# UCP

# User's Manual

# Introduction

UCP or "Unit for Configuration of Pachom" is used for configuration and testing of UBEP units. It can also be used for basic test of UPI unit. In this user manual we will cover all options currently available on UCP unit so that you can go straight with setting up your system.

On the front of the UCP unit there is a 272x480px TFT Touch Screen available together with RGB status LED.

TFT Touch Screen is based on resistive panel technology which makes it well suited for industrial applications. Unlike mobile phone touch screen UCP can be operated with the gloves as well.

RGB LED will blink every 2-3 seconds as "heart-beat" of device and it will show when device is transmitting the configuration or any other command.
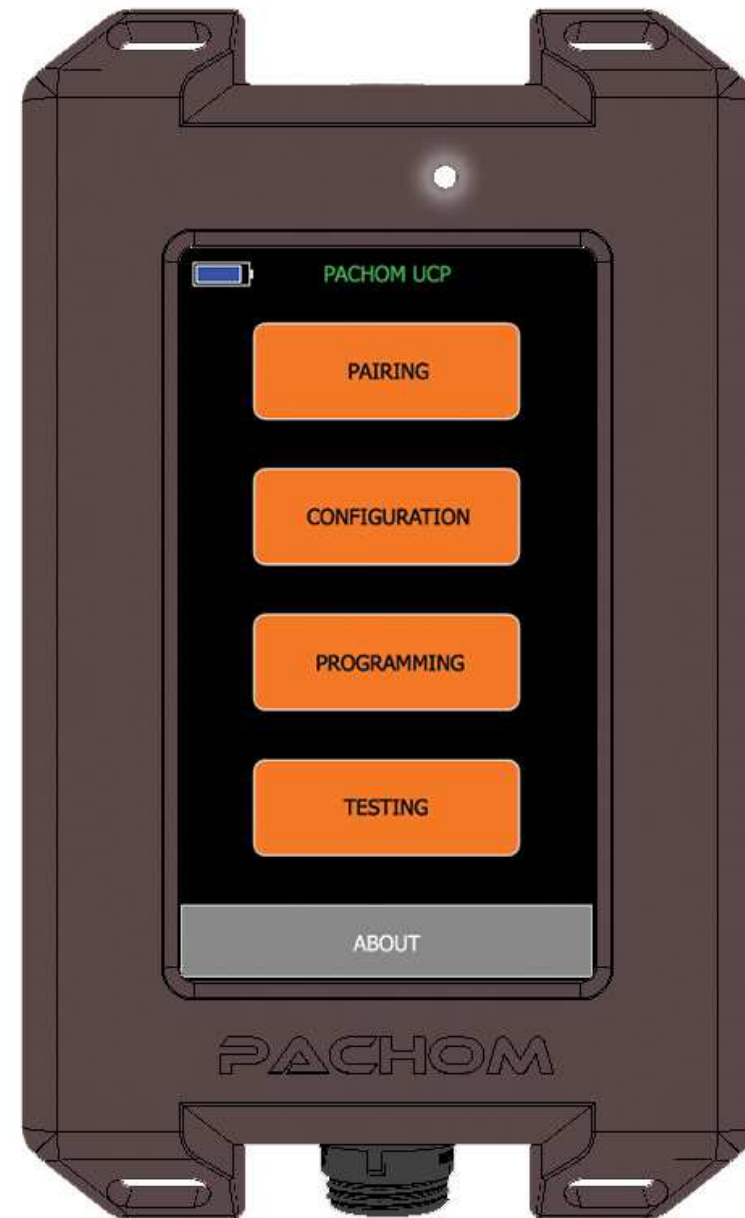
# Power Switch, USB Connector and charging

On the top side of UCP unit power switch with LED Ring is available. In order to turn on UCP unit press power switch. UCP screen will turn on immediately and you should hear short buzz as power up confirmation. In order to turn off UCP unit you must press and hold power switch for 1 second.

On the bottom side of UCP unit there is USB Connector available. The connector is in a MINI-B form factor. The only purpose of UCB connector is the charging of the UCP internal battery. UCP supports both standard 500mA USB charging and high current 1A charging. UCP can be charged regardless if the unit is turned on or off. LED Ring on power switch will represent the status of the charging in both cases.

When USB power is not connected LED Ring will be off. If USB Cable is connected and charging is in progress LED Ring will blink with 1 second pace. Once the charging is done and battery is full LED Ring will be always on.

You can get more details on battery status when you power up UCP unit on the top left side of the Home Screen. This battery bar will also show battery level while device is being used. Several status informations are available at the moment:

*Power Switch with LED Ring*

Bottom Side:
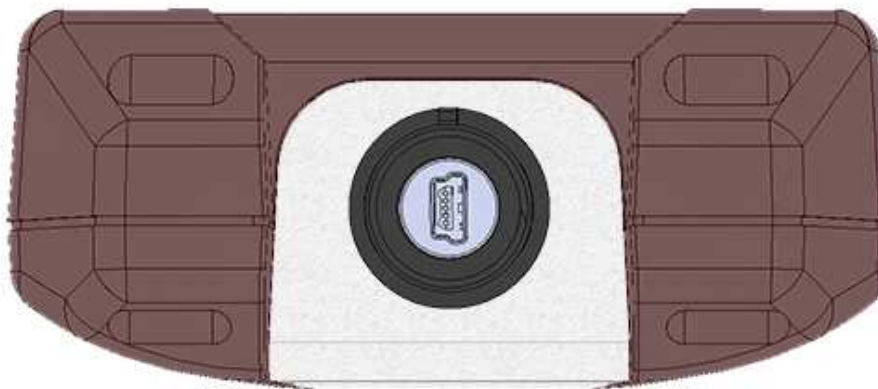


*USB Connector for Battery Charging*

Charging in progress

Charging finished

Battery Empty

Battery Low

Battery Medium

Battery Good

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# Home

After your UCP unit is powered up Home Screen will show up. On Top-Left side of this screen there is Battery status information available. Battery level will be represented by the bar fill. There are several different status information that you can get:

- Battery level information

- Battery Empty warning

- Battery Charging in progress

- Battery Charging finished (battery full)

On Home Screen four buttons are available: "Pairing", "Configuration", "Programming" and "Testing".

Setting up your UBEP unit is really simple and can be done in 4 basic steps:

- Pairing

- Configuration

- Programming

- Testing

We will cover all of these steps one by one.
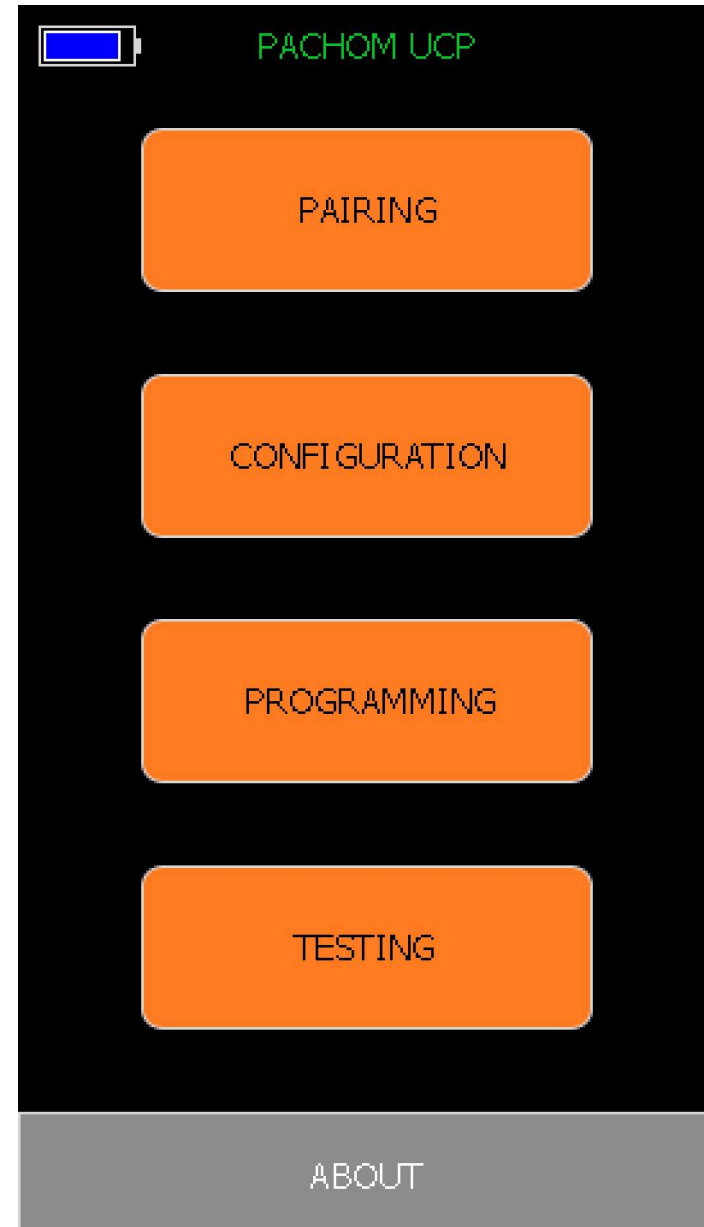
## Pairing

As step 1 you must select "Pairing" button on Home Screen. This will bring you to Pairing Screen. There are four functional buttons available: "Pair with UBEP", "Check ID UBEP", "Pair with UPI" and "Check ID UPI". You can use "Back" button to get back to Home Screen at any time.

