

# AUTOMATE™

## ARC Diagnostic Tool



433 MHz



AUTOMATE™ | The ARC Diagnostic Tool is compatible with all ARC products and can assist in the diagnosis of Radio Frequency (RF 433MHz) issues that can occur in difficult/problematic environments.

### FEATURES:

- Supports up to 6 ARC Channels
- Multiple Diagnostic Modes
- Works at ranges up to 200m [656ft] in open spaces
- Back-lit Alphanumeric LCD display for advanced diagnostics such as:
  - Signal Strength measurement (RSSI)
  - Data integrity (CRC)
  - Receive/transmit device identifier



# TECHNICAL DATA / KIT CONTENTS

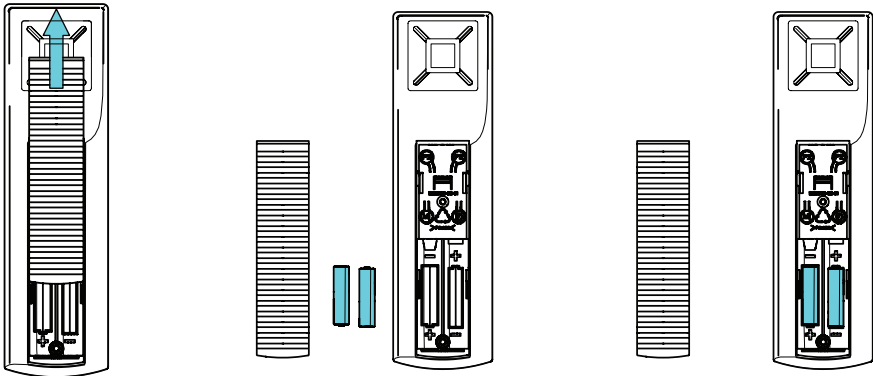
| TECHNICAL SPECIFICATIONS          |                             |
|-----------------------------------|-----------------------------|
| Voltage:                          | 2.8 - 3 V (AAA battery)     |
| Channel number                    | 6                           |
| Frequency:                        | 433.92 MHz                  |
| Transmitting Power:               | 10 mW                       |
| Transmission Distance Indoors:    | 35m [115ft]                 |
| Transmission Distance Open Space: | 200m [656ft]                |
| Ambient Operating Temperature:    | -10°C +60°C [-14°F - 140°F] |
| Storage temperature               | -20°C +60°C [-4°F - 140°F]  |
| Operating humidity                | 0-80%                       |
| Ingress protection                | IP42                        |

## Kit Prep

### KIT CONTENTS

- 1 x Diagnostic Remote
- 2 x AAA battery
- 1 x Instruction Manual

Remove cover from remote control. Press gently in and up to disengage cover.  
Install battery and re-attach the cover. The magnet should be located above the batteries.



NOTE: Any previous motor pairing relations are lost when the battery is changed or the power is reset.

# SAFETY INSTRUCTIONS

## WARNING: Important safety instructions to be read before installation and use.

Incorrect installation or use can lead to serious injury and will void manufacturer's liability and warranty.

It is important for the safety of persons to follow the enclosed instructions. Save these instructions for future reference.

- Do not expose to water, moisture, humid and damp environments or extreme temperatures.
- Persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge should not be allowed to use this product.
- Use or modification outside the scope of this instruction manual will void warranty.
- Installation and programming to be performed by a suitably qualified installer.
- Follow installation instructions.
- For use with motorized shading devices.
- Keep away from children.
- Frequently inspect for improper operation. Do not use if repair or adjustment is necessary.
- Keep clear when in operation.
- Replace battery with correctly specified type.

Rollease Acmeda declares this equipment is in compliance with the essential requirements and other relevant provisions of R&TT EC Directive 1999/5/EC

## Statement Regarding FCC / IC Compliance

This device complies with Part 15 of the FCC Rules / Industry Canada licence-exempt RSS standard(s). 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'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.*

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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 or more 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



Do not dispose of in general waste.  
Please recycle batteries and damaged electrical products appropriately.

