PerfectTilt™
SmartDial™

reddot award 2019
winner

reddot award 2019
honourable mention

MS4 (Motorized Shutters)

User Manual

User Manual(Motorized Shutters)

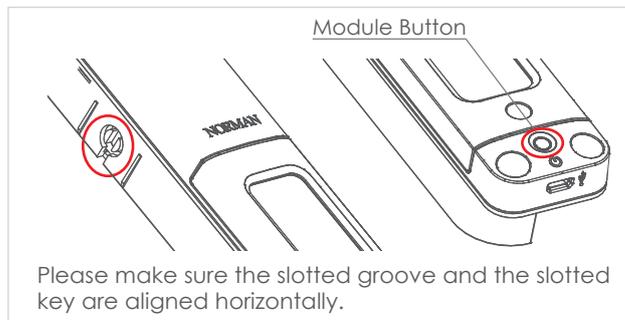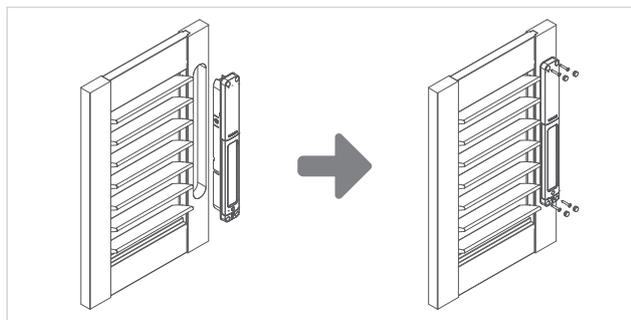**Product：MS4/** PerfectTilt™ G4

Version： 2019.8.21

1.Notices

1. Please read the user manual before operating the product.
2. Please DO NOT dismantle the products, including PerfectTilt™ Motor Module, Remote, Norman® Hub, or Repeater.
3. The products, including PerfectTilt™ Motor Module, Remote, Norman® Hub, and Repeater are for shutters control only.
4. Please DO NOT force the louver to move if it gets stuck. When motors do not operate correctly, please review the troubleshooting procedures.
5. Please DO NOT obstruct the louver while it is moving to avoid damaging the product.
6. Product operation is intended for temperatures between $0℃$/32°F ~$55℃$/131°F.
7. In order to improve the user experience and function improvement, the firmware and software of this product will be automatically updated from time to time. (When the Norman® Hub is installed)
8. When the PerfectTilt™ motor module detects temperatures above 60°C/140°F, the louvers will be automatically opened to position 1 for air convection to cool down, to avoid damage caused by high temperatures.
9. The PerfectTilt™ Motor Module and Remote contain Lithium batteries, the battery contains flammable materials such as organic solvents. Please read the **Safety Instructions** before use the product.
10. The PerfectTilt™ motor module can reach the preset angular position in general operation. However, under repeated operation, the angle may be due to the gap of the mechanism (unavoidable due to the clutch mechanism), and the wireless signal delay or leakage. Causes some angular error or inconsistency. At this time, the angle error can be automatically corrected by simply pressing the **Best privacy** or the **Best view**. (requires that the horizontal correction is done and correct)

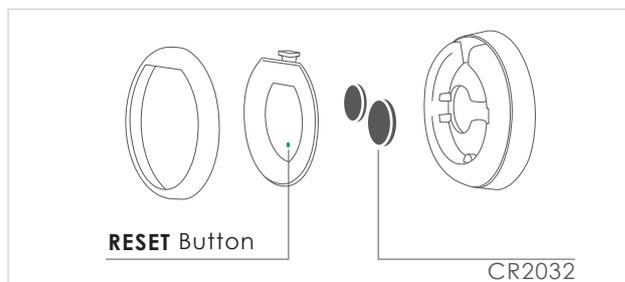## 2.Installation and Settings

• **PerfectTilt™ Motor Module Installation (Two batteries are included in each module.)**

1. Please move the louvers to horizontal position.
2. Insert PerfectTilt™ Motor Module into panel. Please make sure the slotted key is contacted horizontally.
3. After installation, make sure the shutters moves smoothly. If not, please adjust or re-install them.
4. Tighten the screw of 4 corners.
5. Power on the PerfectTilt™ Motor Module by holding down the module button for 3 seconds.
   Then the green LED will start flashing and PerfectTilt™ Motor Module will start calibration for around 45 seconds.
   【Note: Please DO NOT obstruct louvers movement during calibration.】
6. The louvers will move to a horizontal position after calibration.

Module Button

Please make sure the slotted groove and the slotted key are aligned horizontally.

• **Remote Battery Installation**

1. Remove color ring from the remote.
2. Open battery cover.
3. Insert two CR2032.
4. Put battery cover and color ring back into place.
5. Remote LED will enable to light up after successful completion of installation.

RESET Button

CR2032

This process lets you 1)Add a shutter to a Group 2) Remove a shutter from a Group.

