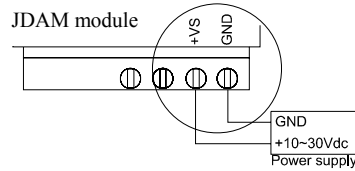
3.3 Host computer

Any computer or terminal that can output in ASCII format over either RS-232 or RS-485 can be connected as the host computer. When only RS-232 is available, an JDAM-9520 module (RS-232/RS-485 converter) is required to transform the host signals to the correct RS-485 protocol. The converter also provides opto-isolation and transformer-based isolation to protect your equipment.

For the ease of use in industrial environments the JDAM modules are designed to accept industry standard +24 VDC unregulated power. Operation is guaranteed when using any power supply between +10 and +30 VDC. Power ripples must be limited to 5 V peak to peak while the voltage in all cases must be maintained between +10 and +30 VDC . All power supply specifications are referenced at module connector. When modules are powered remotely, the effects of line voltage drops must be considered.

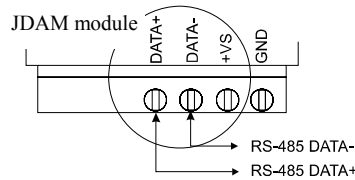
3.4 Power supply

All modules use on-board switching regulators to sustain good efficiency over the 10-30V input range, therefore we can assume that the actual current draw is inversely proportional to the line voltage. The following example shows how to calculate the required current that a power supply should be able to provide.



3.5 Communication Wiring

We recommend that shielded-twisted-pair cables that comply with the EIA RS-485 standard be used with the JDAM network to reduce interference.



3.6 JDAM Utility Software

A menu-driven utility program called “DOSJDAM.EXE” for DOS or “WINJDAM.EXE for Windows is provided for JDAM module configuration, monitoring and calibration. It also includes a terminal emulation program that lets you easily communicate through the JDAM command set

3.7 JDAM Isolated RS-232/RS485 Converter (optional)

When the host computer or terminal has only a RS-232 port, an JDAM-9520 Isolated RS-232/RS-485/422 converter connected to the host’s RS-232 port is required.

This module equips a “Auto baud rate detector” inside, therefore it can detect the baud rate and data format automatically and control the direction of RS-485 precisely

3.8 Initializing a Brand-New Module

All JDAM modules in a RS-485 network must have an *unique* address ID. Therefore, to configure the brand-new JDAM before using is necessary

Factory default settings:

- Address ID is 01
- Baud rate is 9600 bps
- Check-sum disable
- JDAM command sets

INIT* State settings:

The JDAM I/O modules must be set at **INIT* State** when you want to change the default settings, such as the *ID address, baud rate, check-sum status* etc. All JDAM I/O modules have an special pin labeled as **INIT***. The module will be in *Default State* if the **INIT*** pin is shorted to ground when power ON. Under this state, the default configuration is set as following :

- Address ID is 00
- Baud rate is 9600 bps
- Check-sum disable
- JDAM command sets

Therefore, the communication between host and the module will can be easily set as the same configuration, the initialization of a module will be possible no matter what configuration is set under operating state.

Note:

For JDAM-9043D,JDAM-9053D, the pin-6 is used for both DO15 (DI15) and INIT* (default)

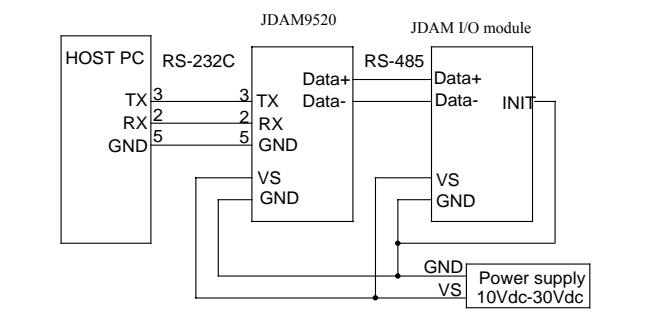
For JDAM-9066D,JDAM-9067D, the pin-6 is used for both RL8_COM and INIT* (default)

When you want to use pin 6 of JDAM-9043D as DO15(DI15) or pin 6 of JDAM-9067D as RL8_COM, you should open the module case to set the JP1.



3.9 Initialization Procedure

1. Connect a brand new JDAM module with the RS-485. Set the module in *Default State* by shorting the **INIT*** pin to GND. Refer to Figure 2.1 for detailed wiring.
2. Power on the power supply for JDAM modules.
3. Use the JDAM utility to configure the address ID, baud rate, check-sum status and command sets of the module.



3.10 Install a New JDAM to a Existing Network

1. Equipments for Install a New Module
2. A existing JDAM network
3. New JDAM modules.
4. Power supply (+10 to +30 VDC)

Installing Procedures

1. Configure the new JDAM module according to the initialization procedure in section 3.8
2. The baud rate and check-sum status of the new module must be identity with the existing RS-485 network. The address ID must not be conflict with other JDAM modules on the network.
3. Power off the JDAM power supply of the existing RS-485 network.
4. Wire the power lines for the new JDAM with the existing network. Be careful about the signal polarity as wiring.
5. Wire the RS-485 data lines for the new JDAM with the existing network. Be careful about the signal polarity as wiring.
6. Wire to the input or output devices. Refer to section 0 for illustrations.
7. Power on the JDAM local power supply.
8. Use the JDAM utility to check entire network.

4.1 Introduction

The JDAM command is composed by numbers of characteristics, including the leading code, address ID, the variables, the optional check-sum byte, and a carriage return to indicate the end of a command.

The host computer can only command only one JDAM module except those synchronized commands with wildcard address command “#*”. The JDAM may or may not give response to the command. The host should check the response to handshake with the modules.

