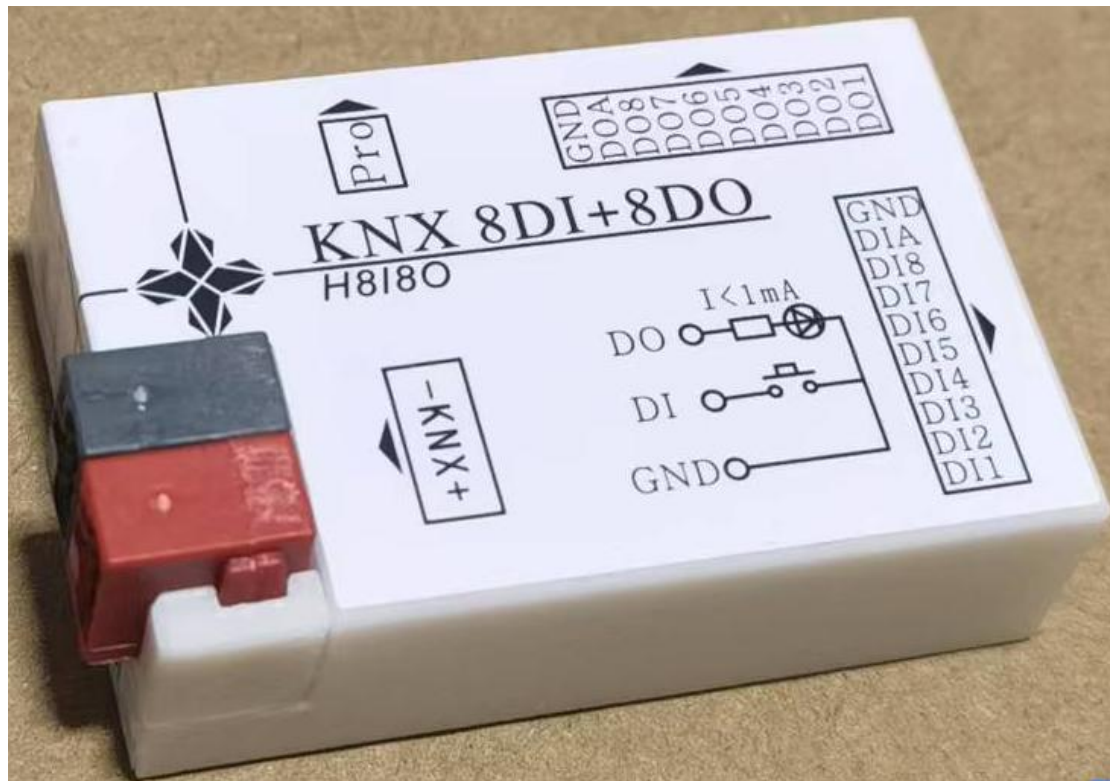


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KNX input/output module manual

H8I80 V0.3.2



characteristic

- ◆ Input detection: long press, short press
- ◆ Input functions: switch, dimming, curtains, fixed value, multi value cycling
- ◆ Output function: high level, low level, positive pulse, negative pulse

Application: Switch panel, relay module

Circuit board size: 48.5mm * 32.0mm * 14.2mm

Weight: approximately 20 grams

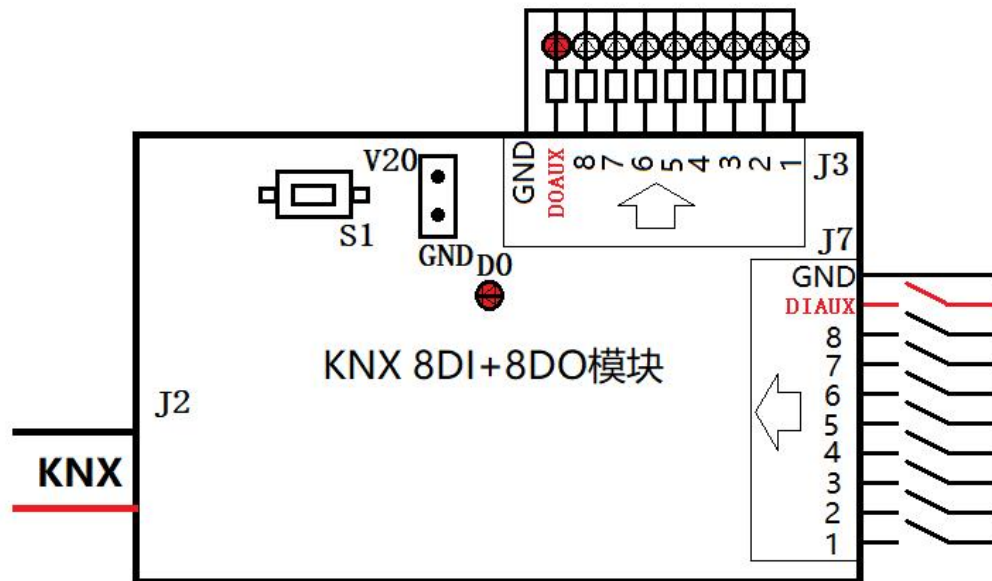
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1 Hardware Description

The hardware schematic is as follows.