PAIRING

PAIR WITH UBEP

CHECK ID UBEP

PAIR WITH UPI

CHECK ID UPI

BACK
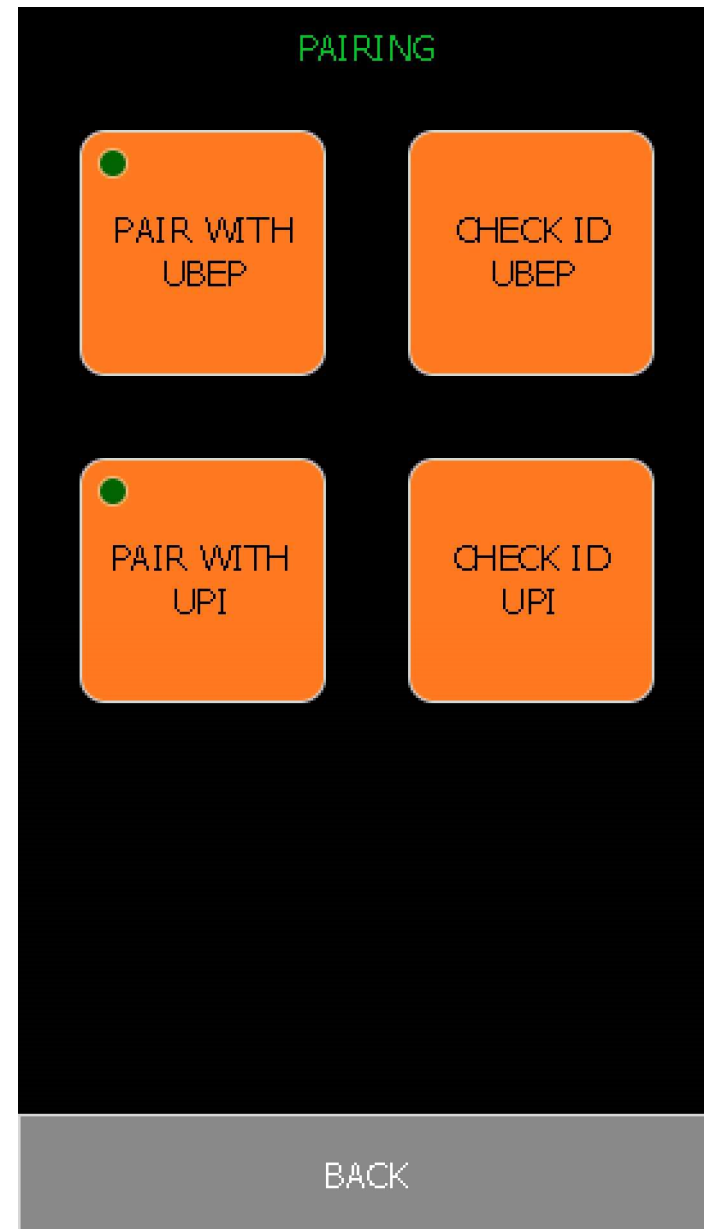
## Pair with UBEP and Check UBEP ID

In order to pair with UBEP unit you must click "Pair with UBEP" button. You will get "Waiting for UBEP ID…" message on the screen. At this stage you must power Off/On your UBEP unit. UBEP unit will send its ID on power-up and UCP will pick-up this ID. Once UCP unit picks-up UBEP ID it will show a message "UBEP ID Received | Serial number:" followed by serial number in the 2nd raw.

Now you can verify if you are paired with correct UBEP unit by pressing "Check ID UBEP" button. UBEP unit that you are paired with will respond to "Check ID UBEP" command by turning on White LED for a second.
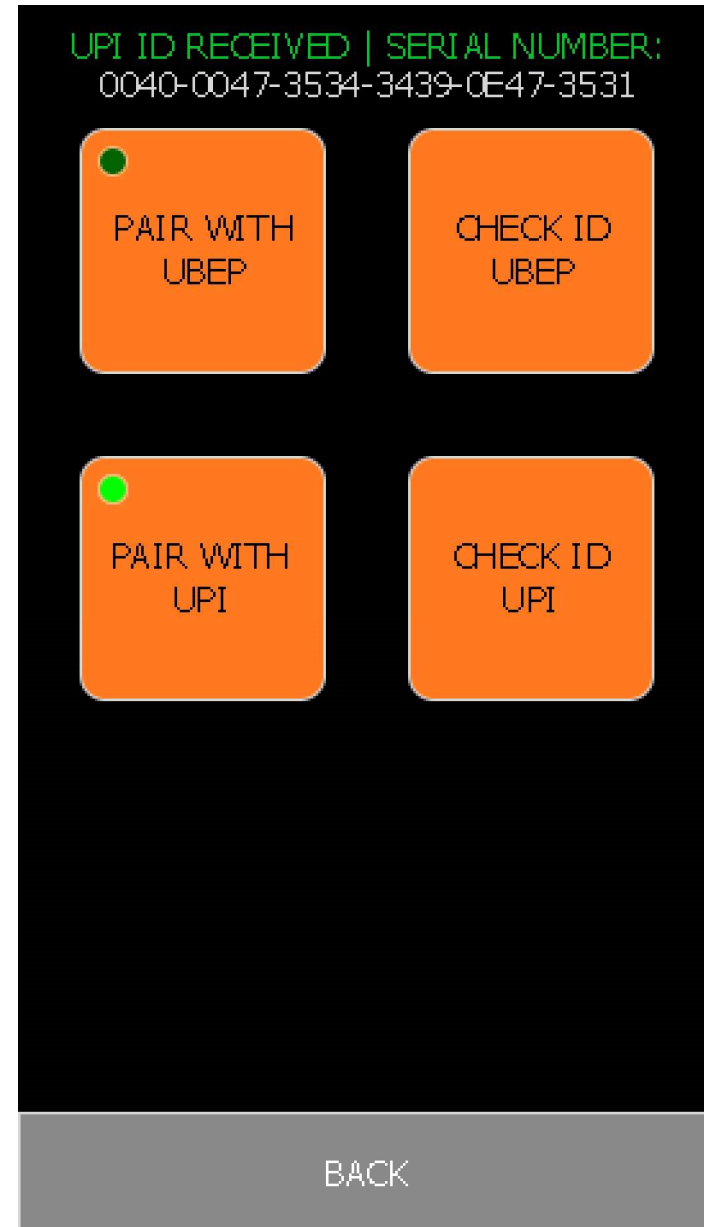
UBEP ID RECEIVED | SERIAL NUMBER:
3230-3934-3335-5104-0026-002D

PAIR WITH UBEP

CHECK ID UBEP

PAIR WITH UPI

CHECK ID UPI

BACK

## Pair with UPI and Check UPI ID

In order to pair with UPI unit you must click "Pair with UPI" button. You will get "Waiting for UPI ID…" message on the screen. At this stage you must either initiate Demo on UPI unit or Reset UPI unit by placing it on Charging Pad and then taking it off. In both cases UPI unit will send its ID. Once UCP unit picks-up UPI ID it will show a message "UPI ID Received | Serial number:" followed by serial number in the 2<sup>nd</sup> raw.

Now you can verify if you are paired with right UPI unit by pressing "Check ID UPI" button. UPI unit that you are paired with will respond to "Check ID UPI" command by turning on short vibration and White LED for a second.

After you verified that you are paired with the correct UBEP and/or UPI unit you can go back to Home Screen by pressing "Back" button.

UPI ID RECEIVED | SERIAL NUMBER:
0040-0047-3534-3439-0E47-3531

PAIR WITH UBEP

CHECK ID UBEP

PAIR WITH UPI

CHECK ID UPI

BACK

# Configuration

As step 2 you must select "Configuration" button on Home Screen. This will bring you to Configuration Screen. There are six buttons available: "Load Preset 1", "Save Preset 1", "Load Preset 2", "Save Preset 2", "Load STD Config" and "View/Edit Config". You can use "Back" button to get back to Home Screen.