4.2 Format of JDAM Commands

Syntax: (Leading code)(Addr)(Command)[Data] <Cksum><CR>

Every command begins with a delimiter character. There are four valid characters: a dollar sign \$, a pound sign #, a percentage sign % and an at sign @.

The delimiter character is followed by a two-character address (hexadecimal) that specifies the target module. The actual two character command follows the address. Depending on the command, an optional data segment follows the command string. An optional two character checksum may be appended to the total string. Every commands is terminated by a carriage return (cr).

Conventions

Leading Code	The first characteristic of the JDAM command, such as %, \$, #, ~, @, ...etc(1- character)
Addr	Module’s address ID, the value is in the range of 00 – FF (Hex) 2- character
Command	Command codes or value of variables
Data	Data needed by some output command
Checksum	Checksum in brackets indicate optional parameter, only checksum is enable then this field is required (2- character)
<CR>	carriage return(0x0D)

Note:

1. all commands should be issued in **UPPERCASE** characters!
2. There is no spacing between characters.

Calculate Checksum:

1. Calculate ASCII sum of all characters of command (or response) string except the character return(cr)
2. Mask the sum of string with 0ffh

$$[\text{Checksum}] = \{(\text{Leading code}) + (\text{addr}) + (\text{command}) + [\text{data}]\} \text{ MOD } 0x100$$

Example:

Command string : \$012(cr)

Sum of string = '\$'+ '0'+ '1'+ '2' = 24h+30h+31h+32h=B7h

The checksum is B7h, and [CHK]='B7'

Command string with checksum=\$012B7(cr)

Response string : !01400600(cr)

Sum of string = '!'+ '0'+ '1'+ '4'+ '0'+ '0'+ '6'+ '0'+ '0'

$$= 21h+30h+31h+34h+30h+30h+36h+30h+30h=1ACh$$

The checksum is ACh, and [CHK]='AC'

Response string with checksum=!01400600AC(cr)

4.3 Response of Commands

The response message depends on JDAM command. The response is also composed with several characteristics, including leading code, variables, and carriage return for ending. There are two kinds of leading code for response message, '!<' or '><' means valid command and '?<' means invalid. By checking the response message, user can monitor the command is valid or invalid.

But under the following conditions, there will have no response message.

- The specified address ID is not exist.
- Syntax error.
- Communication error
- Some special commands does not have response.

4.4 Table of Command sets

■ JDAM Special commands

Command	Syntax	Modules
JDAM Special commands		
Reset module	\$AARS[CHK](cr)	All JDAM modules
Set compatible to other brand	~AA2X01V[CHK](cr)	All JDAM moudles
Read current brand setting	~AA2X02[CHK](cr)	All JDAM modules
Set module LED on/off	!AA2X03IO[CHK](cr)	9041,9042,9043,9044,9050,9052 9053,9060,9063,9065,9066,9067
Read module LED setting	!AA2X03[CHK](cr)	9041,9042,9043,9044,9050,9052 9053,9060,9063,9065,9066,9067

■ General Commands

Command	Syntax	Modules
General Commands		
Set Configuration	%AANNTTCCFF[CHK](cr)	All JDAM modules
Read Configuration	\$AA2[CHK](cr)	All JDAM modules
Set Module Name	~AAO[CHK](cr)	All JDAM modules
Read Module Name	\$AAM[CHK](cr)	All JDAM modules
Read Firmware Version	\$AAF[CHK](cr)	All JDAM modules
Read reset status	\$AA5[CHK](cr)	All JDAM modules

■ Function Commands

Command	Syntax	Modules
Function Commands		
Synchronized Sampling	##*[CHK](cr)	9041,9044,9050,9052,9053,9060,9063,9065
Read Synchronized Data	\$AA4[CHK](cr)	9041,9044,9050,9052,9053,9060,9063,9065
Digital Output	#AAPPDD[CHK](cr)	9042,9043,9044,9050,9060,9063,9065,9066,9067
Read Digital Input Counter	#AAN[CHK](cr)	9041,9044,9050,9052,9053,9060,9063,9065
Read Digital I/O status	\$AA6[CHK](cr)	9041,9044,9050,9052,9053,9060,9063,9065
Clear Latched Digital Input	\$AAC[CHK](cr)	9041,9044,9050,9052,9053,9060,9063,9065
Clear Digital Input Counter	\$AACN[CHK](cr)	9041,9044,9050,9052,9053,9060,9063,9065
Read Latched Digital Input	\$AALS[CHK](cr)	9041,9044,9050,9052,9053,9060,9063,9065
Read Digital Input /Output status	@AA[CHK](cr)	9041,9044,9050,9052,9053,9060,9063,9065
Set Digital Output	@AA(data)[CHK](cr)	9042,9043,9044,9050,9060,9063,9065,9066,9067

4.5 Reset module

Modules:	All JDAM modules	
Description:	Reset all existing JDAM modules	
Command:	\$AARS[CHK](cr)	
Syntax:	\$	Command leading code
	AA	Module address ID (00 to FF)
	RS	Reset command
	CHK	Check sum
	(cr)	Carriage return
Response:	No response	

Note: Reset command will reset module to default settings.

