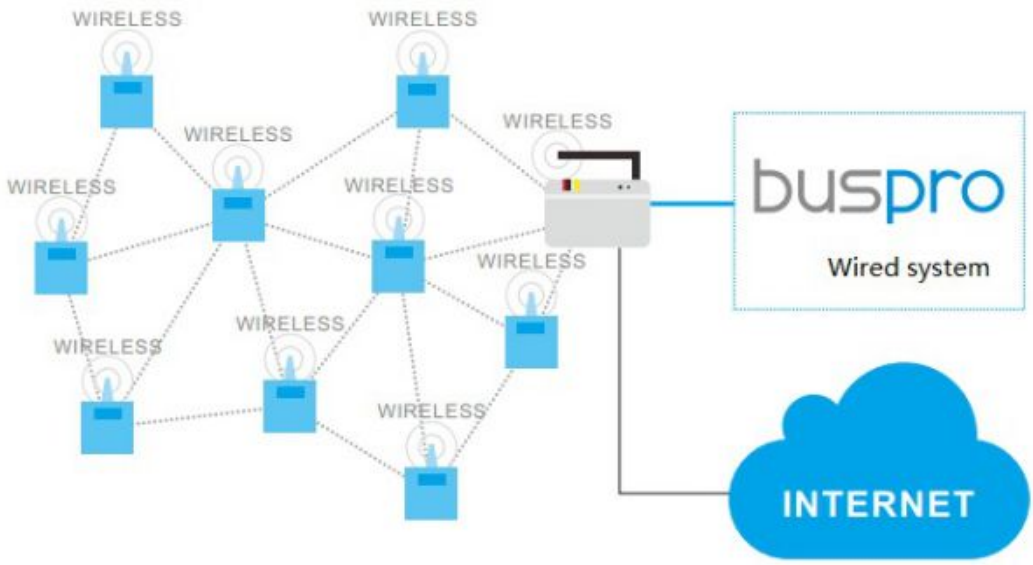
HDL®

HDL Wireless System Introduction



buspro

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V1.0	2015.11.30	Finish new document
V1.1	2015.12.01	Reformulated information

1. Overview

HDL Buspro Wireless System is based on IEEE802.15.4 Standard mesh technology, it provides the best solution for the retrofit projects which have inconvenient layout or difficult environment, and also can be used in new projects which want to reduce installation and wiring costs.

To manage and configure the wireless system you will need a wireless gateway (HDL-MCIP-RF02.10), With this wireless gateway you can interconnect different media platforms (Ethernet, Wired Buspro and RF) of HDL devices.

All the wireless devices will work independently in mesh technology after configured the same frequency channel and password for them.
Every wireless device will automatically find and communicate to the next device as a repeater to transmit data till reach the target device, that means these devices will help each other to extend the distance to make good wireless communication, no matter how big the house or how many walls are there.

Communication Distance: Indoor 50m (Without barriers)
Outdoor 80m (Without barriers)

Transmission Power: 10dBm (10mW)

Frequency Channel: WPAN for China (780MHz - 786MHz)
SRD for Europe (864MHz - 870MHz)
ISM for North America (904MHz - 928MHz)

Encryption: AES

Check the correct Frequency for your area

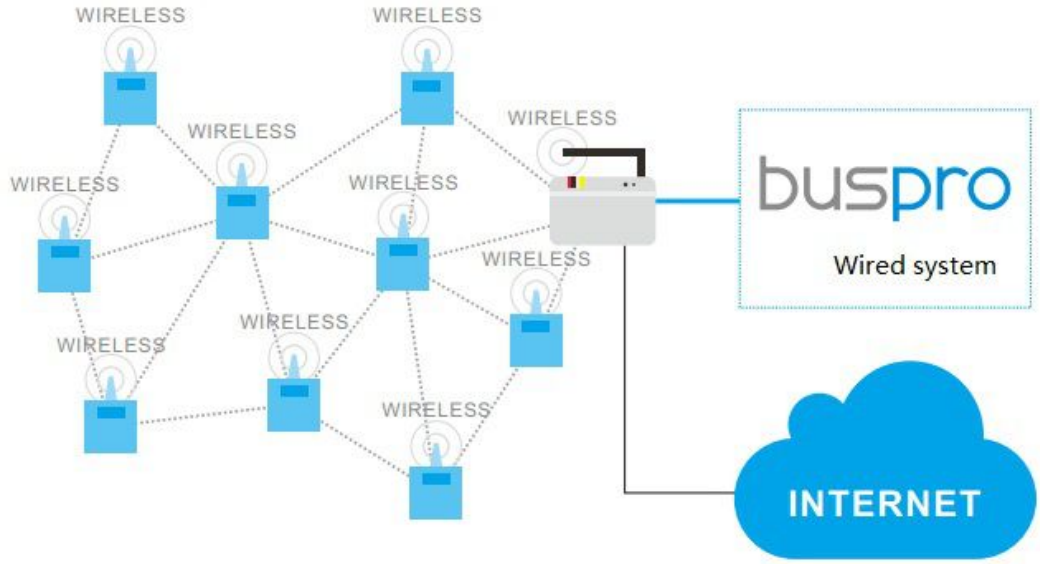
Change the default password to increase the security of the Wireless network