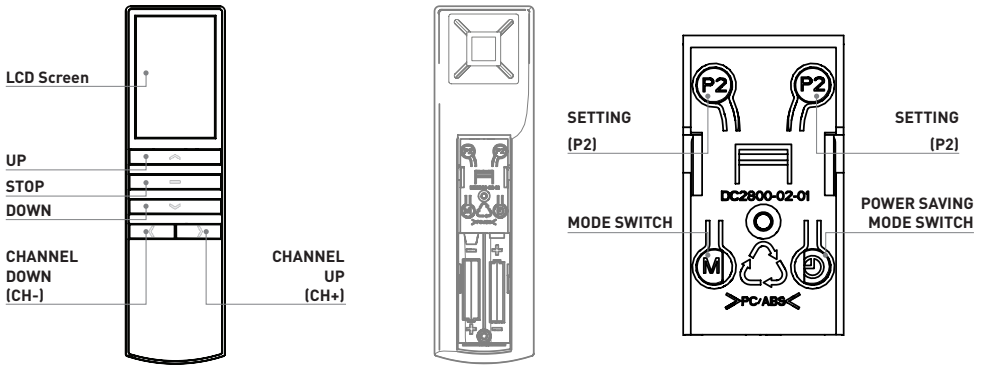


# CONTENTS

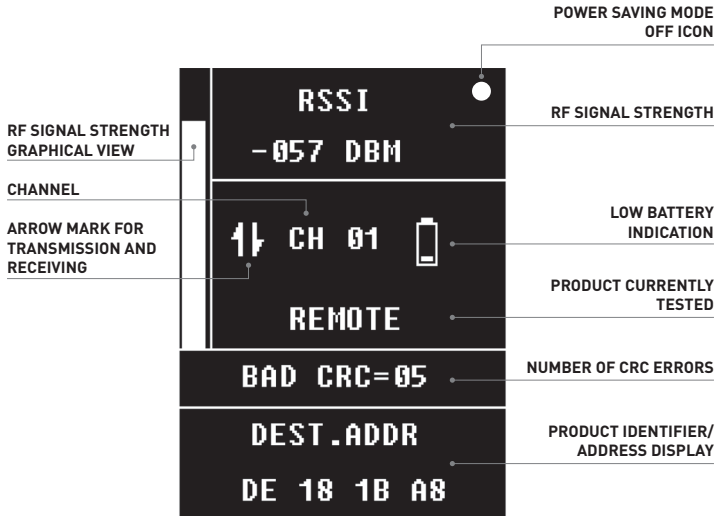
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# 1 FUNCTIONAL OVERVIEW

## 1.1 Button Layout



## 1.2 LCD Screen



## 1.3 Diagnostic Function Breakdown

### RSSI

-057 DBM

#### RF SIGNAL STRENGTH:

RSSI stands for Received Signal Strength Indication. It is a measure of the strength of a 433MHz ARC signal that has been received by the Diagnostic Tool.

The signal strength is displayed in dbm where the highest power signal is -40dbm and the lowest is -120dbm. This range is also graphically represented by the bar-graph indicator.



#### LOW BATTERY INDICATION:

The low battery icon is displayed when the battery power is less than 2.8V.

### REMOTE

#### DIAGNOSTIC MODE SELECTION:

MOTOR Mode

REMOTE Mode

SENSOR Mode

REPEATER Mode

HUB Mode

[See Section 1.4]

### BAD CRC=05

#### NUMBER OF CRC ERRORS:

If a "bad CRC" is received, this counter is incremented by 1 each time. The maximum count is 99 after which it rolls back to 0.

### DEST\_ADDR

DE 18 1B A8

#### PRODUCT IDENTIFIER/ADDRESS DISPLAY:

In each mode, it shows the address of the testing device in the current channel.

### CH 01

#### CHANNEL:

There are six channels from 0 to 5. Each channel can only be paired to one motor. The previous pair relation will be overwritten if a new motor is paired to the diagnostic tool in the same channel.



#### ARROW ICONS FOR TRANSMISSION & RECEIVING:

**UP** icon indicates that data is being transmitted.

**DOWN** icon indicates that valid data is receiving.

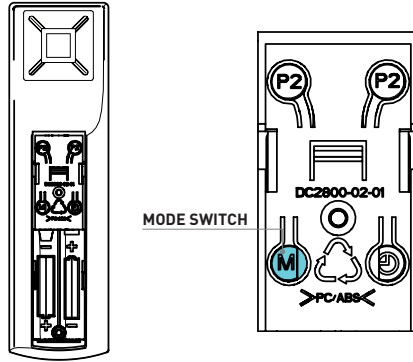


#### NON-POWER SAVING MODE ICON

Circular icon indicates power saving mode is not active. The Diagnostic Tool will not turn off after 60 seconds when it is not in use in this state.

## 1.4 Selecting a Mode

Press MODE button to toggle between modes:

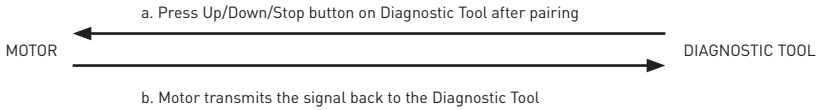


### MOTOR MODE:

Under this mode, the Diagnostic Tool can detect & display a Motor's RSSI and CRC readings.