This command has no response from module

Example: Reset module with ID address is 02

Command: \$02RS(cr)

Response: No response

4.6 Set brand compatible

Modules:	All JDAM modules	
Description:	Set compatible to other brand	
Command:	~AA2X01V[CHK](cr)	
Syntax:	~	Command leading code
	AA	Module address ID (00 to FF)
	2X	JDAM exclusive code
	01	Set Compatible command.
	V	Brand ID 0= JDAM , 1=ADAM 2=NuDAM, 3=I-7000
	CHK	Check sum
	(cr)	Carriage return
Response:	!AA[CHK](cr)	Valid Command
	?AA[CHK](cr)	Invalid Command
	!	Delimiter for valid command
	?	Delimiter for invalid command
	AA	Module address ID
	CHK	Check sum
	(cr)	Carriage return

Note: Module will be set to default states after this command issued

Example: Set JDAM-9050 module with ID=02 to command
compatible with NuDAM-6050

Command: ~022X012(cr)

Response: !02((cr)

Example: Set JDAM-9050 module with ID=02 to command
compatible with I-7050

Command: ~022X013(cr)

Response: !02(cr)

4.7 Read current brand ID

Modules:	All JDAM modules	
Description:	Read current brand ID setting	
Command:	~AA2X02[CHK](cr)	
Syntax:	~	Command leading code
	AA	Module address ID (00 to FF)
	2X	JDAM exclusive code
	02	Read Brand ID com..
	CHK	Check sum
	(cr)	Carriage return
Response:	!AAV[CHK](cr)	Valid command
	?AA[CHK](cr)	Invalid command
	!	Delimiter for valid command
	?	Delimiter for invalid command
	AA	Module address ID
	V	Brand ID
	CHK	Check sum
	(cr)	Carriage return

Example: Read current brand ID of JDAM-9050 module with ID=02

Command: ~022X02(cr)

Response: !022((cr) (current module is compatible to NuDAM-6050

4.8 Set module LED on/off

Modules:	All JDAM modules with LED display panel options	
Description:	Set JDAM module LED on/off	
Command:	~AA2X03IO[CHK](cr)	
Syntax:	~	Command leading code
	AA	Module address ID (00 to FF)
	2X	JDAM exclusive code
	03	status LED control command.
	I	Input status LED control 1=Turn-on input status LED, when input high 0=Turn-on input status LED, when input low
	O	Output status LED control 1=Turn-on output status LED, when output active high 0=Turn-on output status LED, when output active low
	CHK	Check sum
	(cr)	Carriage return
Response:	!AA[CHK](cr)	Valid command
	?AA[CHK](cr)	Invalid command
	!	Delimiter for valid command
	?	Delimiter for invalid command
	AA	Module address ID
	CHK	Check sum
	(cr)	Carriage return

Example: Set module with ID=02 to turn-on the LED when relative input channels are high and output channels are active

Command: ~022X0311(cr)

Response: !02((cr)

4.9 Read LED control settings

Modules:	All JDAM modules with LED display panel options	
Description:	Read status LED control settings	
Command:	~AA2X03[CHK](cr)	
Syntax:	~	Command leading code
	AA	Module address ID (00 to FF)
	2X	JDAM exclusive code
	03	Read LED setting command.
	CHK	Check sum
	(cr)	Carriage return
Response:	!AAIO[CHK](cr)	Valid command
	?AA[CHK](cr)	Invalid command
	!	Delimiter for valid command
	?	Delimiter for invalid command
	AA	Module address ID
	I	Input status LED setting (see 4.8)
	O	Output status LED setting (see 4.8)
	CHK	Check sum
	(cr)	Carriage return

Example: Read LED control settings of module with ID=02

Command: ~022X03(cr)

Response: !0210((cr)

Input LED will turn-on when input channels are high and output LED will turn-on when output channels are low

4.10 Set Module configuration

Modules:	All JDAM modules	
Description:	Set module configuration	
Command:	%AANN TTCCFF[CHK](cr)	
Syntax:	%	Command leading code
	AA	Module address ID (00 to FF)
	NN	New JDAM address ID (00 to FF)
	TT	Type =40 for DIO module
	CC	Set new baud rate of module (See *)
	FF	Data format (See **)
	CHK	Check sum
	(cr)	Carriage return
Response:	!AA[CHK](cr)	Valid command
	?AA[CHK](cr)	Invalid command
	!	Delimiter for valid command
	?	Delimiter for invalid command
	AA	New Module address ID
	CHK	Check sum
	(cr)	Carriage return

* :Baud Rate settings (CC)

Code	03	04	05	06	07	08	09	0A
Baud rate	120	240	490	960	192	384	576	115
	0	0	0	0	00	00	00	200

** :Data format settings (FF)

bit	7	6	5	4	3	2	1	0
-----	---	---	---	---	---	---	---	---

Bit7: Input counter update direction: 1=Falling edge, 0=rising edge

(see 4.13)

Bit6:Checksum 1=Enable, 0=disable

Bit5~bit0: reserved must be 0

Note:

It's needed to short the INIT pin to ground while changing baud rate and/or enable/disable checksum (see following examples)*

Example: Change ID address from 01 to 03 (Assume current baud rate is 9600 and checksum disabled)

Command: %0103400600(cr)

Response: !03(cr)

response new module ID address 03 (change ID address only)

Example: Change baud rate from 9600 to 19200(Assume current ID is 03, baud rate is 9600, and checksum disabled).

Because that the baud rate is changed from 9600 to 19200, the following procedures should be done before sending this command

1. Power off the module
2. Short INIT* pin to GROUND (see Appendix A)
3. Power on the module
4. send command string
Command: %0003400700(cr)
Response: !03(cr)
response module ID address 03
5. Power off module
6. Open INIT* pin
7. Power on module again (Baud rate changed to 19200)

Example: Enable checksum(Assume current ID is 03, baud rate is 9600 and checksum disabled).

Because that the checksum is changed from disable to enable, the following procedures should be done before sending this command

1. Power off the module
2. Short INIT* pin to GROUND (see Appendix A)
3. Power on the module
4. send command string
Command: %0003400640(cr)
Response: !03(cr)
response module ID address 03
5. Power off module
6. Open INIT* pin
7. Power on module again (checksum enabled)

Example: Change baud rate from 9600 to 19200 and enable checksum (Assume current ID is 03, baud rate is 9600 and checksum disabled).