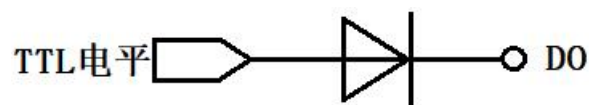


1.1 KNX interface

The pin at J2 is connected to the KNX bus and can be connected to standard KNX terminals.

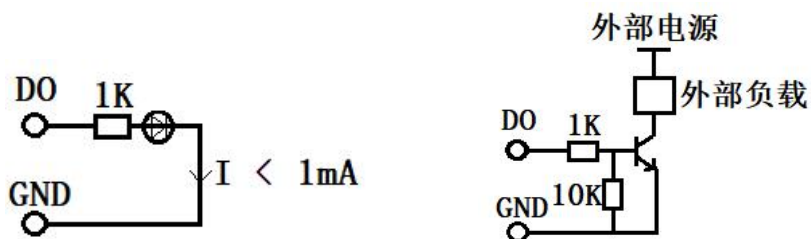
1.2 DO interface

J3 is an output interface with a total of 9 outputs, each with a 3.3V TTL level that passes through a diode before reaching the output end, as shown in the following figure. Each output current is less than 1mA, and a 1K ohm resistor can be connected in series to drive an LED or serve as a control signal. J3 specification: foot spacing of 1.25mm, 10P.



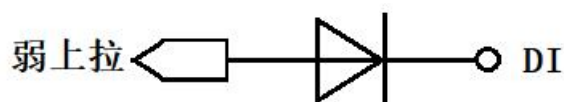
Schematic diagram of DO direct driving LED and current control signal:

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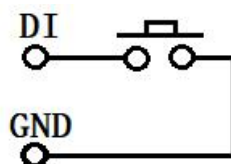


1.3 DI interface

J7 is a DI interface with a total of 9 channels, which is effective when DI is short circuited to GND. J7 specification: foot spacing of 1.25mm, 10P.



Wiring method:



1.4 Programming lights and buttons

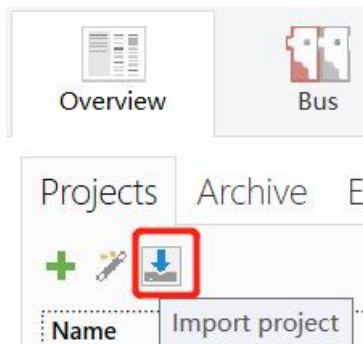
The programming light on the circuit board is D0, and the programming button is S1. At the same time, DOAUX can be configured through the database to control external programming lights and DIAUX to trigger programming mode.

2 ETS database

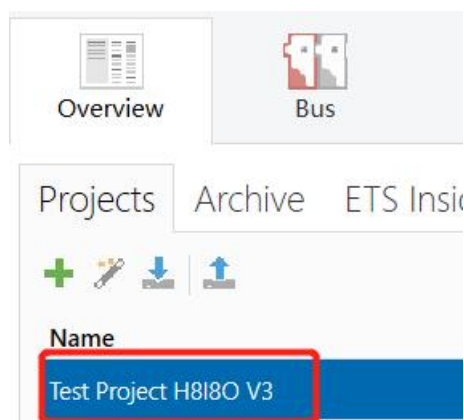
The ETS database file is: Test Project H8I80 V3.knxproj, which is imported into ETS as a project. The device can be found in "Devices" and can be copied to other projects. The database supports both Chinese and English, and can be selected from the "Configuration/Language/Preferred Product Language" section of ETS.

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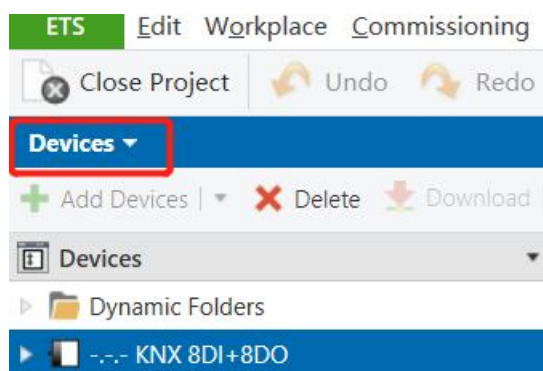
Import project:



Double click to enter the project:

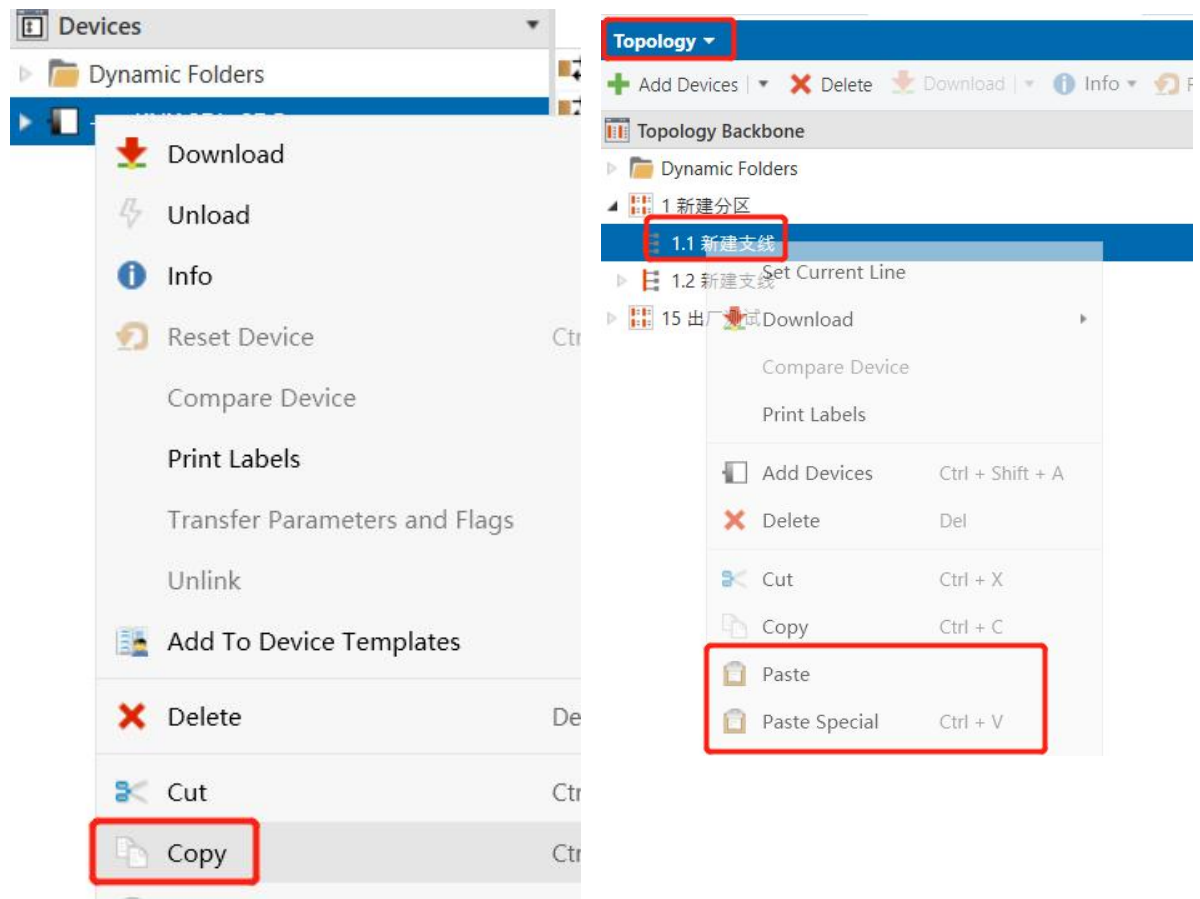


Select device:



You can select the device, right-click, and copy to another project (select the branch line and paste):

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2.1 Database parameters

2.1.1 General Settings

--- KNX 8DI+8DO > Channel 1 > General settings

Channel 1	Dimming message sending cycle (*100ms)	3
General settings	Whether to send a switch message when the dimming state is adjusted to 0% or 100%	100% and 0%
-->DI1	Whether to send a stop message after the long press in the dimming state	<input type="radio"/> No <input checked="" type="radio"/> Yes
-->DI2	Enable to trigger programming mode via DI	<input checked="" type="radio"/> No <input type="radio"/> Yes
-->DI3	Enable a second pulse via DO to indicate entry into programming mode	<input checked="" type="radio"/> No <input type="radio"/> Yes
-->DI4	DIAUX configured to	<input checked="" type="radio"/> Program Key <input type="radio"/> Trigger DOAUX
-->DI5		
-->DI6		
-->DI7		

Dimming message sending cycle (* 100ms) – When DI is configured with dimming function, long press and hold will periodically send relative dimming messages to the bus. This parameter is used to determine the sending cycle, with a unit of 100ms. For example, when this parameter is 3, the cycle=3 * 100ms=300ms.

Whether to send a switch message when the dimming state is adjusted to 0% or 100%? When the DI is configured with dimming function, pressing and holding it will periodically send a relative dimming message to the bus. Each time it is sent, the dimming value inside the module will increase or decrease accordingly based on the dimming amplitude; When reduced to 0% or increased to 100%, this parameter will determine whether to send data through the switch object.

