

Digital Input Module






DI713-S11

User manual

IM23H41-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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Digital Input Module DI713-S11

Section 1 Description

DI713-S11 module is a 24V digital input module, which can collect 16-loop SOE signal and do not support redundancy configuration.

SOE is the abbreviation of Sequence of Event. SOE module is mostly used in power plant. In case of tripping due to accident, there will be a series of switch actions which will be recorded according to the sequence for accident analysis in future.

DI713-S11 module can recorded switch events with min. interval 0.5 millisecond, such as breaker operation, switch tripping etc. The recorded events include time of happening, status, type and location and so on. It is a multifunction module, which can sent SOE signal and real time DI signal of 16 channels to the master controller and have function of low frequency accumulation of the first 8 channels.

Section 2 Technical Specifications

Table 2-1 technical specifications of DI713-S11

Parameter		Description
Module model		DI713-S11
Type		Digital input module
Channel number		16
Redundancy		Not Support
Isolation type		Isolated
Temperature	Operating	(-20~70)°C
	Operating humidity	(-40~85)°C
Humidity	Storage temperature	10%RH~90%RH. No vapor condensation
	Storage humidity	5%RH~95%RH. No vapor condensation
System power supply		24V DC±10%
24V system power consumption		<1.2W
24V cabinet power consumption		<0.12W/channel
Signal type	Passive contact input	The common terminal can be set; NPN and PNP can be input
	Active contact input	
ON and OFF condition	Contact	ON:<1kΩ ; OFF:>100kΩ
	Active contact	ON: (15~30)V;OFF:<5V
Scanning cycle		0.5ms
Relative time resolution		0.5 ms
Resolution precision		1 ms
Record buffer		Max. 100 buffer records in the module
Low frequency impulse accumulation	Channel	0~7 channels have impulse accumulation function
	Impulse width requirement	>20 millisecond(should be bigger than filter time and anti-jitter time)
Communication cycle		50ms

Section 3 Usage Instruction

3.1 Led indicators

Table 3-1 LED indicators in DI713-S11

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	--	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

DI713-S11 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 Feature

DI713-S11 module can collect many types of digital signals through signal input interface circuit. Different types of signals have different connection methods.

3.3.1 Connection of Passive Contact Signal Input

If the signal source is the passive contact signal input; the base connection terminals 33 and 35, 34 and 36 should in short connection respectively (recommended), or 33 and 36, 34 and 35 in short connection respectively. The connection principle diagram is show in Figure 3-1.

