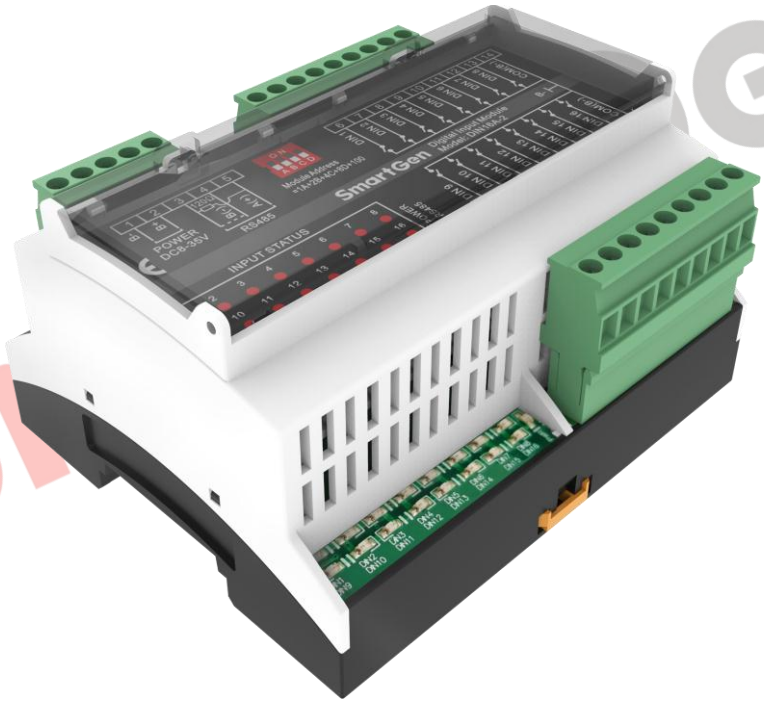
DIN16A-2

DIGITAL INPUT MODULE

USER MANUAL



SMARTGEN (ZHENGZHOU) TECHNOLOGY CO., LTD.

Chinese trademark

English trademark

SmartGen — make your generator ***smart***

SmartGen Technology Co., Ltd.
No.28 Jinsuo Road
Zhengzhou
P. R. China
Tel: +86-371-67988888/67981888/67992951
+86-371-67981000(overseas)
Fax: +86-371-67992952
Web: http://www.smartgen.com.cn
http://www.smartgen.cn
Email: sales@smartgen.cn

Table 1 Software Version

Date	Version	Note
2020-11-20	1.0	Original Release

CONTENTS

1 OVERVIEW

DINT16A-2 Digital Input Module is an expansion module which has 16 auxiliary digital input channels. Expansion module status is transmitted to DIN16A-2 by main control board via RS485.

2 TECHNICAL PARAMETERS

Table 2 Technical Parameters

Items	Contents
Working Voltage	DC8.0V~ DC35.0V continuous power supply
Power Consumption	<2W
Aux. Relay Input Ports	16
Case Dimension	107.6mm x 89.7mm x 60.7mm
Installation Way	35mm guide-rail installation or screw installation
Working Conditions	Temperature: (-25~+70) °C Humidity: (20~93)%RH
Storage Conditions	Temperature: (-30~+80) °C
Weight	0.25kg

3 MODULE ADDRESS

This is a 4-bit in-line DIP switch with 16 coding status, namely 16 module addresses (from 100 to 115). When it is turned to ON, the status is 1. The module address formula is Module Address=1A+2B+4C+8D+100. For example, when ABCD is 0000, the module address is 100. When ABCD is 1000, the module address is 101. When ABCD is 0100, the module address is 102. Similarly, when ABCD is 1111, the module address is 115. The corresponding module addresses of DIP switch 

are as follows.