2. Wireless System

2.1 Mesh Mode

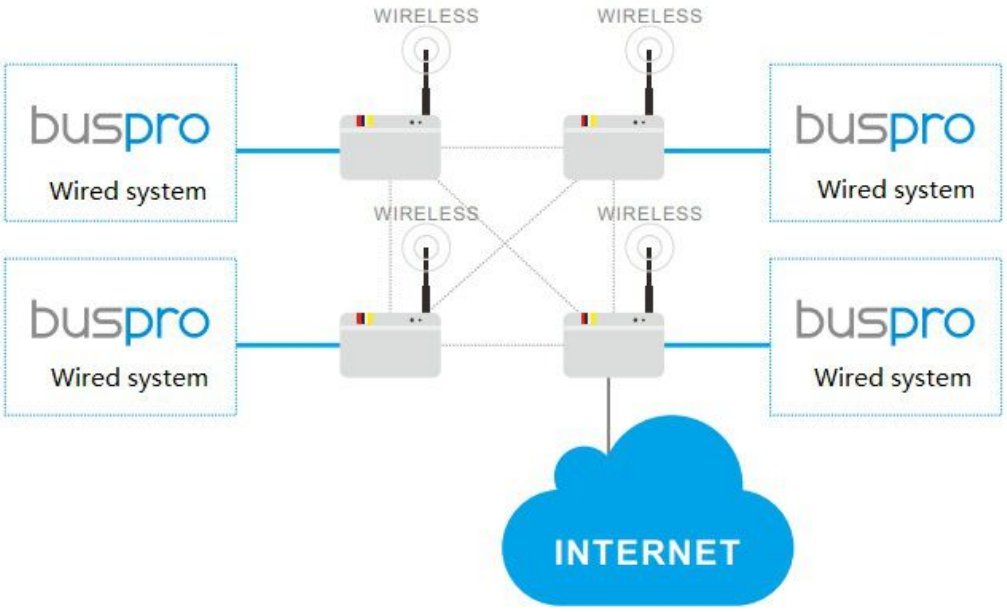
Configure your wireless gateway to work in mesh mode to have multiple repeaters available, making the network connection robust. With this feature you can build the communication between the wireless devices.

Since the wireless gateway has Buspro interface, you can create a Hybrid solution using Wireless + Wired System.



2.2 Bridge Mode

Use this mode to link floors or rooms where you can't pass an Ethernet cable for wired system.

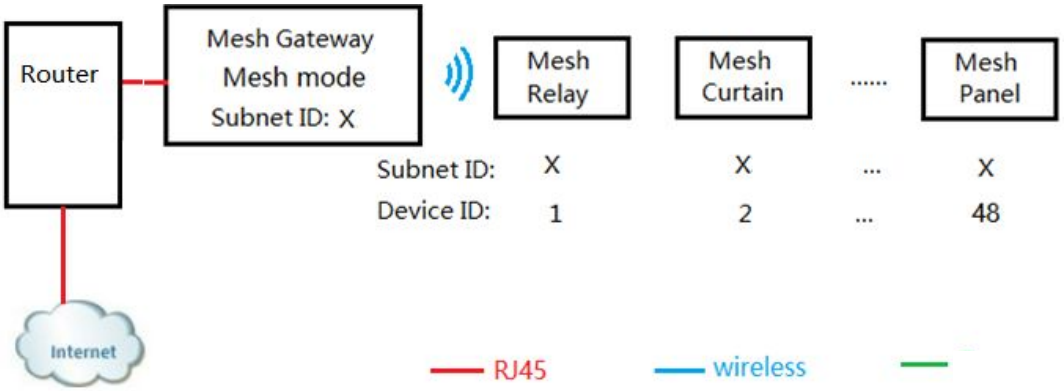


3. Application

3.1 Simple Project

This is the type of project where all devices are communicating through RF, the wireless gateway is indispensable to configure all functions of the system.