Whether to send a stop message after the long press in the dimming state – When DI is configured as dimming function, long pressing will periodically send a relative dimming message to the bus. Whether to send a stop message to the bus through the relative dimming object after long

pressing will be determined by this parameter.

Enable to trigger programming mode via DI? Sometimes it is not convenient to press the **programming button** on the circuit board (such as when it is installed on the wall), we can enter programming mode through DI combination. After enabling this parameter, in non programming mode, press and hold any two or more sets of DI for more than 2 seconds to enter programming mode; In programming mode, pressing any DI will exit programming mode.

Enable a second pulse via D0 to indicate entry into programming mode? Sometimes the circuit board is hidden (such as when installed on a wall) and the programming light is no longer visible. We can enable this parameter and use D0 to indicate programming mode (if D0 can control LED). After enabling this parameter, the LED connected to D0 in programming mode will flash once per second.

DIAUX configured to – DIAUX is a multifunctional input, with the default configuration being the programming button, which is equivalent to the programming button (S1) on the circuit board. We can also configure it to trigger DOAUX, which can be applied, such as turning on the backlight when a person approaches (additional sensing circuit needs to be added), and automatically turning off after a specified time delay.

Number of seconds for DOAUX delay reset (0: Flip DOAUX every time DIAUX is triggered) – This parameter can be configured when DIAUX is configured to trigger DOAUX, and when 0, flip DOAUX every time DIAUX is triggered; When the parameter is not 0, it is the number of seconds for DOAUX delay reset.

2.1.2 DI parameters. switches

The parameters that can be set for each DI are the same, as illustrated

by DI1.

--- KNX 8DI+8DO > Channel 1 > -->DI1

Channel 1	DI1 function selection	Switch
General settings	Confirm as long press time (*100ms)	3
-->DI1	Short-time execution	Toggle
-->DI2	Long press to execute	No action
-->DI3	Execute when long press release	No action
-->DI4	Function description: Short press/long press/long press to release can trigger different objects to set switch values respectively	

When the DI function is selected as "Switch", the three triggering methods of DI, namely short press, long press, and long press release, can individually send 1-bit switch data to the bus through the corresponding communication object.

Confirm as long press time (*100ms) – This parameter tells the module how long to press to calculate long press. Each button can be set separately, with a unit of 100ms. Definition: 1. Short press refers to an operation where the time from pressing to releasing is less than the long press time; 2、 Long press refers to an operation that starts from being pressed and continues to be pressed for more than a long press time; 3、 Long press release refers to the operation of releasing after confirmation as long press.

Short-time execution– This parameter specifies the operation to be executed after short press, which can be: no action/on/off/alternating switch, and the corresponding value will be sent to the bus through the communication object DIx (x=1.. 8) short press.

Long press to execute– This parameter specifies the operation to be executed after long press, which can be: no action/on/off/alternating switch, and the corresponding value will be sent to the bus through the communication object DIx (x=1.. 8) long press.

Execute when long press release – This parameter specifies the operation to be executed after long press release, which can be: no

action/on/off/alternating switch, and the corresponding value will be sent to the bus through the communication object DIx (x=1.. 8) long press release.

2.1.3 DI parameters. Dimming

--- KNX 8DI+8DO > Channel 1 > --> DI1		
Channel 1	DI1 function selection	Dimming
General settings	Confirm as long press time (*100ms)	3
--> DI1	Short-time execution	Toggle
--> DI2	Absolute dimming value	100
--> DI3	Dimming mode	Brighter
--> DI4	Dimming range	1/16

When the DI function is selected as "dimming", a short press of DI will trigger the switch value and absolute dimming, a long press will trigger relative dimming, and a long press release will trigger relative dimming stop.

Confirm as long press time (*100ms)– see 2.1.2.

Short-time execution– see 2.1.2.

Absolute dimming value– After short pressing, if the communication object value of the short press is 1, the communication object of absolute dimming will send some parameter specified values, otherwise 0 will be sent.

Dimming mode – can be configured as: no action/dimming/dimming/alternating dimming/dimming, triggered for a long time.

Dimming range– can be configured as: 1/1, 1/2, 1/4, 1/8, 1/16, 1/32, 1/64, used to set the relative dimming amplitude. Here, for example, 1/64

means that after sending 64 times, the change is 100%.

2.1.4 DI parameters. Curtain

--- KNX 8DI+8DO > Channel 1 > -->DI1

Channel 1	DI1 function selection	Curtain
General settings	Confirm as long press time (*100ms)	3
-->DI1	Moving direction	Move up
-->DI2	Control method	Short press to move
-->DI3	Timeout (seconds)	10

When the DI function is selected as "Curtain", both short and long press of DI can be configured to move or stop the curtain.

Confirm as long press time (*100ms)– see 2.1.2.

Moving direction– The direction of movement after triggering the curtain movement, where "up" and "down" only represent different directions and can be correspondingly understood as "left, right" or "open, close" and so on.