• **Pair PerfectTilt™ Motor Module to Remote**

1. With the PerfectTilt™ Motor Module powered on, press the button on PerfectTilt™ Motor Module(s). The LED will blink, and louvers will move to a horizontal position.
2. Hold **SET** button on Remote for 3 seconds to put it into **Setup Mode**. The middle buttons will start to blink.
3. Press the Group button number (1 to 5) you want to assign to the panel(s) currently in the pairing mode.
4. Motor Module(s) will signal accordingly.
   a. Paired: Louvers move up and down once, and LED will blink in green for 1 second.
   b. Un-Paired: Louvers move up and down twice, and LED will light in green for 1 second.
5. Hold **SET** button of Remote for 3 seconds to exit **Setup Mode**.

This process lets you setup/adjust louver horizontal position if the horizontal position shifted.

- **Setup Louver Horizontal Position - Method 1**

    1. Select the desired group number for setup of horizontal position, and hold down for Tilt Upward button (⋀) 1 second.
    2. Move the louvers to horizontal position by remote ring with spin anticlockwise direction.
       [NOTE: The direction of operation MUST be from up to down. If direction was reversed, please start over.]
    3. Press Remote **Reset** button for 1 second to initiate Remote **Reset Mode**.
    4. Select the desired group number for setup of horizontal position.
    5. Press Best View button (⋀⋀). Group button LED will turn off and middle buttons will blink 3 times.
       [NOTE: Best View won't work if no groups are selected.]
    6. Louvers move up and down once.
    7. Press Remote **Reset** button for 1 second to exit Remote **Reset Mode**.

- **Setup Louver Horizontal Position - Method 2**

    1. Select the desired group number for setup of horizontal position, and hold down for Tilt Downward button (⋁) 1 second.
    2. Move the louvers to horizontal position by hand.
       [NOTE: The direction of operation MUST be from down to up. If direction was reversed, please start over.]
    3. Press Remote **Reset** button for 1 second to initiate Remote **Reset Mode**.
    4. Select the desired group number for setup of horizontal position.
    5. Press Best View button (⋀⋀). Group button LED will turn off and middle buttons will blink 3 times.
       [NOTE: Best View won't work if no groups are selected.]
    6. Louvers move up and down once.
    7. Press Remote **Reset** button for 1 second to exit Remote **Reset Mode**.
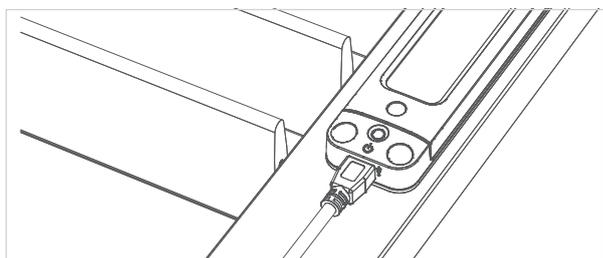
If PerfectTilt™ Motor Module is running out of power, please charge it by 5V/1A power bank or power supply via Micro-USB cable.

- **USB Charging for PerfectTilt™ Motor Module**

    1. Connect Micro-USB cable to Motor Module for charging. (Normally it takes around 10 hours to recharge.)
    2. Green LED will blink while charging and will completely light green when fully charged.
    3. Red LED on indicates the Motor Module charging abnormal, please stop charging immediately.

- **Remote Operation**

    1. Press the Group number or multiple Group numbers (1 to 5) you would like to control.
    2. Press ALL to select all the shutters assigned to the Remote. One Group(s) is selected, press the up and down key to tilt shutters.
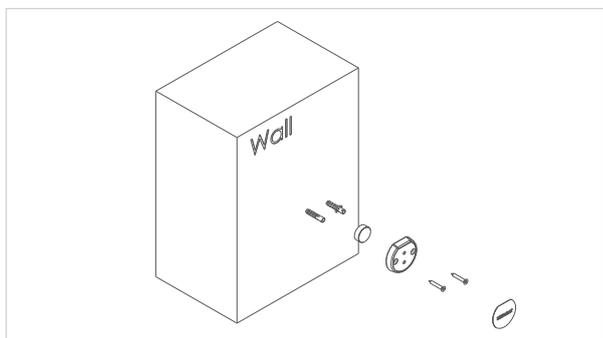   3. Please refer to Remote Button Definition for full instructions on Remote operation.

- **Remote Docking Installation**

    The Remote dock can be secured to the wall either by screw or by double-sided adhesive tape.

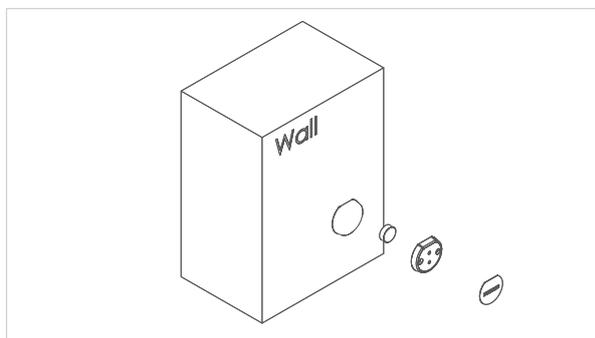 | ► **Screw** : | ► **Adhesive tap** : |
    |---|---|
    | 1. Drill two holes for the conical wall anchor. | 1. Remove the backing of the adhesive paper from magnet and put the magnet into the dock's dedicated hole sticky-side down. |
    | 2. Remove the backing of the adhesive paper from magnet and put the magnet into the dock's dedicated hole sticky-side down. | 2. Put adhesive tape to the bottom of Docking and fix on the wall. |
    | 3. Secure docking to the wall with two screws. Remove the backing of the adhesive paper and stick it to the surface. | 3. Remove the backing of the adhesive paper and stick it to surface of dock. |