Table 3 Module Addresses

A	B	C	D	Module Addresses
0	0	0	0	100
1	0	0	0	101
0	1	0	0	102
1	1	0	0	103
0	0	1	0	104
1	0	1	0	105
0	1	1	0	106
1	1	1	0	107
0	0	0	1	108
1	0	0	1	109
0	1	0	1	110
1	1	0	1	111
0	0	1	1	112
1	0	1	1	113
0	1	1	1	114
1	1	1	1	115

4 TERMINAL DIAGRAM

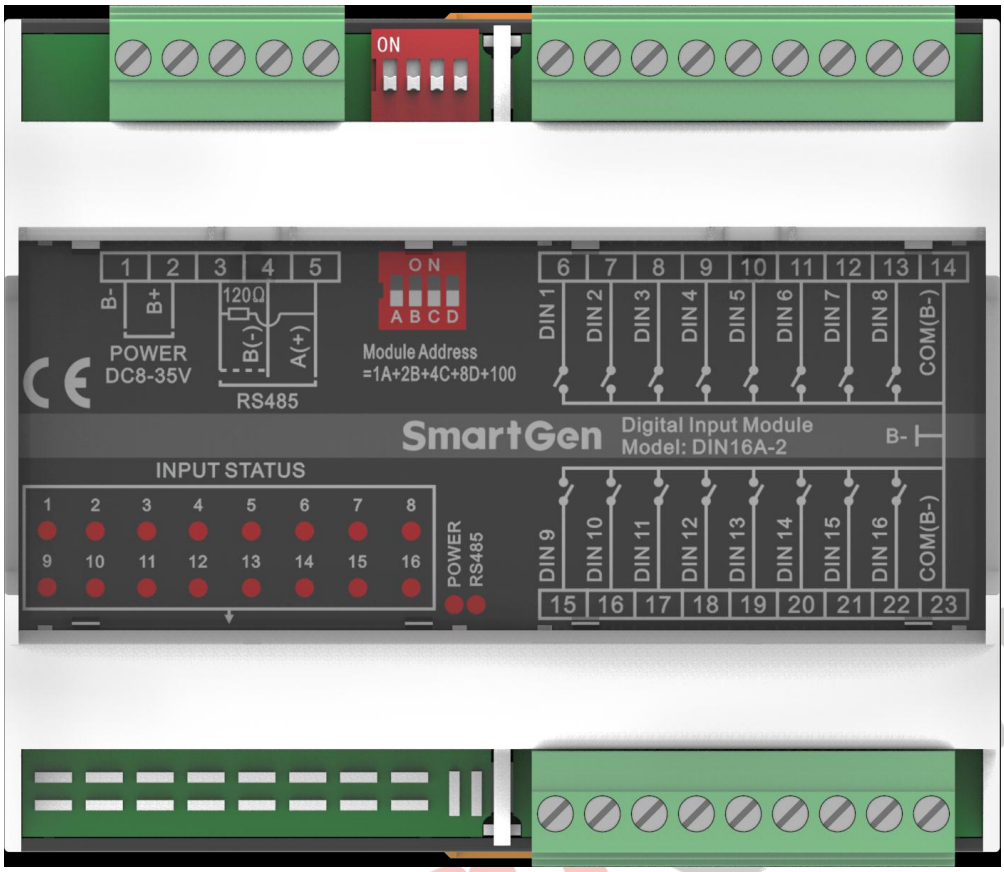


Fig.-1 DIN16A-2 Panel Diagram

Table 4 Description of Rear Panel Terminal Connection

No.	Name		Cable Size	Description
1.	B-		1.5mm²	DC power supply negative input
2.	B+		1.5mm²	DC power supply positive input
3.	120Ω	RS485 Communication Port	0.5 mm²	Twisted shielded line is used. If the terminal needs to match 120Ω resistance, terminal 3 and 4 need to be short circuited.
4.	RS485B (-)			
5.	RS485A (+)			
6.	Aux. Input Port 1		1.0 mm²	Digital input
7.	Aux. Input Port 2		1.0 mm²	Digital input
8.	Aux. Input Port 3		1.0 mm²	Digital input
9.	Aux. Input Port 4		1.0 mm²	Digital input
10.	Aux. Input Port 5		1.0 mm²	Digital input
11.	Aux. Input Port 6		1.0 mm²	Digital input
12.	Aux. Input Port 7		1.0 mm²	Digital input
13.	Aux. Input Port 8		1.0 mm²	Digital input
14.	Aux. Input Common Port		1.0 mm²	B-port connected
15.	Aux. Input Port 9		1.0 mm²	Digital input
16.	Aux. Input Port 10		1.0 mm²	Digital input
17.	Aux. Input Port 11		1.0mm²	Digital input
18.	Aux. Input Port 12		1.0mm²	Digital input
19.	Aux. Input Port 13		1.0mm²	Digital input