Control method– Three control methods are shown in the parameters: "Short press to move, long press to stop", "Short press to stop, long press to move", and "Short press to alternately move/stop".

Timeout (seconds) – When the control mode is "short press alternating movement/stop", a timeout time needs to be specified. The meaning is: assuming the parameter is 10, each short press was originally an alternating move or stop. If the last move was executed, the next move would be executed within 10 seconds, and the next move would be executed after 10 seconds. The purpose of this parameter is to avoid idle pressing after a long period of inactivity, which can be determined based on the time when the curtain moves at full stroke.

2.1.5 DI parameters. Fixed value (1 byte)

--- KNX 8DI+8DO > Channel 1 > --> DI1

Channel 1	DI1 function selection	Fixed value
General settings	Confirm as long press time (*100ms)	3
--> DI1	Short press to send	1
--> DI2	Send on long press	9
--> DI3	Sent when long press release	17

When the DI function is selected as "Fixed value (1 byte)", the three triggering methods of DI, namely short press, long press, and long press release, can individually send 1 byte of specified data to the bus through the corresponding communication object.

Confirm as long press time (*100ms)– see 2.1.2.

Short press to send– This parameter specifies the data sent to the bus through the DIx short press (x=1.. 8) object, which is the same every time.

Send on long press– This parameter specifies the data to be sent to the bus through the DIx long press (x=1.. 8) object on a long time basis, always the same.

Sent when long press release– This parameter specifies the data sent to the bus through the DIx long press release (x=1.. 8) object during long press release, which remains the same every time.

2.1.6 DI parameters. Multi value loop (1 Byte)

--- KNX 8DI+8DO > Channel 1 > --> DI1

Channel 1	DI1 function selection	Multi-value loop
General settings	Confirm as long press time (*100ms)	3
--> DI1	Value 1 (254 means not sending)	254
--> DI2	Value 2 (254 means not to send)	254
--> DI3	Value 3 (254 means not sending)	254
--> DI4	Value 4 (254 means not to send)	254
--> DI5	Value 5 (254 means not to send)	254
--> DI6	Value 6 (254 means not sending)	254
--> DI7	Value 7 (254 means not sending)	254
--> DI8	Value 8 (254 means not sending)	254
DO1-->	Value 9 (254 means not sending)	254
DO2-->	Value 10 (254 means not sending)	254

When the DI function is selected as "Multi-value loop", a short press of the DI will trigger the sending of the multi value loop.

Confirm as long press time (*100ms) – see 2.1.2.

Values 1-10 (254 means not sending) – Switch sequentially to a specified value every short press, and send data to the bus through a multi value loop object. If the value is 254, it will not be sent and will be switched to the next one for transmission. When switching to the last one, the loop will start from the first one. If necessary, the values can be the same.

2.1.7 DO parameters

The parameters that can be set for each DO are the same, and DO1 is used as an example for explanation.

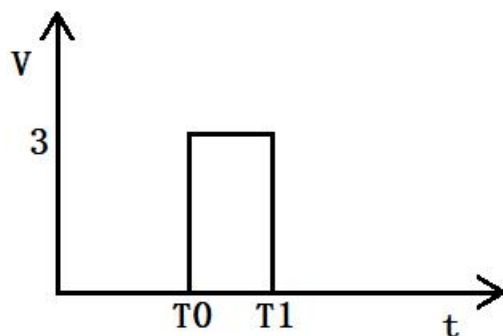
Channel 1	The level output mode of the DO1 object after receiving the data	1->High level, 0->Low level
General settings	Level after reset	<input checked="" type="radio"/> Low level <input type="radio"/> High level

The level output mode of the DOx object after receiving the data (x=1..8) – because the chip pin is output externally through a diode, there will be a voltage drop of approximately 0.2V on the diode. In addition, when the chip outputs low voltage, if used as a control signal, an external pull-down resistor needs to be connected.

1->High level, 0->Low level ": When the DO object receives 1, it outputs a high level through the corresponding DO pin; If 0 is received, it outputs a low level.

1->Low level, 0->High level ": When the DO object receives 1, it outputs a low level through the corresponding DO pin; If 0 is received, it outputs a high level.

1->Positive pulse, 0->Low level ": When the DO object receives 1, it outputs a positive pulse through the corresponding DO pin; If 0 is received, it outputs a low level. As shown in the following figure, at T0 time, the DO object receives 1 and the pin outputs a high level; At T1, the pin automatically becomes low level, and the pulse width is T1-T0.



Other output methods are also easy to understand, so we won't analyze them one by one here.

Level after reset – This parameter can be used to specify the level of the DO after the module is reset.

2.2 Communication objects of the database

Each DI occupies 3 objects, and each DO occupies 1 object, totaling 32 objects.