Because that both the baud rate and checksum is changed , the following procedures should be done before sending this command

1. Power off the module
2. Short INIT* pin to GROUND (see Appendix A)
3. Power on the module
4. send command string

Command: %0003400740(cr)

Response: !03(cr)

response module ID address 03

5. Power off module
6. Open INIT* pin
7. Power on module again

(Baud rate changed to 19200 and checksum enabled)

It is recommended to use the setup utility to configure the module (see section 3.8 and 3.9)

4.11 Synchronized Sampling

Modules:	For JDAM modules involving digital input channel	
Description:	Synchronize all modules to sample input values and store the values in the module's register at the same time and use "Read Synchronized Data" command to read the data and process it one by one.	
Command:	#**[CHK](cr)	
Syntax:	#	Command leading code
	**	Synchronized Sampling command
	CHK	Check sum
	(cr)	Carriage return
Response:	No response	

Example :

command: #**<CR>

Synchronized sampling command has no response

4.12 Set Digital output channel

Modules:	For JDAM modules involving digital output channel	
Description:	Set digital output channels	
Command:	#AAPPDD[CHK](cr)	
Syntax:	#	Command leading code
	AA	Module address ID (00 to FF)
	PP	Output command type
	DD	Output data
	CHK	Check sum
	(cr)	Carriage return
Response:	>[CHK](cr)	Valid command
	?[CHK](cr)	Invalid command
	![CHK](cr)	Ignored command
	>	Delimiter for valid command
	?	Delimiter for invalid command
	!	Delimiter for ignore command(The watchdog timeout status is set)
	CHK	Check sum
	(cr)	Carriage return

PP=00,0A – Multi-channel output and DD=low byte data (DO0~DO7)

PP=0B – Multi-channel output and DD=high byte data (DO8~DO15)

PP=1C,AC – Single channel output and C=low byte channel Number (0~7), and DD=output data

PP=BC – Single channel output and C=High byte channel Number (C=0 –channel 8, C=1 –channel 9,……, C=7 – channel 15) , and DD=0 to reset channel, DD=1 to set channel

Also see *Set digital output command* (refer to 4.24)

Example1:

Command: #01000F<cr>

AA=01 - address ID

PP=00 - Multi-channel output and output to low byte (DO0~DO7)

DD=0F – Set DO0~DO3 to “1” and DO4~DO7 to “0”

<cr> carriage return

Response : >(cr)

Example2:

Command: #010B20<cr>

AA=01 - address ID

PP=0B - Multi-channel output and output to high byte (DO8~DO15)

DD=20 - Set DO8~DO13 to “0” and DO14~DO15 to “1”

<cr> carriage return

Response : >(cr)

Example3:

Command: #011300<cr>

AA=01 - address ID

PP=13 - Single-channel output and channel number=3

DD=00 - Set DO3 to “0”

<cr> carriage return

Response : >(cr)

Example4:

Command: #01B301<cr>

AA=01 - address ID

PP=13 - Single-channel output and high byte channel number=3

DD=01 - Set DO11 to “1”

<cr> carriage return

Response : >(cr)

4.13 Read Digital input counter

Modules:	For JDAM modules involving digital input channel	
Description:	Read Digital input counter value	
Command:	#AAN[CHK](cr)	
Syntax:	#	Command leading code
	AA	Module address ID (00 to FF)
	N	Digital input channel number (0~F)
	CHK	Check sum
	(cr)	Carriage return
Response:	!AADDDDD[CHK](cr)	Valid command
	? AA[CHK](cr)	Invalid command
	!	Delimiter for valid command
	?	Delimiter for invalid command
	AA	Module address ID
	DDDDD	Counter value in decimal (00000~65535)
	CHK	Check sum
	(cr)	Carriage return

Example: Read counter value of channel 5

Command: #025(cr)

Response: !0200012(cr)

Read counter value of digital input channel 5 is 12

Ref. command: Sec 4.21 \$AACN

4.14 Read Configuration

Modules:	For JDAM modules	
Description:	Read module configuration	
Command:	\$AA2[CHK](cr)	
Syntax:	\$	Command leading code
	AA	Module address ID (00 to FF)
	2	Command for reading configuration
	CHK	Check sum
	(cr)	Carriage return
Response:	!AATTBBFF[CHK](cr)	Valid command
	?AA[CHK](cr)	Invalid command
	!	Delimiter for valid command
	?	Delimiter for invalid command
	AA	Module address ID
	TT	Module type(=40 for DIO modules)
	BB	Baud rate
	FF	Configuration value (see *)
	CHK	Check sum
	(cr)	Carriage return

*: Configuration value (FF):

- bit 7: Counter update direction:
0=Falling edge, 1=Rising edge
- bit 6: Checksum: 1=enable, 0=disable
- bit 5~bit 3: always 0
- bit 2~bit 0: =000 for JDAM-9050
=001 for JDAM- 9060
=010 for JDAM-9052
=011 for JDAM-9053

Example: Read configuration of module with ID address=05

Command: \$052(cr)

Response: !05400600(cr)

Read address ID=05 module configuration

40=DIO module

06=9600 baud rate

00=no checksum, Module number=JDAM-9050

Example: Read configuration of module with ID address=06

Command: \$062(cr)

Response: !06400641(cr)