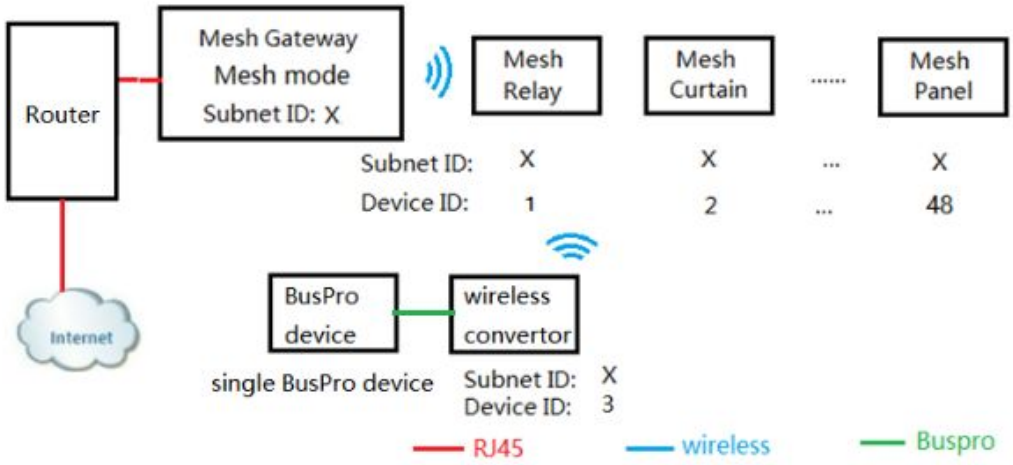
Keep the wireless gateway in the project, since it is an interface between the Mobile App and the Wireless System, also it will help the user to remote access the project from internet.



3.2 Simple Project with Wireless Converter

The wireless converter is a device with specific application, it will enable Wired Buspro devices to communicate through RF.

Use this device in situations where you need Wired Buspro features to be used in your Wireless System.



The Wireless Converter has one Buspro port, RF and 100mA 24DC power output

Note that you can connect only one Buspro device by Wireless Converter

3.3 Big Project

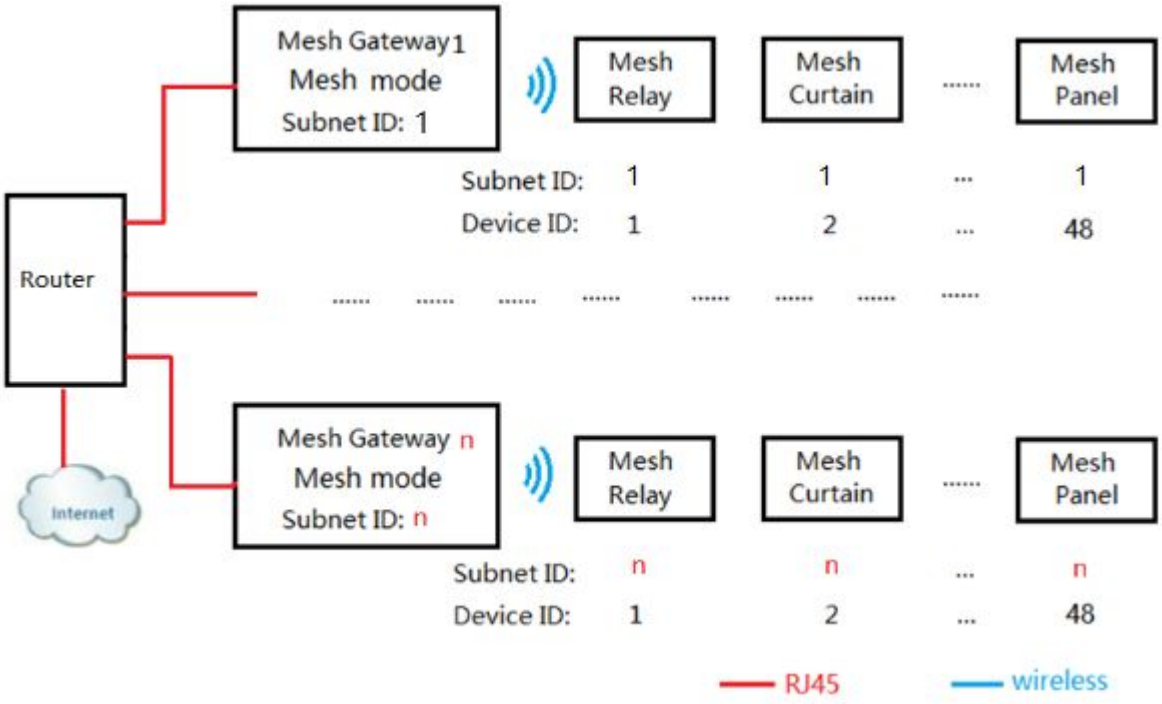
When you have a big project like a villa, or big house which have several floors and the entire project will be planned using the Wireless System, you need to create many “Simple Projects”.

Following this model your project will be very stable and with maximum performance and efficiency.

You need create a good Ethernet structure using a router and network switches to connect all the wireless gateways through the RJ45 cable.