## Loading Preset

You can load presets by pressing "Load Preset 1" or "Load Preset 2" button. You can use these to configure your UBEP unit or as a base to make new configuration. If device is used for the first time Preset 1 and 2 will not be available which will be represented by dark green mark on "Load Preset 1" and "Load Preset 2" buttons.
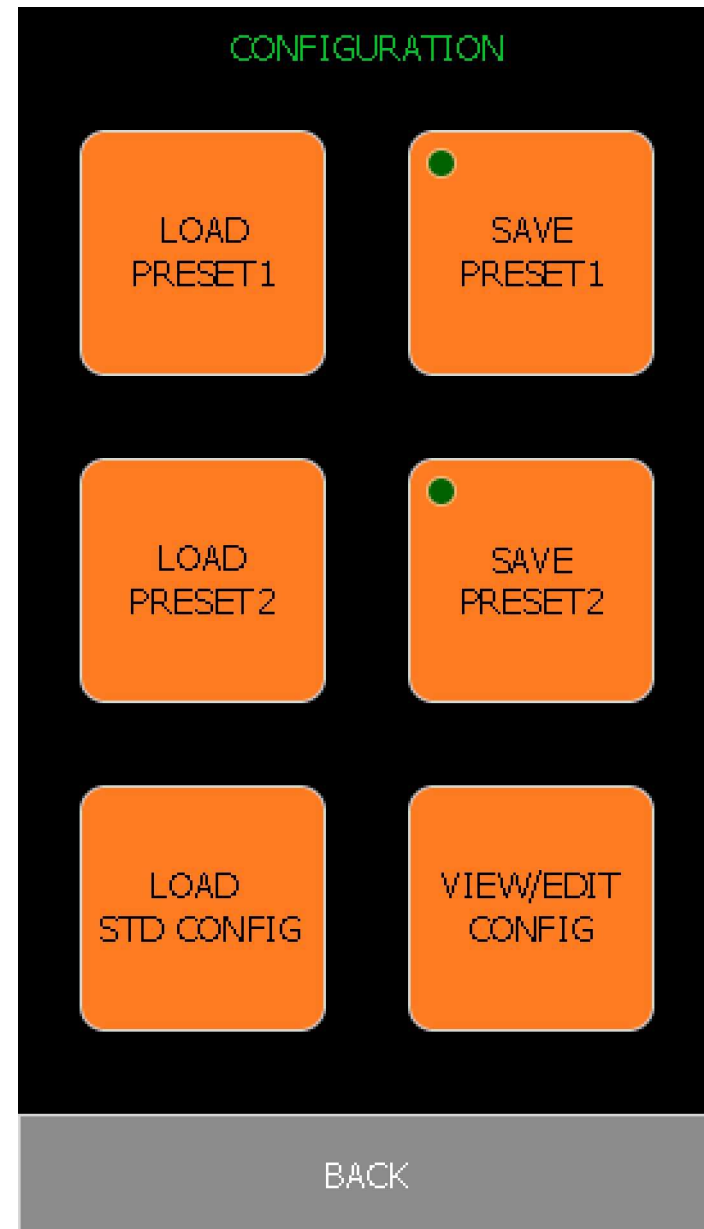
## Loading Standard Configuration

To load any of the available Standard Configurations you must select "Load STD Config" button. This will bring you to Load Standard Config Screen. There are four different groups available: "Truck", Forklift", "Gantry" and "Demo". You can use "Back" button to get back to Configuration Screen.

Within each group several different configurations are available. You can load any of them by clicking on appropriate button. Each Standard Configuration has a unique definition number and appropriate image that should help identifying a particular application covered by it.
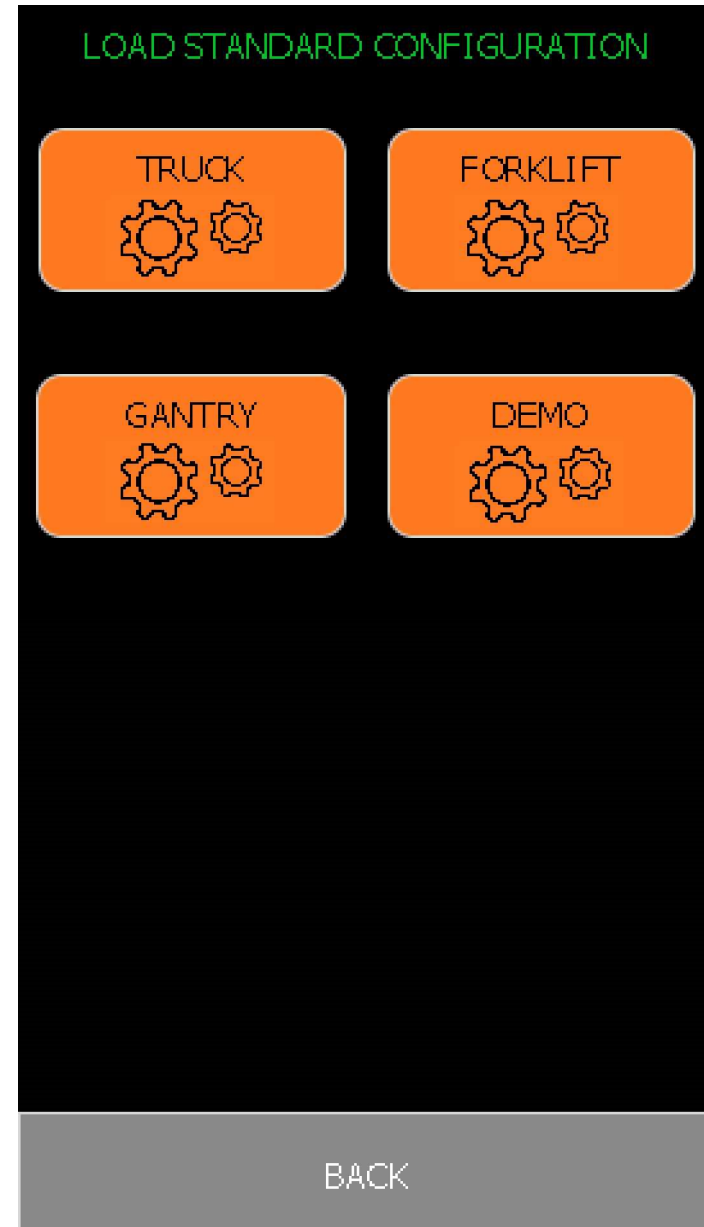
TRUCK Group:

LOAD CONFIGURATION - TRUCK

TR-RL1-XEL04X

TR-RL1-XXL02X

TR-FA1-XXL02X

TR-FL1-XXL02X

TR-SL1-XXE02X

BACK

FORKLIFT Group:

LOAD CONFIGURATION - FORKLIFT

FL-WL1-XXL02X

FL-WL1-XXL03X

FL-OL1-XEL04X

BACK

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GANTRY GROUP:

LOAD CONFIGURATION - GANTRY

| GT-BL1-LXL1005 | GT-BL1-XLL05X |
| GT-BA1-LXL1005 | GT-BA1-XLL05X |

BACK

DEMO Group:

LOAD CONFIGURATION - DEMO

| DM-TL1-XXX01X | DM-TL1-XXL01X |
| DM-TL1-XXX0HX | DM-TL1-XXL0HX |

BACK

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## View/Edit Config

You can view/edit your configuration by pressing "View/Edit Config" button. This will bring you to View/Edit Configuration Screen. On top of the screen you can see a message with information whether you are "Working from Scratch", "Working from Standard Config", "Working from Preset 1" or "Working from Preset 2".

There are eight buttons available: "Condition 0", "Action 0", "Condition 1", "Action 1", "Condition 2", "Action 2", "Condition 3" and "Action 3". You can use "Back" button to get back to Configuration Screen.

Each "Action" is associated with appropriate "Condition". This means that you can set a total of four (4) different Conditions on your UBEP unit. When any of those four conditions are fulfilled UBEP unit will act upon the settings associated with it.

## Condition 1

If you press "Condition 1" button it will bring you to Condition 1 Screen. In this screen you can choose to enable or disable various conditions and sensor inputs together with alarm output that will be used on UBEP unit. We will cover what each option will do one by one.

- "Line In" – If this option is enabled UBEP unit will use Line In input as part of the condition; Line In is considered active on a low to high voltage change (rising edge) and for the next 2 seconds from last rising edge occurrence.

- "Accel" – If this option is enabled UBEP unit will use Acceleration detection as part of the condition; Acceleration is considered active on non-acceleration to acceleration change (rising edge) and for the next 1 second from last rising edge occurrence.

- "Loop" – If this option is enabled "Line In" and "Accel" inputs will have continuous input detection (instead of "edge" detection) and will be considered active as long as the input is active; for "Line In" the input will be considered active as long as it has high voltage while for "Accel" the input will be considered active as long as acceleration is detected.

- "10M Motion" – If this option is enabled UBEP unit will use ten meter PIR sensor as part of the condition.

- "5M Motion" – If this option is enabled UBEP unit will use five meter PIR sensor as part of the condition.

- "2M Motion" – If this option is enabled UBEP unit will use two meter PIR sensor as part of the condition.

- "On Start" – If this option is enabled UBEP unit will consider Condition as TRUE for the first 500ms of UBEP system start-up.

- "UBEP Alarm" – This option can be used to set if and when UBEP unit will output the alarm. There are several options available:
    - No Alarm – No Alarm will be generated when Condition is TRUE
    - OUT1/Cond – UBEP will activate output line 1 to high voltage state as soon as Condition is TRUE
    - OUT2/Cond – UBEP will activate output line 2 to high voltage state as soon as Condition is TRUE
    - OUT3/Cond – UBEP will activate output line 3 to high voltage state as soon as Condition is TRUE (Output line 3 is not available in the Standard UBEP setup)
    - OUT4/Cond – UBEP will activate output line 4 to high voltage state as soon as Condition is TRUE (Output line 4 is not available in the Standard UBEP setup)
    - OUT1/Reply – UBEP will activate output line 1 to high voltage state IF and when UBEP gets a Reply from UPI
    - OUT2/Reply – UBEP will activate output line 2 to high voltage state IF and when UBEP gets a Reply from UPI
    - OUT3/Reply – UBEP will activate output line 3 to high voltage state IF and when UBEP gets a Reply from UPI (Output line 3 is not available in the Standard UBEP setup)
    - OUT4/Reply – UBEP will activate output line 4 to high voltage state IF and when UBEP gets a Reply from UPI (Output line 4 is not available in the Standard UBEP setup)

- "RF Power" – This option can be used to set the size of RF protection zone. Available values are between -31dBm (the weakest RF field and the smallest protection zone) and 0dBm (the

strongest RF field and the biggest protection zone). In case this parameter is set to "Off" RF protection zone is not used.

