RS232/RS485 Signal to Analog Signal Isolated D-A Converter

Digital to Analog Isolated Transmitter ISO DA-RS232/485

Features:

- Low cost, small size, analog signal output precision >0.2%, wide power supply range: 8 ~ 50VDC.
- Converting RS-485/232 digital signal into standard analog signal output.
- Can be remotely reconfigured for modules accuracy.
- Signal output/ communication interface 3kVDC isolation.
- High reliability, convenient to programme, easy to do installation and wiring.
- Setting module address and baud rate, etc is available by programming.
- Realize remote acquisition by setting the host to read ISO DA data.
- Support Modbus RTU communication protocol.

Applications:

- Standard analog signal output.
- Intelligent building control, security and engineering applications.
- RS-232/485 industrial automation control system.
- Industrial fields signal isolation and long-distance transmission.
- Debugging and controlling of equipment.
- Remote transmission and signal restore of sensor signals.
- Given industrial field data to an actuator.
- Development of medical and industrial products.
- 4-20mA signal output.

ISODA products achieve the host RS-485/232 interface signals isolation to standard analog signal to control the remote devices. ISODA products can be applied to RS-232/RS-485 bus industrial automation control systems, 4-20mA , 0-5V, 0-10V and other standard signal output which used to control the implementation of industrial field devices, controlling devices and display devices,etc.

ISO DA series products have the following features:power supply isolation, signal isolation, linearization, D/A conversion and RS-485 serial communication. Each serial port can connect maximum 256 pieces of ISODA series modules which use ASCII code or MODBUS RTU communication protocol in communication. Its command set is compatible with the ADAM modules, the baud rate can be set by user.The ISO DA-RS232/485 converter can operate well with modules from other manufacturers in the same RS-485 bus to facilitate computer programming.

ISODA series modules are designed on the basis of single chip of intelligent monitoring and control systems, all the calibration value, address, baud rate, data format, checksum status and other configuration information are stored in nonvolatile memory EEPROM inside.

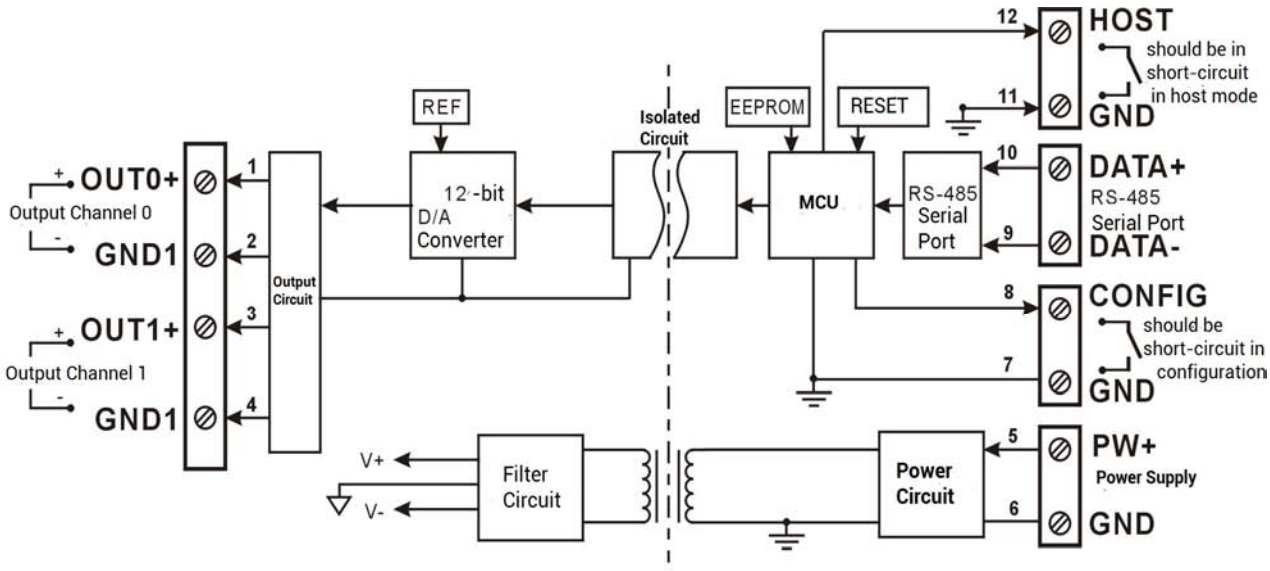

Fig. 1 ISODA functional block diagram

ISODA series products are in accordance with industry standard in design and manufacture. There is 3KV isolation voltage between signal output and communication interface. The products possess anti-interference ability, high reliability and other properties. Operating temperature range: - 45℃ ~ +80℃.

Function of ISODA:

ISODA signal isolated D/A converter module can output one channel voltage/current signals or 2-channel common ground and isolation current/voltage signals.

1. Analog signal output

12-bit output accuracy. The product has been calibrated before delivery. It is also convenient to be programmed and calibrated by the user during the usage.