Note that all Wireless Gateways must have different parameter settings, ex:

- Subnet ID
- Frequency Channel
- Password
-



1) You need to set different Subnet ID for all Wireless Gateways

2) All wireless devices must use the same Subnet ID from its Wireless Gateway of that floor

3) Each Wireless Gateway is limited to manage 48 wireless devices

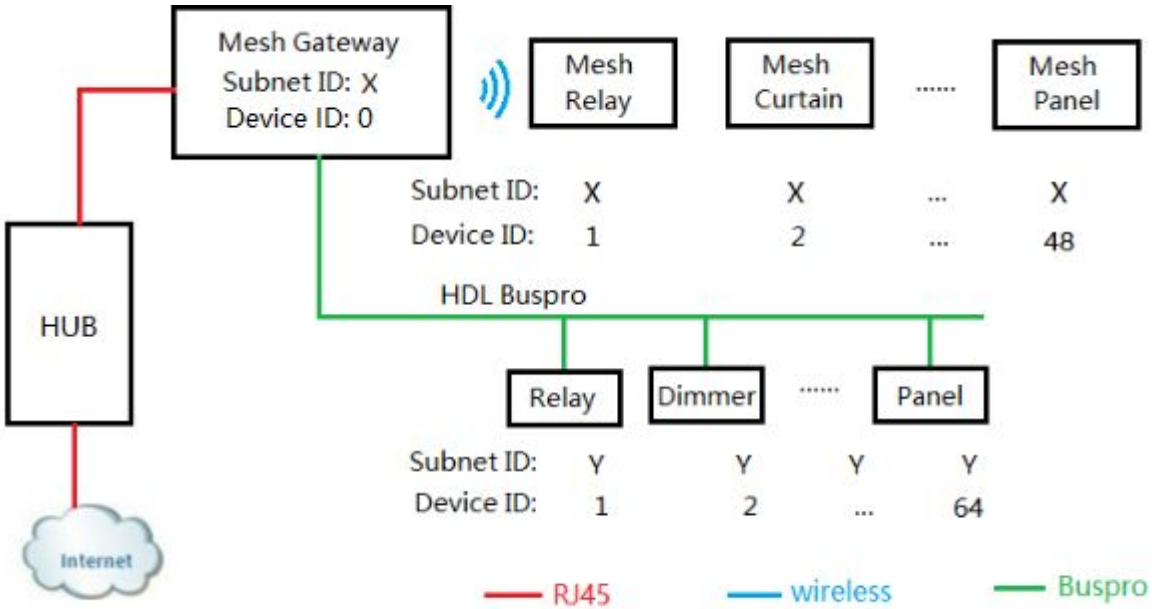
4) Each "Simple Project" must have different frequency channel and password, to avoid the same frequency interference

3.4 Hybrid Simple Project

Using the Buspro port or even through the Ethernet port you can make a Hybrid solution, which is integrated both Wireless and Wired Buspro system.

In many situations you cannot put a Wired solution in a project, but this is not a problem anymore. Now you can integrate your already working Wired Buspro system with the new Wireless System and expand your project as you need.

All these new features in your project can be remotely accessible from Internet and controlled by your Mobile App.