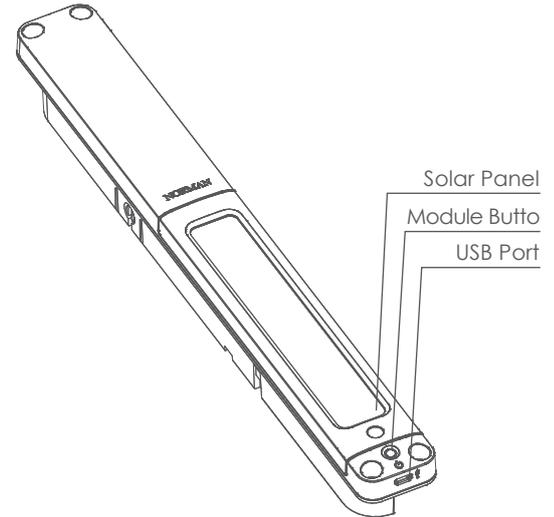   The remote can now be docked onto the wall.   The remote can now be docked onto the wall.

3. Product Functions

PerfectTilt™ Motor Module

• Module Button

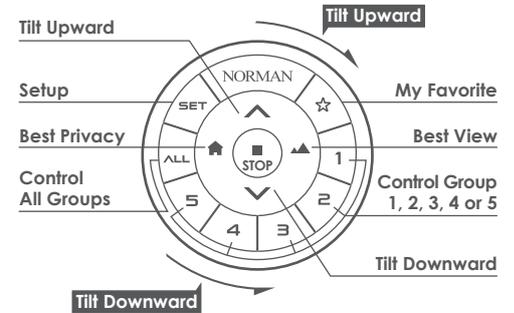| NO.	Function	Description
1	Module Button	1. On/Off: Power On/off PerfectTilt™ Motor Module. 2. Initiate module pairing mode. 3. Reboot PerfectTilt™ Motor Module.

• PerfectTilt™ Motor Module Functions

NO.	Function	Description
1	Power on	1. Hold the module button for 3 seconds when module is powered off. 2. LED will blink in green for 1 second. 3. The panel will start calibrating automatically around 45 seconds.
2	Power off	1. Hold the module button for 3 seconds when module is powered on. 2. LED will blink in red for 1 second. 3. Module will power off.
3	Pair/Un-Pair	1. Press the module button to initiate pairing mode. LED will blink, and louvers will move to horizontal position. 2. If no paring command received, motor module will resume normal operation after 60 seconds.
4	Hardware reboot (in event of Firmware crash)	1. Press and hold the module button for 10 seconds. 2. Motor module will power off. 3. Press the button again for 3 seconds. 4. Motor module will power on and start calibration.
5	USB charging	1. User can charge motor module by Micro USB using a 5V/1A power bank or power supply. (Normally it takes around 10 hours to recharge.) 2. Green LED will blink while charging and will completely light green when fully charged. 3. Red LED on indicates the Motor Module charging abnormal, please stop charging immediately.

Remote (SmartDial™)
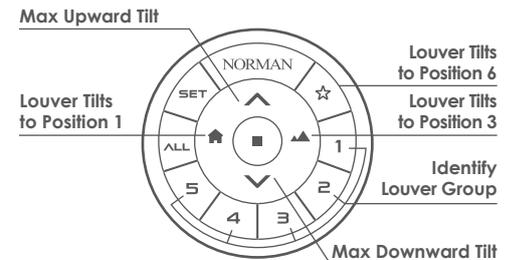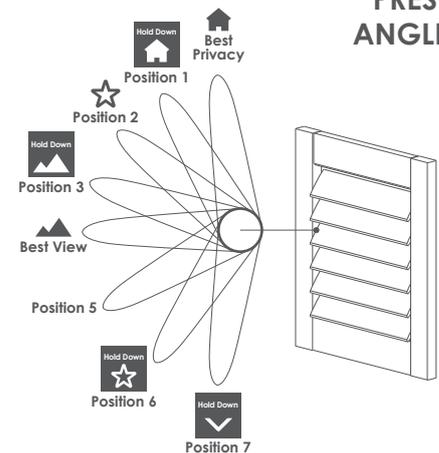
• Button Definitions