The specific current or voltage output range need to be corresponding to the selection of product. The two-channel output selection should be the same when outputting two-channel signals.

2. Communication protocol

Communication Interface: 1 standard RS-485 interface or 1 standard RS-232 interface. Please note before ordering.

Communication protocol：support two types of protocols. one is standard Modbus RTU communication protocol and the other is ASCII character communication protocol. User could decide which protocol to use by programming. The product could have network communication with supervisory computer control system or various types of brands such as PLC. RTU.

Data format：10 bit. One start bit. 8 data bit. one stop bit.

Communication address（00H~FFH） and baud rate（300.600.1200.2400.4800.9600.19200.38400bps）could be set; The network communication distance is up to 1200 meters. connecting by double ground shield cable.

High anti-jamming of the communication interface. ±15KV ESD protection. and the response time is less than 100mS.

3. Anti-jamming

Set checksum according to requirements. TVS inside the module can actively restrain all kinds of surge impulse and protect the module. Digital filter inside could also restrain the power frequency jamming from power grid.

Model Selection：

ISODA O□ - □

Output voltage or current signal

- O1：4-20mA
- O2：0-20mA
- O4：0-5V
- O5：0-10V
- O6：1-5V
- O7：0-±5V
- O8：Customized
- O9：0-±20mA
- O10：0-±10V

Communication interface

- **485：** output is RS-485 interface
- **232：** output is RS-232 interface
- **232/485:** output is RS-232 or RS-485 interface (Automatic selection which one)

Model Selection Examples:

1. ISODA O1-485 Means 4-20ma signal output, output is RS485 interface
2. ISODA O4-232 Means 0-5V signal output, output is RS232 interface
3. ISODA O7-232/485 Means 0-±5V signal output, output is RS485 or RS232 interface (automatic selection)

ISODA General Parameters：

(typical @ +25℃，Vs @24VDC)

Outputs：Voltage / Current output

Accuracy：0.2%

Output imbalance：current output ±0.5 uA/℃, voltage output ±0.1 mV/℃.

Temperature Drift：±20 ppm/℃ (±30 ppm/℃. max.)

Output load：current output 350Ω (4-20mA/0-20mA/0-±20mA)
voltage output 10mA(0-5V/0-10V/0-±5V)

Communications： support the standard Modbus RTU protocol and ASCII character communication protocol, RS-485 or RS-232 interface. Baud rate（300 bps, 600 bps, 1200 bps, 2400 bps, 4800 bps, 9 600 bps, 19200 bps, 38400bps） software selectable，address（00H~FFH）software selectable.

Response Time：100 ms max

Operation Power Supply：+8 ~ 50 VDC wide power supply range, internal anti-reverse & over-voltage circuit protection.
watt consumption：< 1.5W
Operation Temperature：- 45 ~ +80℃
Operation Humidity：10 ~ 90% (non-condensation)
Storage Temperature：- 45 ~ +80℃
Storage Humidity：10 ~ 95% (non-condensing)
Isolation withstand voltage：between interface and output: 3KVDC, one minute, current leakage: 1mA.
Interface and power supply are common-ground.
Endure Impact Voltage： 3KVAC, 1.2/50us(peak value)
Dimensions：83 mm x 37 mm x 51mm
Weight: about 72g

Pin Description：

Pin	Name	Description
1	OUT0+	Output 0 +
2	GND1	Output 0 -
3	OUT1+	Output 1 +
4	GND1	Output 1 -
5	PW+	Power supply +
6	GND	Power supply -
7	GND	Power supply -
8	CONFIG	Config. initiation
9	DATA-	RS-485 signal -
10	DATA+	RS-485 signal +
11	GND	Power supply -
12	HOST	Set as host