No.	Name	Cable Size	Description
20.	Aux. Input Port 14	1.0mm^2	Digital input
21.	Aux. Input Port 15	1.0mm^2	Digital input
22.	Aux. Input Port 16	1.0mm^2	Digital input
23.	Aux. Input Common Port	1.0mm^2	B-port connected
Module Address	Module Address		Select module address by DIP switch.
Input Status	Input Status Indicator		Light when 1~16 indicators of the corresponding input ports are active.
Power	Power Indicator		Light when power supply is normal.
RS485	RS485 Communication Indicator		Light when communication is normal, flash when abnormal.

5 COMMUNICATION CONFIGURATION AND MODBUS COMMUNICATION PROTOCOL

5.1. RS485 COMMUNICATION PORT

DIN16A-2 is an expansion input module with RS485 communication port, which follows Modbus-RTU communication protocol.

Communication Parameters

Module Address 100(range 100-115)
Baud Rate 9600bps
Data Bit 8-bit
Parity Bit None
Stop Bit 2-bit

5.2. INFORMATION FRAME FORMAT EXAMPLE

5.2.1. FUNCTION CODE 01H

Slave address is 64H (decimal 100), read 10H (decimal 100) status of starting address64H (decimal 16).

Table 5 Function Code 01H Master Request Example

Request	Bytes	Example (Hex)
Slave Address	1	64 Send to slave 100
Function Code	1	01 Read status
Starting Address	2	00 Starting address is 100 64
Count Number	2	00 Read 16 status 10
CRC Code	2	75 CRC code which calculated by master EC

Table 6 Function Code 01H Slave Response Example

Response	Bytes	Example (Hex)
Slave Address	1	64 Respond slave address 100
Function Code	1	01 Read status
Read Count	1	02 16 status (total 2 bytes)
Data 1	1	01 The content of address 07-00
Data 2	1	00 The content of address 0F-08
CRC Code	2	F4 CRC code which calculated by slave. 64

The value of status 07-00 is indicated as 01H in Hex, and 00000001 in binary. Status 07 is the high-order byte, 00 is the low-order byte. The state of status 07-00 is OFF-OFF-OFF-OFF-OFF-OFF-OFF-ON.

5.2.2. FUNCTION CODE 03H

Slave address is 64H (decimal 100), starting address is 1 data of 64H (decimal 100) (2 bytes per data).

Table 7 Function Code 03H Master Request Example

Request	Bytes	Example (Hex)
Slave Address	1	64 Send to the slave 64H
Function Code	1	03 Read point register
Starting Address	2	00 Starting address is 64H 64
Count Number	2	00 Read 1 data (total 2 bytes) 01
CRC Code	2	CC CRC code which calculated by master. 20

Table 8 Function Code 03H Slave Response Example

Response	Bytes	Example (Hex)
Slave Address	1	64 Respond to the slave 64H
Function Code	1	03 Read point register
Read Count	1	02 1 data (total 2 bytes)
Data 1	2	00 The content of address 0064H 01
CRC Code	2	35 CRC code which calculated by slave. 8C

