

Current Output Module






AO711-H11

User manual

IM23H36-E

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Symbol Definition	
	WARNING: Indicates information that a potentially hazardous situation which, if not avoided, could result in serious injury or death.
	RISK OF ELECTRICAL SHOCK: Indicates information that Potential shock hazard where HAZARDOUS LIVE voltages greater than 30V RMS, 42.4V peak, or 60V DC may be accessible.
	ESD HAZARD: Indicates information that Danger of an electro-static discharge to which equipment may be sensitive. Observe precautions for handling electrostatic sensitive devices
	ATTENTION: Identifies information that requires special consideration.
	TIP: Identifies advice or hints for the user.

Security& Caution Symbols

The following table lists Security& Caution symbols used on equipments.














No.	Symbol	Description
1		Direct current (DC)
2		Alternating current (AC)
3		Ground (Earth) terminal
4		Protective earth (ground) terminal
5		Reference ground (Earth) terminal
6		Frame or chassis
7		Equipotentiality
8		On (power)
9		Off (power)
10		Caution, risk of electric shock
11		Caution, hot surface
12		Caution, risk of danger
13		Electrostatic sensitive devices (ESD)

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Current Output Module AO711-H11

Section 1 Description

AO711-H11 is both an 8-channel and channel-channel isolated current signal output and HART module. It can be connected to 8 HART intelligent instruments, output current signal of III type and realize equipments management. The module can be configured 1:1 for redundancy.

The AO711-H11 module adopts advanced DA conversion circuit, which greatly shortens data conversion period and modulated period of PWM (Pulse Width Modulation) signal, and consequently shortens the stability time of the output signal, realizing fast response.

Making full use of the performance of CPU, the module can operate independently, conduct fault analysis, and complete the on-line disturbance-free transfer process. Users can set the communication fault time of the module via configuration. The module will enter into safe mode of fault when the module and the main controller have network communication fault. The module keeps the pre-gained configuration or outputs according to the set value. Meanwhile, the module keeps outputting and operating normally when hot reposition occurs.

Section 2 Technical Specifications

The technical specifications of current signal output and HART module AO711-H11 shows in the table below:

Table 2-1 technical specifications of AO711-H11

Parameter		Description
Module model		AO711-H11
Type		Current Output Module
Channel number		8
Redundancy		Support
Type of isolation		Channel-channel isolated
Isolated power		500V AC
Temperature	Operating temperature	(-20~70)°C
	Storage temperature	(-40~85)°C
Humidity	Operating humidity	10%RH~90%RH. No vapor condensation
	Storage humidity	5%RH~95%RH. No vapor condensation
System power supply		24V DC±10%
24VDC system power consumption		<2.0W
24VDC auxiliary power consumption		<0.7W/Channel
Signal type		(4~20) mA + HART
Precision		0.2%
Maximal output range of signal		(0~24) mA
Response time		10%~90% step:<100ms
Load capability of output		<750Ω ((4~20) mA)
Temperature drift at 0°C		±0.1μV/°C
Temperature drift in whole range		±30 PPM/°C
Response time of the communication between equipment management soft and HART communication module	Response time of configuration, adjustment and other operations of a single instrument.	<2s
	Response time of reading real-time data of HART equipment (8 sets)	<0.2s

Section 3 Usage Instruction

3.1 Led Indicators

Table 3-1 LED indicators in AO711-H11

LED indicator	Fault (red)	Status (green)	Duplex (green)	L-Bus (green)	Supply (green)
Description Status	Fault indicator	Running indicator	Work/standby indicator	Communication indicator	Auxiliary power supply status indicator
OFF	Normal	Fault-safety state	Standby	Communication link break	Abnormal auxiliary power supply
ON	Fault	Normal	Work	Normal	Normal
Flashing	--	No configuration	--	IP confliction	--

3.2 Installation of I/O Modules

AO711-H11 is installed on I/O Module base, which equips with power terminal and field signal terminal.

Please refer to *Control Station Hardware User Manual*.

3.3 Interface Features

AO711-H11 module can output current and control field execution mechanism. Combining with field application, the module provides with signal-value detecting terminal, with which users can easily measure field signal value without causing any influence to the operation of the field equipments.

The interface circuit of AO711-H11 module is shown as bellow.

