

# HDL<sup>®</sup>

## User Manual

Floor Heating Controller

SB-DN-FH06



buspro

[www.hdlautomation.com](http://www.hdlautomation.com)

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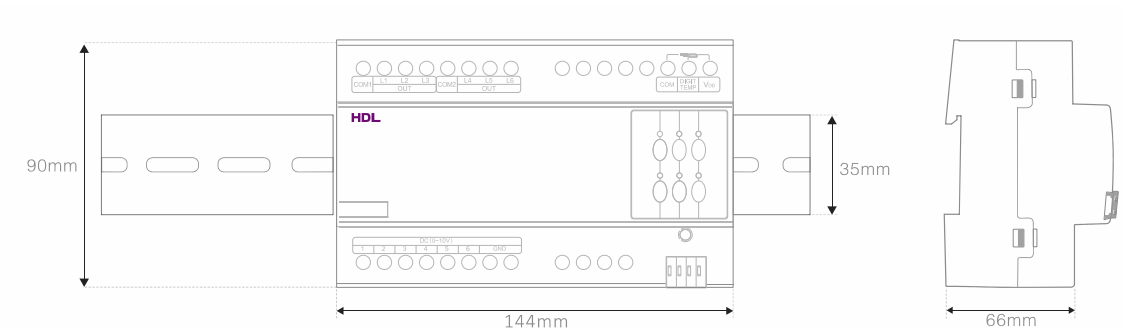
## 1. Overview

### 1.1 General Information

#### 1.1.1 Description

SB-DN-FH06 is a floor heating controller with 6 relay output channels and 6 0-10V analog output channels. It has temperature sensor input port, to which you can connect the digital temperature sensor DS18B20 (only the one supplied by HDL can be used!). It can work in two modes, i.e., “slave control” and “fully control”.

#### 1.1.2 Mounting

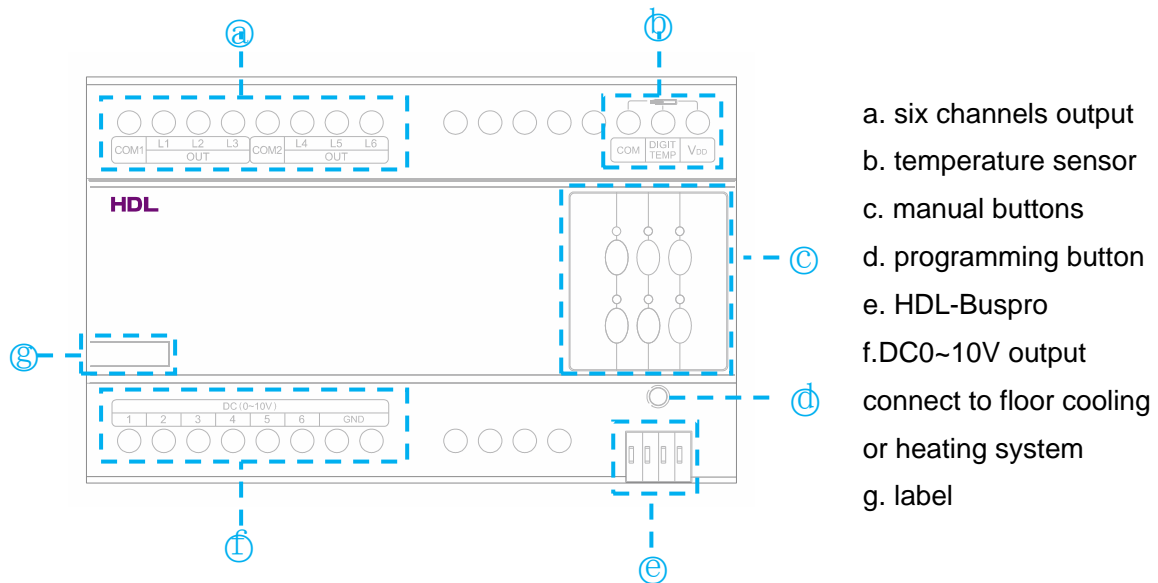


- Standard 35mm Din Rail Installation
- Inside Distribution Box (DB)