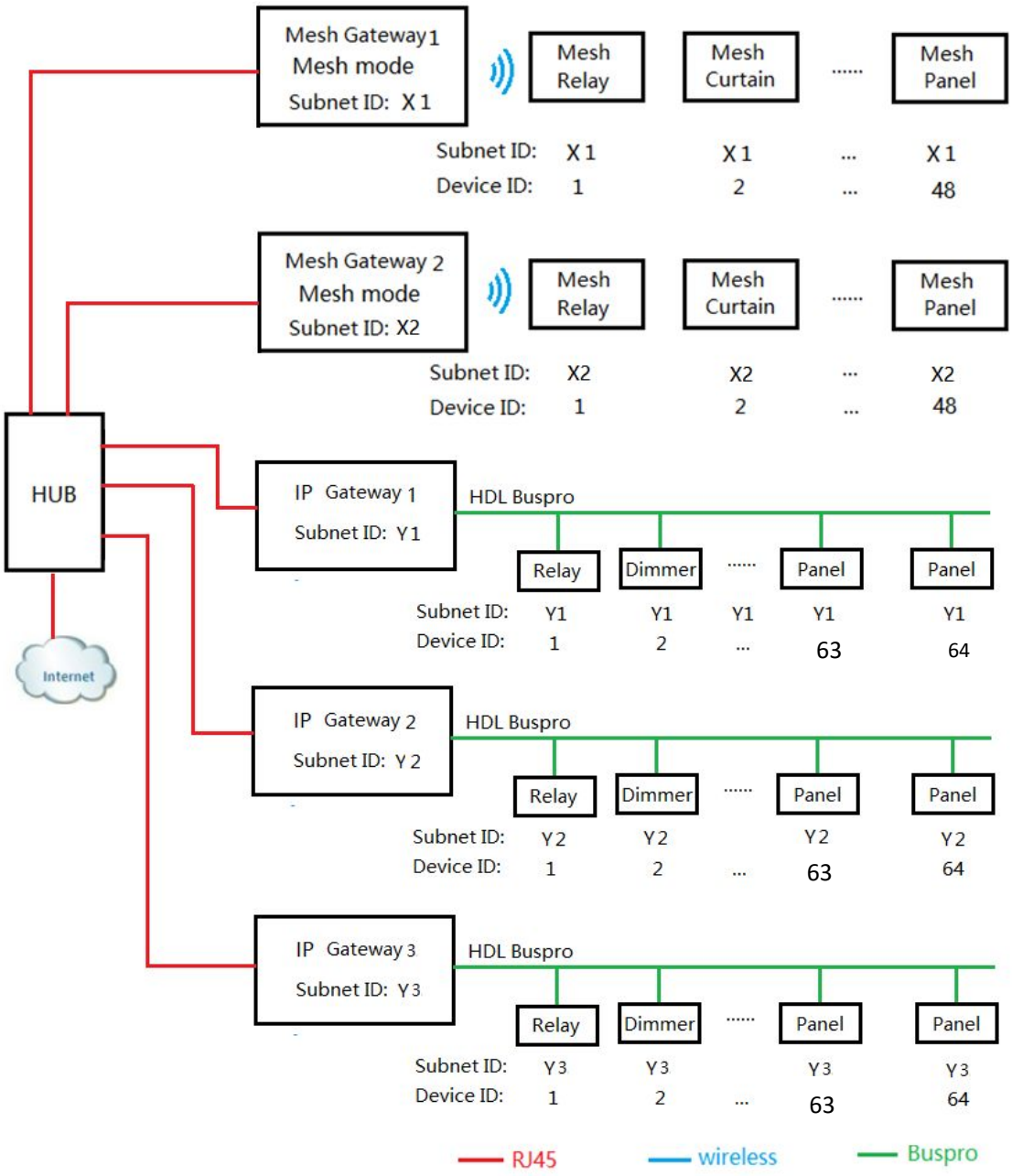


1) The Wireless Gateway is considered as a two port IP module, one port for Wireless System and the other for Wired System

2) You need to set a different Subnet ID for the Wired System in order to connect Wired devices on the Buspro port, if the Wireless Subnet is X, the Wired Subnet must be Y

3.5 Hybrid Big Project

Some big projects like buildings for example, where some floors you have Wired system and others you just need some wireless solution, is a good way to link those floors using the Ethernet backbone of the building.



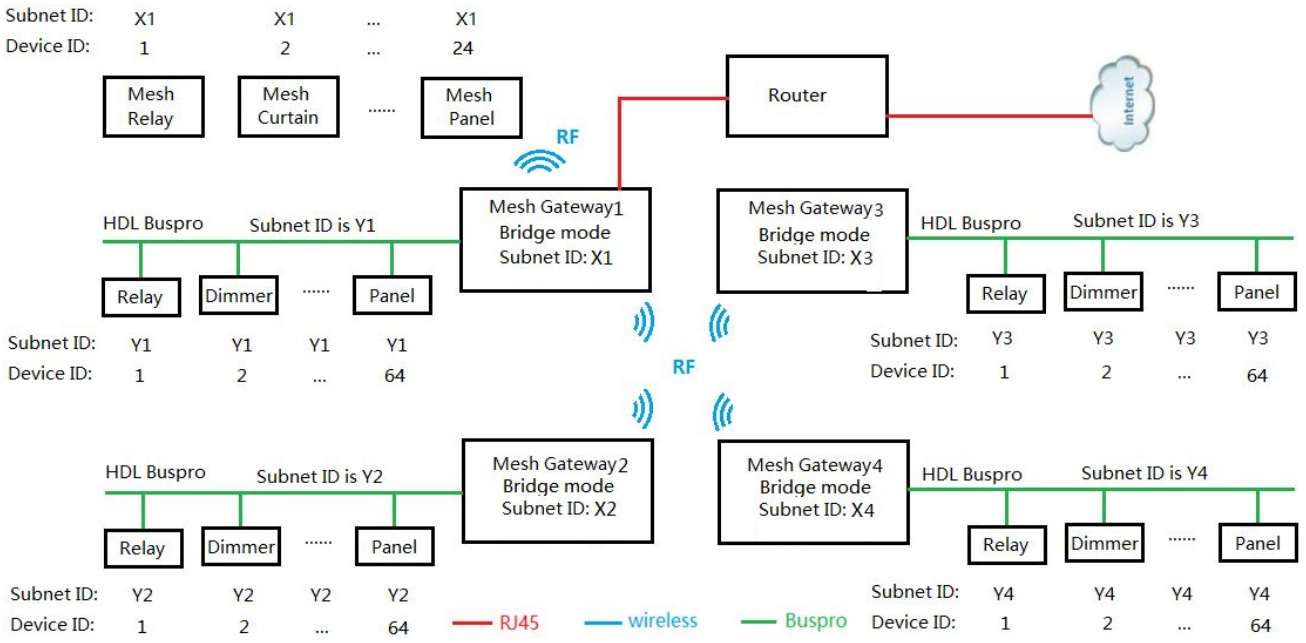
1) Wireless System need to work in mesh mode