Compatible Components:

- ARC Motors

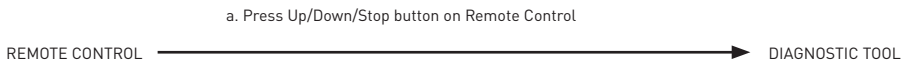


### REMOTE MODE:

Under this mode, the Diagnostic Tool can detect & display a Remote Control's RSSI and CRC readings.

Compatible Components:

- Paradigm Remotes
- Wall Switches
- Dry Contact Input Module



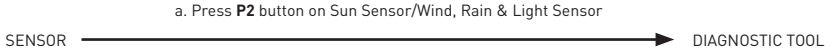


**SENSOR MODE:**

Under this mode, the Diagnostic Remote can detect & display a Sensor’s RSSI and CRC readings.

Compatible Components:

- Sun Sensor
- Wind, Light & Rain Sensor

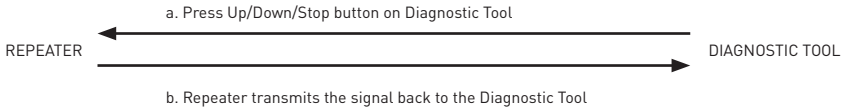


**REPEATER MODE:**

Under this mode, the Diagnostic Tool can detect & display a Repeater’s RSSI and CRC readings.

Compatible Components:

- USB Repeater

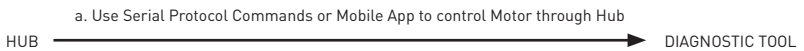


**HUB MODE:**

Under this mode, the Diagnostic Remote can detect & display a Hub’s RSSI and CRC readings.

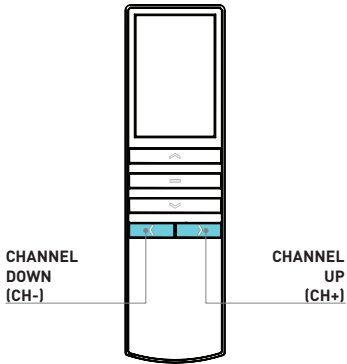
Compatible Components:

- PULSE HUB



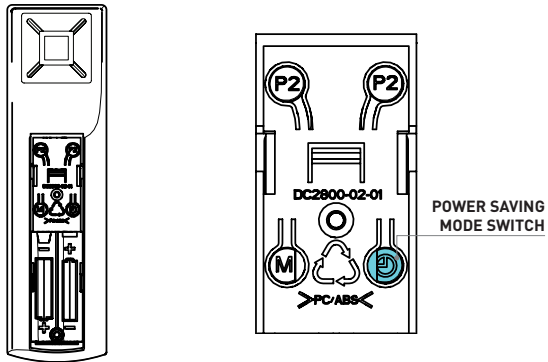
## 1.5 Selecting a Channel

Press channel keys to switch the current channel.



## 1.6 Selecting a Power Saving Mode

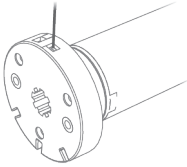
Press power saving mode switch to switch the power saving mode ON/OFF.



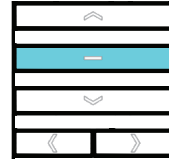
## 1.7 Pair a Motor

Under the MOTOR SIM mode, an ARC motor can be paired to the Diagnostic Tool.

Hold **P1** button on motor head.



Hold **STOP** on controller to add or remove



Motor Response



Motor Response



NOTE: The motor address is displayed in the diagnostic tool.

## 1.8 Copy existing remote control settings to Diagnostic Tool

Under the MOTOR SIM mode, a pairing relation can be copied to the diagnostic tool using the **P2** button

**A**= Existing controller or channel (to keep)

**B**= Controller or channel to add or remove

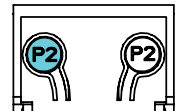
Press **P2** on existing controller



Press **P2** on existing controller



Press **P2** on new controller



Motor Response



Motor Response



Motor Response



NOTE: After the pairing operation, the diagnostic tool can control a motor under MOTOR mode as a normal remote control.