- "Target Dev." – This option is used to determine if RF protection zone is applied to all Pachom devices or for a particular type. There are several options available at the moment: "All", "UPI" and "Pachom RF".

You can combine either "Line In" or "Accel" input with any of the PIR Sensors with or without "Loop" flag. In case that you are using RF protection zone you have to define the appropriate Action that will be sent as message to UPI.

If you set only "Loop" flag without any other inputs/sensors enabled, this will be considered as "unconditional execution". This is useful if you want to set a permanent RF protection zone around the vehicle.

## Action 1

If you press "Action 1" button it will bring you to Action 1 Screen. In this screen you can choose how UPI unit will act upon reception of Condition 1 message. We will cover what each option will do one by one.

- "Vibration" – With this option you can choose whether "Const" (Constant) or "Pulse" vibration will be used to execute message on UPI unit.

- "Motor" – With this option you can choose whether "One" or "Alt" (Alternate) vibration scheme will be used to execute message on UPI device. UPI will use only one motor during execution of complete message if you select option "One". On the other hand different motor will be used between message cycles if you select option "Alt".

- "Motor PWR %" – With this option you can choose motor power that will be used to execute message on UPI unit.

- "Color" – With this option you can choose LED color that will be used to execute message on UPI unit.

- "Cycles #" – With this option you can choose how many vibration cycles will be applied while executing message on UPI unit.

- "Alarm time ms" – With this option you can choose the length of alarm (in ms) during execution of one message cycle.

- "Cycle delay ms" – With this option you can choose the length of delay (in ms) to be applied between two message cycles.

- "Alarm delay ms" – With this option you can choose the length of delay (in ms) to be applied at the end of message execution on UPI unit.

After you are finished setting up Action 1 options you should press "Back" button to go back to View/Edit Configuration Screen.

## Other Conditions and Actions

By pressing appropriate button in View/Edit Configuration Screen you can set up other Conditions and Actions too. These conditions and actions offer the same options as previously described in Condition 1 and Action 1 topics. You can refer to Condition 1 and Action 1 topics for more details on each option.

By setting up several different Conditions you can configure UBEP unit to transmit message on various inputs/sensors and for several different protection zones. You can also set-up different Actions which will cause UPI unit to react differently on different conditions or different protection zone size.

After you are finished setting up all conditions and actions you can go back to Configuration Screen by pressing "Back" button.

## Save Preset

Within Configuration Screen you can choose to save current configuration into Preset 1 or Preset 2 memory locations in order to use the same configuration later. You can do this by pressing "Save Preset 1" or "Save Preset 2" button.

When UCP unit is finished saving current configuration into memory location it will show this preset as available by placing light green mark on appropriate preset button.

After you are finished with loading existing configuration, editing from scratch or simply viewing existing configuration use "Back" button to go back to Home Screen.
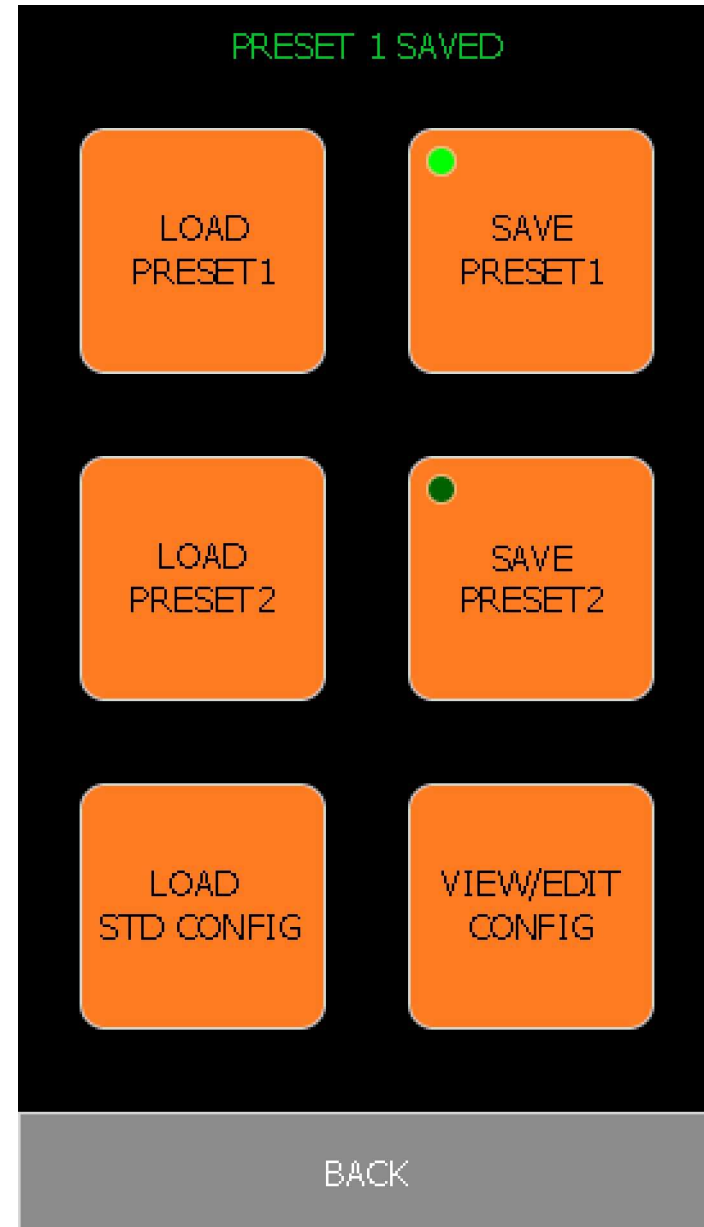
## Examples

We will go through several examples in order to explain how you can use many of the available options in Conditions and Actions in order to help setting up your UBEP device properly.

There is automatic options validity check within the View/Edit Screen. If Condition or Action is setup properly it will be marked with light green mark on each button.

If there is dark green mark on a button it means that the Condition/Action is either not used at all (blank) or it is not set up properly.

In order for Condition to be valid at least one input/sensor flags has to be selected. Also at least one output type has to be set up: either UBEP Alarm on Condition (without the use of RF protection zone) or RF protection zone with any of the available UBEP Alarm options.

In case that you are using RF protection zone you must set up the appropriate Action too. In order for Action to be valid you must select Motor Power and/or LED Color to be used on UPI. Also at least one cycle and some Alarm time has to be set.

## Example 1 – Condition 1 Good Setup:

In this example UBEP unit will activate alarm output on OUT2 line if motion is detected on 5 meter PIR sensor within 2 seconds from rising edge on Line In input. No RF protection zone is used.

## Example 2 – Condition 1 Good setup:

In this example UBEP unit will activate alarm output on OUT2 line if motion is detected on 5 meter PIR sensor as long as Line In input is active (high voltage level). No RF protection zone is used.

## Example 3 – Condition 1 Good setup:

In this example UBEP unit will create RF protection zone with -12dBm of power as long as Line in input is active (high voltage level). UBEP unit will activate alarm output on OUT2 line if it receives the Reply from UPI located inside of protection zone.



CONDITION 1

LINE IN

ACCEL

LOOP

10M Motion

5M Motion

2M Motion

UBEP ALARM
◄ OUT2/Reply ►

ON START

RF POWER
◄ -12dBm ►

TARGET DEV
◄ Any ►

BACK

## Example 4 – Condition 1 Good setup:

In this example UBEP unit will create RF protection zone with -12dBm of power all the time (unconditionally). UBEP unit will not generate any of the output alarms.



CONDITION 1

| LINE IN | ACCEL | LOOP |

| 10M Motion | 5M Motion | 2M Motion |

UBEP ALARM
No Alarm

ON START

RF POWER
-12dBm

TARGET DEV
Any

BACK

## Example 5 – Condition 1 Bad setup:

In this example UBEP unit is not configured correctly because there is no RF protection zone activated nor UBEP is setup to activate any of the output alarms on Condition event.

**CONDITION 1**

- LINE IN
- ACCEL
- LOOP
- 10M Motion
- 5M Motion
- 2M Motion
- UBEP ALARM: ◄ No Alarm ►
- ON START
- RF POWER: ◄ Off ►
- TARGET DEV: ◄ Any ►

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## Example 6 – Action 1 Good setup:

In this example UBEP must be set to create RF protection zone. This Action will command UPI to execute short and medium strength vibration in constant mode. This setup is suitable to be used as a warning.



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## Example 7 – Action 1 Good setup:

In this example UBEP must be set to create RF protection zone. This Action will command UPI to execute long and powerful vibration in pulsating mode. This setup is suitable to be used as alarm.

## Example 8 – Action 1 Bad setup:

In this example UBEP unit is not configured to send a proper command to UPI. In "Cycle" parameter not even one cycle is selected.