2) Wireless gateways need to work individually from each floor with different frequency and password

3.6 Bridge Mode Project

In some wired system projects you don't have an Ethernet backbone and need control many floors, but it is impossible to pass the Ethernet cable to link them.

To solve this you need to set all your Wireless Gateways to Bridge Mode, just set the same Frequency and Password to all your Wireless Gateways and they will be linked by RF.



1) On Bridge Mode each Wireless Gateway can manage only 24 Wireless devices

2) Wireless Gateways linked by Bridge Mode communicate with each other by broadcasting

3) Each Wireless Gateway must have independent Subnet ID to manage their own Wireless devices

4) All the Wired Buspro devices must have independent Subnet ID

4. Configuration

You need to configure the Frequency of RF and password to the Wireless Gateway, and then you link the Wireless devices to be managed by it.

Follow the steps:

1) Search the Wireless Gateway in the HDL Buspro software

Make sure your PC and the Wireless Gateway are in the same IP segment

- Default IP address of the Wireless Gateway is "192.168.10.250"

2) Select the right Frequency for the Wireless Gateway

For China, select WPAN band, and the range of frequency is 780MHz -786MHz

For Europe, select SRD band, and the range of frequency is 864MHz - 870MHz

For North America, select ISM band, and the range of frequency is 904MHz - 928MHz

- Each floor need an independent Frequency and Subnet ID

3) Set the Password

You can use a single password for the entire project, is recommended different passwords for each client.

- Default password is "HDL-SecurityKey0"

4) Enter Setup Mode

You can enable/disable the Setup Mode manually or using the HDL Buspro software.

Manually: To enable just press the “PROG” button 3 times continuously within 3 seconds in the Wireless Gateway. To disable just press “PROG” again.

Software: Go to the tab [Node Configuration] click on the button (Enter Setup Mode) and to disable press (Exit Setup Mode).

- When Setup Mode is enabled, the mode LED of the Wireless Gateway will flash quickly in red, indicating it is ready to broadcast its Wireless parameters (Frequency & Password) to another Wireless device

5) Attach the Wireless devices to the Wireless Gateway

Some devices have the “PROG” button and others don’t, in each case you will do the procedure differently.

The devices which has the “PROG” button you just need to press 3 times continuously within 3 seconds, and then the LED will quickly flash.

If the attachment to the Wireless Gateway was correct, the LED of the Wireless device will return back to normal after the 5 seconds.

See some examples of modules which don't have the "PROG" button:

DLP Panel:

Press the 1st and 8th buttons at the same time to enter the setting page and select 'WIRELESS' option, the 7th and 8th buttons LED will turn ON to indicate the DLP Panel is enabled the Setup Mode and is ready to attach itself to the Wireless Gateway.

The LED on the DLP will turn OFF after successfully attached.

Normal Panel with single color LED:

Press any button for a long period (25 seconds) and the LED will flash 1 time per second to indicate the Normal Panel is enabled the Setup Mode and is ready to attach itself to the Wireless Gateway.

The LED on the Panel will turn back to normal after successfully attached.

- Beware it will flash quickly (at 15 seconds pressing) and it is only the address modification state

Touch panel with RGB LED:

Press any touch button for a long period (25 seconds) and the GREEN LEDS will flash 1 time per second to indicate the Touch Panel is enabled the Setup Mode and is ready to attach itself to the Wireless Gateway.

The LED on the Panel will turn back to normal after successfully attached.

- Beware the BLUE LEDS will flash quickly (at 15 seconds pressing) and it is only the address modification state

6) Start configuring your system

After attached all the Wireless devices to the Wireless Gateway, exit the Setup Mode and try to search all the Wireless devices on the HDL Buspro software to configure your system.

5. Power Interface

There are two types of Power Interfaces:

- L
- L+N

Both (L) and (L+N) version of Power Interfaces are considered as a electronic switch to ON/OFF lights without the dimming function.

Both cases the Channel 1 is MOSFET dimming (trailing edge), which is suitable for resistive and capacitive load, ex:

- Incandescent Lamp
- Electronic Transformer
- LED Driver

Never connect an inductive load to Channel 1, ex: Fan, Transformer, Inductance Ballast and Motor

The Channels 2 and 3 are TRIAC dimming (leading edge), which is suitable for resistive and inductive load.