## 2 DIAGNOSTIC SCENARIOS

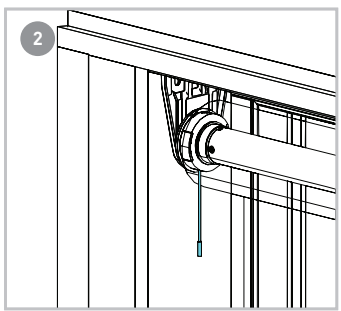
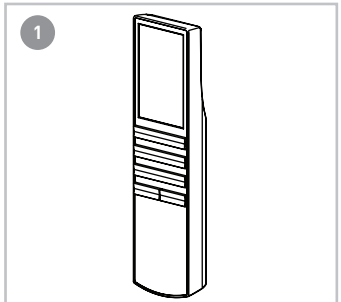
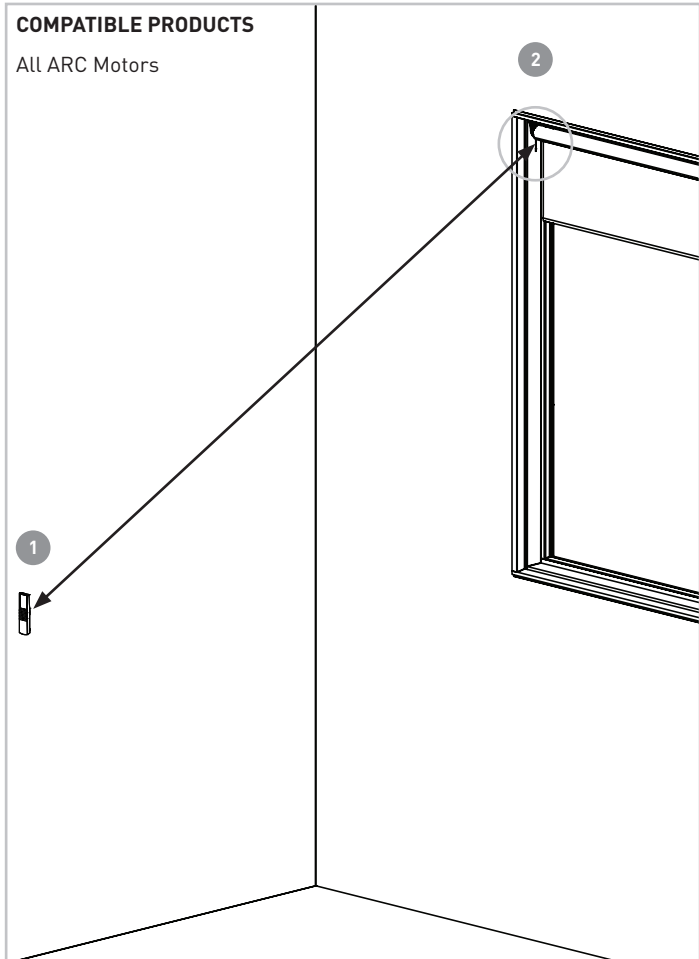
The 433 MHz signal power reduces with the increase of the propagation. The sensitivity of the motors or remote controls is -120dbm. The Diagnostic Remote can measure the signal power of the transmitter over a distance.

### 2.1 Motor RF Signal Reception Test

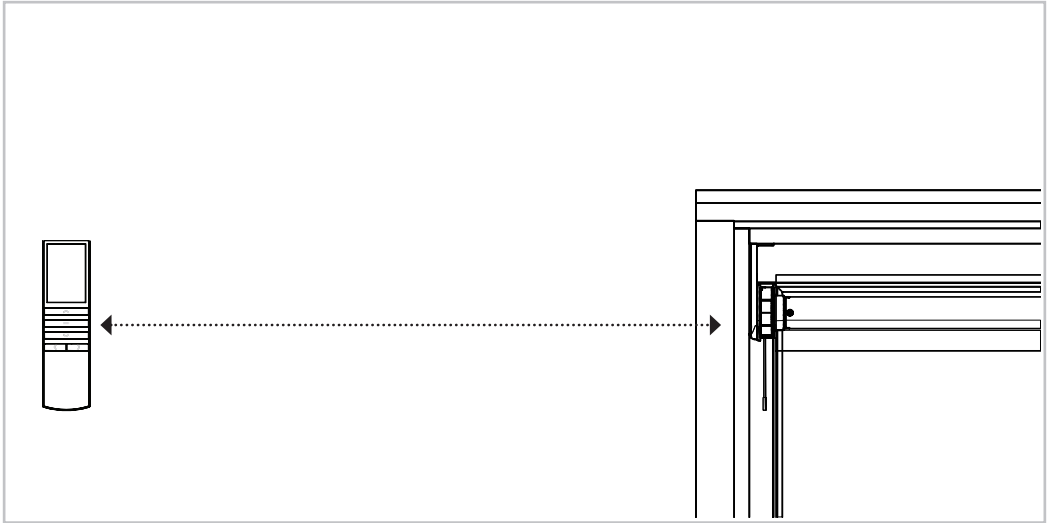
Using the MOTOR mode, the Diagnostic Tool simulates (pretends to be) a standard remote, so it can send commands (just like a normal remote) and then measure the RF response signal being sent to it by a Motor. The received signal strength is displayed on the diagnostic remote.