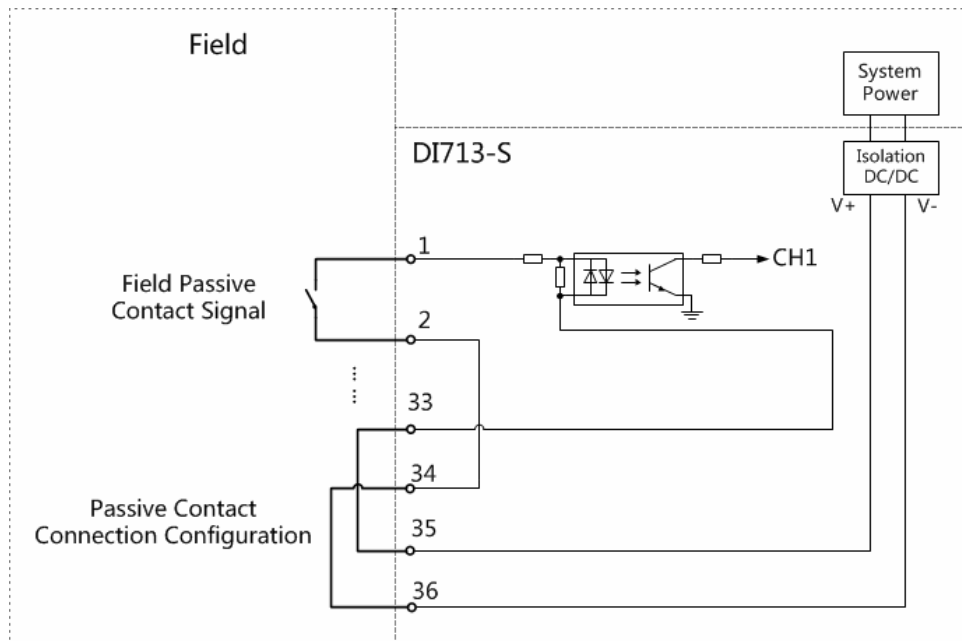


Figure 3-1 Passive contact interface circuit

3.3.2 Connection of Active Contact Signal Input

If the signal source is the active contact signal input, the connection terminals of base 33 and 34 should be in short connection, 35 and 36 be suspended. The connection principle is shown in Figure 3-2.

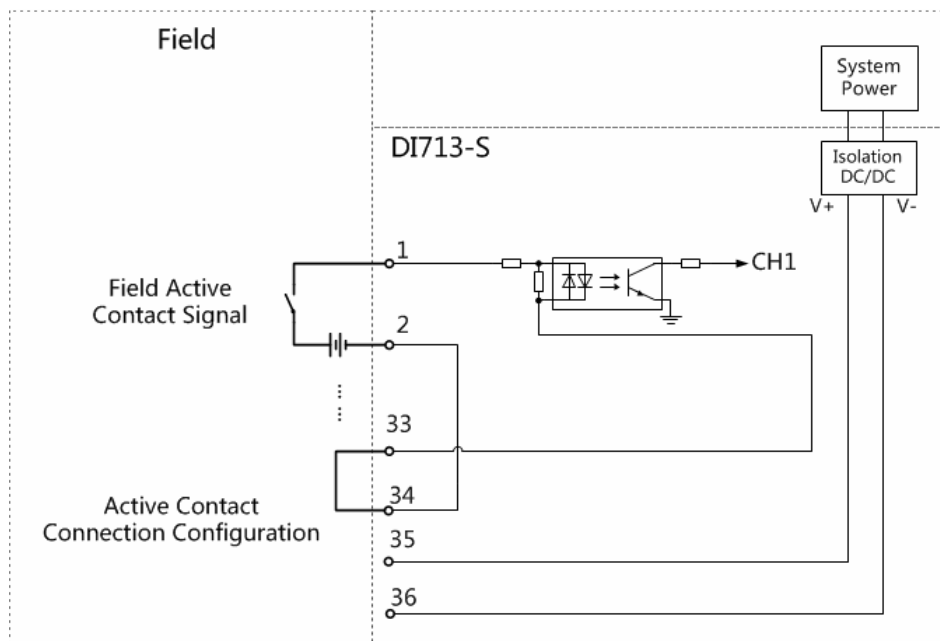


Figure 3-2 Active contact interface circuit

3.3.3 Connection of Proximity Switch Signal Input

If the signal source is PNP proximity switch signal input and the power source is periphery power source, the connection terminals of base 33 and 34 should be in short connection, 35 and 36 be suspended. The connection principle is shown in Figure 3-3.

If the signal source is NPN proximity switch signal input and the power source is periphery power source, the connection terminals of base 33 and 34 should be in short connection, 35 and 36 be suspended. The connection principle is shown in Figure 3-4.

Proximity switch signals of PNP and NPN cannot connect the same DI module simultaneously, as shown in Figure 3-3 and Figure 3-4.