All Channels (1, 2 and 3) have small leakage current, in some projects it may cause some LED lights and energy saving lamps flickering when lights are OFF.

To eliminate this flickering, you need a constant current module (Bypass module) to parallel connect to lights and it will consume the small leakage current.

Always turn OFF the AC Power from the Power Interface before changing the FUSES and loads.

In order to protect the Channels 2 and 3 from short-circuit, you must use a (aR type) fuse

5.1 Power Interface (L)

Connect a load or Bypass module to let the power interface detect signal from Channel 1.

The Power Interface has an AC/DC converter inside to work and supply to the switch Panel.

Change the Max Output to a lower value, ex:

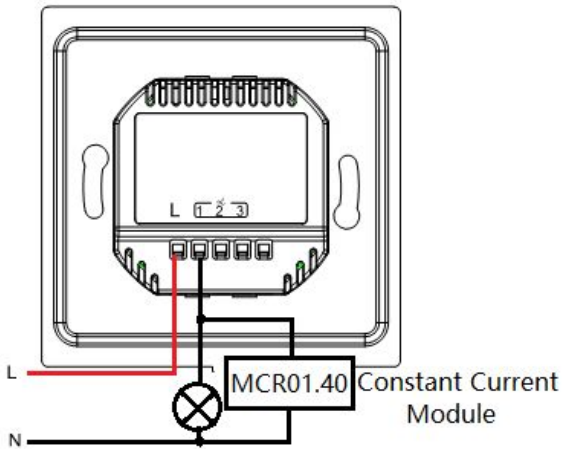
- Channel 1, 2 or 3 = 90% Max Output

This measure is to supply more current to the AC/DC converter in case all Channels are ON and have around 40W totally, then will not be enough current to supply the AC/DC converter.

If there is not enough current to the AC/DC converter, the Panel will reset when turning ON all Channels

To make a correct Max. level of channel output, it is better to test which level is suitable

Parallel connect one constant current module (Bypass module) to Channel 1 output and Neutral (N) , this solution will supply enough current to AC/DC converter of Power Interface.



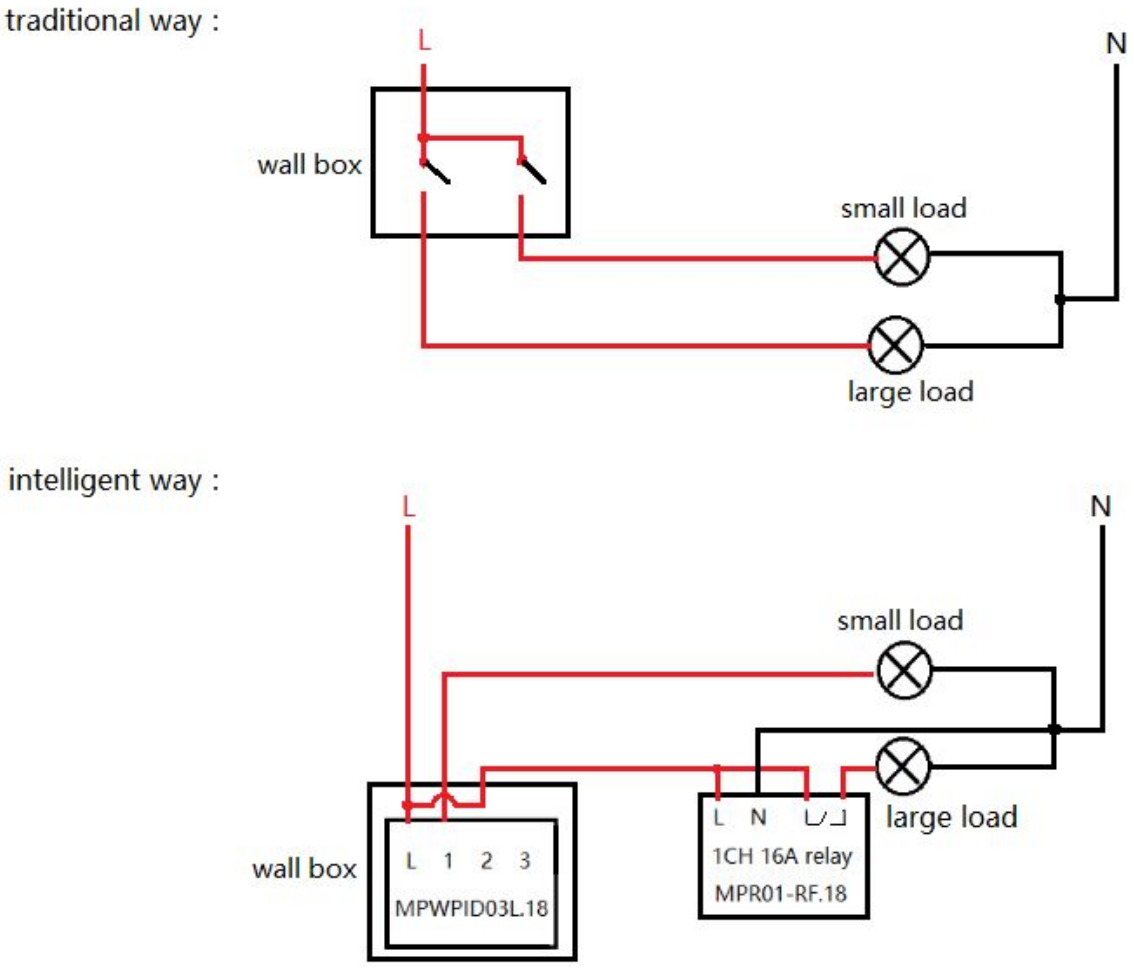
5.2 Power Interface (L+N)