# Programming

As step 3 you must press "Programming" button available on Home Screen. This will bring you to Programming Screen. There are three options available: "Send Custom UBEP Configuration", "Send Standard UBEP Configuration" and "Send Erase UBEP Configuration". You can use "Back" button to get back to Home Screen at any time.
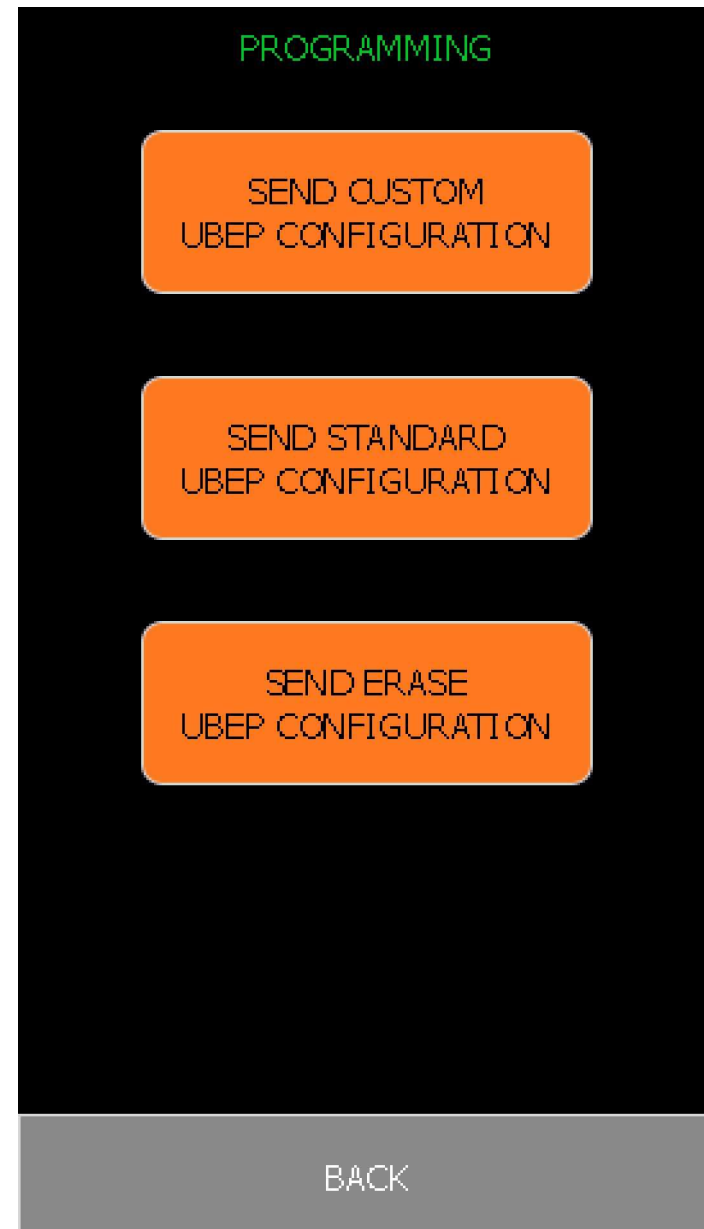
## Send Custom UBEP Configuration

This Option is used to send custom configuration and receive acknowledgement from paired UBEP unit.

You must initiate programming by pressing "Send Custom Configuration" button. UCP will start procedure with sending configuration, followed by writing of new configuration in UBEP unit's memory and end the procedure with receiving acknowledgment from UBEP unit.

Note: After UBEP unit is finished programming new configuration into memory and respond with acknowledgement message UBEP unit will be reset automatically.

After you are finished programming UBEP unit you can use "Back" button to go back to Programming Screen.
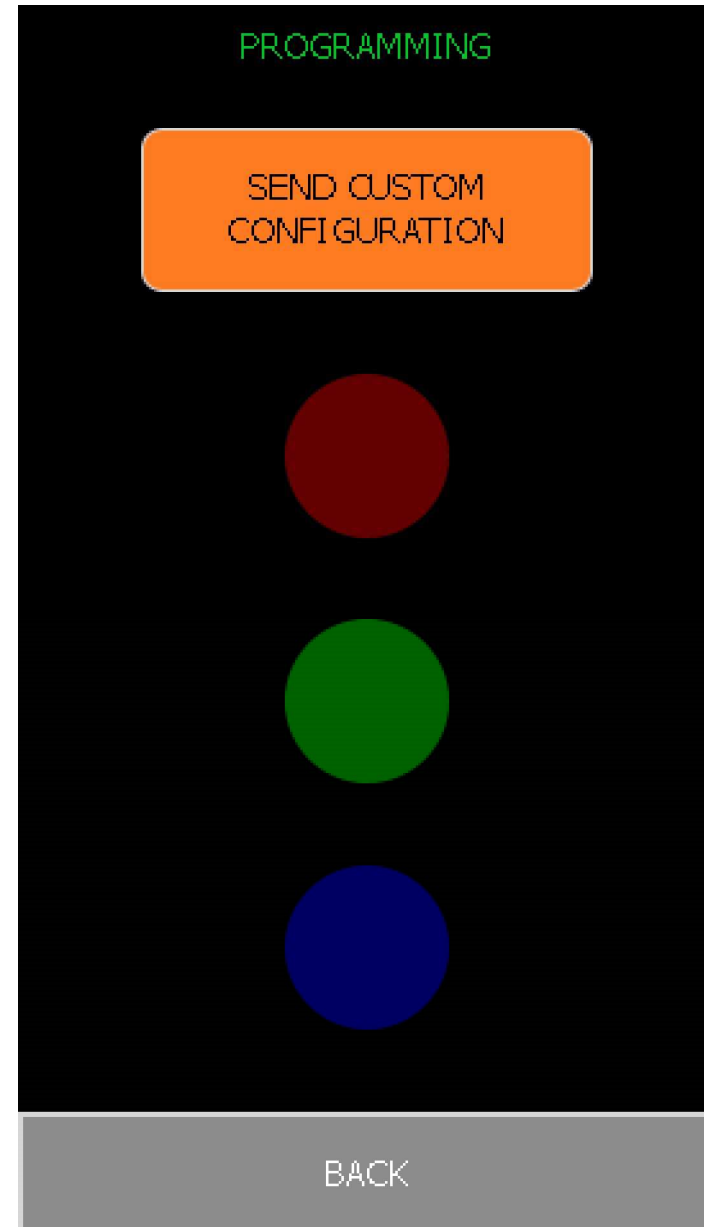
In case of successful programming UCP unit will show the message "UBEP Programming Finished OK" and Green light will show up on the screen.
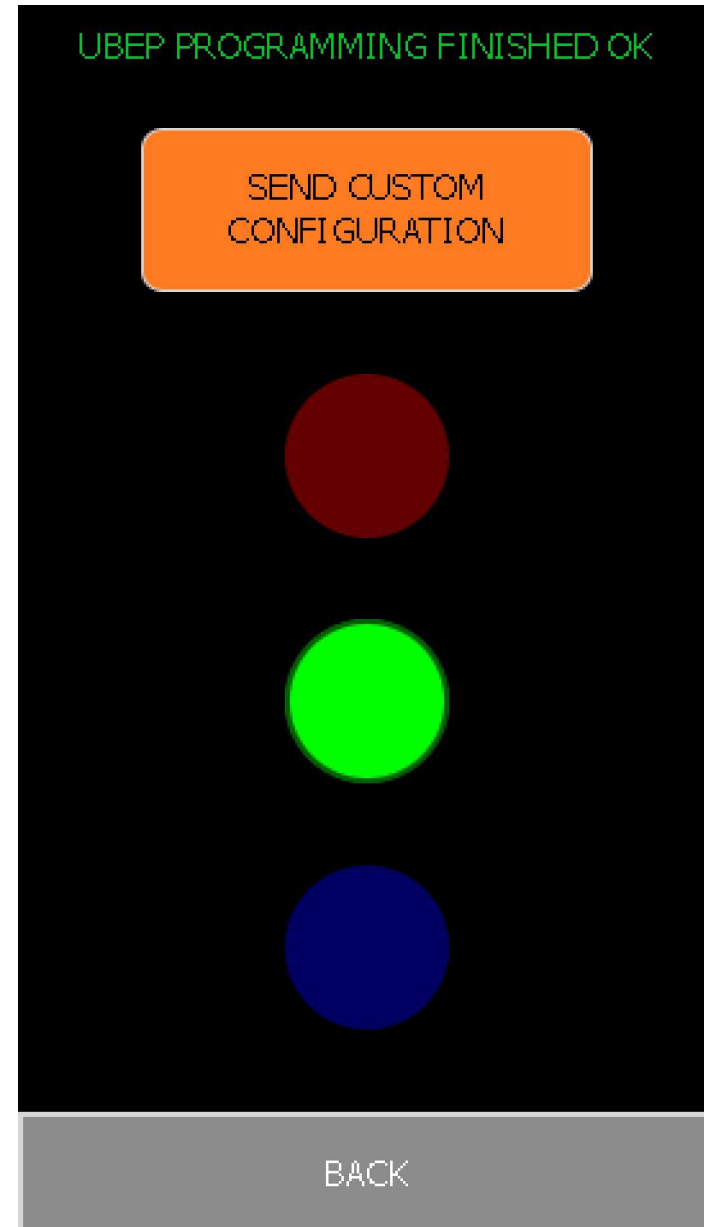
In case of programming Erase/Write error UCP will show message "UBEP erase error| please try again" or "UBEP write error| please try again" and Red light will show up on the screen.
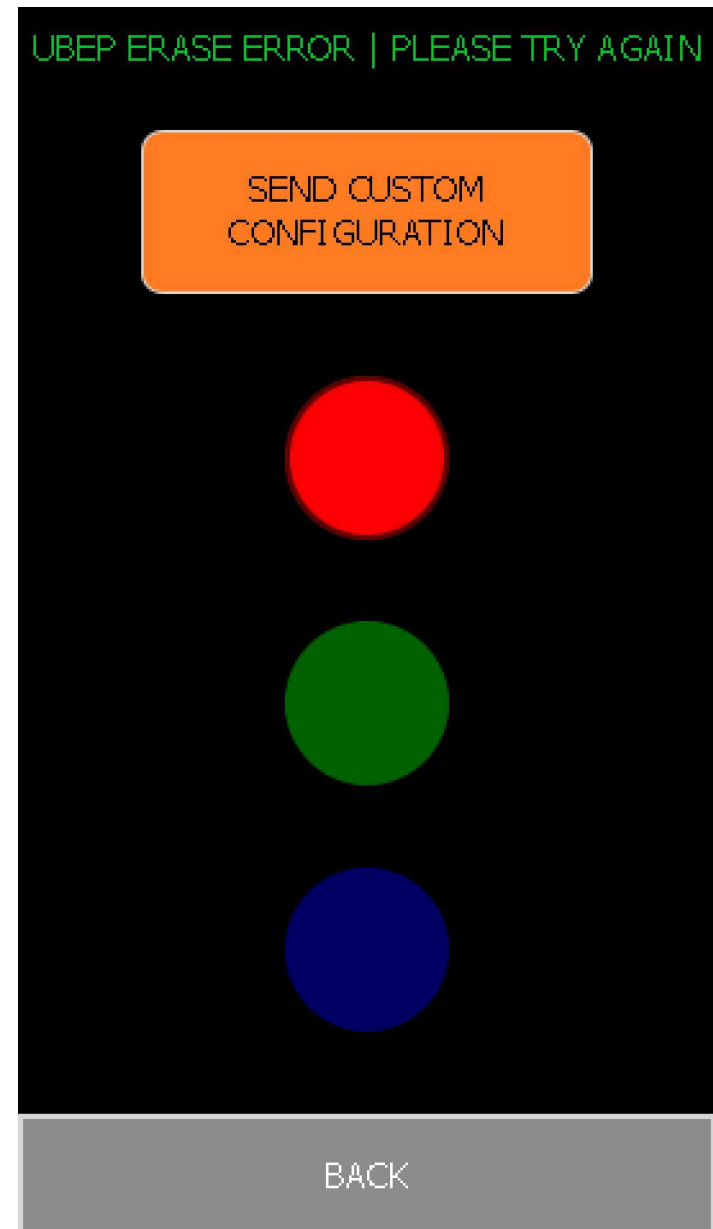
In case of reception error UCP will show message "UBEP Rx error| please try again" and Blue light will show up on the screen. In all cases it is recommended that you power Off/On UBEP unit and try programming again.