Table 1 Pin Description

Fig. 2 Figure of ISODA

Wiring Scheme：

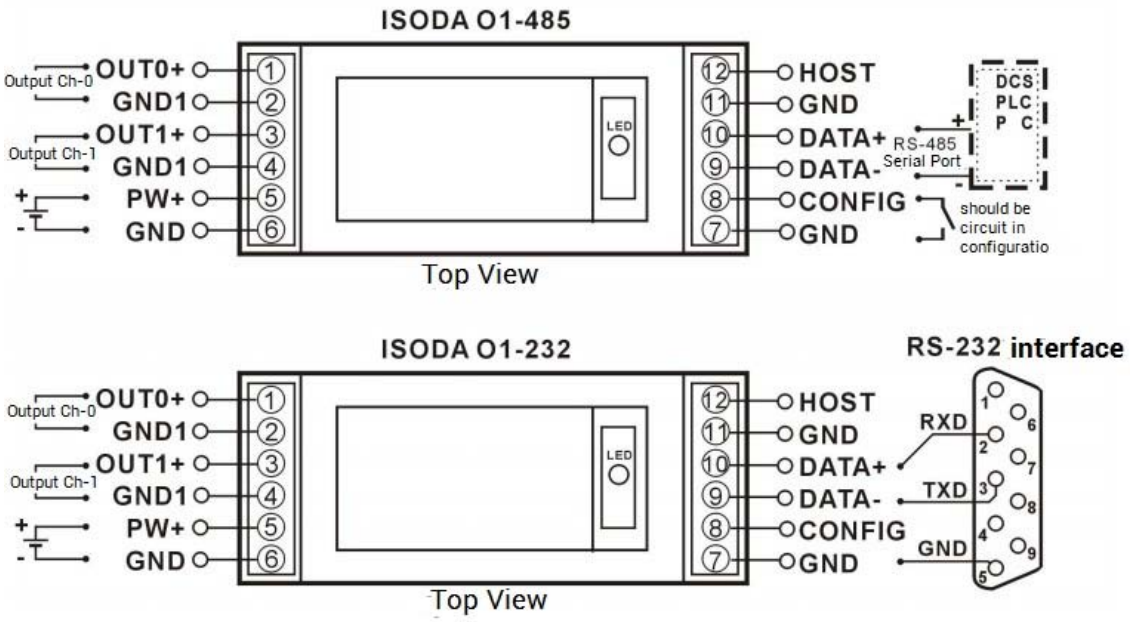

Fig. 3 ISODA module wiring scheme

Initialization of ISODA Module：

All ISODA modules. if using RS-485 network. must be assigned a unique address code (between 00H ~ FFH). However. all the new ISODA modules use the same factory initial setting as following:
Address code of 01
Baud rate is 9600 bps
Checksum prohibited
As the new module code is the same. their address will be contradictory with other modules. so when you set up the system. you must re-configure each analog output module address. Users can modify ISODA module's address through configuration commands after connecting ISODA module power cable and RS485 communication lines. Baud rate. parity. status. and communication protocols can also be adjusted according to user's requirements. Before the adjusting process. one must set the module to the default state firstly; otherwise it can not be modified.

Let the modules be in default status：

ISODA module has a Pin marked CONFIG. Connect CONFIG Pin to the ground (GND). and then connect power supply. In this way. the module is in default status.

Under default status. the module setting is as following：
Address code: 00H
Baud rate: 9600 bps
Checksum: disabled
At this time. users can modify ISODA module. baud rate. checksum state and other parameters by configuring the command and select the means of communication by setting the module's communication protocol command. If the configuration of a module is uncertain. the module could be in default state by installing the jumper and then reconfigure the module. If user requires the module to be set to MODBUS RTU communication protocol. see introduction of MODBUS communication protocol section for reference.

ISO DA Command Set

The command consists of a series of characters. such as the leading code. address ID. variables. and optional checksum byte and a stop command (cr). ISODA module does not support the broadcast address. so the host only commands one ISODA module each time. The host not only has wildcard address asterisk "**". the synchronous command. it only commands one ISO DA module one time.

Command Format：(Leading Code)(Addr)(Command)[data][checksum](cr)

(Leading code) It is the first letter of a command. Every command requires a leading code. e.g.: %.$.#.@. etc.	1- C
(Addr) Address code of a module. Its range is from 00 to FF (hexadecimal) if there is no allocation.	2- C
(Command) Display command code or variable value.	Length of variable value
[data] Some output command requires.	Length of variable value
[checksum] Checksum in the bracket displays optional parameters. It is required only when checksum is used.	2- C
(cr) a control code character which is used as the end code. It is 0x0D.	1- C

[Checksum] is needed when enabling checksum. It takes up 2 characters. Commands and responses must have checksum feature. Checksum is used to check all input commands to help user finding the command error from the host machine to the module. or response error from module to the host. Checksum character follows command or response character and in front of the carriage return.

Calculation method: Get the sum of ASCII code value of all prior issued bytes. This sum and hexadecimal digits 0xFF is two characters (the hexadecimal number).

E.g.: Prohibit checksum
User command $002(cr)
Module response !00020600 (cr)
Enable checksum
User command $002B6(cr)
Module response !00020600 A9 (cr)
'$' = 0x24 '0' = 0x30 '2' = 0x32
B6=(0x24+0x30+0x32+0x32) AND 0xFF
'!' = 0x21 '0' = 0x30 '2' = 0x32 '6' = 0x36
A9=(0x21+0x30+0x30+0x30+0x32+0x30+0x36+0x30+0x30) AND 0xFF

Common commands:

1. Set the analog output value of channel N
2. Set the Analog Output of Channel N after Power-on Reset
3. Setup analog output module
4. Read allocation status
5. Offset calibration
6. Full scale calibration
7. Read module name
8. Read the analog output of channel N
9. Set communication protocol mode

Response of Commands:

Response message depends on a variety of commands. Response also consists of several characters. including leading code, variables and end tags. There are two leading codes of response signal: '!' or '>' indicates a valid command and '?' means invalid. By checking the response information. user can monitor whether the command is valid or not.

Note: 1. In some cases, many commands use the same command syntax. User needs to ensure the address which he used is correct in a command. If one use the wrong address and this address represents another module, then the command will take effect in another module, resulting in an error.