### 1.2 Function Qualities Description

- 6 channels floor heating or cooling control
- 2 output ways in each channel: relay output and 0~10v output
- Maximum 13 digital temperature sensors
- Temperature adjustment range: 5°C~40°C (0.5°C accuracy)
- Timing or manually floor heating system flush function by time or manually
- Support controlling external high power relay modules
- Auto protect from error temperature collection
- Support Buspro online upgrading

### 1.3 Device Description



### 2. Technical Data

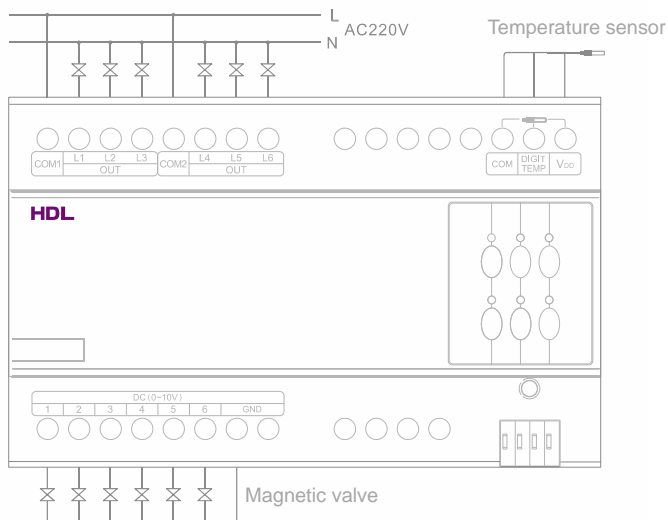
Electric Parameter :	
Power supply	DC15~30V
Dynamic BUS power consumption	150mA/DC24V
Static BUS power consumption	30mA/DC24V
Output channels	6
DC 0-10V output current	10mA
Relay output current	1A
Relay unit life time	5000000 times
Environmental Condition:	
Working temperature	0°C~45°C
Working relative humidity	Up to 90%
Storage temperature	-20°C~+60°C
Storage relative humidity	Up to 93%
Approved	
CE	
RoHS	
Production information:	
Dimensions	144x90x66 (mm)
Weight	284.7 (g)
Housing material	Nylon, PC
Installation	35mm Din Rail installation

Protection degree	IP20
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## 3. Installation

### 3.1 Connecting

Please follow the connecting showed below strictly.



### 3.2 HDL BUS Pro Description

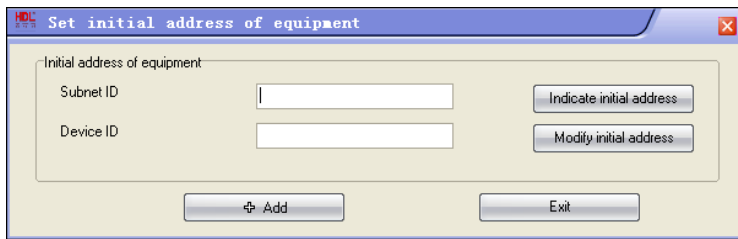
#### Connector Information

buspro	
DC24V	Red
COM	Black
DATA-	White
DATA+	Yellow

### 3.3 Commissioning

Method One:

- open the HDL-BUS Pro Setup tool.
- Keep pressing the programming button for 3 seconds, it turns to red color.
- on the software, click the "Address management", and select the "Modify address (when device button is pressed)", it will show a window like this:



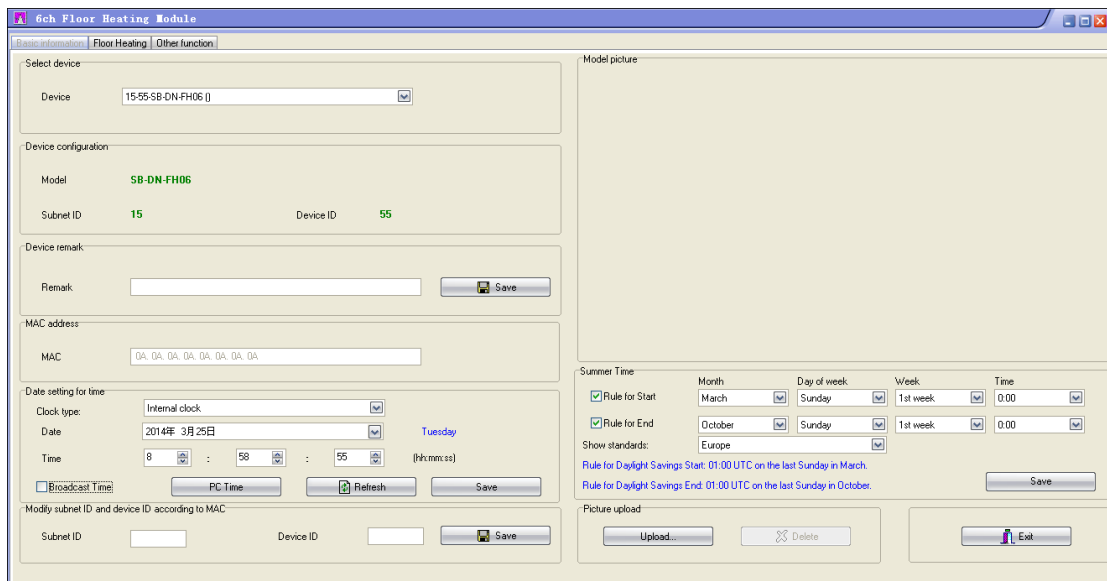
- d) click the “Indicate initial address”, then it will show the ID of this device. If you want to modify the address, fill in the new address, and click the “Modify initial address”. Click the “+Add” button, the device will be add in “ON-line devices” list.

Method Two:

- a) open the HDL-BUS Pro Setup tool.
- b) click the search button, it will show a new window, click search button, search the online devices. Click the “Add all” button, the devices which be searched will be add in “ON-line devices” list.

## 4. Software Configuration

### 4.1 Basic setting



#### 4.1.1 Change the ID of the device

Every Buspro device has one Subnet ID and one Device ID, the Device ID should be unique in its Subnet and the Subnet ID should be kept consistent with the Gateway (typically the SB-DN-1IP or HDL-MBUS01IP.431).

## 4.1.2 Remark

Generally set it like for “living room” to indicate some info.

## 4.1.3 Date setting for time

The screenshot shows a configuration window titled "Date setting for time". It contains the following elements:

- Clock type:** A dropdown menu set to "Internal clock".
- Date:** A date picker showing "2014年 3月 25日" and the day of the week "Tuesday".
- Time:** Three spinners for hours (8), minutes (58), and seconds (55), with the label "(hh:mm:ss)".
- Broadcast Time:** A checkbox that is currently unchecked.
- Buttons:** "PC Time", "Refresh" (with a circular arrow icon), and "Save".

Set the time for Floor Hearing:

### Clock type:

**Internal clock:** use floor heating time. (SB-DN-FH06 has built-in battery and real time clock).

**External clock:** use other device’s time, such as logic module, DMX recorder.

**Time:** select the time, or use PC Time.

**Broadcast Time:** broadcast to HDL-BUS system.

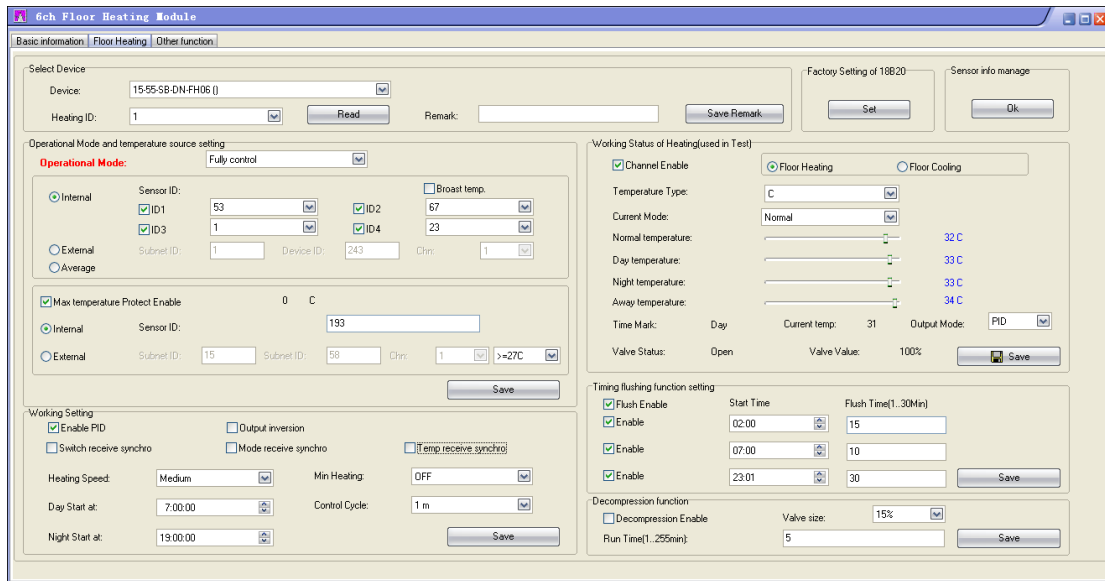
## 4.1.4 Summer Time

The screenshot shows a configuration window titled "Summer Time". It contains the following elements:

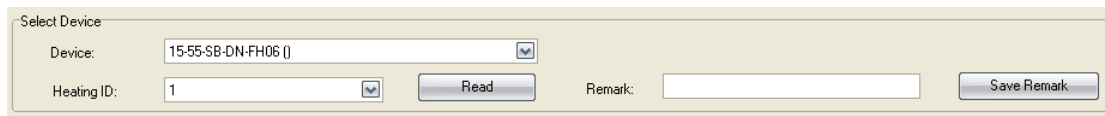
- Rule for Start:** A checked checkbox. Below it are dropdowns for "Month" (March), "Day of week" (Sunday), "Week" (1st week), and "Time" (0:00).
- Rule for End:** A checked checkbox. Below it are dropdowns for "Month" (October), "Day of week" (Sunday), "Week" (1st week), and "Time" (0:00).
- Show standards:** A dropdown menu set to "Europe".
- Text:** "Rule for Daylight Savings Start: 01:00 UTC on the last Sunday in March." and "Rule for Daylight Savings End: 01:00 UTC on the last Sunday in October."
- Buttons:** "Save".

It is use for Summer Time.

## 4.2 Floor Heating

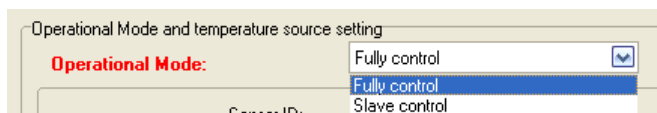


### 4.2.1 Heating ID



Heating ID: channel ID

### 4.2.2 Operational Mode



**Slave control:** in “slave control” (and DLP shall be in “fully control” mode), the SB-DN-FH06 works in a simplest way, it just reacts the commands (relay on... relay off...) that sent to it, the DLP panel is in charge of the controlling, and the SB-DN-FH06 is just a simple actuator (so it does not has to be SB-DN-FH06, it can be a general relay module).