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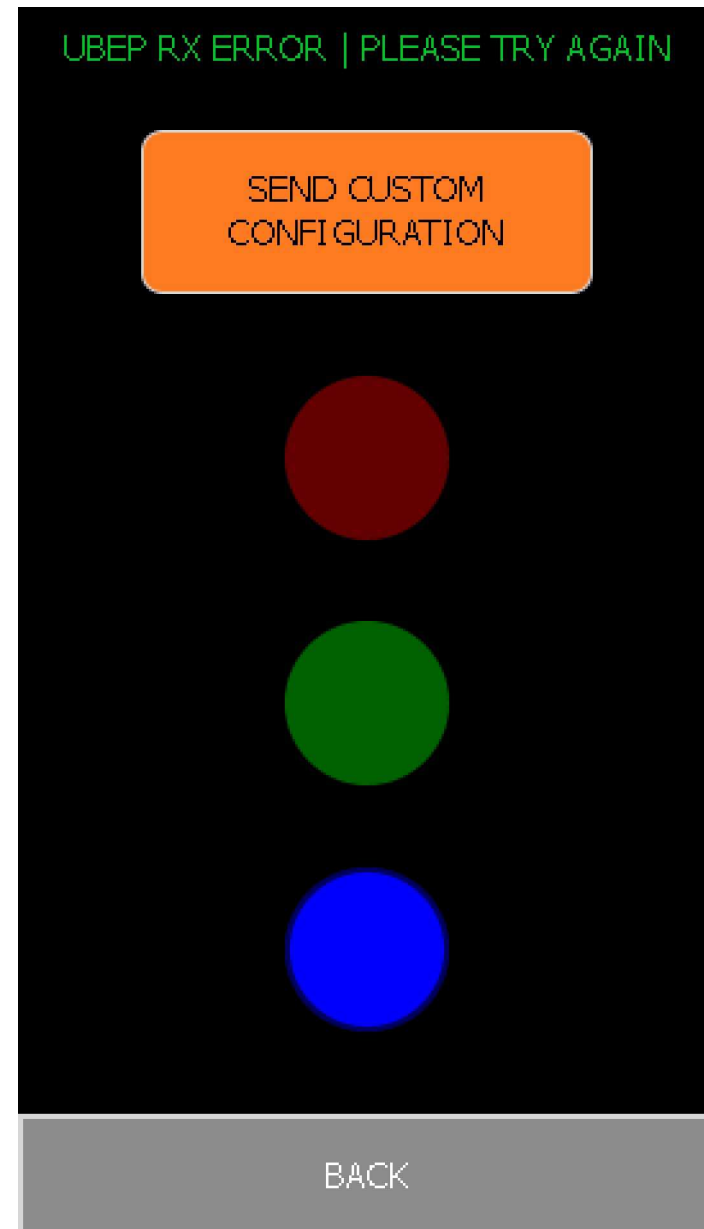
## Send Standard UBEP Configuration

To send any of the available Standard Configurations you must select "Send Standard UBEP Configuration" button. This will bring you to Send Standard Configuration Screen. There are four different groups available: "Truck", Forklift", "Gantry" and "Demo". You can use "Back" button to get back to Programming Screen.

Within each group several different configurations are available. You can send any of them by clicking on appropriate button. Each Standard Configuration has a unique definition number and appropriate image that should help identifying a particular application covered by it.
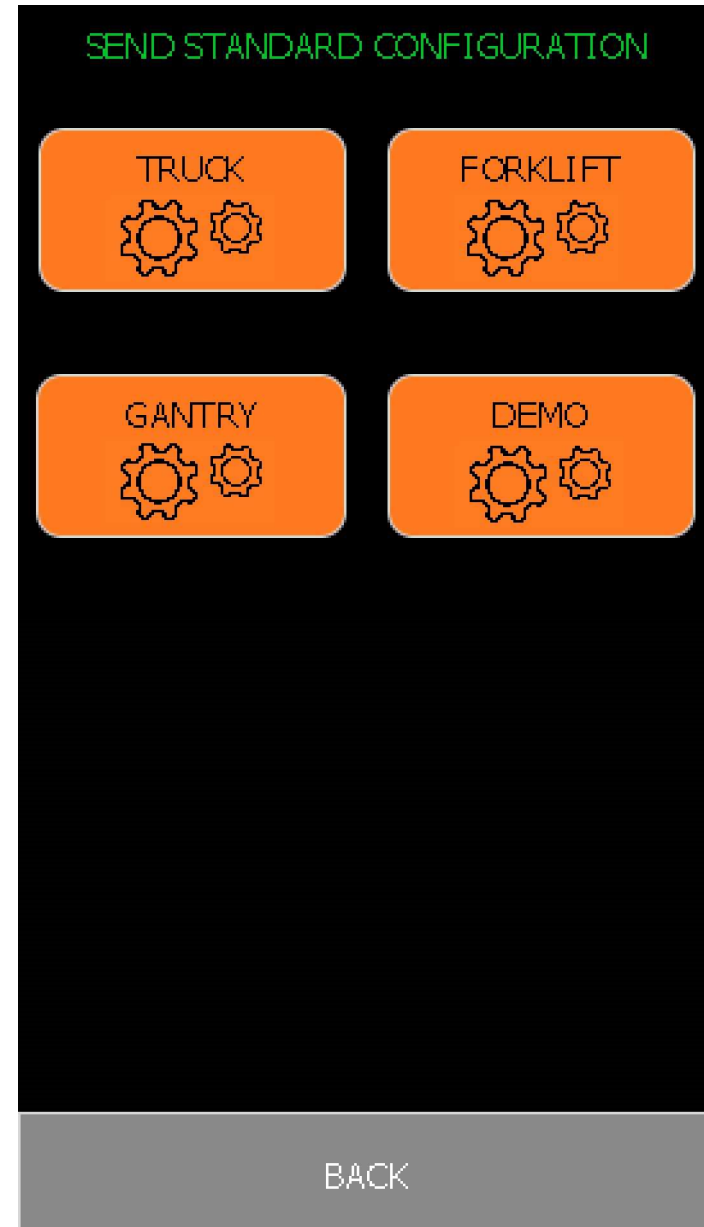
TRUCK Group:

SEND CONFIGURATION - TRUCK

TR-RL1-XEL04X

TR-RL1-XXL02X

TR-FA1-XXL02X

TR-FL1-XXL02X

TR-SL1-XXE02X

BACK

FORKLIFT Group:

SEND CONFIGURATION - FORKLIFT

FL-WL1-XXL02X

FL-WL1-XXL03X

FL-OL1-XEL04X

BACK

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GANTRY GROUP:

SEND CONFIGURATION - GANTRY

| GT-BL1-LXL1005 | GT-BL1-XLL05X |
| GT-BA1-LXL1005 | GT-BA1-XLL05X |

BACK

DEMO Group:

SEND CONFIGURATION - DEMO

| DM-TL1-XXX01X | DM-TL1-XXL01X |
| DM-TL1-XXX0HX | DM-TL1-XXL0HX |

BACK

After you press appropriate Standard Configuration button UCP will send programming information to the UBEP and wait for the UBEP to send back acknowledge information. In case of successful programming UCP unit will show the message "UBEP Programming Finished OK". In case of programming Erase/Write error UCP will show message "UBEP erase error| please try again" or "UBEP write error| please try again".
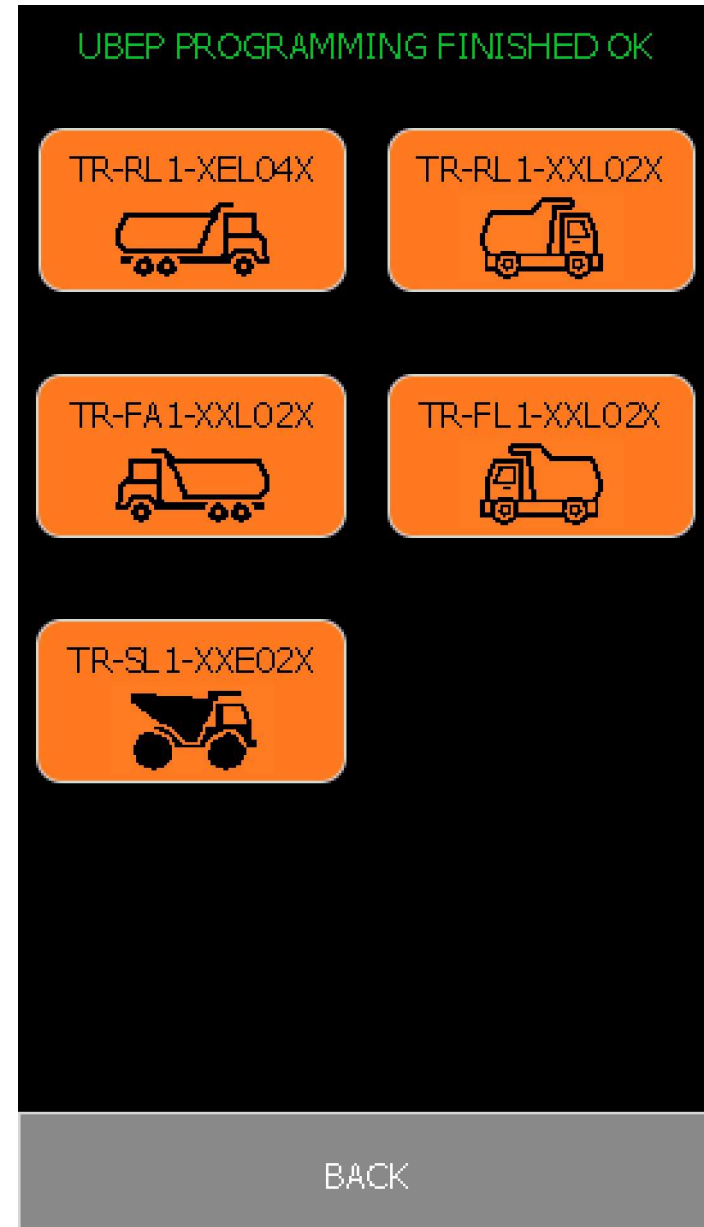
## Send Erase UBEP Configuration

This Option is used to send erase UBEP configuration command to the paired UBEP unit.

You can use "Send Erase UBEP Configuration" command to erase current configuration stored in paired UBEP. This command is already a part of both Custom and Standard Configuration programming so you don't need to use it before you program new configuration.

You should use this option only in case that you want to have UBEP unit blank without any Configuration stored.

SENDING UBEP ERASE...

SEND CUSTOM
UBEP CONFIGURATION

SEND STANDARD
UBEP CONFIGURATION

SEND ERASE
UBEP CONFIGURATION

BACK

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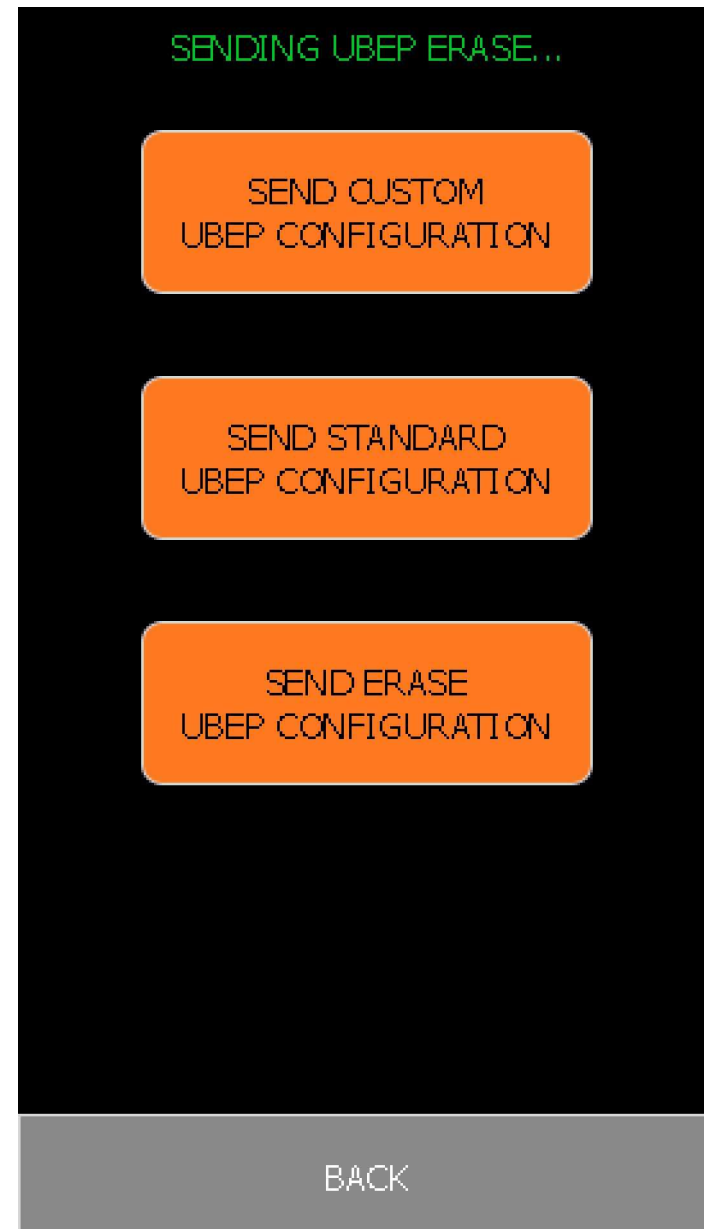
# Testing

As step 4 you can press "Testing" button within Home Screen. This will bring you to Testing Screen. There are eight buttons available: "UBEP active test mode", "UBEP passive test mode", "Send UPI demo", "Execute On Start", "Execute Condition 0", "Execute Condition 1", "Execute Condition 2" and "Execute Condition 3". You can use "Back" button to get back to Home Screen.
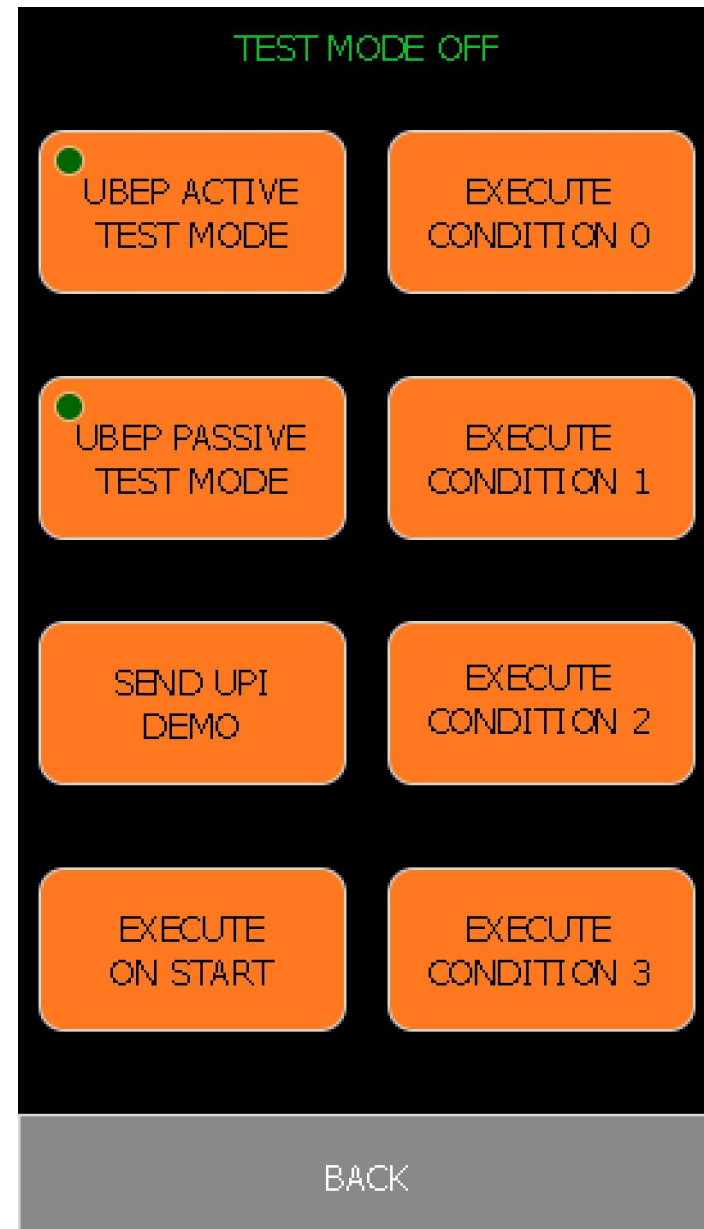
## UBEP Active and Passive Test Modes