Read address ID=06 module configuration

40=DIO module

06=9600 baud rate

41= checksum enable, Module number=JDAM-9060

4.15 Read Synchronized data

Modules:	For JDAM modules involving digital input channel		
Description:	Read synchronized data		
Command:	\$AA4[CHK](cr)		
Syntax:	\$	Command leading code	
	AA	Module address ID (00 to FF)	
	4	Command for reading synch. data	
	CHK	Check sum	
	(cr)	Carriage return	
Response: (see Note)	!SHHLL00[CHK](cr)		Valid command
	? AA[CHK](cr)		Invalid command
	!	Delimiter for valid command	
	?	Delimiter for invalid command	
	S	Data status, S=1 first read, S=0 been readed	
	HH	First data byte(D8~D15) (2 characters)	
	LL	Second data byte(D0~D7) (2 characters)	
	00	Always be 00	
	CHK	Check sum	
(cr)	Carriage return		

Note:

JDAM9041 response :!(Status)(DataInH)(DataInL)00<cr>
JDAM9042 response :!(Status)(DataOutH)(DataOutL)00<cr>
JDAM9043 response :!(Status)(DataOutH)(DataOutL)00<cr>
JDAM9044 response :!(Status)(DataOut)(DataIn)00<cr>
JDAM9050 response :!(Status)(DataOut)(DataIn)00<cr>
JDAM9052 response :!(Status)(DataIn)0000<cr>
JDAM9053 response :!(Status)(DataInH)(DataInL)00<cr>
JDAM9060 response :!(Status)(DataOut)(DataIn)00<cr>
JDAM9063x response :!(Status)(DataOut)(DataIn)00<cr>
JDAM9065x response :!(Status)(DataOut)(DataIn)00<cr>
JDAM9066/67 response :!(Status)(DataOut)0000<cr>

Example1: Read Synchronized data from JDAM9053 (ID=05)

Command: \$054(cr)

Response: !1097900(cr)

Read synchronized data from address ID=05 module

S=1 – first read

synchronized data=0978 (D8~15=09H, D0~7=78H)

4.16 Read reset status

Modules:	For JDAM modules	
Description:	Read reset status	
Command:	\$AA5[CHK](cr)	
Syntax:	\$	Command leading code
	AA	Module address ID (00 to FF)
	5	Command for reading reset status
	CHK	Check sum
	(cr)	Carriage return
Response:	!AAS[CHK](cr)	Valid command
	?AA[CHK](cr)	Invalid command
	!	Delimiter for valid command
	?	Delimiter for invalid command
	S	S=1 has been reset, S=0 not been reset
	CHK	Check sum
	(cr)	Carriage return

Example1: read digital input data from JDAM9053 (ID=03)

Command: \$035(cr)

Response: !031(cr)

Read reset status from address ID=03 module
(S=1 module has been reset)

4.17 Read digital I/O status

Modules:	For JDAM DIO modules		
Description:	Read the digital input channel value and readback the digital output channel value.		
Command:	\$AA6[CHK](cr)		
Syntax:	\$	Command leading code	
	AA	Module address ID (00 to FF)	
	6	Command for reading digital I/O status	
	CHK	Check sum	
	(cr)	Carriage return	
Response: (see Note)	!FFSS00[CHK](cr)		Valid command
	?AA[CHK](cr)		Invalid command
	!	Delimiter for valid command	
	?	Delimiter for invalid command	
	FF	First byte of I/O status (See **)	
	SS	Second byte of I/O status (See **)	
	00	Always be 00	
	CHK	Check sum	
	(cr)	Carriage return	

Note:

- JDAM9041 response: **!(DataInH)(DataInL)00<CR>**
- JDAM9042 response: **!(DataOutH)(DataOutL)00<CR>**
- JDAM9043 response: **!(DataOutH)(DataOutL)00<CR>**
- JDAM9044 response: **!(DataOut)(DataIn)00<CR>**
- JDAM9050 response: **!(DataOut)(DataIn)00<CR>**
- JDAM9052 response: **!(DataIn)0000<CR>**
- JDAM9053 response: **!(DataInH)(DataInL)00<CR>**
- JDAM9060 response: **!(DataOut)(DataIn)00<CR>**
- JDAM9063x response: **!(DataOut)(DataIn)00<CR>**
- JDAM9065x response: **!(DataOut)(DataIn)00<CR>**
- JDAM9066/67 response: **!(DataOut)0000<CR>**

Example1: read digital input data from JDAM9050 (ID=05)

Command: \$056(cr)

Response: !397900(cr)

Read data=3978

Digital output status :DO0~DO7=39H

Digital input data : DI0~DI6=78H

4.18 Read firmware version

Modules:	For JDAM DIO modules	
Description:	Read module's firmware version.	
Command:	\$AAF[CHK](cr)	
Syntax:	\$	Command leading code
	AA	Module address ID (00 to FF)
	F	Command for reading firmware version.
	CHK	Check sum
	(cr)	Carriage return
Response: (see Note)	!AA(data)[CHK](cr)	Valid command
	?AA[CHK](cr)	Invalid command
	!	Delimiter for valid command
	?	Delimiter for invalid command
	AA	Module address ID
	data	Module's firmware version.
	CHK	Check sum
	(cr)	Carriage return

Example: Read firmware version of module address ID=30

Command: \$30F<CR>

Response: !30A1.04<CR>

! Command is valid., Address ID=30, Firmware Version=A1.04

4.19 Read module name

Modules:	For JDAM DIO modules	
Description:	Read module's name	
Command:	\$AAM[CHK](cr)	
Syntax:	\$	Command leading code
	AA	Module address ID (00 to FF)
	M	Command for reading module's name
	CHK	Check sum
	(cr)	Carriage return
Response: (see Note)	!AA(data)[CHK](cr)	Valid command
	?AA[CHK](cr)	Invalid command
	!	Delimiter for valid command
	?	Delimiter for invalid command
	AA	Module address ID
	data	Module's name
	CHK	Check sum
	(cr)	Carriage return