Object of switch function:

Number	Name	Object Function	De Gr	Length	C	R	W	T	U	Data Type	Priority
0	DI1 Short press	Switch		1 bit	C	R	W	T	-	switch	Low
3	DI2 Short press	Switch		1 bit	C	R	W	T	-	switch	Low
6	DI3 Short press	Switch		1 bit	C	R	W	T	-	switch	Low

Objects of dimming function:

Number	Name	Object Function	De Gr	Length	C	R	W	T	U	Data Type	Priority
0	DI1	Switch		1 bit	C	R	W	T	-	switch	Low
1	DI1	Relative dimming		4 bit	C	R	W	T	-	dimming control	Low
2	DI1	Absolute dimming		1 byte	C	R	W	T	-	percentage (0..255)	Low

The object of curtain function:

Info Reset Unload Print											
Number	Name	Object Function	De Gr	Length	C	R	W	T	U	Data Type	Priority
0	DI1	Curtain move		1 bit	C	R	W	T	-	up/down	Low
1	DI1	Curtain stop		1 bit	C	R	W	T	-	open/close	Low

Fixed value (1 byte) object:

Number	Name	Object Function	De Gr	Length	C	R	W	T	U	Data Type	Priority
0	DI1 Short press	Fixed value		1 byte	C	R	W	T	-		Low
1	DI1 Long press	Fixed value		1 byte	C	R	W	T	-		Low
2	DI1 Long press t...	Fixed value		1 byte	C	R	W	T	-		Low

Object of multi valued loop (1 Byte):

Number	Name	Object Function	De Gr	Length	C	R	W	T	U	Data Type	Priority
0	DI1	Multi-value loop		1 byte	C	R	W	T	-		Low

Object of DO:

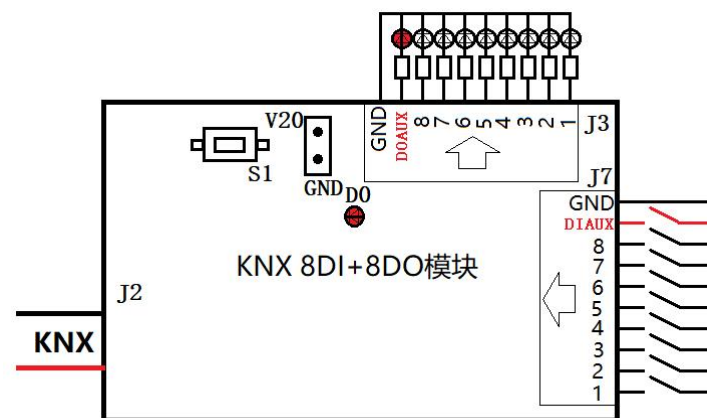
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Number	Name	Object Function	De Gr	Length	C	R	W	T	U	Data Type	Priority
24	DO1	Output		1 bit	C	R	W	T	-	switch	Low
25	DO2	Output		1 bit	C	R	W	T	-	switch	Low
26	DO3	Output		1 bit	C	R	W	T	-	switch	Low
27	DO4	Output		1 bit	C	R	W	T	-	switch	Low
28	DO5	Output		1 bit	C	R	W	T	-	switch	Low
29	DO6	Output		1 bit	C	R	W	T	-	switch	Low
30	DO7	Output		1 bit	C	R	W	T	-	switch	Low
31	DO8	Output		1 bit	C	R	W	T	-	switch	Low

3 Application examples

3.1 Dry contact switch

Connect the switch signal line to DI interface J7 as shown in the figure below. If there is a status feedback light, it can be output and controlled through DO interface J3.