By pressing UBEP Active or Passive Test mode buttons UCP unit will send command to UBEP unit to enter appropriate test mode. After UBEP unit receives either of these commands it will show White LED for a few seconds and then it will use White LE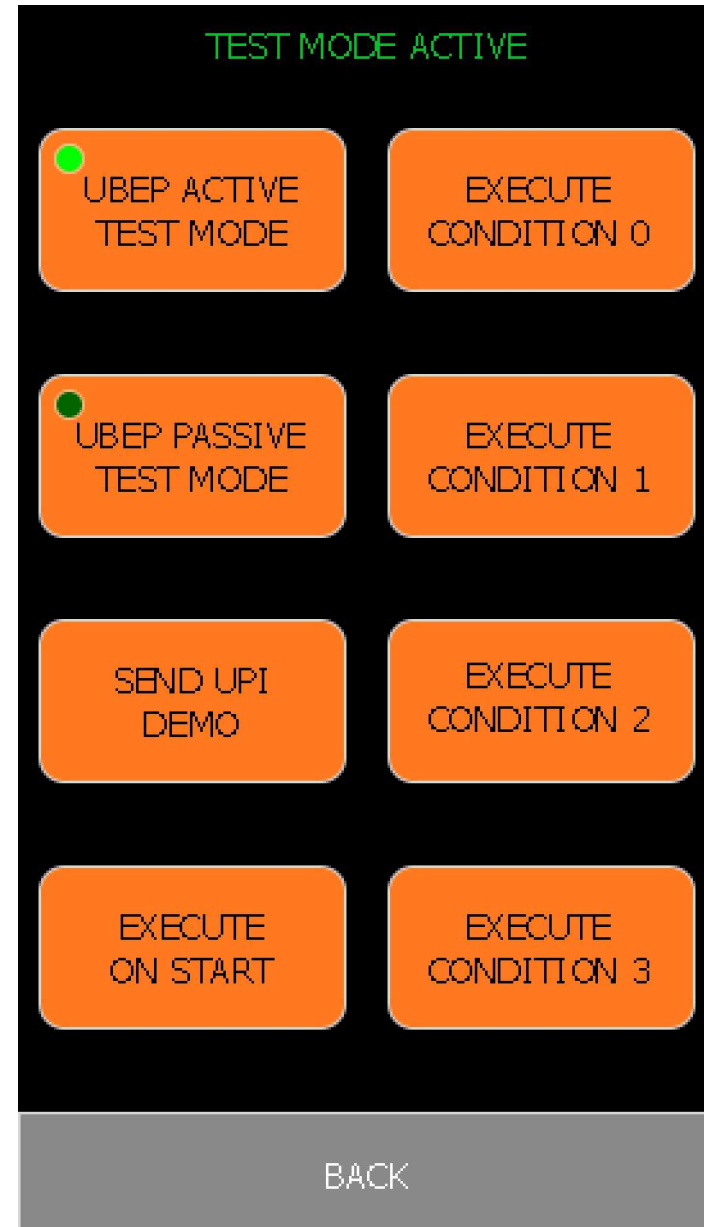D color as "hearth-beat". Once UCP unit initiates one of these test modes it turns-on green mark on the appropriate button to show which mode us currently active.

UBEP unit will ignore Condition 0, 1, 2 or 3 options that are set-up in current configuration when in test mode. You can then use "Execute On Start", "Execute Condition 0", "Execute Condition 1", "Execute Condition 2" and "Execute Condition 3" buttons on UCP unit Test Screen to initiate appropriate condition execution on UBEP unit side. As if a real-life condition is fulfilled.

TEST MODE ACTIVE

UBEP ACTIVE TEST MODE

EXECUTE CONDITION 0

UBEP PASSIVE TEST MODE

EXECUTE CONDITION 1

SEND UPI DEMO

EXECUTE CONDITION 2

EXECUTE ON START

EXECUTE CONDITION 3

BACK

The only difference between Active and Passive Test Mode is that in Active Test Mode messages will be transmitted from UBEP unit with parameters "one-on-one" as how they are set-up in current UBEP unit configuration. On the other hand in Passive Test Mode "Motor PWR %" parameter will be masked and instead of the value set-up in current UBEP configuration zero value will be sent. This means that in Passive Test Mode UPI units will not vibrate upon reception of Condition 0, 1, 2 or 3 messages but will execute other message parameters.

Note: After you are finished testing UBEP unit you should press the same button that you used to initiate Test Mode. This will send a command to UBEP to get back to Test Off mode. After UBEP unit receives this command it will show default LED for a few seconds and then it will be reset automatically.
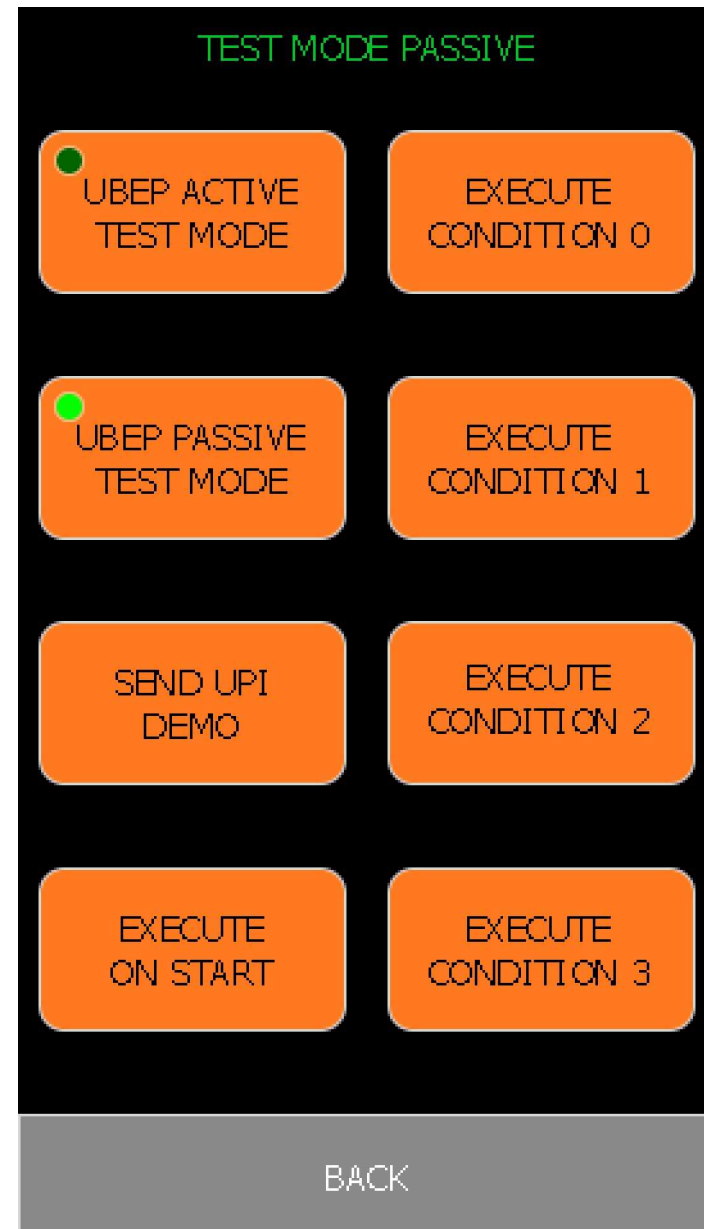
## Send UPI Demo

You can use "Send UPI Demo" button to send demo command to paired UPI unit. With this option UCP will emulate being UBEP unit and transmit alarm message to paired UPI unit. Upon reception of this command UPI will execute Demo configuration with "Reply" parameter set on.

Within Test Screen UCP unit will monitor for a reply messages being sent to paired UBEP unit. It will also monitor for reply message being sent as a response to "Send UPI Demo" command sent to paired UPI unit. Upon reception of this message UCP unit will show Alarm Screen for a few seconds and then go back to Testing Screen.

After you are finished with testing UBEP or UPI unit you can use "Back" button to go back to Home Screen.

## Testing and Maintenance

In order to test the functionality of UCP you must use one UPI unit.

First, you should pair with the UPI unit used for test. After the pairing use Check ID UPI command to verify you are paired with appropriate unit.

Second, you should go to test submenu and Send UPI Demo command. UPI should start vibrating in random sequence with White LED flashing and UCP should pick up a Reply from UPI and show Red ALERT message on the screen.

This verifies the Pairing and RF functionality of the device.

## General Specifications

Dimensions of UCP device: 162mm (L) x 96mm (W) x 41mm (H)

Weight of UCP device: 360gr

Operational temperature range:

- while charging: 0 – 45 °C

- while discharging: -10 – 60 °C

Ingress Protection: IP64 - Dust Tight, Splash proof

USB Charging:

- Power Supply Input: 5V DC

- Supported USB Ports: 500mA and 1A

- Connector type: MINI-B form factor

Maximum Power Consumption:

- while charging: 3W

- while discharging: 1.1W