1. Select the MOTOR mode on the Diagnostic Tool [section 1.4]
2. Select a channel
3. Pair the ARC Motor to the Diagnostic Tool [section 1.7]
4. Press the **UP**, **DOWN** or **STOP** button of the Diagnostic Tool
5. Evaluate Diagnostic Tool readings at a distance

**COMPATIBLE PRODUCTS**  
All ARC Motors



| RSSI EVALUATION |         |
|-----------------|---------|
| -120 dBm        | BAD     |
| -110 dBm        | MINIMUM |
| -100 dBm        | OK      |
| -80 dBm         | BETTER  |
| -60 dBm         | BEST    |



**EXAMPLE MOTOR MODE DIAGNOSTIC READINGS**

|   |   |   |
|---|---|---|
| <p>MOTOR SIGNAL STRENGTH</p> <p>CHANNEL</p> <p>UP ARROW= DIAGNOSTIC REMOTE TO MOTOR</p> <p>DOWN ARROW= MOTOR TO DIAGNOSTIC REMOTE</p> | <pre> RSSI -057 DBM  ↑↓ CH 01 MOTOR  BAD CRC=05  DEST.ADDR DE 18 1B A8                 </pre> | <p>MOTOR RF SIGNAL STRENGTH OVER DISTANCE</p> <p>LOW BATTERY INDICATION</p> <p>PRODUCT CURRENTLY TESTED</p> <p>NUMBER OF CRC ERRORS FROM MOTOR</p> <p>MOTOR ADDRESS</p> |
|---|---|---|

**USING THE DIAGNOSTIC TOOL:**

**CRC ERRORS** – These can be caused by interference. A common cause can be garage door remotes and lack of signal strength. Turn off anything that emits an RF signal while testing.

**SIGNAL STRENGTH** – Measure the RF Signal power transmitted from the motor. The signal attenuates with the increase of propagation distance. The minimum value should be bigger than -110dbm for reliable RF communication.

## 2.2 Remote Control RF Signal Reception Test

Using the REMOTE MODE, the Diagnostic Tool simulates (pretends to be) a motor so it can measure the RF signal being sent to it by Remote Control. The received signal strength is displayed on the Diagnostic Tool.

1. Select the REMOTE mode on the Diagnostic Tool [section 1.4].
2. Toggle the POWER SAVING MODE to **OFF** on the Diagnostic Tool [section 1.6].
3. Keep the Diagnostic Tool close to the motor antenna and press a button on a standard remote to log the address of the standard remote with the Diagnostic Tool.
4. Fix the Diagnostic Tool next to the motor antenna.
5. Move away from the motor antenna/Diagnostic Tool.
6. Press a standard remote button over a distance.
7. Evaluate Diagnostic Tool readings. The address should be the same as set in step 3.
8. Toggle the POWER SAVING MODE to **ON** on the Diagnostic Remote once completed.

NOTE: In this mode the Diagnostic Tool only displays diagnostic info of the latest signal received. So before testing, please make sure no other RF devices sending signals in testing area.

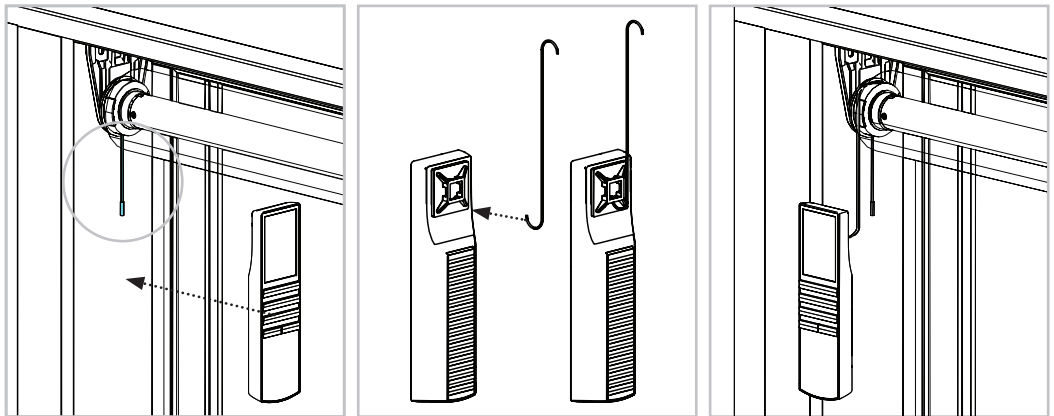
### COMPATIBLE PRODUCTS

#### Remote controls:

|                |            |
|----------------|------------|
| MTRF-REM-1C    | MTRF-WS-1C |
| MTRF-REM-15    | MTRF-WS-2C |
| MTRF-WS5-FLUSH | MTRF-WS-5C |
| MTRF-DCIM-1C   |            |

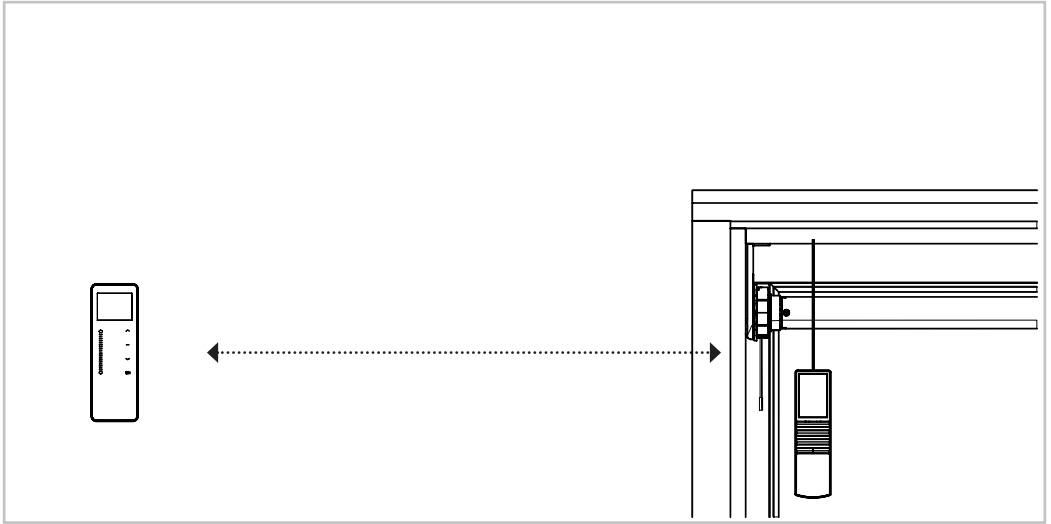
| RSSI EVALUATION |         |
|-----------------|---------|
| -120 dBm        | BAD     |
| -110 dBm        | MINIMUM |
| -100 dBm        | OK      |
| -80 dBm         | BETTER  |
| -60 dBm         | BEST    |

IMPORTANT: Keep Diagnostic Tool next to the motor antenna.



OPTIONAL: Use wire to attach Diagnostic Remote in place next to motor antenna (wire not supplied).

IMPORTANT: Ensure shade can rotate without interference.



**EXAMPLE MOTOR SIM MODE DIAGNOSTIC READINGS**

|  |  |   |
|--|--|---|
|  |  | <b>POWER SAVING MODE OFF ICON</b>                   |
| <b>RF SIGNAL STRENGTH GRAPHICAL VIEW</b>                             | <b>RSSI</b><br><b>-057 DBM</b>         | <b>RF SIGNAL STRENGTH OF REMOTE OVER A DISTANCE</b> |
| <b>CHANNEL</b>   | <b>↑ ↓ CH 01</b>                       | <b>LOW BATTERY INDICATION</b>                       |
| <b>UP ARROW MARK TO REMOTE</b><br><b>DOWN ARROW MARK FORM REMOTE</b> | <b>REMOTE</b>                          | <b>REMOTE MODE</b>                                  |
|  | <b>BAD CRC=05</b>                      | <b>NUMBER OF CRC ERRORS</b>                         |
|  | <b>DEST.ADDR</b><br><b>DE 18 1B A8</b> | <b>REMOTE ADDRESS</b>                               |

**USING THE DIAGNOSTIC TOOL:**

**CRC ERRORS** – These can be caused by interference. A common cause can be garage door remotes and lack of signal strength. Turn off anything that emits an RF signal while testing.

**SIGNAL STRENGTH** – The power of the RF signal from the tested remote propagated over a distance. The longer the distance, the weaker the signal power. The value should be more than -110dbm for good RF communication.

**DESTINATION ADDRESS** - This information can be used to check if the signal is from the test remote.

## 2.3 Sensor RF Signal Reception Test

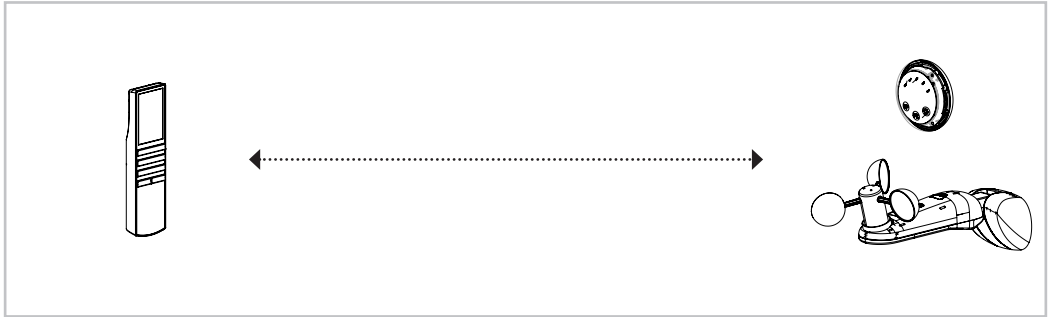
1. Select the SENSOR mode on the Diagnostic Tool [section 1.4]
2. Press the **P2** button on the Sun Sensor/Wind, Rain & Light Sensor
3. Evaluate Diagnostic Tool reading at a distance where a motor would receive the Sensor's signal

NOTE: In this mode the Diagnostic Remote only displays diagnostic info of the latest signal received. So before testing, please make sure no other RF devices sending signals in testing area.

### COMPATIBLE PRODUCTS

MTRF-SUNSENS

MT02-0301-072001



### USING THE DIAGNOSTIC REMOTE:

**CRC ERRORS** – These can be caused by interference. A common cause can be garage door remotes and lack of signal strength. Turn off anything that emits an RF signal while testing.

**SIGNAL STRENGTH** – Measure the RF Signal power transmitted from the sensor. The signal attenuates with the increase of propagation distance. The minimum value should be bigger than -110dbm for reliable RF communication.

| RSSI EVALUATION |         |
|-----------------|---------|
| -120 dBm        | BAD     |
| -110 dBm        | MINIMUM |
| -100 dBm        | OK      |
| -80 dBm         | BETTER  |
| -60 dBm         | BEST    |

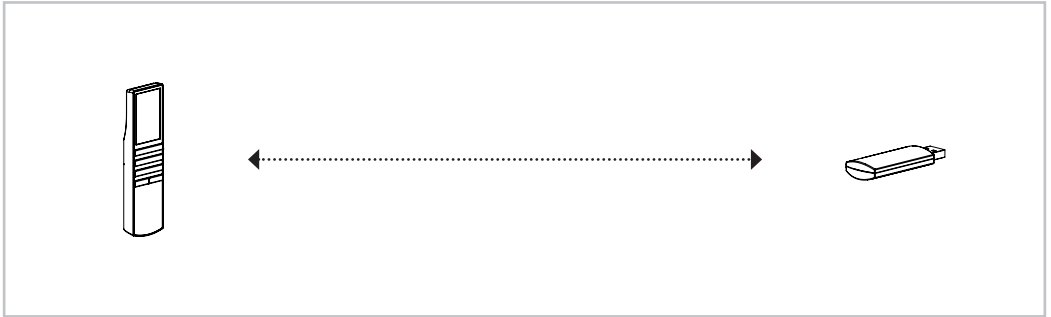


## 2.4 Repeater RF Signal Reception Test

1. Select the REPEATER mode on the Diagnostic Tool [section 1.4]
2. Press the **UP** or **DOWN** button of the Diagnostic Tool
3. Evaluate Diagnostic Tool reading at a distance where a motor would receive the Repeater's signal

### COMPATIBLE PRODUCTS

MT02-0401-050007



### USING THE DIAGNOSTIC TOOL:

**CRC ERRORS** – These can be caused by interference. A common cause can be garage door remotes and lack of signal strength. Turn off anything that emits an RF signal while testing.