2. The command must be entered in capital letters.

1. Set N-Channel Analog Output Value Command

Description: As the current configuration data format, set analog output module N-channel output value

Syntax：#AAN (data)(cr)

Parameter Description:

delimiter character

AA Module address, range 00-FF (hexadecimal)

N Channel code 0 or 1

data Represent analog data output from the channel-N to be set, data format available: engineering unit, FSR percentage, hexadecimal complement. For details, please refer to command set the third article.

(cr) is the terminating character. carriage return (0Dh)

Response:

>(cr) command is valid.

?AA(cr) invalid command or illegal operation

Parameter Description:

> delimiter character

(cr) terminating character. carriage return (0Dh)

There will be no response if the module detects a syntax error or communication error or if the specified address does not exists.

Example: Command: #230+04.632(cr)

Response: >(cr)

The channel 0 output value is +04.632mA at address 23H (data format: engineering unit).

2. Set the Analog Output of Channel N after Power-on Reset

Description: Set Analog Output Value of channel N after power-on reset as present data formats.

Syntax：#AASN(data)(cr)

Parameter Description:

delimiter character

AA module address (range 00-FF) hexadecimal

S analog output value after power-on reset to be set.

N channel code 0 or 1

(data) refers to analog value of channel N after power-on.The data format is in Engineering Units，Percent of FSR. complement of hexadecimal. Refer to Command Set of the third article.

(cr) is the terminating character. carriage return (0Dh)
Response :
>(cr) command is valid.
?AA(cr) invalid command or illegal operation
Parameter Description:
> delimiter character
(cr) terminating character. carriage return (0Dh)
There will be no response if the module detects a syntax error or communication error or if the specified address does not exists.
Example: Command #23S0+04.000(cr)
Response >(cr)
Explanation: Power-on output of channel 0 is +04.000mA at address 23H (data format: engineering unit).

3. Set Analog Output Module

Description: Set address, output range, baud rate, data format, checksum, status for analog output module. Configuration information is stored in nonvolatile memory EEPROM.
Syntax：% AANNTTCCFF(cr)
Parameter Description:
% delimiter character
AA module address (range 00-FF) hexadecimal
NN New module hexadecimal address. NN range is 00-FF.
TT hexadecimal represents type code. ISODA must be set as 00.
CC hexadecimal represents baud rate code.

Baud rate code	Baud rate
01	300 baud
02	600 baud
03	1200 baud
04	2400 baud
05	4800 baud
06	9600 baud
07	19200 baud
08	38400 baud

Table 2 Baud rate code

FF (8-bit parameter) hexadecimal represents data formats, checksum.
It is not the obligatory requirement to set the value of bit2, bit3,bit4,bit5 to the value 0.

Bit7	Bit 6	Bit 5	Bit 4	Bit 3	Bit2	Bit 1	Bit 0

Table 3 Data format&Checksum& Code

Bit7：reserved bit (must set to value 0)
Bit6：checksum states, if 0：Disabled. if 1: Enabled
Bit5-bit2：Not use (set to 0)
Bit1-bit0：Data Format Bit
00：Engineering Units
01：% of FSR
10: Complement of hexadecimal
11：ohms (only for thermal resistance products)
(cr) terminating character, carriage return (0Dh)

Response Syntax：
!AA(cr) command is valid
?AA(cr) command is invalid or illegal operation, or do not set up jumper before changing baud rate or checksum

Parameter Description:

! delimiter character which indicates a valid command.
? delimiter character which indicates a invalid command.
AA represents module address
(cr) terminating character, carriage return (0DH)

Note: If you configure module for the first time, AA=00, NN equals to the new address. If reconfigure module changing address, input range, data formats, AA equals to present or new address. If it requires to reconfigure module, changing baud rate or checksum state, user should install command string, make them in default states, module address is 00H, also AA=00H, NN=present or new address.

There will be no response if the module detects a syntax error or communication error or if the specified address does not exists.

Example: Command **%0011000600(cr)**
Response **!11(cr)**

Description: % delimiter character
00 indicates analog input module initial address that you want to set is 00H
11 indicates new module hexadecimal address is 11H
00 indicates type code, ISODA must be set 00
06 indicates baud rate:9600 baud
00 indicates data format is Engineering Units，checksum is disabled

4. Read Allocation Status

Description: Read configuration of the specified a analog output module.

Syntax: **$AA2(cr)**

Parameter Description:

$ delimiter character
AA module address. (range 00-FF) hexadecimal
2 indicates read configuration state command
(cr) terminating character, carriage return (0Dh)

Response Syntax：

!AATTCCFF(cr) command is valid
?AA(cr) command is invalid or illegal operation

Parameter Description:

! delimiter character
AA represents module address
TT Type Code
CC Baud rate code.Table 3
FF Table 4
(cr) terminating character. carriage return (0Dh)

There is no response if the module detects a syntax error or communication error or if the specified address does not exist.