**Fully control:** in “fully control” (and DLP shall be in “slave control” mode, Version4 DLP only, here we use HDL\_V04.03U\_2012/12/20), the SB-DN-FH06 works in a smarter way, it is in charge of the controlling. The DLP will be just a user interface that accepts the user command and transfers the command to SB-DN-FH06. You can have other functions that built in the floor heating module when it is configured in this mode.



### 4.2.3 Temperature source setting

**Internal:** use floor heating module’s digital temperature sensor, one channel has max four IDs for senso.

**External:** use other device’s sensor.

**Average:** the average temperature between Internal and External.

### 4.2.4 Max temperature Protect Enable

Use to shut down floor heating if floor is overheated, so as to protect the floor.

**Internal:** use floor heating module’s digital temperature sensor.

**External:** use other device’s temperature sensor.

### 4.2.5 Working Setting

**PID:** PID algorithm, suitable for controlling floor heating, recommend to tick.

**Output inversion:** need to tick this option if a *negative logic valve* is used.

**Switch receive synchro, Mode receive synchro, Temp receive synchro:** If checked, it will receive and execute the user input that broadcast from any DLP, so that one DLP can control all online SB-DN-FH06.

**Min Heating:** standby heating level when target temperature is reached.

**Control Cycle:** recommend to use 5 minutes (turning on and off frequently is not good for

relay)

#### 4.2.6 Working Status of Heating (used in Test)

Set the type and temperature, use to test the floor heating module.

#### 4.2.7 Timing flushing function setting

When time is reached, flush function will be triggered and start to clean the pipe. (SB-DN-FH06 has built-in battery and real time clock)

#### 4.2.8 Decompression function

When all 6 channels are turned off, will trigger this decompression function and channel will be turned on for a period of time one by one, so as to reduce the pressure of pipe or tank.

#### 4.2.9 Factory Setting of 18B20

When about to connect the sensor DS18B20 to SB-DN-FH06, check its ID (1-200) that is

printed on the head first:



In case you've got more than one DS18B20 having the same ID, you can use the method below to change it in HDL-BUS software.

Connect the one you want to change to the floor heating module (if more than one DS18B20 are connected to floor heating module, this method will not work.)

Password: 85521566



a) The max number of DS18B20

Because of the restrictions on driving ability, the max number of DS18B20 that can be connected to a FH06 module is 13.

The FH06 module can be used as a temp source, other devices can read its temp value, each channel has different functions, as shown in the following table:

Channel No.	Function
1	Indoor temp of channel 1*
2	Indoor temp of channel 2*
3	Indoor temp of channel 3*
4	Indoor temp of channel 4
5	Indoor temp of channel 5
6	Indoor temp of channel 6
7	Max temp protect of channel 1
8	Max temp protect of channel 2
9	Max temp protect of channel 3
10	Max temp protect of channel 4
11	Max temp protect of channel 5

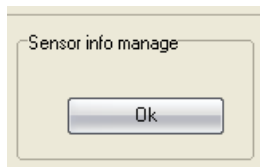
12	Max temp protect of channel 6
13	Outdoor temp

\*: if more than one DS18B20 are connected to channel 1, the indoor temp of channel 1 will be the average of these DS18B20 .