**SIGNAL STRENGTH** – Measure the RF Signal power transmitted from the Repeater. The signal attenuates with the increase of propagation distance. The minimum value should be bigger than -110dbm for reliable RF communication.

| RSSI EVALUATION |         |
|-----------------|---------|
| -120 dBm        | BAD     |
| -110 dBm        | MINIMUM |
| -100 dBm        | OK      |
| -80 dBm         | BETTER  |
| -60 dBm         | BEST    |

| PART | MTPS-USB5-1000AU | MTPS-USB5-100EU | MT03-0301-050002 | MTPS-USB-BK |
|------|------------------|-----------------|------------------|-------------|
|      | AU               | EU              | UK               | US          |
|      |                  |                 |                  |             |
|      |                  |                 |                  |             |

## 2.5 Hub RF Signal Reception Test

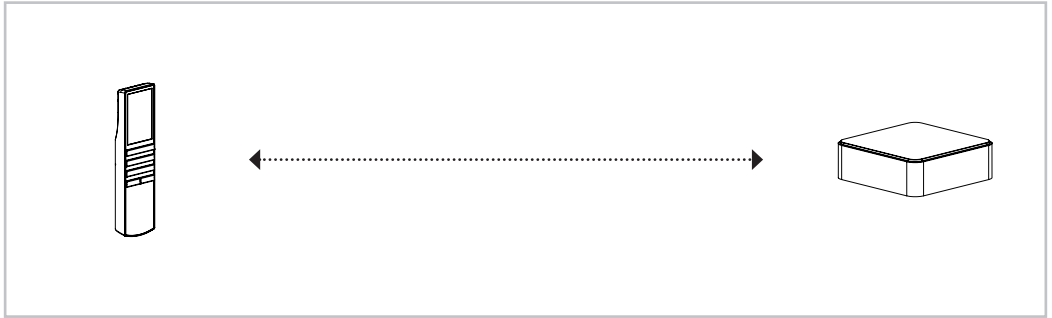
1. Select the HUB mode on the Diagnostic Tool [section 1.4]
2. Use Serial Protocol Commands or the Mobile App to control the Motor through the Hub
3. Evaluate Diagnostic Tool reading at a distance where a motor would receive the Hub's signal

NOTE: In this mode the Diagnostic Tool only displays diagnostic info of the latest signal received. So before testing, please make sure no other RF devices sending signals in testing area.

### COMPATIBLE PRODUCTS

MTRF-WIFIBRIDGE-KIT

MTRF-PULSE-AU



### USING THE DIAGNOSTIC TOOL:

**CRC ERRORS** – These can be caused by interference. A common cause can be garage door remotes and lack of signal strength. Turn off anything that emits an RF signal while testing.

**SIGNAL STRENGTH** – Measure the RF Signal power transmitted from the Hub. The signal attenuates with the increase of propagation distance. The minimum value should be bigger than -110dbm for reliable RF communication.

| RSSI EVALUATION |         |
|-----------------|---------|
| -120 dBm        | BAD     |
| -110 dBm        | MINIMUM |
| -100 dBm        | OK      |
| -80 dBm         | BETTER  |
| -60 dBm         | BEST    |

## 3 TROUBLE SHOOTING

### 3.1 General Components

| Problem  | Cause   | Remedy   |
|--|---|--|
| Motor RF cannot be detected                                  | Incorrect Mode is selected  | Switch to MOTOR mode   |
|  | Radio interference/shielding  | Ensure the motor antenna is positioned away from metal objects         |
|  | Motor distance is too far from the diagnostic tool                              | Move the Diagnostic Remote closer to a closer position                 |
|  | Power failure   | Check power supply to motor  |
|  | Incorrect wiring  | Check motor wiring is connected correctly                              |
|  | Motor is not paired to Diagnostic Tool  | Pair motor to Diagnostic Remote  |
| Standard Remote Control or Hub or Sensor can not be detected | MOTOR SIM mode is selected incorrectly  | Switch to REMOTE SIM mode  |
|  | Radio interference/shielding  | Ensure the remote/hub/sensor is positioned away from metal objects     |
|  | Remote control or Hub or Sensor distance is too far from the Diagnostic Tool    | Move the tool to a closer position                                     |
|  | Standard Remote or Sensor battery is flat, Hub is not connected to power supply | Replace batteries or check power supply to Hub                         |
| Repeater RF can not be detected                              | Radio interference/shielding  | Ensure the Repeater is positioned away from metal objects              |
|  | Power failure   | Check power supply to Repeater   |
|  | Diagnostic Tool has not sent a command to the Repeater                          | Press <b>UP</b> , <b>DOWN</b> or <b>STOP</b> button on Diagnostic Tool |

### 3.2 Diagnostic Tool

| Problem  | Cause                                   | Remedy   |
|--|---|--|
| Diagnostic Tool is not responding                | Diagnostic Remote battery is flat       | Replace batteries  |
|  | Diagnostic Battery inserted incorrectly | Check battery polarity   |
|  | Radio interference/shielding            | Ensure the Diagnostic Tool is positioned away from metal objects and the aerial on the Diagnostic Tool/receiver is kept straight and away from metal |
| Diagnostic Tool is not automatically turning off | Power saving mode is selected           | Deselect power saving mode   |

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