NO.	Function	Button	Description
1	Group1	1	Select/Deselect Group 1, hold to identify Group 1 shutters
2	Group 2	2	Select/Deselect Group 2, hold to identify Group 2 shutters
3	Group 3	3	Select/Deselect Group 3, hold to identify Group 3 shutters
4	Group 4	4	Select/Deselect Group 4, hold to identify Group 4 shutters
5	Group 5	5	Select/Deselect Group 5, hold to identify Group 5 shutters
6	Control All Groups	ALL	Select/Deselect Group ALL
7	Favorite	☆	Operate to favorite angle (Press: Louver Position 2. Hold down for 1 second: Louver Position 6 as default.)
8	Setup	SET	Setup Mode
9	Tilt Upward	∧	Tilt louvers up one step. Hold down for 1 second: Max Upward Tilt (Fully closed)
10	Tilt Downward	∨	Tilt louvers down one step. Hold down for 1 second: Max Downward Tilt (Louver Position 7)
11	Best View	▲▲	Press: Fully Open Hold down for 1 second: Louver Position 3
12	Best Privacy	⌂	Press: Fully closed Hold down for 1 second: Louver Position 1
13	Stop	■	Stop movement
14	Reset	RESET	Reset Mode [Back side]
15	Spin anticlockwise	Ring	Spin to tilt louvers downward
16	Spin clockwise	Ring	Spin to tilt louvers upward

Solar Panel
Module Butto
USB Port

THE JOY OF DIAL CONTROL

Tilt Upward — Tilt Upward
Setup — My Favorite
Best Privacy — Best View
Control All Groups — Control Group 1, 2, 3, 4 or 5
Tilt Downward
Tilt Downward

HOLD-DOWN FEATURES

Max Upward Tilt
Louver Tilts to Position 1 — Louver Tilts to Position 6
Louver Tilts to Position 3
Identify Louver Group
Max Downward Tilt

PRESET ANGLES

Hold Down — Best Privacy — Position 1
☆ Position 2
Hold Down — Position 3
▲▲ Best View
Position 5
Hold Down — ☆ Position 6
Hold Down — ∨ Position 7

• Remote – Operating Functions

NO.	Function	Description
1	Wake Up Remote	1. Three ways to wake up Remote: • Vibration • Press button • Spin the remote ring 2. Remote will light up when awakened.
2	Select/ Deselect Group	1. Press one or more Group button (1 to 5) to select shutter groups. 2. Groups can be deselected by pressing the Group button (1 to 5) again.
3	Group Assignment Check	1. Hold Group button (1 to 5) for 1 second. 2. The shutters assigned to the group will toggle.
4	Operation Function	Refer to Button Definitions

• Remote – Setting Function

NO.	Function	Description
1	Initiate **Setup Mode**	Press **SET** button for 3 seconds. The remote will start blinking once is initiated.
2	Exit **Setup Mode**	Either press **SET** button for 3 seconds or leave remote idle for 20 seconds.
3	Initiate **Reset Mode**	Press **Reset** button for 1 second. The remote will start blinking once is initiated.
4	Exit **Reset Mode**	Either press **Reset** button for 1 second or leave remote idle for 20 seconds.
5	Factory Reset [Note: User data saved on the remote will be deleted.]	1. Initiate **Reset Mode**. 2. Press Stop button for 3 seconds. 3. Remote LED will light for 3 seconds after factory reset is completed.
6	Copy Remote	1. Trigger Copy Mode on the new Remote Press **RESET** hole with a paper clip for 1 second. The white light will flash. 2. Upload settings from Original Remote to New Remote Press **SET** button for 3 seconds. Press ALL button once. 3. New Remote will automatically exit Copy Mode once the information received. Original Remote: Press **SET** button for 3 seconds to exit **Setup Mode**.
7	Backup Remote Data from PerfectTilt™ Motor Module	1. Get New Remote into **Reset Mode**, and place it near PerfectTilt™ Motor Module. 2. Reboot one of the Motor Modules, pairing data will be sent. 3. Once Remote has received the pairing data, LED will turn on for 3 seconds and go back to normal mode.
8	Setup My Favorite	1. Select the desired group number for setup of favorite position, and hold down for Tilt Upward button (⋀) 1 second. 2. Move louvers by remote to desired favorite position. 3. Initiate Remote **Setup Mode**. 4. Press My Favorite button (☆) for favorite setting. 5. Louvers will move up and down once and blink for 1 second after My Favorite has been set. 6. Exit Remote **Setup Mode**.
9	Setup Louver Horizontal Position	• **Method 1** 1. Select the desired group number for setup of horizontal position, and hold down for Tilt Upward button (⋀) 1 second. 2. Move the louvers to horizontal position by remote ring with spin anticlockwise direction. [NOTE: The direction of operation MUST be from up to down. If direction was reversed, please start over.] 3. Press Remote **Reset** button for 1 second to initiate Remote **Reset Mode**. 4. Select the desired group number for setup of horizontal position. 5. Press Best View button(▴▴). Group button LED will turn off and middle buttons will blink 3 times. [NOTE: Best View won't work if no groups are selected.] 6. Louvers move up and down once. 7. Press Remote **Reset** button for 1 second to exit Remote **Reset Mode**. • **Method 2** 1. Select the desired group number for setup of horizontal position, and hold down for Tilt Downward button (⋁) 1 second. 2. Move the louvers to horizontal position by hand. [NOTE: The direction of operation MUST be from down to up. If direction was reversed, please start over.] 3. Press Remote **Reset** button for 1 second to initiate Remote **Reset Mode**. 4. Select the desired group number for setup of horizontal position. 5. Press Best View button(▴▴). Group button LED will turn off and middle buttons will blink 3 times. [NOTE: Best View won't work if no groups are selected.] 6. Louvers move up and down once. 7. Press Remote **Reset** button for 1 second to exit Remote **Reset Mode**.
10	Delete/Clear Louver Horizontal Position	1. Initiate Remote **Reset Mode**. 2. Select the group(s) you want to delete horizontal position. 3. Press Best Privacy button(⌂), group LED will turn off and middle buttons will blink 3 times. [NOTE: Best Privacy won't work if no groups are selected.] 4. Louvers move up and down twice. 5. Press Remote **Reset** button for 1 second to exit Remote **Reset Mode**.