E.g. : User command **$302(cr)**
Module response **!30000600(cr)**

Instructions: **!** delimiter character
30 indicates analog input module address is 30H
00 indicates that output type code
06 represents that baud rate is 9600 baud
00 represents that data format is Engineering Units, disabled checksum

5. Offset Calibration

Description: Calibrate zero offset of the output value for channel N of an analog output module.

Syntax: **$AA1N(cr)**

$ delimiter character
AA module address. (range 00-FF) hexadecimal
1 represents offset calibration command
N channels code 0~1
(cr) terminating character, carriage return (0Dh)

Response: **! AA (cr)** command is valid
?AA(cr) command is invalid or illegal operation

Parameters Description:

! delimiter character which indicates a valid command.
? delimiter character which indicates a invalid command.
AA represents module address
(cr) terminating character, carriage return (0Dh)

Note: Products have been calibrated, user can use them directly. User calibrate offset command, then calibrate gain errors. In the process of calibration, analog output modules need to be calibrated and connected to the multimeter to monitor the output signals, through the first command set to set the analog output and regulate multimeter to make the value of the output signal show zero, then enter the calibration bias shift command. Please refer to the specific calibration methods to calibrate the module .

There is no response if the module detects a syntax error or communication error or if the specified address does not exist.

Example: Command $2310(cr)
Response !23 (cr)

Calibrate offset of channel 0 at address 23H.

6. Gain Calibration

Description: Calibrate the gain and full scale of analog output module of channel N.

Syntax: **$ AA0N(cr)**

Parameters description:

$ delimiter character
AA module address, (range 00-FF) hexadecimal
N channels code 0~1
(cr) terminating character, carriage return (0Dh)

Response: **!AA(cr)** command is valid
?AA(cr) command is invalid or illegal operation

Parameters description:

! delimiter character which indicates a valid command.
? delimiter character which indicates a invalid command.
AA represents module address
(cr) terminating character. carriage return (0Dh)

Note: Products have been calibrated.user can use them directly. User calibrate offset command, then calibrate gain errors. In the calibration. analog output modules need to be calibrated channel connected to the multimeter to monitor the output signal, through the first command set command to set the analog output. regulated to multimeter inside shows the value of the output signal is zero. and then enter the calibration bias shift command. see the specific calibration methods calibrate the module sections.

There is no response if the module detects a syntax error or communication error or if the specified address does not exists.

E.g.: User command $2300(cr)
Module response !23(cr)

Calibrate gain errors of channel 0 at address 23H.

7. Read Module Name

Description: Read the module name from the specified analog output module

Syntax: **$AAM(cr)**

$ delimiter character
AA module address. (range 00-FF)
M represents read module name command
(cr) terminating character, carriage return (0Dh)

Response: **!AA(Module Name)(cr)** command is valid
?AA(cr) command is invalid or illegal operation

Parameters description:

! delimiter character which indicates a valid command.
? delimiter character which indicates a invalid command.
AA represents input module address
(Module Name) is ISOADA08, ISODA or ISO4021,etc, represents module type user used.
(cr) terminating character. carriage return (0Dh)

There is no response if the module detects a syntax error or communication error or if the specified address does not exists.

E.g.: User command $08M(cr)
Module response !08ISODA (cr)

Instructions: At address 08H, the Module is ISODA .

8. Channel N Analog Output Read-back Command

Description:Read-back on channel N analog output value, power-on value of analog output module .

Command Syntax: **$AADN(cr)**

Parameter Description:

$ delimiter character
AA module address (range 00-FF) hexadecimal
D Read-back on analog output value
N Channel code 0 or 1
(cr) terminating character, carriage return (0Dh)

Response Syntax：

!AA(data)(cr) command is valid
?AA(cr) command is invalid or illegal operation

Parameter Description:

! delimiter character
AA represents input module address (range 00-FF) hexadecimal
(data) represents back to read the output channel N analog data. The data format is in Engineering Units Percent of FSR. Two's complement hexadecimal. Refer to 3rd article of Command Set.
(cr) terminating character, carriage return (0Dh)

There is no response if the module detects a syntax error or communication error or if the specified address does not exists.

E.g.: User command $23D0 (cr)
Module response !23+04.632 (cr)

Instructions: For channel 0, present output value is +04.632mA at address 23H.

9. Set Communication Protocol Command

Description: Set ASCII command set or MODBUS RTU as operation protocol

Command Syntax: **$AAPV(cr)**

Parameter Description:

$ delimiter character
AA module address, (range 00-FF) hexadecimal
P set communication protocol command
V Protocol code 0: ASCII command set, 1: MODBUS RTU
(cr) terminating character. carriage return (0Dh)

Response: **!AA (cr)** command is valid
?AA(cr) invalid command or illegal operation

Parameter description:

! delimiter character which indicates a valid command.
? delimiter character which indicates a invalid command.
AA represents output module address
(cr) terminating character, carriage return (0Dh)

There is no response if the module detects a syntax error or communication error or if the specified address does not exist. Setting communication protocol is only available in default status.

E.g. 1： User command $00P1(cr)
Module response !00 (cr)
Set the communication protocol as MODBUS RTU.