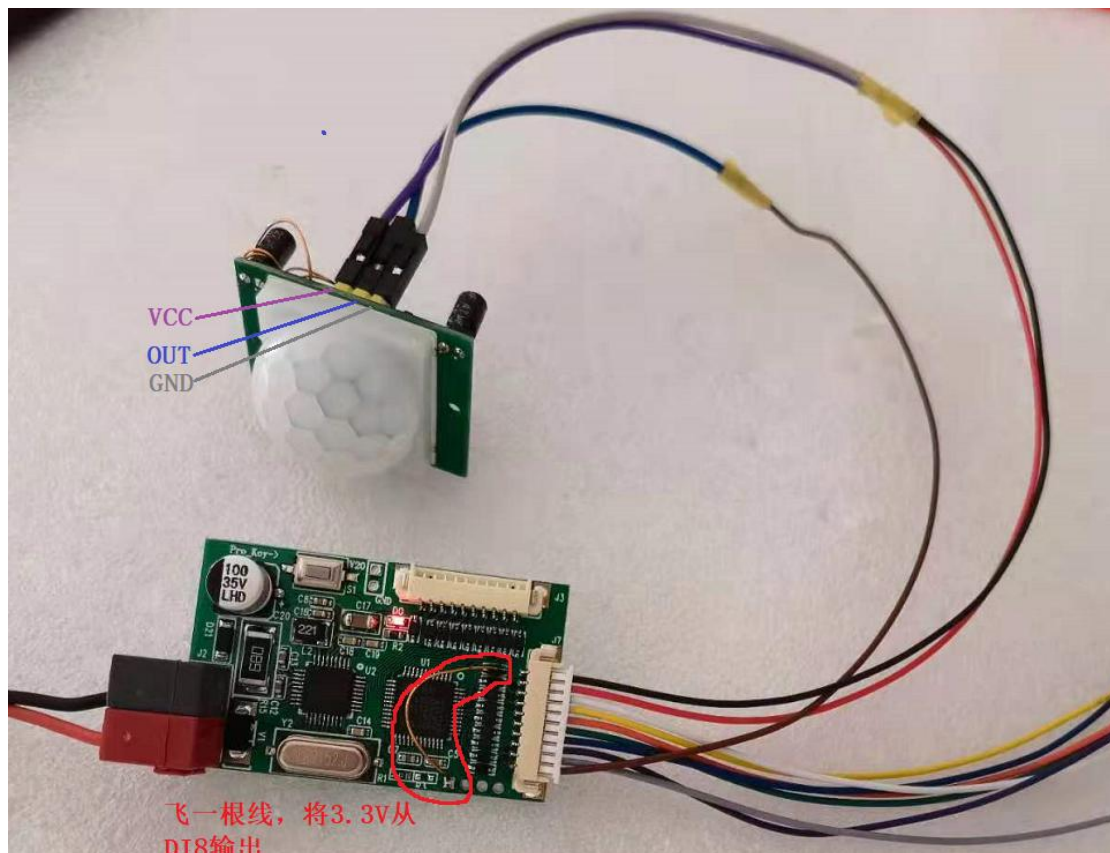


3.2 Mobile detection module

Here, a common human infrared sensing module on the market is used for modification: remove the voltage regulator chip from the sensing module and directly connect to 3.3V. Simultaneously add a transistor to flip the OUT signal. H8I80 module: Fly a wire to output 3.3V from DI8 to the induction module for power supply. The OUT signal of the induction

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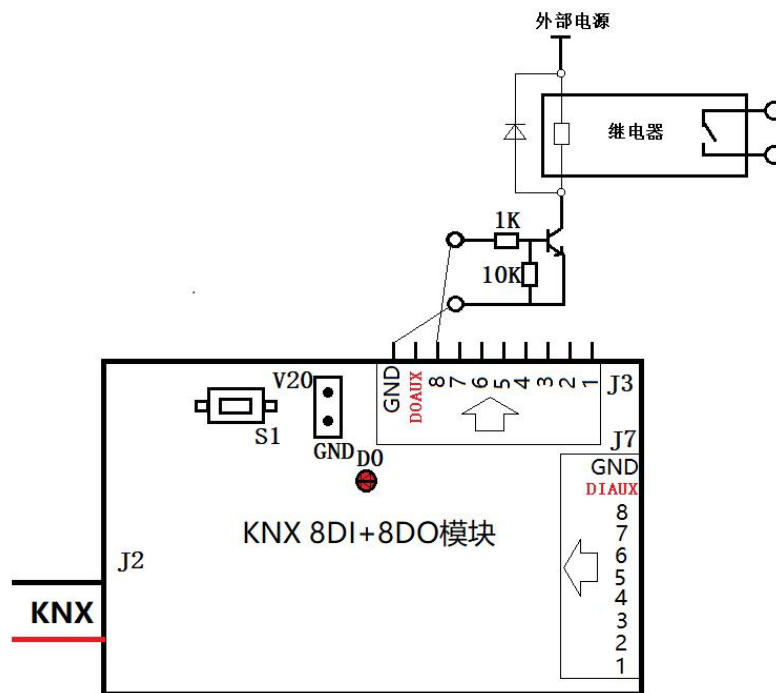
module is input to DI1 of H8I80, which can be used by configuring DI1 to achieve automatic shutdown with a specified delay time.



(Subsequent versions may add high-level triggering methods, so there is no need to add transistor flip signals.)

