



Current Output Module

AO714-H11

User Manual

IM23H55-E
20230629

Copyright Notice

Trademarks or marks SUPCON, SPlant, Webfield, ESP-iSYS, MultiF, InScan, SupField are all registered, registering and being used by Zhejiang SUPCON Technology Co., Ltd., which owns the properties of all the above trademarks or marks. It is strictly prohibited to use any of the above trademarks or marks without a written permission from Zhejiang SUPCON Company. We reserve the right to take legal action against any individuals or companies using trademarks or marks above illegally.

The reproduction, transmission or use of this document or its contents is not permitted without express written authority. Information and specifications in this document are subject to change without notice. While information in this document is well edited and checked, mistakes or omissions may exist. Please don't hesitate to contact SUPCON if you have any questions about this document. Please contact SUPCON via email "SMS@supcon.com" if you have any questions.

Copyright © 2022 **Zhejiang SUPCON Technology**. All rights reserved.

Zhejiang SUPCON Technology Co., Ltd.
No.309 Liuhe Road, Binjiang District
Hangzhou, 310053
P.R.China
<http://global.supcon.com>

Symbol Definitions



WARNING:

Indicates a potentially hazardous situation which, if not avoided, could result in serious injuries or death.



RISK OF ELECTRICAL SHOCK:

Indicates a Potential shock hazard where HAZARDOUS LIVE voltages greater than 30V RMS, 42.4V peak, or 60V DC may be accessible.



ESD HAZARD:

Indicates the 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 users.

Table of Contents

1 Overview.....	1
2 Technical Specifications.....	2
3 Usage Instruction.....	4
3.1 LED Indicators	4
3.2 Installation of I/O Modules.....	4
3.3 Interface Features.....	4
3.4 Terminal Definition & Connection.....	5
3.5 Base/Terminal Unit Selection.....	7
3.6 Configuration Instruction.....	7
3.7 Maintenance	8
4 Application.....	9
4.1 Achievement of Channel-channel Isolation.....	9
4.2 Notices.....	10
4.3 Fault Diagnosis and Troubleshooting.....	10
5 Revision.....	12

1 Overview

The 16-channel current signal output module AO714-H11 is a current signal output module with HART communication function. AO714-H11 can realize III current signal output. The HART communication supports connecting to the handheld communicator and is compatible with break-out communication mode. It supports 1: 1 redundancy.

User can set the module corresponding fault-safety mode through configuration. When there is any problem with network corresponding between the module and main controller, the module will enter the fault-safety mode. The module configuration will output previous configuring value or the configuration will be held on. Meanwhile, the module will hold on the output state and work normally when heat-resetting occurs.

The AO714-H11 also has functions of exceeding output, free span, and freely setting fault-safety mode. Configure freely according to the engineering field.

2 Technical Specifications

Table 2.1 AO714-H11 Module Specification

Parameter		Description
Model		AO714-H11
Type		Current output module
Channel		16
Redundancy		Support
Isolation type		Isolated
Temperature	Operating temperature	(-20 ~ 70) °C
	Storage temperature	(-40 ~ 85) °C
Humidity	Operating humidity	10%RH ~ 90%RH, non-condensing
	Storage humidity	5%RH ~ 95%RH, non-condensing
System power supply		24 V DC±10%
Module System Power consumption (24 V)		<1.8 W
Module auxiliary power consumption		<0.7 W/Channel
Signal type		(4 ~ 20) mA + HART
Precision		0.1%
Max. scope of signal output		(2.4 ~ 21.6) mA
Responding time		10% ~ 90% step-up<10ms
Max load		750 Ω
Temperature excursion		±0.1 μV/°C
Whole span excursion		±30 PPM/°C
Offline check		Support
Response time of communication between the device management software and HART communication module	Response time to single instrument configuration, adjustment, rectification etc. operation	<2 s
	Response time to reading real time data of HART equipment(16 pcs)	<0.4 s

Table 2.1 AO714-H11 Module Specification (continued)

Parameter		Description
	Multi-variate data update interval (16 pcs)	<1 s

3 Usage Instruction

3.1 LED Indicators

Table 3.1 Instruction of Module Indicator

Led Indicator	Fault (Red)	Status (Green)	Duplex (Green)	L-Bus (Green)	Supply (Green)
Description Status	Fault Indicator	Running Indicator	Working/Standby Indicator	Communication Indicator	Auxiliary Power Supply Status Indicator
OFF	Normal	Fault-safety state	Standby	Communication Link is Broken off	Abnormal Auxiliary Power Supply
ON	Severe Fault	Normal	Working	Normal	Normal
Flashing	--	No Configuration	--	Address Conflict	--

3.2 Installation of I/O Modules

AO714-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

AO714-H11 module realizes current output and can control field execution

The terminal connection is illustrated in the following figure.

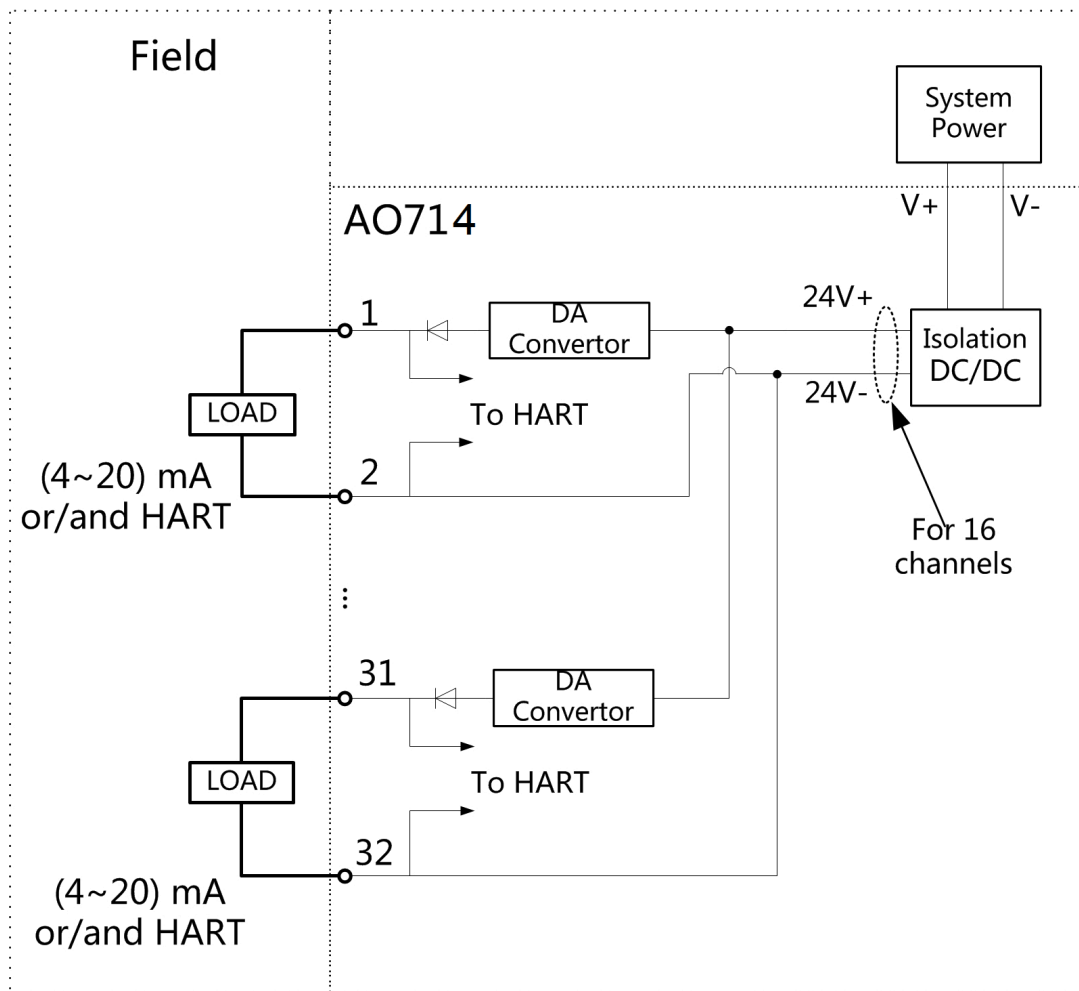


Figure 3.1 Interface Circuit of Current Signals by Module Power Supply

3.4 Terminal Definition & Connection

The terminal wiring of AO714-H11 working with the change-over bases MB745-S11 and MB746-S11 and the change-over terminal unit TUA711-AIO16 in *TUA711-AIO16 User Manual*.

The terminal wiring of AO714-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* refers to channel number. 1 means CH1. CH-1 and CH-2 refer to the 2 terminals of each channel.

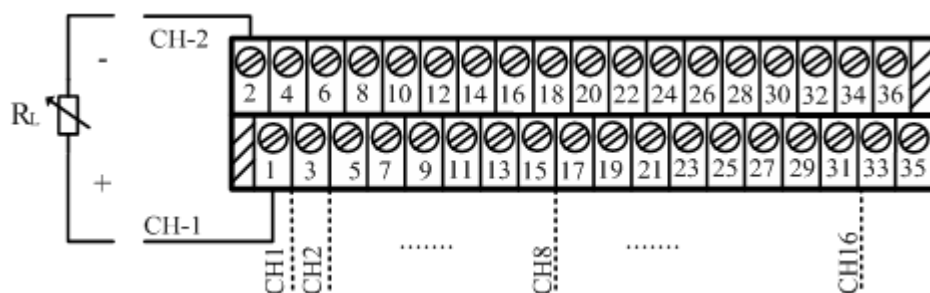


Figure 3.2 Terminal Connection Diagram

Table 3.2 Terminal Connection

Connection Diagram	Terminal	Description	Instruction	Channel
	1	CH-1	+	CH1
	2	CH-2	-	
	3	CH-1	+	CH2
	4	CH-2	-	
	5	CH-1	+	CH3
	6	CH-2	-	
	7	CH-1	+	CH4
	8	CH-2	-	
	9	CH-1	+	CH5
	10	CH-2	-	
	11	CH-1	+	CH6
	12	CH-2	-	
	13	CH-1	+	CH7
	14	CH-2	-	
	15	CH-1	+	CH8
	16	CH-2	-	
	17	CH-1	+	CH9
	18	CH-2	-	
	19	CH-1	+	CH10
	20	CH-2	-	

Table 3.2 Terminal Connection (continued)

Connection Diagram	Terminal	Description	Instruction	Channel
	21	CH-1	+	CH11
	22	CH-2	-	
	23	CH-1	+	CH12
	24	CH-2	-	
	25	CH-1	+	CH13
	26	CH-2	-	
	27	CH-1	+	CH14
	28	CH-2	-	
	29	CH-1	+	CH15
	30	CH-2	-	
	31	CH-1	+	CH16
	32	CH-2	-	
33, 34, 35, 36		Unconnected		

3.5 Base/Terminal Unit Selection

Selection of bases/terminal unit matching AO714-H11 is shown below.

Table 3.3 Selection of bases/terminal unit matching AO714-H11

Signal Connection Requirement	Working Mode	Base Model	Terminal Unit
Direct connection	Single	MB735-S11	-
	Redundancy	MB736-S11	-
Terminal change-over	Single	MB745-S11	TUA711-AIO16
	Redundancy	MB746-S11	TUA711-GS00

3.6 Configuration Instruction

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

The address of AO714-H11 is determined by its position in the rack. 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. (0~15) according to the position of the module in the rack. Please refer to *Control Station Hardware User Manual*.

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.

4 Application

4.1 Achievement of Channel-channel Isolation

Module can achieve the channel-channel isolation of field signal by setting the safety barrier.

In channel-channel isolation, the selection of base and safety barrier is shown in Table 4.1. The achievement of channel-channel isolation for safety barrier is shown in the following figure.

For baseplate isolated barriers, AO714-H11 should work with I/O module terminal change-over base.

For rail isolated barriers, AO714-H11 should work with I/O module base.

Table 4.1 Selection of base and safety barrier

Field Signal Type	I/O Module Base	I/O Change-over Base	Baseplate Isolated Barrier	Rail Isolated Barrier
III current signal	√	-	-	√
	-	√	√	-

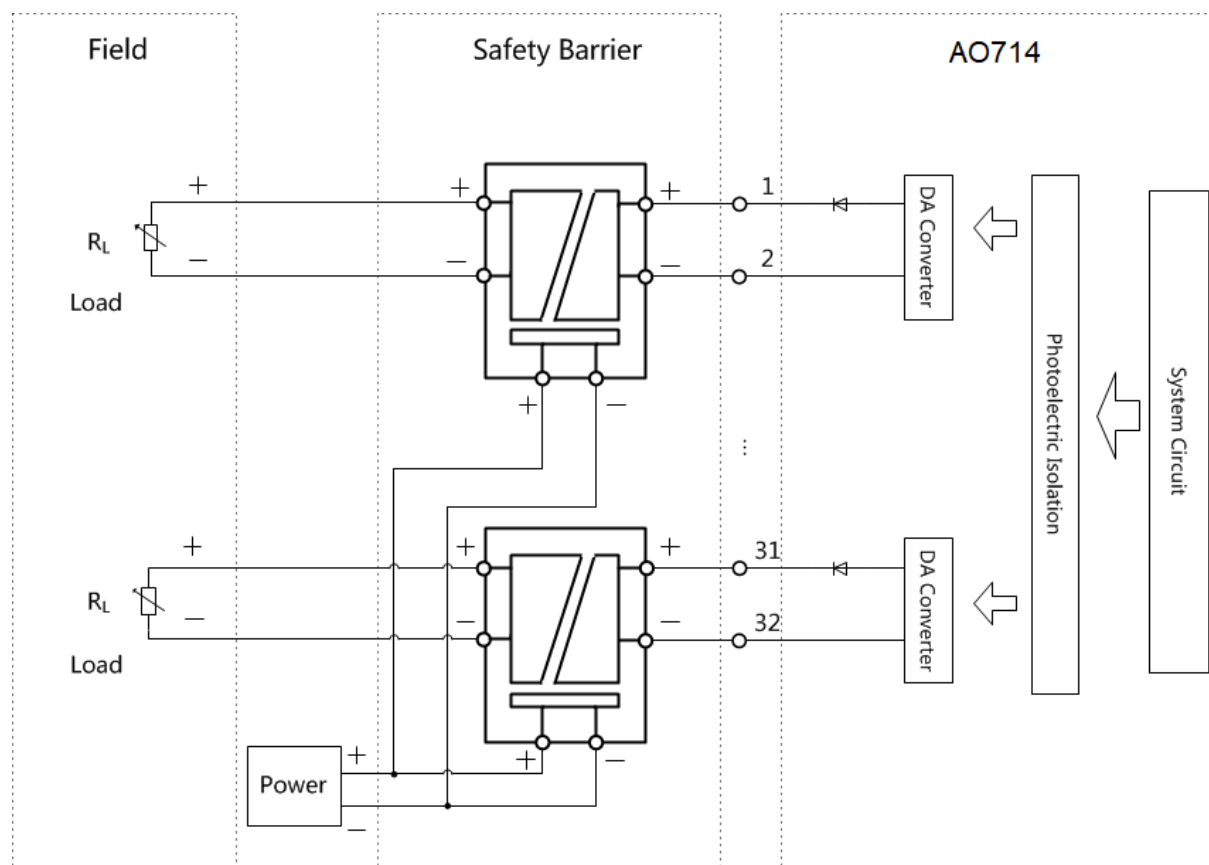


Figure 4.1 Achievement of channel-channel isolation for safety barrier

4.2 Notices

AO714-H11 module can realize function of span-exceeding output by setting the bit number configuration. (4 ~ 20) mA can realize -10% ~ 110% exceeding output.

The setting of bit-number configuration is shown below.

Table 4.2 Setting in Configuration

Parameter	Description
Expand the upper-limit percentage of the span(%)	The percentage that exceed the span; Example: input 10 means the max signal model is 110%.
Expand the lower-limit percentage of the span(%)	The percentage that exceed the span; Example: input 10 means the minimum signal model is -10%.
Output the upper limit	The output must below the upper limit; the max value is the max value of signal model. Example: the exceeding percentage with the upper limit (%) =5, output upper limit can be maximally set to 105%, and the output is limited in 105%. If setting upper limit to 110%, the output is limited in 110%.
Output the lower limit	The output must above the lower limit; the minimum value set is the minimum value of signal model. Example: the exceeding percentage with the upper limit (%) =5, output upper limit can be maximally set to -5%, and the output is limited in -5%. If setting upper limit to -10%, the output is limited in -10%.
Upper limit of span	Represent the engineering max value of bit-number. 100 for the most time.
Lower limit of span	Represent the engineering minimum value of bit-number. 0 for the most time.

4.3 Fault Diagnosis and Troubleshooting

1. The Fault indicator being ON all the time indicates that AO714-H11 has the severe fault. The solution is to replace the fail module.
2. The L-Bus indicator being OFF all the time indicates communication fault or damage of L-Bus indicator circuit or there is no other node in the I/O bus. Please check the communication connection.
3. If the L-Bus indicator is flashing, there is address confliction. Please check if there is module confliction in the bus.

4. If Power Supply indicator is OFF, there is bad connection of auxiliary 24V power source or unreliable module connection. Please check the auxiliary power supply connection and the connection between module and base.
5. If all indicators are OFF when the module is energized, the power supply of module has problem. Check the system power connection. If the connection is reliable, please replace the module.

5 Revision

Table 5.1 Retrofit list of the version

Document version	Product Model	Remarks
V1.0 (20230629)	AO714-H11 V10.10.00	First edition.