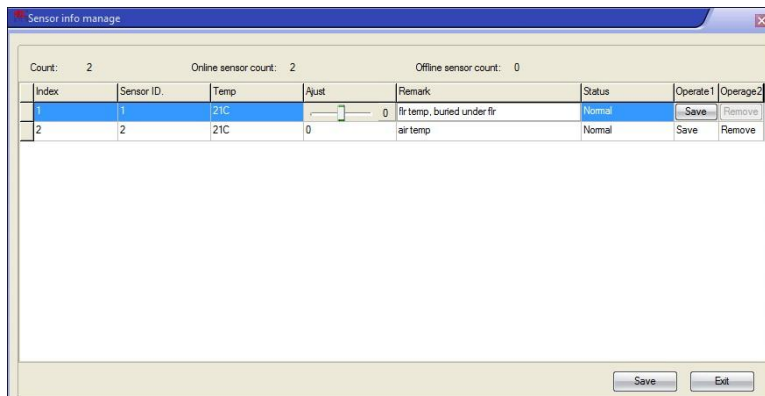
b) Wiring of DS18B20

Red: V<sub>DD</sub>, yellow: DIGIT TEMP, white: COM

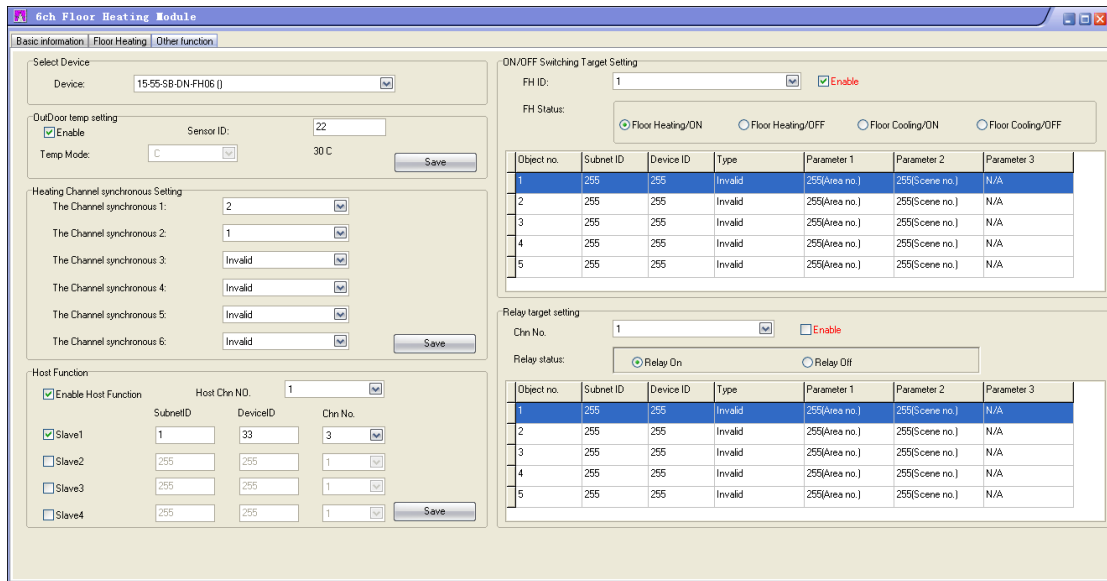
4.2.10 Sensor info manage



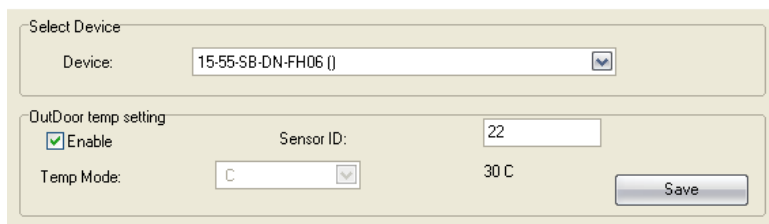
Sensor list: used to see/change the temp.



### 4.3 Other function

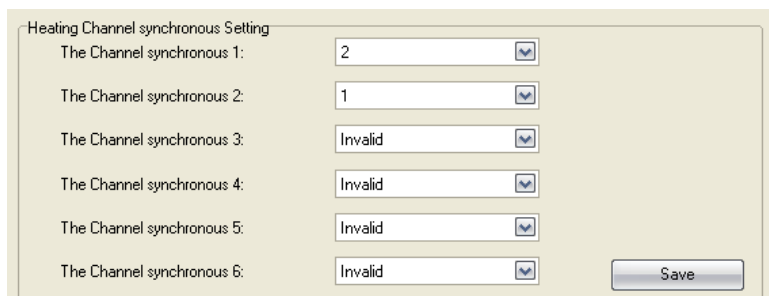


#### 4.3.1 OutDoor temp setting



Enable outdoor temperature sensor.