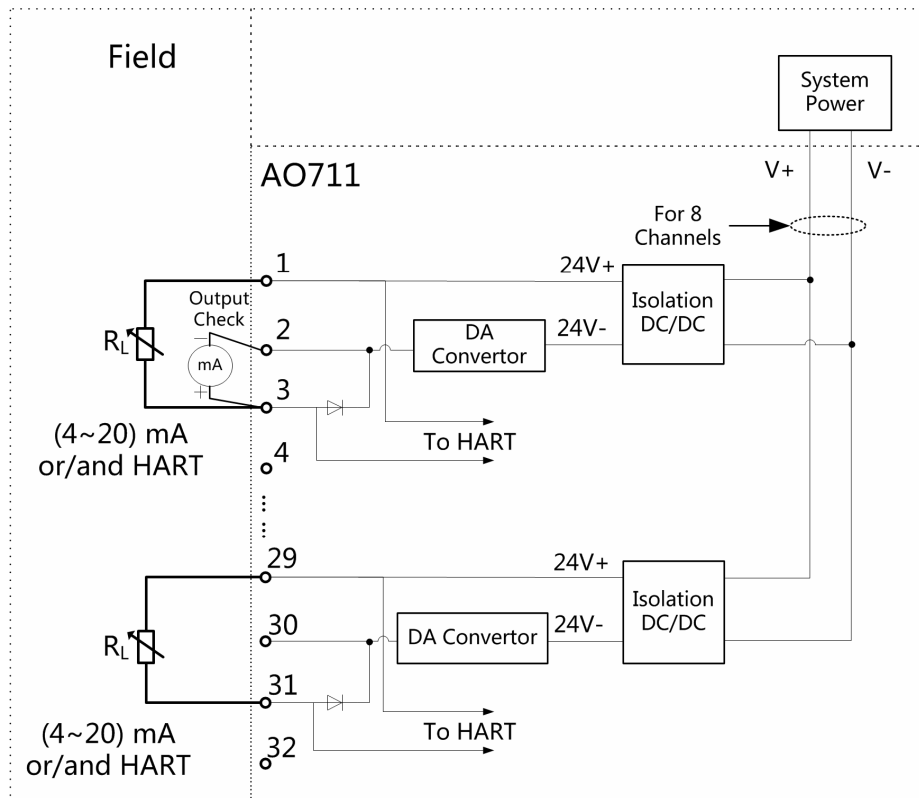


Figure 3-1 interface circuit of AO711-H11

3.4 Terminals Definition & Connection

The terminal wiring of AO711-H11 working with the change-over bases MB745-S11 and MB746-S11 and the change-over terminal unit TUA711-GS00 or with the I/O bases MB735-S11 and MB736-S11 is shown below. TUA711-GS00 corresponds to the 36 terminals of I/O base respectively.

CH* is channel No., means 1 is CH1. The 4 terminals of each channel are described as CH-1, CH-2, CH-3, CH-4 respectively.

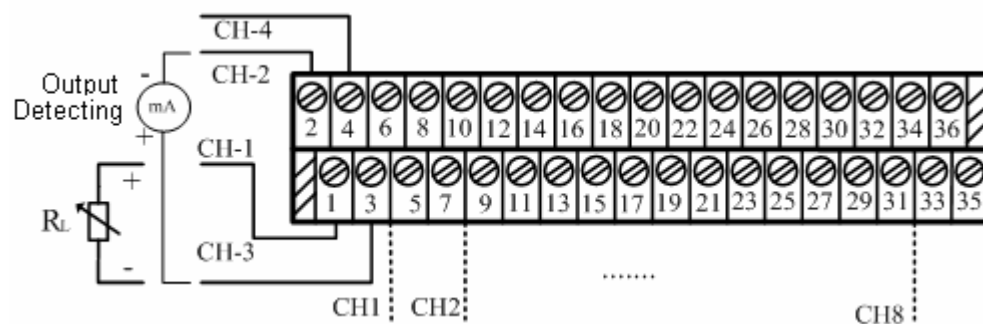
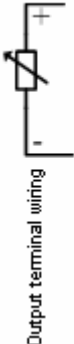
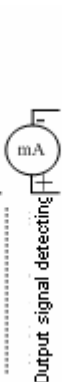


Figure 3-2 terminal interface circuit

Table 3-2 Connections of terminals of AO711-H11

Wiring diagram	Terminal	Channel	Output Signal	Check Signal	Remarks	
<div><div></div><div></div><div><div>CH-1</div><div>CH-2</div><div>CH-3</div><div>CH-4</div></div></div>	1	CH-1	+	No connection	CH1	
	2	CH-2	No connection	-		
	3	CH-3	-	+		
	4	CH-4	No connection	No connection		
	5	CH-1	+	No connection	CH2	
	6	CH-2	No connection	-		
	7	CH-3	-	+		
	8	CH-4	No connection	No connection		
	9	CH-1	+	No connection	CH3	
	10	CH-2	No connection	-		
	11	CH-3	-	+		
	12	CH-4	No connection	No connection		
	13	CH-1	+	No connection	CH4	
	14	CH-2	No connection	-		
	15	CH-3	-	+		
	16	CH-4	No connection	No connection		
	17	CH-1	+	No connection	CH5	
	18	CH-2	No connection	-		
	19	CH-3	-	+		
	20	CH-4	No connection	No connection		
	21	CH-1	+	No connection	CH6	
	22	CH-2	No connection	-		
	23	CH-3	-	+		
	24	CH-4	No connection	No connection		
	25	CH-1	+	No connection	CH7	
	26	CH-2	No connection	-		
	27	CH-3	-	+		
	28	CH-4	No connection	No connection		
	29	CH-1	+	No connection	CH8	
	30	CH-2	No connection	-		
	31	CH-3	-	+		
	32	CH-4	No connection	No connection		
	33	No connection				
	34					
	35					
	36					