NO.	Function	Description
11	Setup Louver Bottom Position (Down Limit)	1. Select the group(s) you want to setup bottom position, and hold down for Tilt Upward button (⋀) 1 second. 2. Move the louvers to bottom position by hand. [NOTE: The direction of operation MUST be from up to down. If direction was reversed, please start over.] 3. Initiate Remote **Reset Mode**. 4. Select the group(s) you want to setup bottom position. 5. Press Tilt Downward button (⋁), group LED will turn off and middle buttons will blink 3 times. [NOTE: Tilt Downward button won't work if no groups are selected.] 6. Louvers move up and down once. 7. Exit Remote **Reset Mode**.
12	Delete/Clear louver Bottom Position	1. Initiate Remote **Reset Mode**. 2. Select the group(s) you want to delete bottom position. 3. Press Tilt Upward button (⋀), group LED will turn off and middle buttons will blink 3 times. [NOTE: Tilt Upward button won't work if no groups are selected.] 4. Louvers move up and down twice. 5. Press Remote **Reset** button for 1 second to exit Remote **Reset Mode**.

Norman® Hub

· Preparation Notes

1. Finish shutter assignment of each room to corresponding Remote first.
2. Each room needs a Repeater installed. If the signal needs to pass to a different floor, you will need Repeater installed around the stairs as well.

· Hub Installation

1. Connect the Micro USB to the Norman® Hub and connect it to the power source.
2. Support two network connection settings, please choose one of them.

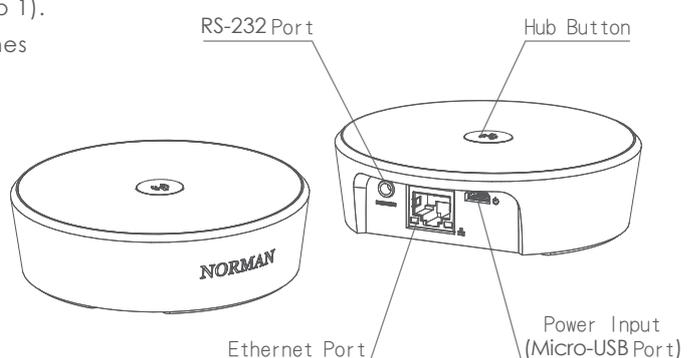► **Option 1 :** Connect Norman® Hub and home AP router via **Ethernet route.**

　1) Connect one end of the Ethernet route to the LAN port of the AP router and one end to the Ethernet port of the Norman® Hub.

　2) The mobile phone is connected to the home AP router WiFi.

　3) Open the App and select Connect to Hub to connect to the Norman® Hub.

► **Option 2 :** Connect Norman® Hub and home AP router via **WiFi.**

　1) The Norman® Hub is **AP Mode** without any network connection. You can find the SSID of NORMANHUB_OOOOOO (the last six codes of the MAC is the same as the label number on the Hub) through the mobile phone, and can be connected.

　2) Norman® Hub WiFi password: **norman1974**

　3) Open the Norman® App and select Connect to Hub > Menu > Hub Info > Home AP Settings and follow the instructions to connect the Norman® Hub to your home WiFi.

　4) When the Norman® Hub is connected to the home AP router via WiFi, it will automatically switch to **Station Mode**. The SSID of NORMANHUB_OOOOOO will not be visible at this time. The phone will automatically switch back to the commonly used and connected AP router (basically the home AP router)

　5) Open the App and select Connect to Hub to connect to the Norman® Hub.

· Join Remote to Hub Network

1. Power on Norman® Hub, orange LED will blink while it boots up.

2. Once booted up, LED will light on in white.

3. Initiate Remote **Reset Mode** in close proximity to the Hub. (You can do multiple Remotes joining at same time)

4. Press **Hub button** once.

5. LED of Remote will light for 3 seconds once network sync completes.

6. Press Remote button (☆) for updating data to all shutters(Motor Modules).

7. Do **Manual Search** for adding shutters. [Same as Norman® Hub Function No.1]

　1) Hold Norman® **Hub button** for 3 seconds to initiate **User Setting mode**. The LED will turn blue.

　2) Press once within 5 seconds right after step 1).

　3) LED will blink in blue and white as it searches shutters status.