#### 4.3.2 Heating Channel Synchronous Setting



Use in central control, synchronous setting temperature and mode. See above, channel2 is synchronize with channel1's setting.

### 4.3.3 Host Function

If use host function, the slave floor heating channel will synchronize with the host floor heating channel.

### 4.3.4 On/OFF Switching Target Setting

Object no.	Subnet ID	Device ID	Type	Parameter 1	Parameter 2	Parameter 3
1	255	255	Invalid	255(Area no.)	255(Scene no.)	N/A
2	255	255	Invalid	255(Area no.)	255(Scene no.)	N/A
3	255	255	Invalid	255(Area no.)	255(Scene no.)	N/A
4	255	255	Invalid	255(Area no.)	255(Scene no.)	N/A
5	255	255	Invalid	255(Area no.)	255(Scene no.)	N/A

When the **FH Status** is changed, will trigger this targets.

### 4.3.5 Relay Target Setting

Object no.	Subnet ID	Device ID	Type	Parameter 1	Parameter 2	Parameter 3
1	255	255	Invalid	255(Area no.)	255(Scene no.)	N/A
2	255	255	Invalid	255(Area no.)	255(Scene no.)	N/A
3	255	255	Invalid	255(Area no.)	255(Scene no.)	N/A
4	255	255	Invalid	255(Area no.)	255(Scene no.)	N/A
5	255	255	Invalid	255(Area no.)	255(Scene no.)	N/A

When the channel status (Relay status) is changed, will trigger this targets.

## 5. FAQ

### 5.1 FAQ001\_FloorHeating

Q:

Can I buy the sensor probes that are wired to the Floor Heating module from 3rd party?

A:

No, you can only buy it from HDL and note that HDL provides two kinds sensor probes - analog type(for SB-MTS04.20) and digital type (for SB-DN-FH06).

## 5.2 FAQ002\_FloorHeating

Q:

Where am I supposed to place the sensor probes?

A:



The one used to provide floor overheat protection is supposed to be buried under the floor, the one used to detect outdoor temperature is placed outdoor, the one used to detect the room temperature is supposed to be installed above the floor, low profile place like the corner of the wall. If you can not find a proper place above the floor, you can set the SB-DN-FH06 to refer to the temperature from other devices, like LCD panel HDL-MPL8.48.

## 5.3 FAQ003\_FloorHeating

Q:

What is Timer mode?

A:

Timer mode switches between Day mode  and Night mode  automatically, on DLP panel you can find a moon icon it is running Timer-Night mode, and a sun icon if it is running Timer-Day mode. The Day/Night changeover time can be set in both SB-DN-FH06(by installer) and HDL-MPL8.48(by end-user, long press the first button -> "TIME SET" option).

## 5.4 FAQ004\_FloorHeating

Q:

What is Auto mode?

A:

Auto mode switches between floor heating and floor cooling, given that the room is equipped with both floor heating system and floor cooling system.

You can set a setpoint, e.g., 23 Celsius degrees, and the changeover value is set as 3 degrees, then Auto mode can gurantee that the room temperaure will be in this range - 20

to 26 degrees, by triggering floor heating when room temperature is lower than 20 degrees, and trigger floor cooling when room temperature is higher than 26 degrees. This can be useful in Autumn season, in which outdoor temperature varies dramatically within a day. Auto mode regulates two relay channels, one for floor heating, one for floor cooling. Auto mode is available only when DLP is set as "Fully Control".

Text "A" is displayed on the top right corner of HDL-MPL8.48 when it is running Auto mode.

## 5.5 FAQ005\_FloorHeating

Q:

Both water-based and electricity-based floor heating exist in the market, any difference?

A:

You probably need to connect an external AC contactor since electricity-based floor heating generally draws higher current than the rated one for the relay channel. Floor heating module max current is 1A per channel.