5.3. CORRESPONDING ADDRESS TO FUNCTION CODE

Table 7 Function Code 01H

Address	Item	Description
100	Input Port 1 Status	1 for active
101	Input Port 2 Status	1 for active
102	Input Port 3 Status	1 for active
103	Input Port 4 Status	1 for active
104	Input Port 5 Status	1 for active
105	Input Port 6 Status	1 for active
106	Input Port 7 Status	1 for active
107	Input Port 8 Status	1 for active
108	Input Port 9 Status	1 for active
109	Input Port 10 Status	1 for active
110	Input Port 11 Status	1 for active
111	Input Port 12 Status	1 for active
112	Input Port 13 Status	1 for active
113	Input Port 14 Status	1 for active
114	Input Port 15 Status	1 for active
115	Input ort 16 Status	1 for active

Table 108 Function Code 03H

Address	Item	Description	Bytes
100	Input Port 1-16 Status	Unsigned	2Bytes

6 DIN16A-2 TYPICAL APPLICATION DIAGRAM

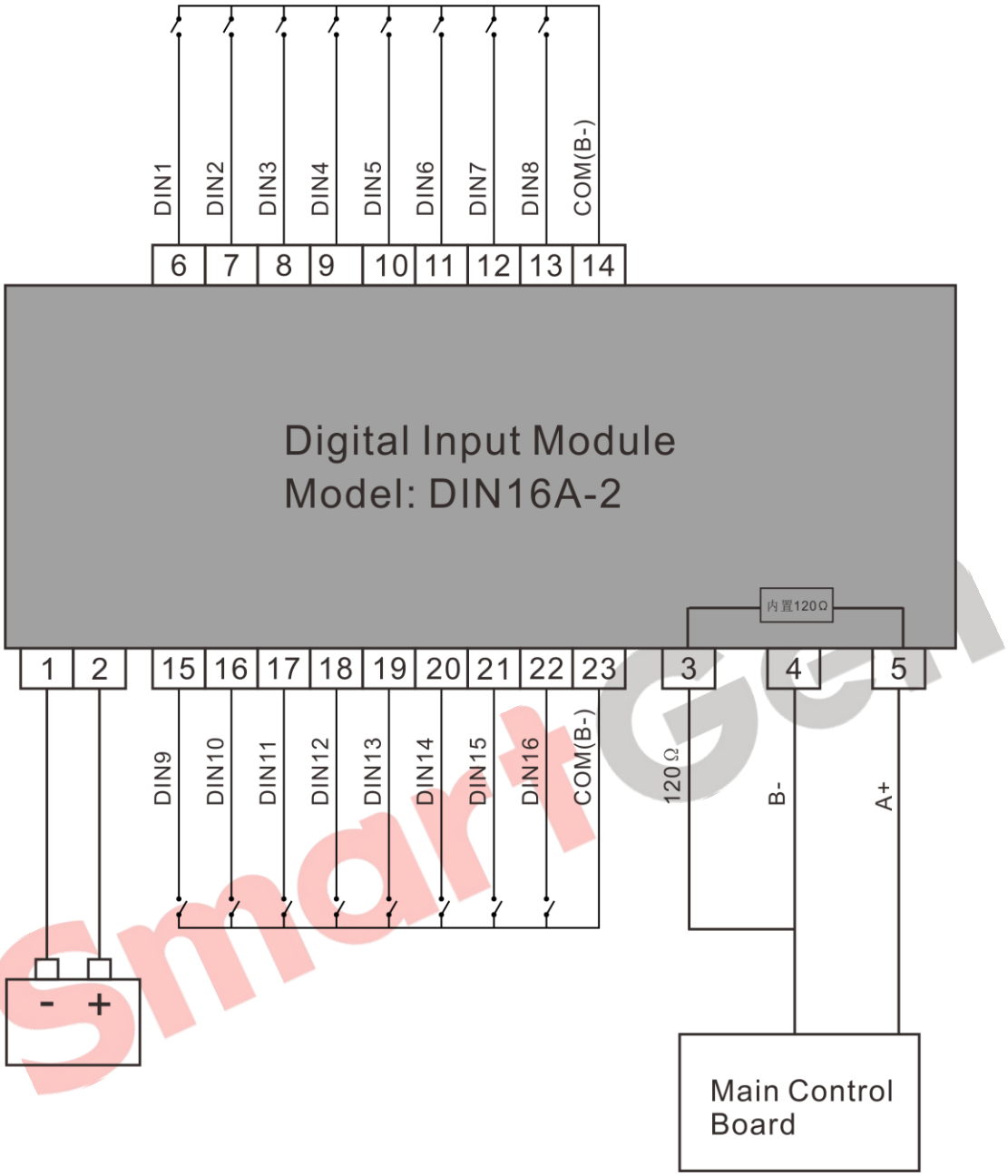


Fig.2- Typical Application Diagram

7 INSTALLATION

Overall dimensions are shown as follows:

Unit: mm

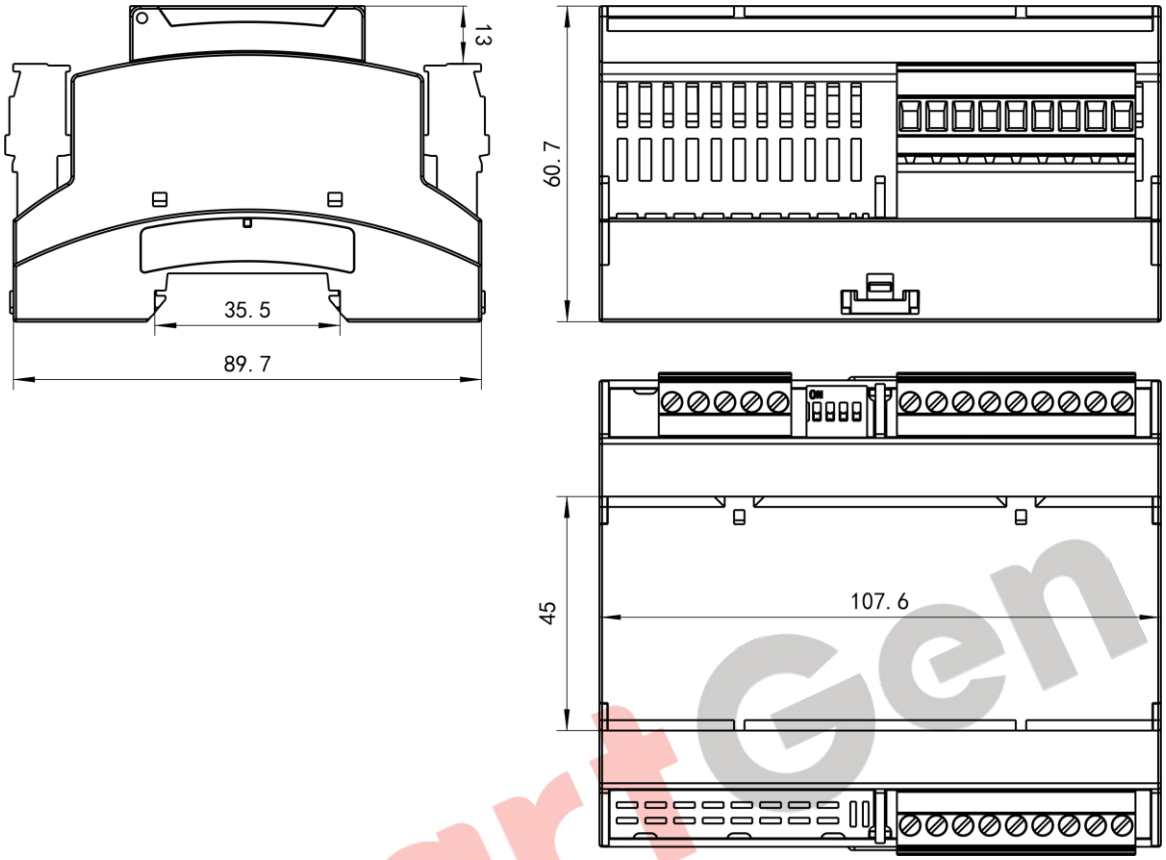


Fig.3- Case Dimensions