E.g. 2： User command $00P0(cr)
Module response !00 (cr)
Set the communication protocol as ASCII command set.

The input range and data format：

There are three types of data format which are been used by analog input module:
00： (Engineering Units)
01：full scale percentage (% of FSR)
10：hexadecimal (complement)

Application Examples:

E.g.1: Output range is O1: 4~20mA, the output of channel 0 (module: address code is 01H) is 4mA.

Engineering unit	User command	#010+04.000(cr)
% of FSR	User command	#010+020.00(cr)
Complement of hexadecimal	User command	#010333(cr)

E.g.2: Output range is O4: 0~5V. the output of channel 1 (module: address code is 08H) is 3V.

Engineering unit	User command	#010+03. 0000(cr)
% of FSR	User command	#010+060.00(cr)
Complement of hexadecimal	User command	#010999(cr)

Output range	Data format	Max	Min
O1：4-20mA	Engineering Units	+20.000	+04.000
	% of FSR	+100.00	+020.00
	Complement of hexadecimal	FFF	333
O2：0-20mA	Engineering Units	+20.000	±00.000
	% of FSR	+100.00	±000.00
	Complement of hexadecimal	FFF	000
O4：0-5V	Engineering Units	+5.0000	±0.0000
	% of FSR	+100.00	±000.00
	Complement of hexadecimal	FFF	000
O5：0-10V	Engineering Units	+10.000	±00.000
	% of FSR	+100.00	±000.00
	Complement of hexadecimal	FFF	000
O6：1-5V	Engineering Units	+5.0000	+1.0000
	% of FSR	+100.00	+020.00
	Complement of hexadecimal	FFF	333
O7：0-±5V	Engineering Units	+5.0000	-5.0000
	% of FSR	+100.00	-100.00
	Complement of hexadecimal	FFF	000
O8：customized	Engineering Units	+100.00	±000.00
	% of FSR	+100.00	±000.00
	Complement of hexadecimal	FFF	000
O9：0-±20mA	Engineering Units	+20.000	-20.000
	% of FSR	+100.00	-100.00
	Complement of hexadecimal	FFF	000
O10：0-±10V	Engineering Units	+10.000	-10.000
	% of FSR	+100.00	-100.00
	Complement of hexadecimal	FFF	000

Table 4 Output Range and Data Format

Module Calibration

The product has been calibrated before delivery, the user can directly use it without calibration.
The user can also recalibrate the module via the calibration function of the product. During the calibration, user needs to use a high-accuracy universal meter to monitor the output value.

In order to improve the accuracy, it is recommended to use the following device:
A voltage/current measuring instrument with five and a half bit or higher-precision is required to monitor the accuracy of output signals.

Calibration process:

1. Select the output channels to be calibrated and connect them to the corresponding voltage or current measuring instrument based on the output range of the module.
2. Set the zero output value of the channel which needs to be calibrated, usually the value is 0mA, 4mA or 0V,etc. Set analog output value through the first command of the command set and adjust the settings

until the output signal shows zero value on the measuring instrument.

3. When the signal is stable, send offset calibration command ($AA1N, N represents the channel code currently being calibrated) to the module.
4. Set the output full scale value of the channel which needs to be calibrated. Set analog output value through the first command of the command set and adjust the settings until the output value shows the full scale value on the measuring instrument.
5. When the signal is stable, send gain calibration command ($AA0N, N represents the channel 0/1 currently being calibrated) to the analog output module.
6. Complete the Calibration.

Modbus RTU Protocol

ASCII Character communication protocol is the default of ISODA before delivery. If need to set the module to Modbus RTU mode. please refer to below the settings:

1.Switch off the power supply, short circuit CONFIG (the 8th pin) and GND (the 7th pin).
2. Correctly link Power and other interface cables.
3. Switch on power supply, make module be in default state automatically, communication address is 00. baud rate is 9600.
4. The module is to finish initialization (about 1 minute).
5. Send command $00P1 (cr), check response, if it is !00(cr), set correctly.
6. Switch off power supply, cut off the connecting between CONFIG and GND.
7.Switch on the power supply again, the Module has been set to MODBUS RTU protocol.
8.In Modbus RTU mode, function code 03H and 06H is supported by the module.

Notes: The module doesn't support broadcast address. The corresponding relations between the contents of MODBUS data and the output, please refers to table 4.

Instructions of register:

Address 4X	Data	R/W	Description
40001	Out0(0x0000-0x0FFF)	R/W	Analog output value of Channel 0
40002	Out1(0x0000-0x0FFF)	R/W	Analog output value of Channel 1
40003	Sout0 (0x0000-0x0FFF)	R/W	Electric analog output value of Channel 0
40004	Sout1 (0x0000-0x0FFF)	R/W	Electric analog output value of Channel 1

Table 5 Modbus RTU Register Instruction

The Host Mode

ISODA module can set to host mode by short-circuit of connection on HOST-ended to GND terminal (Pin 11 and Pin12), connect them to A-D Converter (ISO 4021 module) communication interface, and set A-D Converter (ISO 4021 module) to Modbus communication mode. In that case, it can achieve two-channel input signal from A-D Converter (ISO 4021 module) correspondingly match to two channels output of ISODA module. The model is mainly applied digitally long-distance transmission and restoration of analog signals, and is widely used in the fields: optical fiber transmission, GSM, CDMA wireless transmission, Ethernet transmission and other areas.