　4) Once it finishes searching, LED will light on in white to indicate normal status.
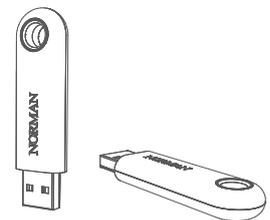
RS-232 Port　　　　Hub Button

Ethernet Port　　Power Input (Micro-USB Port)

NORMAN

- **Norman® Hub Button Function**

NO.	Function	Description
1	Hub button	• Press once: Join network. • Press for 3 seconds to initiate **User Setting Mode**: (lasts 5 seconds) 1. Press once: Search shutters. 2. Press twice: Station Mode switch to **AP Mode**. • Press for 20 seconds to **Factory Reset** Norman® Hub.

- **Norman® Hub Function**

NO.	Function	Description
1	Manual Search	1. Hold Norman® Hub button for 3 seconds to initiate **User Setting mode**. The LED will turn blue. 2. Press **once** within 5 seconds right after step 1. 3. LED will blink in blue and white as it searches shutter status. 4. Once it finishes searching, LED will light on in white to indicate normal status.
2	Station Mode to AP Mode	**Station Mode** means Norman® Hub is connected to your home router. **AP Mode** means Norman® Hub is working as a standalone Access Point. 1. Hold Hub button for 3 seconds to initiate **User Setting Mode**. The LED will turn blue. 2. Press **twice** within 5 seconds. 3. Hub will switch to **AP Mode** from Station Mode. 4. Once **AP Mode** is working successfully, the WiFi SSID "NORMANHUB_OOOOOO" will appear on your smart phone.
3	Factory Reset [Note: User data saved on the Hub will be deleted.]	1. Hold Norman® Hub button for 20 seconds. 2. Hub will reboot and start **Factory Reset**. 3. Once booted, LED will light in white.
4	AP Mode	1. By default Norman® Hub will be in **AP Mode** in following situations: • Not connecting to Home router Wi-Fi • Not connecting to Ethernet cable 2. Once **AP Mode** is working successfully, the "NORMANHUB_OOOOOO" will appear on your smart phone. 3. The default password is "**norman1974**".
5	Connecting to Home AP via Ethernet cable	1. Connect Norman® Hub to Home AP by Ethernet cable. 2. With Ethernet connection, Hub will work as **Station Mode**. The SSID will not be detected.
6	Reboot	1. Unplug and re-plug power cable. 2. Orange LED will blink as it boots up.

Repeater Installation

- Plug Repeater to Power Adapter.
- Repeater deployment guide:
  1. Each room needs a Repeater installed.
  2. If the signal transmission path might be shielded by wall or something, then need Repeater installed.
  3. The distance between Hub and Repeater, or Repeater to Repeaters better less than 10 meters.
  4. If the signal needs to pass through different floors, the repeater should be installed around the stairs as well.

4、Troubleshooting

NO.	Issues	Troubleshooting
1	Louvers are stuck.	DO NOT manually operate it. Please follow the steps 1. Wait 5 seconds and check if they release automatically? 2. Do the normal operation by Remote and check for normal operation. Check whether louvers are released after movement stops? 3. Press PerfectTilt™ Motor Module button once to initiate pairing mode and see if louvers move to a horizontal position. Check whether louvers are released after movement stops? 4. Power off Motor Module press Module button for 3 seconds and then power it on (Pressing Motor Module button for 3 seconds, check whether shutters calibration normally and move to horizontal position. Check whether louvers are released after movement stops? 5. Do PerfectTilt™ Motor Module Hardware Reset (Hold Motor Module Button for 10 seconds)and power-on PerfectTilt™ Motor Module, check whether shutters calibration normally and move to horizontal position? Check whether louvers are released after movement stops? 6. Check if PerfectTilt™ Motor Module is running out of power (LED in red or off). If PerfectTilt™ Motor Module is running out of power, please charge it by power bank or power supply via USB cable. (Normally it takes around 10 hours to recharge.)
2	No reaction upon operation	1. Ensure Remote is not running out of power?(Lights up normally without sudden extinction) 2. Check PerfectTilt™ motor module to receive the message light: • Green light : Indicates that the operation is normal. • Red light : Indicates low battery, or abnormal status. • No light : Please try rebooting to confirm that the module is exhausted. 3. If the motor module is exhausted, please charge it with a USB power source. 4. Ensure distance between Remote and PerfectTilt™ Motor Module is or been blocked? 5. Check Repeater LED blinking status for Remote signal transmission(while Repeater is properly installed). Ensure Repeater's LED light blinks while operating the remote control? 6. Ensure PerfectTilt™ Motor Module with Remote pairing is correct? 7. Power off PerfectTilt™ Motor Module (press Module button for 3 seconds) and then power it on (press Module button for 3 seconds).Check whether shutters calibrates normally and move to horizontal position? And check whether shutters can be controlled by remote/App?

NO.	Issues	Troubleshooting
		8. To Delete/Clear louver bottom position as the following procedure and then check whether shutters can be controlled by remote/App? 1) Initiate Remote **Reset Mode**. 2) Select the group(s) you want to delete bottom position. 3) Press Tilt Upward button (⋀), group LED will turn off and middle buttons will blink 3 times. [NOTE: Tilt Upward button won't work if no groups are selected.] 4) Louvers move up and down twice. 5) Press Remote **Reset** button for 1 second to exit Remote **Reset Mode**.
3	App can't connect to Norman® Hub	1. Check if the Norman® Hub has a network route or WiFi connection to the home AP router? If the Norman® Hub is not connected to the home AP router, you can find the SSID of the NORMANHUB_OOOOOO via the WiFi settings of the phone. 2. If you can find the NORMANHUB_OOOOOO SSID, connect to this WiFi and open the App, then go to Connect to Hub > Menu > Hub Info > Home AP Settings and follow the instructions to connect the Norman® Hub to your home AP router. 3. If you can't find the SSID of NORMANHUB_OOOOOO, please reboot the Norman® Hub and try to connect it again through the App. 4. If none of the above steps can be resolved, manually switch Norman® Hub to AP mode. Press the router button for 3 seconds to enter the **User Setting Mode**. At this time, the blue light will be on constantly. Press 2 times within 5 seconds in the **User Setting Mode** and go to step 2. 5. Some AP routers will automatically enable the **Multicast Filter** function. Please log in to the home AP router to enter the setting page and **turn off** the **Multicast Filter** function. (The setting method of each brand may be different, please refer to the manual of each brand)

5、Safety Instructions

The PerfectTilt™ Motor Module and Remote (SmartDial™) contain lithium batteries, the battery contains flammable materials such as organic solvents. Mishandling the battery may cause fire, smoke, or an explosion and the battery's functionality will be seriously damaged. Please read and check the following prohibited actions. [NOTE: The Remote batteries (CR2032) is not rechargeable.]

・**Danger**

(1) Immersion
Do not immerse the battery in liquid such as water, beverages, or other fluids.
Exposure to liquid may damage the battery or the battery pack (including protection circuit). As a result, the battery may generate heat, smoke, catch fire, or explode.

(2) High Temperature
Do not use or place the battery near an open flame, heater or high temperature (above 80°C).
Subjecting the battery to high temperature may damage the polyolefin separator and can cause an internal short circuit. This may cause the battery to generate heat, smoke, catch fire, or explode.

(3) Chargers and Charge Conditions
Do not use unauthorized chargers.
Only charge the battery within specified conditions (e.g., temperature range, voltage, and current). Use of an unauthorized charger could cause the battery to generate heat, smoke, catch fire, or explode.

(4) Reverse Polarity
Do not attach or insert battery with polarity reversed.
A battery has polarity. If the battery does not easily fit into the charger or device, check the battery's orientation. Do not force the battery into the battery compartment. If attached to the device with reversed polarity, the battery may generate heat, smoke, catch fire, or explode.

(5) Direct Connection
Do not connect the battery to an AC outlet or DC automotive plug.
The battery requires a specific charger. If the battery is connected directly to a power outlet, the battery may generate heat, smoke, catch fire, or explode.

(6) Use in Other Equipment
Do not use the battery in equipment for which it was not intended.
If the battery is used in unapproved applications or systems, the battery may become damaged and generate heat, smoke, catch fire, or explode.

(7) Incineration and Heat
Keep the battery away from heat and fire.
Heat will damage the battery and may cause it to generate heat, smoke, catch fire, or explode.

(8) Short-Circuit
Do not apply a short-circuit.
Do not connect the positive (+) and negative (-) terminals with a conductive material. Do not carry or store the battery with any metal objects. If the battery is shorted, the shorting item may overheat and the battery may generate heat, smoke, catch fire, or explode.

(9) Impact
Avoid excessive impact to the battery.
Impact beyond specification may damage the battery. This may cause the battery to leak, generate heat, smoke, catch fire, or explode.

(10) Penetration
Do not penetrate the battery with a nail or strike with a hammer.
If subjected to a hard strike or penetrated by an object, the battery may be damaged or destroyed, thereby causing an internal short-circuit. This may cause the battery to generate heat, smoke, catch fire, or explode.

(11) Soldering
Do not directly solder to the battery.
Soldering directly to the battery could melt the separator or damage the gas release vent or other safety mechanisms. This may cause the battery to generate heat, smoke, catch fire, or explode.

(12) Disassembly
Do not disassemble the battery.
Disassembly or modification of the battery may damage the protection circuit. This may cause the battery to generate heat, smoke, catch fire, or explode.

(13) Charge near High Temperatures
Do not charge the battery near high temperature.
If the battery is charged while exposed to high temperature, the battery's protection circuit may activate and prevent charging, or fail and cause the battery to generate heat, smoke, catch fire, or explode.

・Warning

(1) Ingestion
Keep away from small children.
Keep the battery away from small children. If the battery or any of its component parts is swallowed, seek medical attention immediately.

(2) Storage
Do not place the battery in or near a microwave or other cooking appliances.
If subjected to heat or electromagnetic radiation, the battery may leak, generate heat, smoke, catch fire, or explode.

(3) Mixed Use
Do not mix with other batteries.
The battery should not be used with other batteries having a different capacity, chemistry, or manufacturer. Doing so could cause the battery to generate heat, smoke, catch fire, or explode.

(4) Rust, Discoloration and Deformities
Do not use abnormal batteries.
Immediately stop using the battery if there are noticeable abnormalities, such as smell, heat, discoloration, or deformity. The battery may be defective and could generate heat, smoke, catch fire, or explode with continued use.