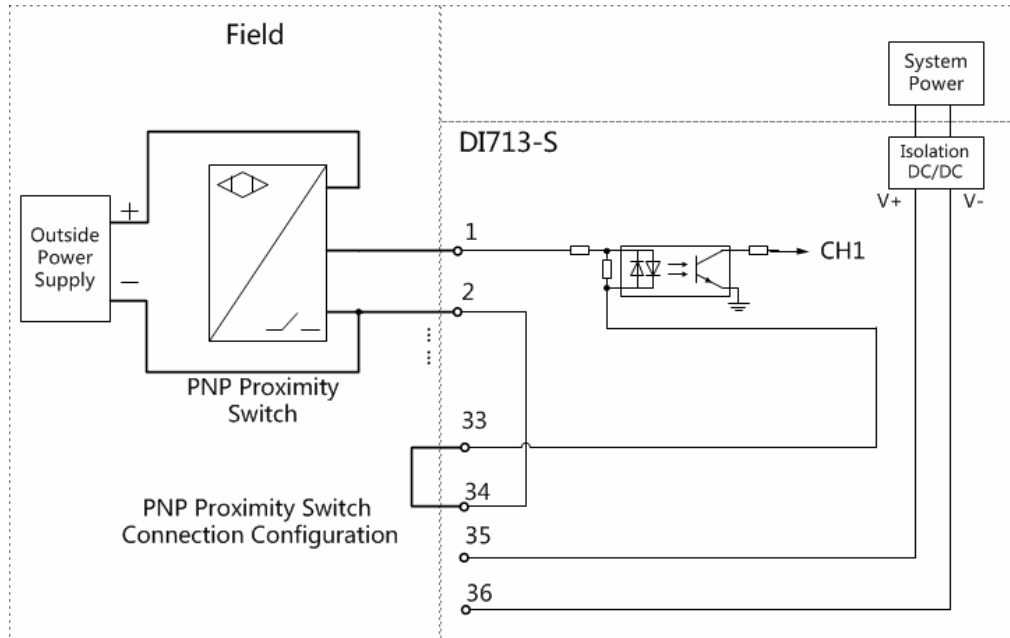


Figure 3-3 PNP proximity switch interface circuit

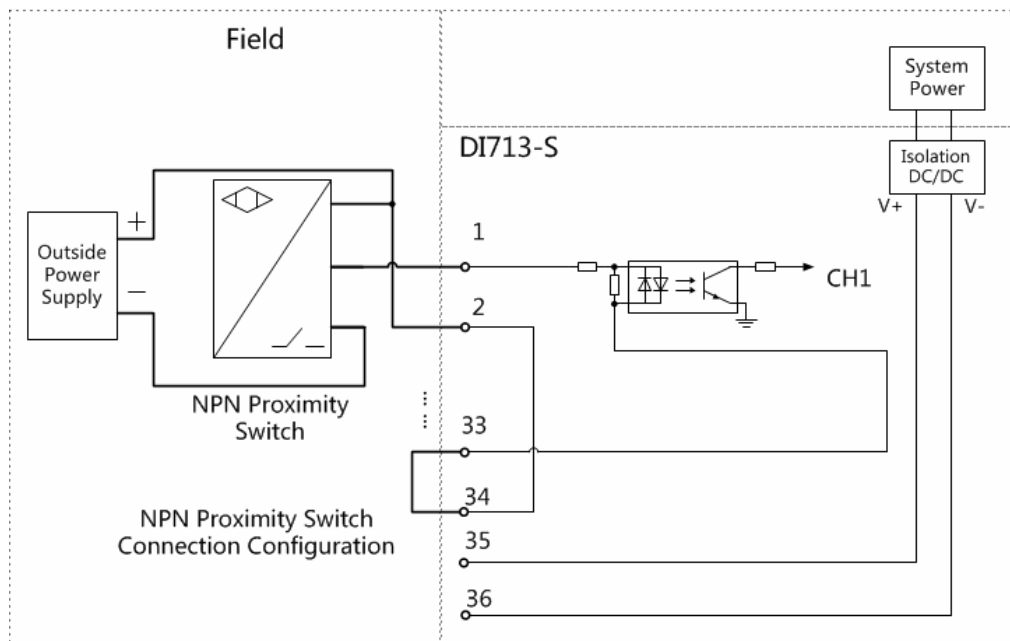


Figure 3-4 NPN proximity switch interface circuit

3.4 Terminals Definition & Connection

The terminal wiring of DI713-S11 working with the change-over bases MB745-S11 and the

change-over terminal unit TUA711-GS00 or with the I/O bases MB735-S11 is shown below. TUA711-GS00 corresponds to the 36 terminals of I/O base respectively.

The input connection instruction of DI713-S11 module base is shown in Table 3-2. CH* refers to the channel number.