Host Mode Setting Method:

1. When the module does not power on, short-circuit connection on HOST-ended and GND (Pin 11and Pin12).
2. Connect power to the module, the module is to enter the host mode, it will continuously send out read register command based on Modbus protocol data.
3. Note that if user wants to enter the host mode, do not short connect CONFIG pin and GND pin, otherwise the module will be in the default mode.

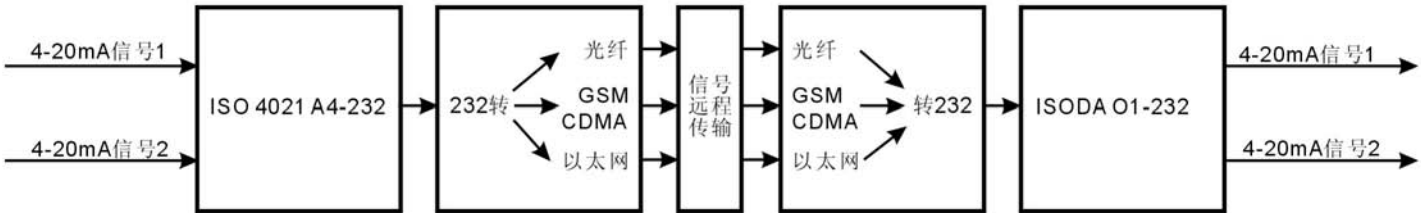

Fig. 4 Signal Long-distance Transmission

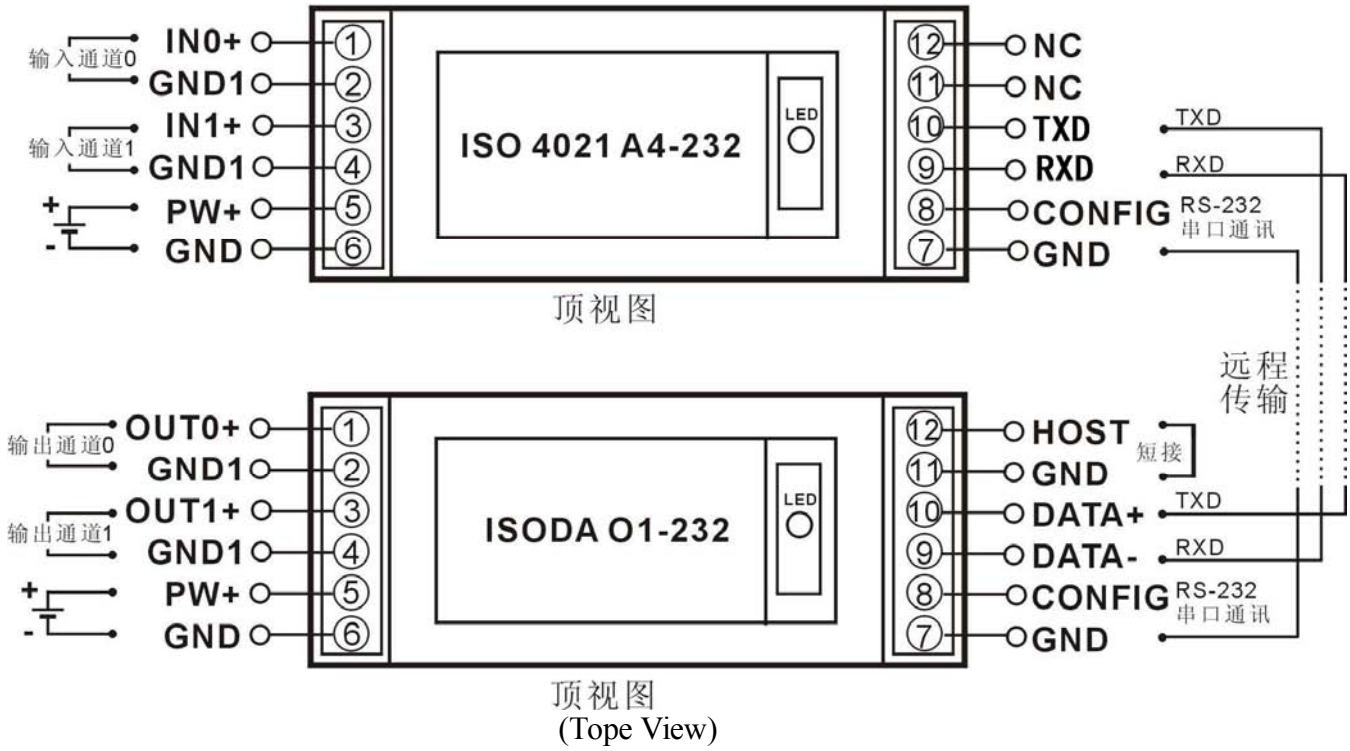

Fig.5 ISODA and ISO4021 RS-232 Communication Diagram

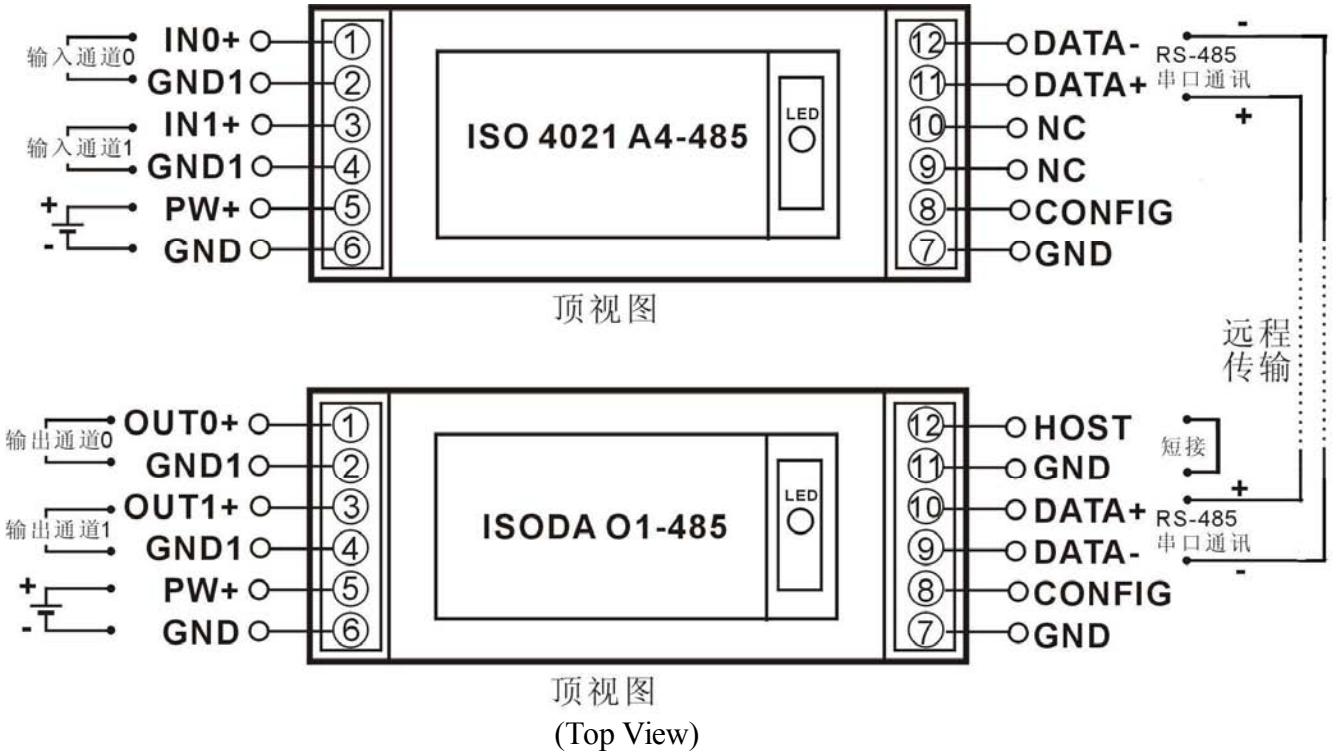

Fig.6 ISODA and ISO4021 RS-485 Communication Diagram

Dimension: (Unit：mm)

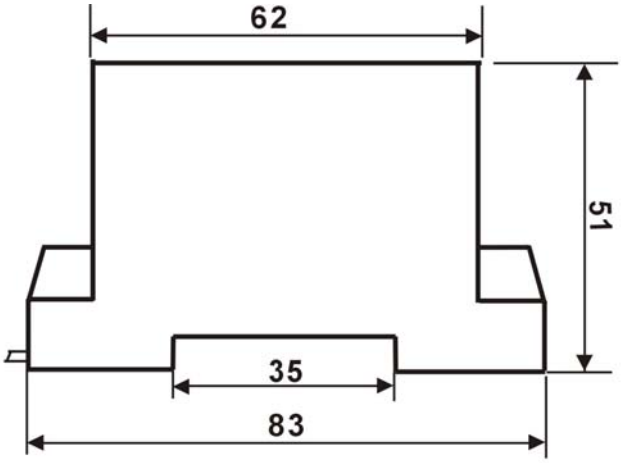

Fig.7 Front View

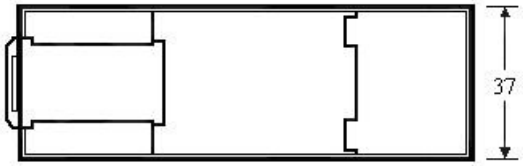

Fig.8 Bottom View