Example: Read module's name of address ID=30

Command: \$30M<CR>

Response: !309042<CR>

! Command is valid., Address ID=30, module's name=9042

4.20 Clear latched digital input

Modules:	For 9041,9044,9050,9052,9053,9060,9063X,9065X	
Description:	Clear latched digital input	
Command:	\$AA[CHK](cr)	
Syntax:	\$	Command leading code
	AA	Module address ID (00 to FF)
	C	Command for clearing latched digital input
	CHK	Check sum
	(cr)	Carriage return
Response: (see Note)	!AA[CHK](cr)	Valid command
	?AA[CHK](cr)	Invalid command
	!	Delimiter for valid command
	?	Delimiter for invalid command
	AA	Module address ID
	CHK	Check sum
	(cr)	Carriage return

Example: Clear latched input of module address ID=30

Command: \$30C<CR>

Response: !30<CR>

! Command is valid., Address ID=30, latched inputs are cleared

4.21 Clear digital input counter

Modules:	For 9041,9044,9050,9052,9053,9060,9063X,9065X	
Description:	Clear digital input counter	
Command:	\$AACN[CHK](cr)	
Syntax:	\$	Command leading code
	AA	Module address ID (00 to FF)
	C	Command for clearing digital input counter
	N	Digital counter channel N be cleared
	CHK	Check sum
	(cr)	Carriage return
Response: (see Note)	!AA[CHK](cr)	Valid command
	?AA[CHK](cr)	Invalid command
	!	Delimiter for valid command
	?	Delimiter for invalid command
	AA	Module address ID
	CHK	Check sum
	(cr)	Carriage return

Example: Read channel 2 input counter of module addr. ID=30

Command: #302<CR>

Response: !3000123<CR>

! Command is valid., channel 2 input counter value =00123

Example: Clear channel 2 input counter of module addr. ID=30

Command: \$30C2<CR>

Response: !30<CR>

! Command is valid., channel 2 input counter cleared

Example: Read channel 2 input counter of module addr. ID=30

Command: #302<CR>

Response: !3000000<CR>

! Command is valid., channel 2 input counter value =00000

4.22 Read latched digital input

Modules:	For 9041,9044,9050,9052,9053,9060,9063X,9065X	
Description:	Read latched digital input	
Command:	\$AALS[CHK](cr)	
Syntax:	\$	Command leading code
	AA	Module address ID (00 to FF)
	L	Command for reading latched digital input
	S	=1 latched high status =0 latched low status
	CHK	Check sum
	(cr)	Carriage return
Response: (see Note)	!HLL[CHK](cr)	Valid command
	?AA[CHK](cr)	Invalid command
	!	Delimiter for valid command
	?	Delimiter for invalid command
	HH	High byte Latched input status
	LL	Low byte latched input status
	00	Always be 00
	CHK	Check sum
	(cr)	Carriage return

Example: Read latched input status of module address ID=30

Command: \$30L1<CR>

Response: !012300<CR>

! Command is valid.,

High byte latched status(D8~D15)=01

Low byte latched status(D0~D7)=23

Example: Clear latched input status of module address ID=30

Command: \$30C<CR>

Response: !30<CR>

! Command is valid., and clear latched input status

Example: Read latched input status of module address ID=30

Command: \$30L1<CR>

Response: !000000<CR>

! Command is valid.,

High byte latched status(D8~D15)=00

Low byte latched status(D0~D7)=00

4.23 Read digital input/output status

Modules:	For all JDAM DIO modules	
Description:	Read digital input/output status	
Command:	@AA[CHK](cr)	
Syntax:	\$	Command leading code
	AA	Module address ID (00 to FF)
	CHK	Check sum
	(cr)	Carriage return
Response: (see Note)\	>HHLL[CHK](cr)	Valid command
	?AA[CHK](cr)	Invalid command
	>	Delimiter for valid command
	?	Delimiter for invalid command
	HH	High byte input/output status(2 characters)
	LL	Low byte input/output status(2 characters)
	CHK	Check sum
	(cr)	Carriage return

Example: Read input/output status of module from JDAM-9060

address ID=30

Command: @30<CR>

Response: >0203<CR>

! Command is valid.,

High byte output status(DO1~DO4)=02

Low byte input status(DI1~DI4)=03

Ref. sec. 4.17 notes

4.24 Set digital output

Modules:	For9042,9043,9044,9050,9063X,9065X,9066,9067	
Description:	Set digital output channel value at specified address.	
Command:	@AA(Data)[CHK](cr)	
Syntax:	\$	Command leading code
	AA	Module address ID (00 to FF)
	Data	Data=0~F(1 character) for 9060 Data=0~7(1 character) for 9063X Data=00~FF(2 characters) for 9044,9050 Data=00~1F(2 characters) for 9065X Data=00~7F(2 characters) for 9066,9067 Data=0000~1FFF (four characters) for 9042 Data=0000~FFFF(four characters) for 9043
	CHK	Check sum
	(cr)	Carriage return
	>	Valid command
	[CHK](cr)	
?[CHK](cr)	Invalid command	
! [CHK]<cr	Ignore command	
> *		
Response: (see Note)\	>	Delimiter for valid command
	?	Delimiter for invalid command
	!	Delimiter for ignore command
	CHK	Check sum
	(cr)	Carriage return

*: Ignore command returned, if the module is in host watchdog timeout mode and output is set to safe value

*: Also see *Set digital output channel* command (see sec.4.12)

Example: Set output of JDAM 9060 with address ID=30

Command: @306<CR>

Set JDAM9060 relay output to 6 (0110)

Response: ><CR>

> Command is valid.,

Example: Set output of JDAM 9044 with address ID=30

Command: @3055<CR>

Set JDAM9044 output to 55 (01010101)

Response: ><CR>

> Command is valid.,

Example: Set output of JDAM 9042 with address ID=30

Command: @300905<CR>

Set JDAM842 output to 0905 (0000100000000101)

Response: ><CR>

> Command is valid.,

Example: Set output of JDAM 9042 with address ID=30

Command: @300905<CR>

Set JDAM842 output to 0905 (0000100000000101)

Response: !<CR>

! Command is ignored, because that the module is in host watchdog timeout state

4.25 Set module name

Modules:	For all JDAM modules	
Description:	Set new module name.	
Command:	~AAODD[CHK](cr)	
Syntax:	\$	Command leading code
	AA	Module address ID (00 to FF)
	O	Command for setting new name
	DD	Module name, Max. 6 characters
	CHK	Check sum
	(cr)	Carriage return
Response: (see Note)\	!AA [CHK](cr)	Valid command
	?AA[CHK](cr)	Invalid command
	!	Delimiter for valid command
	?	Delimiter for invalid command
	AA	Module address ID
	CHK	Check sum
	(cr)	Carriage return

Example: Set new module name at address ID=30

Command: ~30O4042<CR>

Set new name 4042 to the module at address ID=30

Response: !30<CR>

! Command is valid.,

4.26 Host OK

Modules:	For all JDAM modules	
Description:	Host send this command to all modules for send the information “Host OK”	
Command:	~**[CHK](cr)	
Syntax:	~	Command leading code
	**	For all modules
	CHK	Check sum
	(cr)	Carriage return
Response:	No response	

*: When host watchdog timer is enable, host computer must send this command to all module before timeout otherwise “**Host watchdog timer enabled**” module’s output value will go to safety state output value.

4.27 Read module’s watchdog timeout status

Modules:	For all JDAM modules		
Description:	Read watchdog timeout status		
Command:	~AA0[CHK](cr)		
Syntax:	~	Command leading code	
	AA	Module address ID (00 to FF)	
	0	Command for reading timeout status	
	CHK	Check sum	
	(cr)	Carriage return	
Response:	! AASS[CHK](cr)		Valid command
	?AA[CHK](cr)		Invalid command
	!	Delimiter for valid command	
	?	Delimiter for invalid command	
	AA	Module address ID	
	SS	SS=00 - watchdog timeout is cleared SS=04 - watchdog timeout is set	
	CHK	Check sum	
	(cr)	Carriage return	

Note:

1. the watchdog timeout status will be stored in EEPROM of the module and can only be cleared by issuing ~AA1 command (see ~AA1 and ~AA3EVV commands)
2. When the module’s watchdog timeout value is reached, this command will be responded with SS=04 otherwise SS=00

4.28 Reset module status

Modules:	For all JDAM modules	
Description:	Reset watchdog timeout status	
Command:	~AA1[CHK](cr)	
Syntax:	~	Command leading code
	AA	Module address ID (00 to FF)
	1	Command for resetting watchdog timeout status
	CHK	Check sum
	(cr)	Carriage return
Response:	! AA [CHK](cr)	Valid command
	?AA[CHK](cr)	Invalid command
	!	Delimiter for valid command
	?	Delimiter for invalid command
	AA	Module address ID
	CHK	Check sum
	(cr)	Carriage return

(reference to ~AA3Evv command)

4.29 Read host watchdog timeout value

Modules:	For all JDAM modules	
Description:	Read host watchdog timeout value	
Command:	~AA2[CHK](cr)	
Syntax:	~	Command leading code
	AA	Module address ID (00 to FF)
	2	Command for reading watchdog timeout value
	CHK	Check sum
	(cr)	Carriage return
Response:	!AAE[VV][CHK](cr)	Valid command
	?AA[CHK](cr)	Invalid command
	!	Delimiter for valid command
	?	Delimiter for invalid command
	AA	Module address ID
	E	Host watchdog enabled status E=1 – Enable E=0 – Disable
	VV	Timeout value in Hex format from 01 to FF=25.5 seconds (one unit is 0.1 sec)
	CHK	Check sum
	(cr)	Carriage return

(also see section 4.30)

4.30 Set host watchdog timeout value

Modules:	For all JDAM modules	
Description:	Set host watchdog timeout value	
Command:	~AA3E[VV][CHK](cr)	
Syntax:	~	Command leading code
	AA	Module address ID (00 to FF)
	3	Command for setting watchdog timeout value
	E	1= enable, 0= disable Host watchdog
	VV	Timeout value (01~FF, each for 0.1 second)
	CHK	Check sum
	(cr)	Carriage return
Response:	! AA [CHK](cr)	Valid command
	?AA[CHK](cr)	Invalid command
	!	Delimiter for valid command
	?	Delimiter for invalid command
	AA	Module address ID
	CHK	Check sum
	(cr)	Carriage return

Note:

If host watchdog timer is enabled, the host should send *Host OK* (see section 4.26) command periodically within Timeout value to refresh the timer, otherwise the module will be forced to safety state (see section 4.32)

Example1: Set module (ID=04) to have watchdog timeout value 10.0 seconds and enable host watchdog

Command: ~043164<cr>

Set watchdog timeout value 10.0 sec and enable host watchdog

Response: !04<cr> Valid command

Example2: Read watchdog timeout value form module (ID=04)

Command: ~042<cr>

Read watchdog timeout value

Response: !04164

Watchdog timeout value=10.0 seconds, and host watchdog is enabled

Example3: Reset watchdog timer

Command: ~**<cr>

Read host watchdog timer

Stop sending any command string to modules for at least 10.0 seconds. The LED on the module will go to flash. The flash LED indicates the host watchdog is timeout and timeout status is set

Example4: Read watchdog timeout status

Command: ~040<cr>

Read module (ID=04) watchdog timeout status

Response: !0404<cr>

Timeout status is set

Example5: Read watchdog timeout value form module (ID=04)

Command: ~042<cr>

Read watchdog timeout value

Response: !04164

Watchdog timeout value=10.0 seconds, and host watchdog is enabled

Example6: Reset watchdog timeout status

Command: ~041<cr>

Reset watchdog timeout status

Response: !04<cr>

Watchdog timeout is cleared and LED stop flashing, and host watchdog is disabled

Example7: Read watchdog timeout status

Command: ~040<cr>

Read module (ID=04) watchdog timeout status

Response: !0400<cr>

Timeout status is cleared

4.31 Read power-on/safe value

Modules:	For all JDAM modules	
Description:	Read Power on and safe value	
Command:	~AA4V[CHK](cr)	
Syntax:	~	Command leading code
	AA	Module address ID (00 to FF)
	4	Command for reading power on and safe value
	V	V=P – Read power on value V=S – Read safe value
	CHK	Check sum
	(cr)	Carriage return
Response: (see Note)	! AADD[CHK](cr)	Valid command
	?AA[CHK](cr)	Invalid command
	!	Delimiter for valid command
	?	Delimiter for invalid command
	AA	Module address ID
	DD	DD=XXXX for JDAM9042,9043X DD=XX00 for other modules
	CHK	Check sum
	(cr)	Carriage return

Note: ..DD - Power on value for V=P
- Safe value for V=S

Example1: Set module (ID=04) to have output value AA

Command: @04AA<cr>

Set value AA to module (ID=04) outputs

Response: ><cr>

> Valid command

Example2: Set module (ID=04) current output as safe value

Command: ~045S<cr>

Set current output value AA as safe value

Response: !04<cr>

! Valid command

Example3: Set module (ID=04) to have output value FF

Command: @04FF<cr>

Set value FF to module (ID=04) outputs

Response: ><cr>

> Valid command

Example4: Set module (ID=04) current output as power on value

Command: ~045S<cr>

Set current output value FF as power on value

Response: !04<cr>

! Valid command

Example5: Read Power on value

Command: ~044P<cr>

Read power on value

Response: !04FF00<cr>

FF=power on value

Example6: Read safe value

Command: ~044S<cr>

Read safe value

Response: !045500<cr>

55=safe value

4.32 Set power-on/safe value

Modules:	For all JDAM modules	
Description:	Set current output value as power on or safe value	
Command:	~AA5V[CHK](cr)	
Syntax:	~	Command leading code
	AA	Module address ID (00 to FF)
	5	Command for setting power on or safe value
	V	V=P – set current output value as power on value V=S – set current output value as safe value
	CHK	Check sum
	(cr)	Carriage return
Response:	! AA [CHK](cr)	Valid command
	?AA[CHK](cr)	Invalid command
	!	Delimiter for valid command
	?	Delimiter for valid command
	AA	Module address ID
	CHK	Check sum
	(cr)	Carriage return

Examples: See sec.4.31

Appendix A INIT*pin operation

The “INIT*mode” has two purposes, one for reading module current configuration, and another for configuring the module baud rate and checksum

■ Reading module current configuration

Each JDAM module has a built-in EEPROM which is used to store the configuration information such as address ID, type, baud rate etc..

If the user unfortunately forget the configuration of the module. User may use a special mode called “INIT* mode” to resolve the problem

When the module is set to “INIT* mode”, the default settings are ID=00, baud rate=9600, and checksum=disable

The following steps show you how to enable INIT* mode and read the current configuration

,

1. Power off the module
2. Connect the “INIT*” pin to GND pin
3. Power on the module
4. Send command \$002<cr> in 9600 baud rate to read the current configuration stored in the EEPROM
5. Power off the module again
6. Open “INIT*” pin to force the module to normal mode

■ Configuring the module baud rate and checksum

The module should be set to “INIT* mode”, While changing baud rate and/or checksum state by sending “Set module configuration” command(see section 4.10).

The following steps show you how to enable INIT* mode and change baud rate and/or checksum state

1. Power off the module
2. Connect the “INIT*” pin to GND pin
3. Power on the module
4. Send command %AANN TTCCFF in 9600 baud rate to set baud rate and/or checksum state (*ID should be set to 00 in “INIT* mode”*)
5. Power off the module again
6. Open “INIT*” pin to force the module to normal mode

Appendix B Input counter and input latch

Input counter:

Each input channel has internal counter used to count the state change (falling edge or rising edge) of input signal. The counting value can be read and cleared by sending “Read digital input counter” command or “Clear digital input counter command (see section 4.13 and 4.21)

Input latch:

Each input channel has internal latch which is used to latch the pulse signal from the input. This latched state can be read by sending “*Read latched digital input* “ command (see section 4.22) and cleared by sending “Clear latched digital input” command (see section 4.20)

For example, if the digital input is connected to a key switch. The key switch is a pulse signal. The user may lose the strike information by sending command \$AA6.

The digital input latch can latch the pulse and ready be read by sending “*Read latched digital input* “ command. If the latched state=1 means that there is a key strike occurred.

Appendix C Power on/Safe value

Power on value:

Power on value are used to set the module default output value when the module is turned-on or watch dog timeout reset. This function is especially importance in some application where the specified initial output states are required

User can set power on value by sending *Set power-on/safe value* command (see section 4.32)

Safe value:

Safe value are used to set the module outputs into the specified values when Host watchdog timeout

If The host watchdog timer is enabled by sending *Set host watchdog timeout value*(see section 4.30), the host should send *Host OK* (see section 4.26) command periodically within Timeout value to refresh the timer, otherwise the module will be forced to safety state (see section 4.32)