3.5 Base/Terminal Unit Selection

Selection of bases/terminal unit matching AO711-H11 is shown in Table 3-3.

Table 3-3 Selection of bases/terminal unit matching AO711-H11

Signal connection requirement	Module work model	Base model	Terminal unit model
Connected directly	Single	MB735-S11	-
	Redundancy	MB736-S11	-
Terminal switch	Single	MB745-S11	TUA711-GS00
	Redundancy	MB746-S11	

AO711-H11 of this version is totally compatible with last version.

3.6 Configuration Instruction

Please refer to *Hardware Module Builder User Manual* for details.

The module address is determined according to the module's position in rack. Please refer to *Control Station Hardware User Manual* for details. When configuring, select the corresponding control domain address (0~15), controller address (2~126), IO link module address (1~7), IO rack address (0~3), module address (0~15) and channel No. (0~7) according to the position of the module in the rack.

3.7 Maintenance

Clean and fasten all power and ground points for every 6 months or during the time when system stops running.

Vacuum the modules, bases, racks, fan unit, power supply terminal unit, etc via static-resistant vacuum every 6 months or during the time when system stops running.

Please refer to *Control Station Hardware User Manual* for the installation and disassembly.

Section 4 Application

4.1 Notices

It is prohibited to connect 24VDC power directly to current input channel; otherwise it may cause the damage to the corresponding channel.

By the setting in the tag configuration setting, AO711-H11 can realize over-range output function. Because the max. output scope of the module is (0~24) mA, it can realize output of (4~20) mA -25%~125% of the configuration.

Table 4-1 Tag configuration software settings instruction

Parameter	Meaning
Upper limit percent (%) of over range	Meaning: percentage over max. value of the range. Example: enter 25 means 125% over the max. value of the signal type.
Lower limit percent (%) of over range	Meaning: percentage over min. value of the range. Example: enter 25 means -25% over the min. value of the signal type.
Output upper limit value	Meaning: keep the output value lower than "output upper limit value"; the max. signal type value can be set as the upper limit value. Example: over-range upper percentage (%) =16, the upper limit value can be set up to 116%, and at this time, the output value is limited within 116%. If the output upper limit value is set at 110%, the output value is set within 110%.
Output lower limit value	Meaning: keep the output value higher than "output upper limit value"; the min. signal type value can be set as the lower limit value. Example: over-range lower percentage (%) =15, the lower limit value can be set at -15%, and at this time, the output value is limited within -15%. If the output lower limit value is set at -10%, the output value is set within -10%.
Upper limit of engineering value	It means the upper limit of engineering value of the tag, which is usually 100.
Lower limit of engineering value	It means the lower limit of engineering value of the tag, which is usually 0.

4.2 Fault Diagnosis and Troubleshooting

1. If the Fault indicator is ON all the time, there is a module fault. Module replacement is required.
2. If L-Bus indicator is OFF, there is a communication fault or L-Bus indicator circuit damage or there is no other node in the I/O bus. Please check the communication connection.
3. If the L-Bus indicator flashes, there is IP confliction. Please check if there is module confliction in the bus.
4. If Supply is OFF, there is bad connection of periphery 24VDC power source or unreliable module connection. Please check the periphery power connection and the connection between module and base.
5. If all indicators are OFF when the module is energized, the power of module system is in failure. Check the system power connection. If the connection is reliable, please replace the module.

Section 5 Revision

Table 5-1 Retrofit list of the version

Document Version	Applicable Module Model	Remarks
V1.0	AO711-H-11.11.00	
V1.1	AO711-H-12.12.00	
V1.2	AO711-H-13.13.00	
V1.3	AO711-H-13.13.00 and later versions	Bases selection has been changed.
V2.0(20131029)	AO711-H11 V21.20.00 and later versions	Bases selection and power distribution have been changed Add model information
V2.1(20141218)	AO711-H11 V21.20.00 and later versions	Modify LED indicators
V2.2(20150917)	AO711-H11 V21.20.00 and later versions	Modify IO link module address
V2.3(20161116)	AO711-H11 V21.20.00 and later versions	Add code