The difference between (L) and (L+N) version is there is no minimum load requirement in L+N power interface, so the Max. output of 3 channels can be set to 100% for full output.

6. Installation

6.1 Roof Installation

Some wall boxes may have some channels with high power lights/loads and sometimes you can't control using the Power Interface, the solution is to use a Wireless Relay or Dimmer and install in the roof near the high power light/load.



6.2 Wireless Limitations

Wall obstacles and corner will reduce the transmission distance, in some extreme cases there is no wireless signal, hurting the communication between the Wireless devices.

- Try to install a wireless repeater between those devices which have not good communication

Avoid installing Wireless devices in metal boxes, if necessary to, then put the antenna outside the metal box

7. Firmware Upgrade

Normally you will use the automatic process of firmware upgrading. In case of failed attempt to automatically upgrade the firmware, you will need to upgrade it manually.

In the manual upgrade process, the Wireless devices are set to the default Frequency & Password, so you need to set the Wireless Gateway to Setup Mode to build communication with the Wireless device.

8. Wireless Devices

System components		
S/N	Brief Description	Model Number
（A）Gateway		
1	Wireless Gateway	HDL-MCIP-RF02.10
（B）Panel Power Interface (LN Type) (It must work in conjunction with panel)		
1	Wireless Power Interface (LN)	HDL-MPWPID00LN.18
2	Power Interface with 1ch dimmer (LN)	HDL-MPWPID01LN.18
3	Power Interface with 3ch dimmer (LN)	HDL-MPWPID03LN.18
4	Power Interface with 1CH relay &Temperature (LN)	HDL-MPWPIR01T.18
5	Wireless Power Interface (L+N Type) with 1 channel relay	HDL-MPWPIR01.18
（C）Panel Power Interface (L Type) /(It must work in conjunction with panel)		
1	Power Interface with 1ch dimmer (L)	HDL-MPWPID01L.18
2	Power Interface with 3ch dimmer (L)	HDL-MPWPID03L.18
Actuators		
（A）Dimmer		
1	1 channels dimmer	HDL-MPD01-RF.18
（B）Relay		
1	1 channel relay actuator	HDL-MPR01-RF.18
2	2 channels relay actuator	HDL-MPR02-RF.18
（C）Curtain controller		
3	1 channel curtain actuator	HDL-MPC01-RF.18
4	Master Curtain Control Motor	HDL-MWM70-RF.12
User Interface		
（A）DLP Modern		

1	Modern DLP EU	HDL-MPL8-RF.18
（B）iFlex Series Panel		
1	iFlex 2 Button EU	HDL-MP2B-RF.18
2	iFlex 4 Button EU	HDL-MP4B-RF.18
3	iFlex 6 Button EU	HDL-MP6B-RF.18
4	iFlex 8 Button EU	HDL-MP8B-RF.18
（C）iTouch Series Panel		
1	iTouch 1 Button EU	HDL-MPT1-RF.18
2	iTouch 2 Button EU	HDL-MPT2-RF.18
3	iTouch 3 Button EU	HDL-MPT3-RF.18
4	iTouch 4 Button EU	HDL-MPT4-RF.18
（D）iSense Series Panel		
1	iSense 1 Button EU	HDL-MP01R-RF.18
2	iSense 2 Button EU	HDL-MP02R-RF.18
3	iSense 3 Button EU	HDL-MP03R-RF.18
4	iSense 4 Button EU	HDL-MP04R-RF.18
（E）Wireless Signal Transmitter		
1	2 Button Wireless Signal Transmitter	WS200-2X
Sensor		
（A）Wireless Detector		
1	Ultrasonic and PIR Sensor	HDL-MSPU05-RF.1C
（B）Wireless Dry controller		
1	4CH dry contact	HDL-MPS04-RF.18