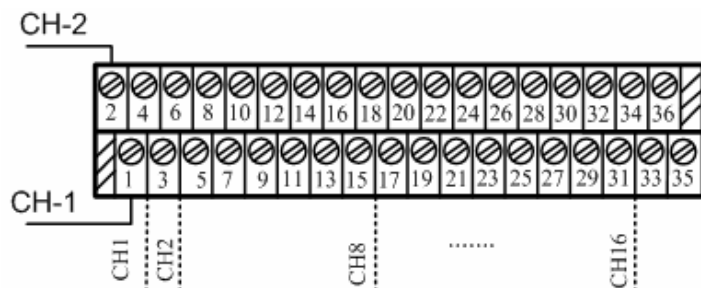


Figure 3-5 Terminal Connection Diagram

Table 3-2 Connections of terminals of DI713-S11

Terminals	Description	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	
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

Terminals	Description	Channel
28	CH-2	
29	CH-1	CH15
30	CH-2	
31	CH-1	CH16
32	CH-2	
33	Collocation terminal	-
34		
35		
36		

Table 3-3 Power distribution terminal instruction table

Signal type	Connection instruction
Passive contact	Terminals 33 and 35, and terminals 34 and 36 in short connection respectively(recommended); or terminals 33 and 36, and terminals 34 and 35 in short connection respectively
Active contact	Terminals 33 and 34 in short connection, and terminals 35 and 36 in disconnection
PNP type proximity switch	Terminals 33 and 34, in short connection and terminals 35 and 36 in disconnection
NPN type proximity switch	Terminals 33 and 34, in short connection and terminals 35 and 36 in disconnection

3.5 Base/Terminal Unit Selection

Selection of bases/terminal unit matching DI713-S11 is shown in Table 3-4.

Table 3-4 Selection of bases/terminal unit matching DI713-S11

Signal type	Working mode of DI713-S11	Base model	Terminal unit model
24V DI signal	Single	MB735-S11	-
24V DI change-over signal	Single	MB745-S11	TUA711-GS00
Relay isolation signal (24V DI signal)	Single	MB745-S11	TUA711-DIR16

DI713-S11 of this version is totally compatible with last version.

3.6 Configuration Instruction

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

The module address is determined according to the module position in the rack (please refer to the *Control Station Hardware User Manual*). When configuring, according to the module position in the

rack, choose corresponding control domain addresses (0~15), control machine address (2~126), IO connecting module address (1~7), IO rack address (0~3), module address (0~15) and channel NO. (0~15).

3.7 Maintenance

Clean and fasten all the power and grounding points every six months(or system stops running).

Vacuum the modules, bases, racks, fan unit, power supply terminal unit, etc via static-resistant vacuum every six months (or system stops running).

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

Section 4 Application

4.1 Notices

- Because there are many types of digital input signals, proper connection method should be selected according to the site signal type. As for some types of signals (such as AC220V switch signal etc.), change-over base and special terminal unit should be provided. When using terminal unit from outside, pay attention to the signal type selection and module connection method etc.
- DI713-S11 module used for SOE record can only be installed in local cabinet connected directly through local I/O bus and controller because controller in the local cabinet can provide sync pulse signal but IO connection module can not provide sync pulse signal.

4.2 Fault diagnosis and troubleshooting

1. If the Fault indicator is ON all the time, there is a severe 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 indicator is OFF, there is bad connection of periphery 24V power source or unreliable module connection. Please check the auxiliary 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 has problem. 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 Version	Remarks
V1.0	DI713-S-11.11.00	
V2.0	DI713-S-12.12.00	Modified the base selection
V2.1(20131223)	DI713-S11 V14.12.00 and later versions	Bases selection and power distribution have been changed Modified the interface circuit Add model information
V2.2(20141218)	DI713-S11 V14.12.00 and later versions	Modified the description
V2.3(20150916)	DI713-S11 V14.12.00 and later versions	Modified IO connecting module address Replace FCU711-S as controller in notices
V2.4(20161116)	DI713-S11 V14.12.00 and later versions	Add code
V2.5(20220105)	DI713-S11 V14.12.00 and later versions	Add TUA711-DIR16 in model list