(5) Charging Time
Stop charging if the charging process cannot be finished.
If the battery can not finish the charging process within the specified time, halt the charging process. The battery may generate heat, smoke, catch fire, or explode.

(6) Leakage -1
Do not use a leaking battery near open flame.
If the battery or liquid leaking from the battery has an irritating odor, the battery should be kept away from any open flame. If exposed to an open flame, the battery could ignite and explode.

(7) Leakage -2
Do not touch a leaking battery.
If liquid leaking from the battery gets into your eyes, immediately flush your eyes with clean water and seek medical attention. If left untreated, it will cause significant eye damage.

(8) Transport
Pack the battery securely for transport.
To prevent short-circuit or damage during transport, securely pack the battery in a case or carton.

・Caution

(1) Exposure to Direct Sunlight
Do not use or leave the battery in a location exposed to excessive heat, such as in direct sunlight or in a car. Doing so could cause the battery to generate heat, smoke, catch fire, or explode. It may also cause the battery's performance and life to deteriorate.

(2) Static Electricity
The battery pack has a protection circuit. Do not use the battery where static electricity in excess of 100V is generated as it may damage the protection circuit. If the protection circuit fails, the battery may generate heat, catch fire, smoke, or explode.

(3) Charging Temperature Range
Only charge the battery between 0°C and 45°C. Charging outside of this temperature range may cause the battery to leak, generate heat, or result in serious damage. It may also cause the battery's performance and life to deteriorate.

(4) Manual
Read the manual before use. Keep for future reference.

(5) Charging Method
Read the charger's manual before use for proper charging method.

(6) First Time Usage
Please contact the supplier if the battery gives off an unusual odor, generates heat, or shows signs of rust prior to its initial use.

(7) Use by Children
Parents must explain how to use the product and the battery. Please check back periodically to ensure children are using the product and the battery correctly.

(8) Flammable Materials
Do not charge or discharge near flammable materials. Doing so could result in fire.

(9) Leakage
If electrolyte leaks from the battery and comes into contact with skin or clothing, immediately flush with water. Otherwise, it may cause skin irritation.

(10) Handling of Exposed Contacts or Conductors
If the battery pack has a system interface consisting of stripped lead wires or exposed contact plates, handle with due care. Temporarily insulate exposed contacts and conductors with an insulator such as polypropylene tape or polyvinylchloride tape. Failure to do so could result in an electrical shock; a short circuit causing the battery to generate heat, smoke, catch fire, or explode; or the combustion of other materials.

(11) Recycling
When disposing of the battery, recycle it according to local rules and regulations.

6、Appendix

・Warning

1. Important safety instructions. It is important for the safety of persons to follow these instructions. Save these instructions.
2. The drive shall be disconnected from its power source during cleaning, maintenance and when replacing parts.
3. mportant safety instructions. Follow all instructions, since incorrect installation can lead to severe injury.

- **Caution**

1. The appliance is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction. Children being supervised not to play with the appliance.
2. The battery must be removed from the appliance before it is scrap; The appliance must be disconnected from the supply mains when removing the battery; The battery is to be disposed of safely.
3. Do not allow children to play with fixed controls. Keep remote controls away from children;
4. Frequently examine the installation for imbalance and signs of wear or damage to cables and springs. Do not use if repair or adjustment is necessary
5. Do not operate when maintenance, such as window cleaning, is being carried out in the vicinity;
6. Before installing the drive, remove any unnecessary cords or components and disable any equipment not needed for powered operation; That the characteristics of the driven part must be compatible with the rated load and rated operating time.

Federal Communication Commission Interference Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Industry Canada statement:

This device complies with ISED's licence-exempt RSSs. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d' ISED applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

RF Information

1. Frequency band(s): 2415~2459MHz
2. Receiver category: Category 2
3. Maximum Transmit Power EIRP (mW): 100 mW
4. EU declaration;
   EN 300 328 V2.1.1(2016-11)
   EN 301 489-1 V2.1.1(2017-02)
   EN 301 489-17 V3.1.1(2017-02)
   EN 55032:2015 +AC:2016, Class B
   EN 61000-3-2:2014(Not Applicable)
   EN 61000-3-3:2013(Not Applicable)
   EN 61000-4-2:2009
   EN 61000-4-3:2006 +A1:2008 +A2:2010

MS4 Motor Module specification:

NO.	Item		Specification
1	Power source		3.7V,3000mAh,18650 Li-ion battery cell x2 parallel
2	Battery operating voltage range		4.2V~3.2V
3	Radio type		Proprietary 2.4G RF
4	Motor type		Brush DC motor
5	Interface		USB micro B receptor(water proof)
6	Charge type		USB, Solar
7	Charge capability	USB	4W(5V, 0.8A)
		Solar	0.06W@37000lux(5V,12mA)
8	Charge time @ 3000mAh battery cell x2	USB	10hrs
		Solar	300hr@37000lux
9	Thermal protection	Charge	H:≥60°C L:≤0°C
		Discharge	H:≥60°C L:≤-10°C
10	Dust and Water proof		IP54
11	Operation temperature		0°C~55°C