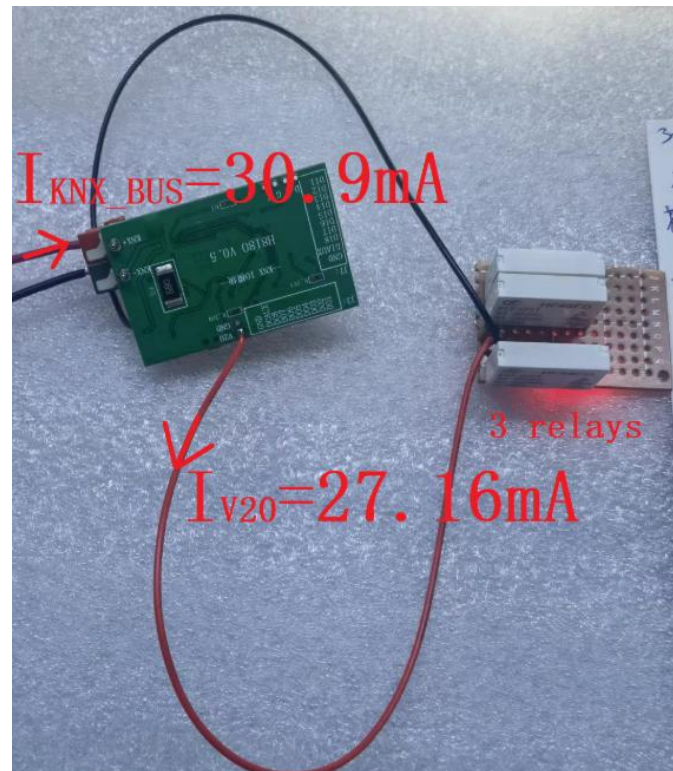
3.3 General Relays

Because the operation of a general relay requires maintaining current, it is best to use an auxiliary power supply. The DO signal can be controlled by a transistor or other driver chip to control the relay, as shown in the following figure.



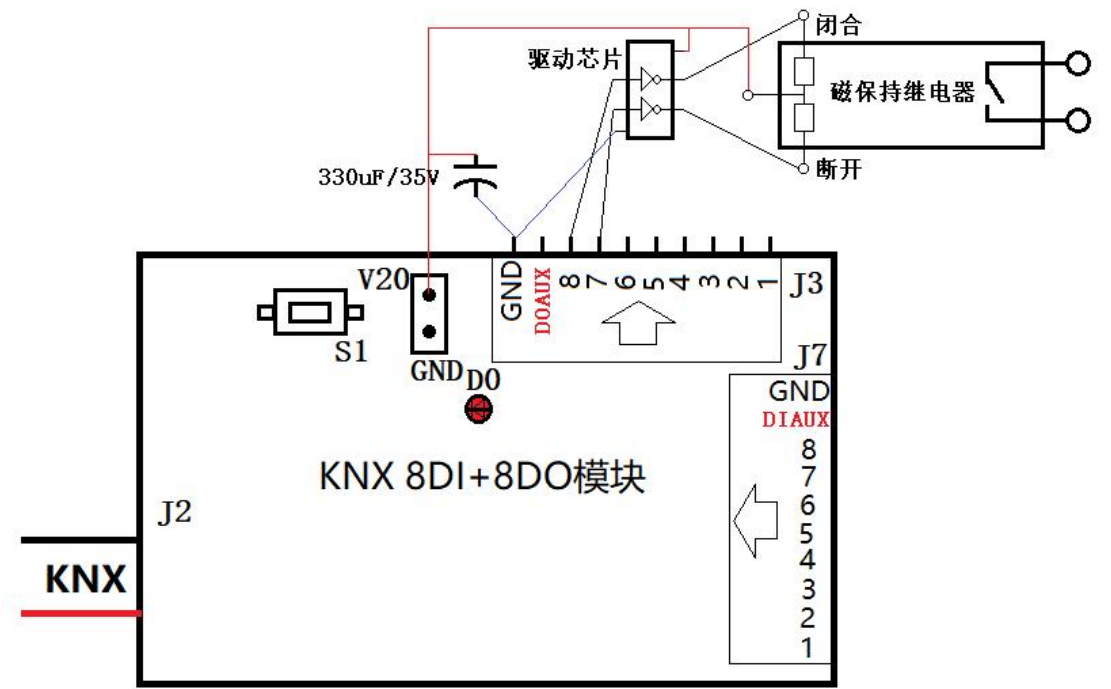
The following figure shows an example of using onboard V20 drive instead of auxiliary power supply. Here, driving three relays can also be activated, but it will increase the consumption of bus power:

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3.4 Magnetic retention relay

The following diagram shows the control of a relay, which only requires KNX bus power supply. V20 is connected to a large capacitor and supplies power to the driver chip (such as ULN2803).



The two DO output pulses that control the closing and opening of the relay are set to be opposite:

DO7对象收到数据后的电平输出模式	1->正脉冲, 0->低电平
脉冲宽度(*10ms)	5
DO8对象收到数据后的电平输出模式	0->正脉冲, 1->低电平
脉冲宽度(*10ms)	5

The communication object is bound to the same control address:

30	DO7	输出	新建群组地址	1/1/4
31	DO8	输出	新建群组地址	1/1/4

This way, this relay can be controlled through group address 1/1/4.

4 Version Description

current version

Hardware: H8I80 V0.3

Database: Test Project H8I80 V3.knxproj

Differences between historical and current versions

The hardware is the H8I80 V0.2 version and does not support absolute dimming; Trigger programming mode through DI combination is not supported.

This module is a universal module, and its functions are also some commonly used ones, which cannot meet all application scenarios. If there are special needs, personalized customization can be carried out.

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5 Contact me

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here are other modules, such as the one with 4 500mA relays:

