

ARROWES™
ROADING SAFETY

eSTOP™ Auto



Operation & Service Manual



Version: 2.1

Dated: 24/10/23

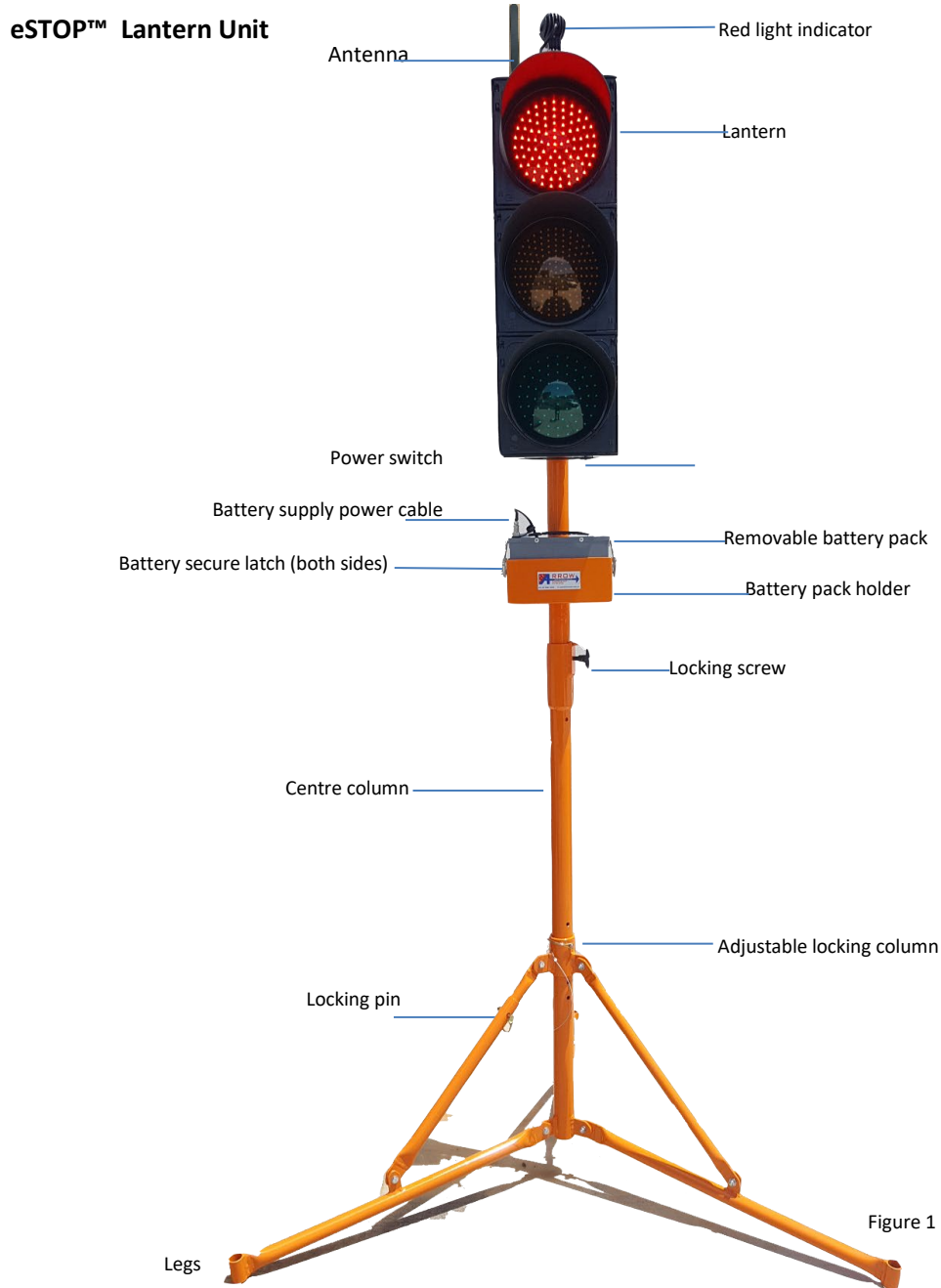
Manufactured by:

ARROWES Roding Safety
17 Bailey Court
Brendale, Queensland 4500
PH: (07) 3881 3302
FAX: (07) 3881 3324

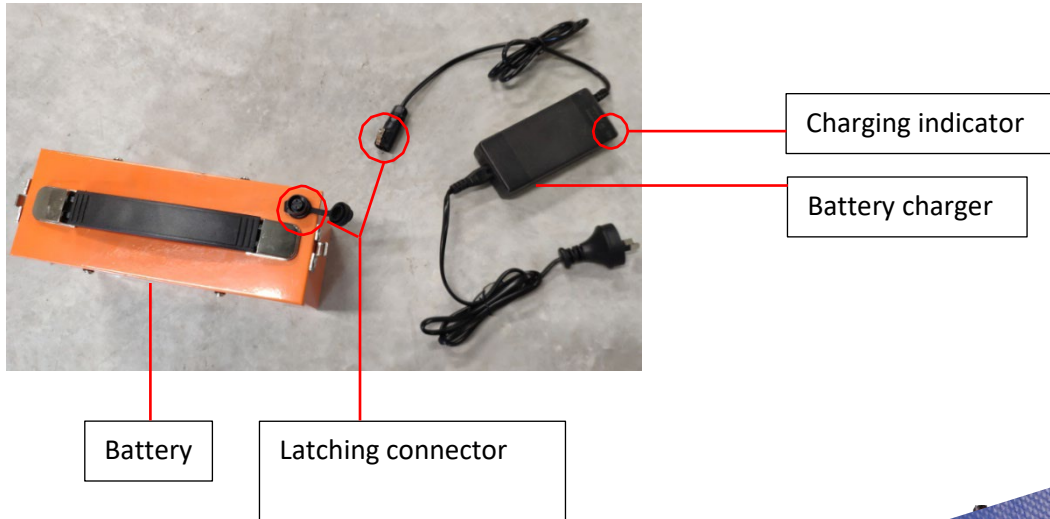
Contents

eSTOP™ System Components Diagram	4
Safety Considerations	6
eSTOP™ System Specifications	7
Labels	8
Key Features	8
Unit Assembly/On-site Setup	9
Target Board Assembly	10
Operational Procedures	11
eSTOP™ Lantern Unit	11
Hand Remote Controller X – HRC X	12
Button Press Types	12
Operational Steps	13
Pairing the eSTOP™ Handheld Remote Controller (HRC X) to lantern units	15
eSTOP Auto	17
Activate Auto Mode	17
Setup Auto and Timing	17
GUI screens	18
Powered Off screen	18
Battery Status screen	18
Home Screen	18
User manual – eSTOP DVR camera system	19
Batteries - Care, Safe Handling and Charging	23
Maintenance of the eSTOP™	25
Troubleshooting	25
Repairs & Servicing	26
Safe Transportation of the eSTOP™	26
Material Life	26
Warranty	26

eSTOP™ System Components Diagram



Lantern battery pack and charger

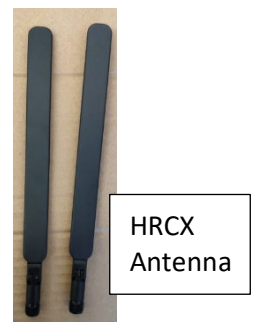


eSTOP™ Handheld Remote Controller (HRCX)



Equipment Contents

1. 2 eSTOP™ lantern units
2. 2 tripod legs + battery holder
3. 2 lantern battery packs
4. 2 HRCX - hand remote control
5. 2 HRCX Antenna
6. 2 C4 USB charging cable
7. 1 double USB charge socket
8. 2 battery charger and power socket
9. Carry case
10. User and Service & Operation Manuals
11. 2 target boards (Applicable model only)



Safety Considerations

The eSTOP™ has been developed as a response to a need for safer working conditions for traffic controllers on job sites. It is designed to remove traffic controllers from the hazard zones, but still allow traffic controllers to manage traffic movement within the worksite from a safe distance. In order to reduce the risk to road workers, traffic controllers and road users, the unit must at all times be operated effectively and consistently by authorized and trained operators.

The eSTOP™ must be operated in accordance with all safety, operation and service instructions contained in the manufacturer's operation and service manual. It is recommended that all operators read and understand the manual before operating the eSTOP™. Operators must understand and comply with the manufacturer's instructions as printed in the manual accompanying each eSTOP™ in conjunction with the respective Company's Safe Work Method Statement.

The eSTOP™ should only be operated by a designated, competent operator within the scope of on-site operation parameters (such as the Company's Safe Work Method Statement).

The eSTOP™ should be installed in a suitable location clear of obstructions. An appropriate risk assessment must be conducted to ensure the safe and suitable use of the eSTOP™. Examples of factors to consider when assessing suitable location are a safe distance from the traffic path so that wide loads or turning vehicles will not impact the unit, length of worksite, volume of traffic and topography. The eSTOP™ should be installed on a stable surface.

The unit including the lanterns (red, amber and green), amber light indicator and battery box must be kept clean. The equipment must be handled with care.

The eSTOP™ batteries (both for the hand remote control and the lanterns) should be fully charged before operating the unit.

The eSTOP™ has been designed in accordance with DTMR's (Department of Transport and Main Roads) specifications, MUTCD guidelines and the MRTS254, Arrowes ISO quality system and ACMA approved. The eSTOP™ has been approved for use by DTMR. The application of the eSTOP™ must be in accordance with these guidelines/standards as well as the respective company's worksite risk assessment and Safe Work Method Statements.

Any modifications made to the eSTOP™ (unless by or approved by Arrowes) could compromise the function of the eSTOP™ and therefore the safe application of the units and voids the warranty of the eSTOP™.

eSTOP™ System Specifications

Lantern

Operating life of cluster:	100,000 hours
View angle of cluster:	12°
Lantern IP rating:	IP45
LED Optics IP rating:	IP65
Voltage:	12v
Operating amperage:	1.2 A
Battery (rechargeable)	26 A/H Lithium Iron phosphate
Operating Hours (80% DoD)	~20 Hours
Charging time:	4-5 Hours
Operating Temperature Range:	-20 to 90° Celsius
Lantern Compliancy	AS2144
Comms Range	<2km

Hand Remote Controller (HRCX)

RF operating frequency:	868-915Mhz
Configuration:	up to 4 unit control
IP rating:	IP65
Battery (rechargeable):	8 A/H Lithium Polymer
Operating Hours (50% DoD)	~30 Hours
Charging time:	6-8Hours
Operating Current: (Average)	150mA
Sleeping Current:	1mA
Operating Temperature Range:	-20 to 85° Celsius
Comms Range	<2km

Overall Device

Total mass per device (incl. batt, Target Board):	24kg (allocated to 3 components)
Top lantern weight (max lifting weight):	14kg
Tripod leg footprint radius:	0.80m
Wind loading – no sandbag base:	~40km/h
Wind loading – 3 sandbag/leg ~50kg:	~100km/h

Dimensions

Maximum working height:	2900 cm
Minimum working height:	2600 cm
Dimensions when stored:	1710 mm x 480mm x 370mm
Base width, fully extended:	1600 mm diameter
Lantern height:	770 mm
Lantern width:	270 mm
Lantern depth:	170 mm

Labels



Hand control identification number is located at the back base as shown here



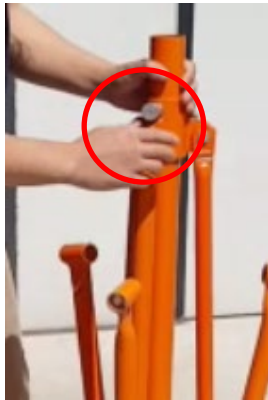
eSTOP™ identification number is located at the base of the lantern as shown here

Key Features

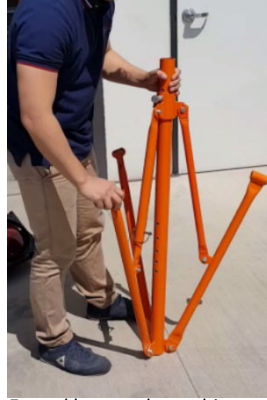
The eSTOP™ is the first Electronic Single Traffic Operator Portable system of its kind. Designed to remove the traffic controllers from the hazard zone, the key features of the eSTOP™ system are:

- Traffic controllers operate from a safe distance
- Communication range of 2km in line of sight
- Can be implemented anywhere a stop/slow baton would normally be used
- Can be operated with one controller, whilst the other takes a break or is on rotation as the HRCX can control up to 4 Lanterns
- Fail safe features - ensure no two green lights can be on at the same time, low battery, tilt and lantern fault warnings
- Environmentally robust, light weight, three-piece assembly, adjustable height
- Small Hand Remote Control (IP65)
- Hand Remote Control mimics traffic lantern states in real time
- Wind load up to 100km/hr when used as per manufacturer's guidance

Unit Assembly/On-site Setup



Pull spring pin to release leg



Extend legs out by pushing towards the ground



Place legs onto a flat surface and align adjustable locking column with pin holes for uneven surface. (red circle)



Slide pole up and down to adjust height then release pin to lock in place



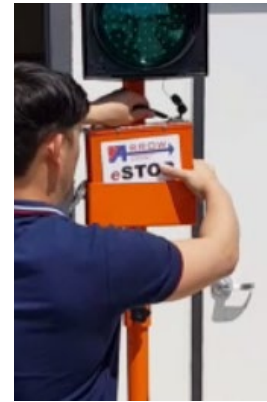
Check antenna is vertical. Use two hands to lift traffic lantern onto base



Slide lantern into the center locking column



Secure with locking screw to stop lantern from rotating



Insert battery pack into battery holder



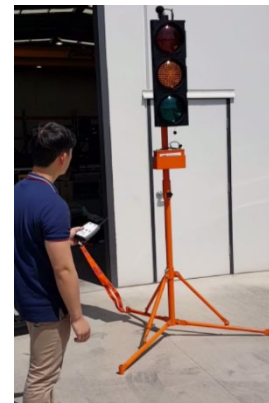
Lock latches to secure battery box



Connect power cable. Connector latches once pushed in place.



Switch on lantern



Unit is ready to operate with Hand Remote Control

IMPORTANT: ensure eSTOP™ is stable and is weighted down with sandbags prior to operation. One sand bag per tripod leg is required.

Target Board Assembly

Target only applies to applicable systems with Target board brackets.



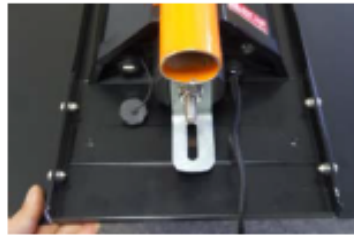
1. Place lantern and target board on a flat surface



2. Lift lantern and place in the gap of the target board.



3. Lift one side of the target board over and behind the lantern edge.



4. Lift the right side up then align the bolt hole.



5. Insert bolt then tighten wing nut.



6. Adjust camera bracket and align hole on the top side of the target board, then tighten wing nut.

Note: Ensure front facing camera (if applicable) is adjusted to be above the target board.

Operational Procedures

When the units have been assembled.

eSTOP™ Auto Lantern Unit

1. **Connect power cable** from lantern to battery box. To switch on the lantern, push the small power switch underneath the lantern unit. The green LED light will illuminate when powered on. The lantern unit will be controlled by its master, the Handheld Remote Controller X (HRCX) once it is paired. *Note: make sure the antenna on top of the lantern is vertical.*

Modes - The unit runs in three modes: 'Test Mode', 'Manual Mode', and 'Auto Mode'.

Test Mode – When the unit first powers on, it is by default in test mode. In this mode, the HRCX can be used to perform a lantern test. See HRCX procedures for LED test function, each lantern will flash for 0.5 seconds.

Manual Mode – The unit can be activated (using HRCX) to 'Manual Mode' after power-on/LED test. When the unit first activates, it will flash amber for 5 seconds then default to red. The unit will **halt for 5 seconds before it can be operated**. The unit must be activated to 'Manual Mode' first before activating 'Auto Mode'. See HRCX procedures for operation functions.

Auto Mode – The unit can be activated (using HRCX) to 'Auto Mode' after being activated to 'Manual Mode'. When 'Auto Mode' is activated, the amber lantern may either flash for 5 seconds or display a countdown status, to provide feedback for the motorist when a green state will occur. Lantern state change in 'Auto Mode' is controlled automatically by the HRCX. The HRCX must remain running and within range of all lantern units in 'Auto Mode'. See HRCX procedures for operation functions.

2. When the lantern unit is on the RED state, a small amber LED, called the "red light indicator" will flash. This red light indicator faces the workers on the worksite. Its purpose is to indicate to the workers on the jobsite that the traffic lantern is red. The red light Indicator must NOT face the motorists.
3. The eSTOP™ Lantern Unit is also fitted with a "Cut-Off Switch". This is the Power Switch, located at the base of the lantern. This switch will turn off the lantern instantaneously as required. It must also be switched off when not in use.

Note: When setting up the eSTOP Auto™, the lanterns should face away from motorists until the unit is activated for use to control traffic (Operation Mode).

The lanterns must always be in line of sight of the HRCX. The HRCX is the master, all lanterns communicate directly to the HRCX only.

Hand Remote Controller X – HRC X



Button Press Types

Quick press – A Quick press of the buttons (less than 0.5s) is used to navigate the GUI. Home, Wake, Left, Right, Up and Down Button presses are all quick presses. If the GUI screen is off, quick press does not apply.

Firm press – A Firm press of the buttons (more than 0.5s) is used to change states of a paired lantern (A/B/C/D) during manual mode, or test a paired lantern during test mode. Firm press applies to A, B, C, D and STOP Button.

Long press- A Long press of the buttons (more than 5s), applies to the Power Button for powering of and powering off.

Operational Steps

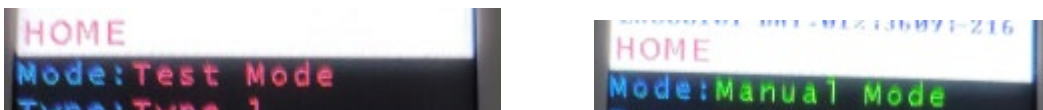
1. **Power On** – Long press the power button for 5 seconds to power on the HRCX. During power on, the battery status screen will appear briefly to show the battery status. Refer to the ‘battery status screen’ section for more detail.
2. **Home Screen** – Once the HRCX is powered on the, the GUI home screen will appear, showing the current mode, and the paired Lanterns relative to Buttons A/B/C/D and its status. Refer to ‘home screen’ section for more detail.
3. **Wait for Comms** – If a lantern is already paired to a button, the status of the lantern will be shown next to the respective status indicator [A][B][C][D] on the home screen. The status will read “No Comms” in red text. Wait up to 60 seconds for the communication to establish. Once there is communication, the status will show the lantern battery percentage in green text or any faults in orange text. If there are still “No Comms” after 60 seconds, refer to the ‘Troubleshoot’ section, or ‘Pairing’ section to un-pair and re-pair. If there are no lanterns paired, it will appear blank.



4. **Modes** – the HRCX may start on any mode depending on the last mode before power off. Usually, the HRCX will start on *Test Mode*, where a paired lantern can be tested by firm pressing the respective paired button. To activate to another mode, quick press the left or right buttons to highlight the modes button on the bottom of the home screen. Quick press the enter button to enter the modes screen.



5. **Manual Mode** – Once the paired lanterns are all communicating and no faults are showing on their status, the system can be activated to *Manual Mode* by navigating to the modes screen and entering the *Manual* button on the modes screen. Once entered, the screen will return to the home screen and the mode will be changed from *Test* to *Manual Mode*. The lantern start-up sequence will then commence.



6. **Start-up** - Upon switching from *Test Mode* to *Manual Mode* the lantern will flash amber for 5 seconds, then 4 seconds of steady amber, then default to red. The HRCX will lock for 10 seconds and all buttons will not work during this time. After 10 seconds, the system with the paired lanterns is in *Manual Mode*.

7. **Control Traffic Signals** - Use the respective paired A/B/C/D buttons and STOP button to operate the lanterns for traffic control. Use the Green A/B/C/D buttons to switch one or the other signal to turn green. (Note: in order to turn a signal green, all signals must be red first). Use the red STOP button to change all signals to red. *Note: the amber lantern will activate for 4 seconds during the transition from green to red. It will lock for 5 seconds in all red before any change to green is allowed. The lantern LED state indicators reflect the lantern status.*
8. **Power Saving feature** – Once the system is in *Manual Mode*, the power saving feature on the HRCX will activate after 60 seconds. The screen will turn off and the Lantern LED state indicators will remain on, allowing the lanterns to be operated as normal. If there is a fault, the screen will automatically turn back on. The screen can also be turned on by pressing the ‘Wake’ button.
9. **Auto Mode** – If the Auto function is switched on (refer to Setup Section to switch on the Auto function), the system can be activated to *Auto Mode* after *Manual Mode* has been activated. This can be done through the GUI Modes screen. Once *Auto Mode* is activated, the counting GrnT (green time) and RedT (all red time) is shown on the home screen. There will be a 5 second time out period where the HRCX will lock, and all buttons will not work during this time. After 5 seconds, the unit is ready to operate as usual.
10. **Activate Test Mode**- The system can be activated to *Test Mode* at any time in either *Manual* or *Auto Mode*. When activating *Test Mode*, the lanterns will flash amber for 5 seconds, then switch the lanterns off.
11. **Power Off HRCX** – the HRCX can be powered off any time. When powered back on, the system will start on the last mode that it was in before powering off. To avoid unwanted activation when powering on, it is best practice to activate to *Test Mode* before powering off.
12. Switch off all lantern power and disconnect battery cable before packing up.

Note: While HRCX is off, pressing “Power” button on the HRCX will indicate battery status. In the event of forced power off is required on the HRCX, pressing “Power” and “Wake” button at the same time forces the HRCX to soft reset then power off.

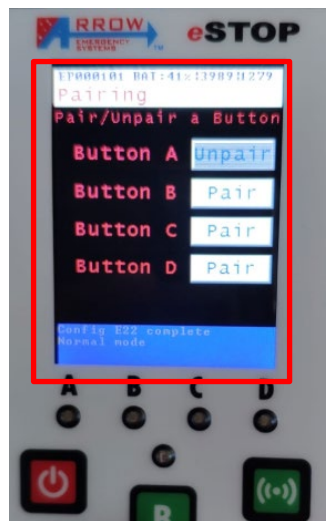
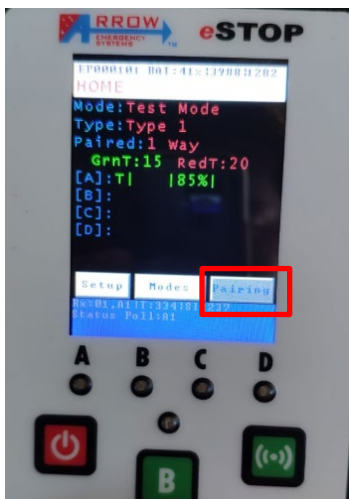
eSTOP Auto™ Operations & Service Manual

Pairing the eSTOP™ Handheld Remote Controller (HRC X) to lantern units

The eSTOP™ HRCX can be paired to any eSTOP Auto lantern units. Once a lantern unit is paired to a HRCX, it is stored in memory. They will be automatically synced when powered up and ready for operation. By default, a HRCX is paired to 1 lantern unit only. Re-pairing is not required unless the HRCX is pairing to a different lantern unit, pairing up to 4 lantern units to 1 HRCX, or lanterns have been mixed up and not knowing which lantern is paired.

It is recommended to begin pairing by un-pairing all lantern units from the HRCX. This will reduce confusion about which lantern unit to pair if it has been already paired previously. Follow the steps below to begin the process.

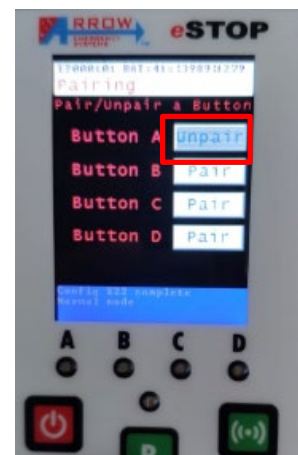
HRC X provides a simple GUI for pairing and unpairing any lanterns. Below shows how to navigate from the 'Home' screen to the 'Pairing' screen. The pairing shows the 4 respective buttons to pair/un-pair a lantern.



Un-pairing lantern units

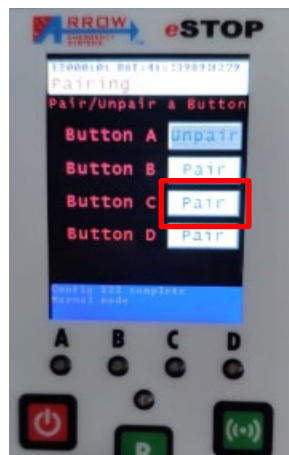
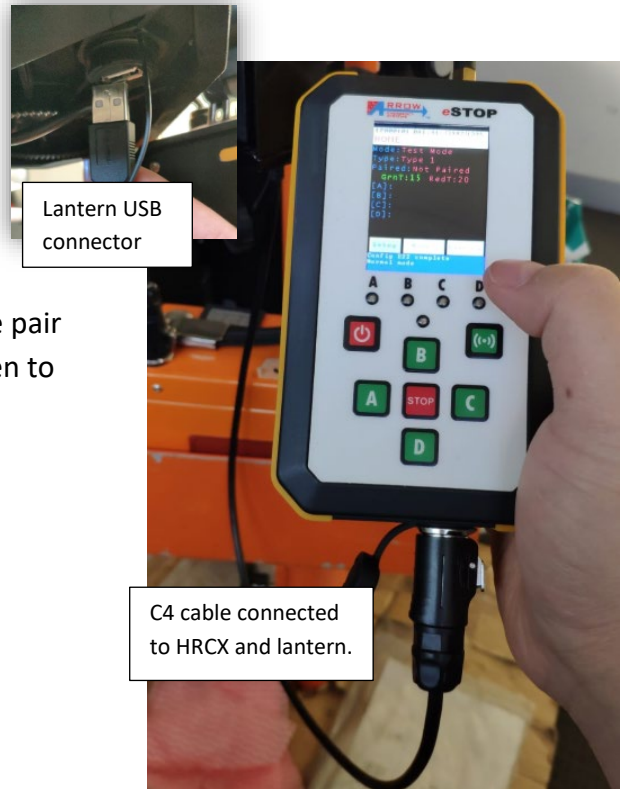
Un-pairing is required if the HRCX is already paired to an unknown lantern and unable to sync. To do this, the HRCX **must be in Test Mode**. Then navigate to the 'Pairing' screen. Once the 'Pairing' screen is opened, it will show 4 buttons indicating if the lanterns are paired or not. If they are paired, the option to un-pair is provided. If they are not paired, the option to pair is provided. Quick press the STOP button to pair or un-pair.

It is recommend to un-pair all lantern before re-pairing lanterns, to avoid confusion.

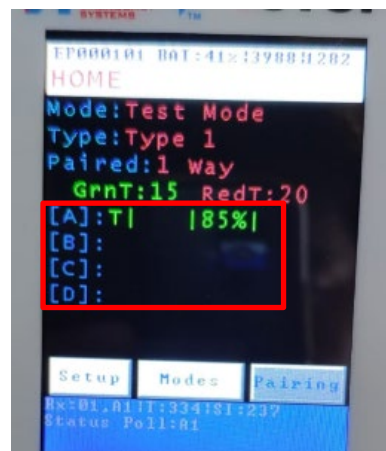
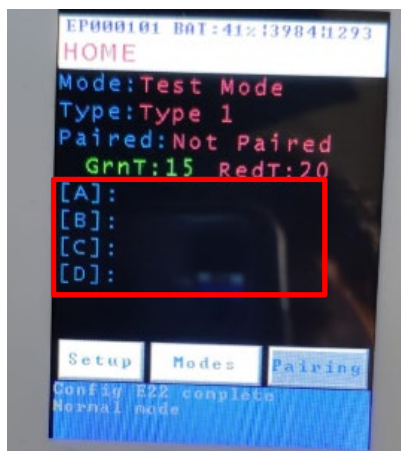


Pairing eSTOP™ HRCX Unit1 (Left side of the HRCX)

1. When in *Test Mode*, attach the C4 USB cable from the bottom of the HRC X unit to the USB connector on the base of the eSTOP™ lantern unit, as shown on the image.
2. Navigate from home screen to pairing screen. Then select any button on the pairing screen to pair a lantern. Once pairing is started, an interactive pair menu will start. Follow the instructions on the screen to complete the pairing process.



3. Once a button is paired to a lantern, the status on the home screen will change from blank status to providing information. It demonstrates the mode and battery status for the paired lantern.

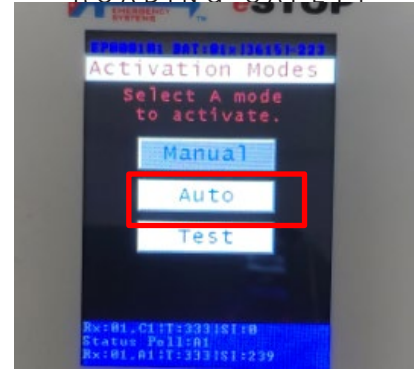


Note: allow up to 60 seconds for the paired lanterns to establish communication.

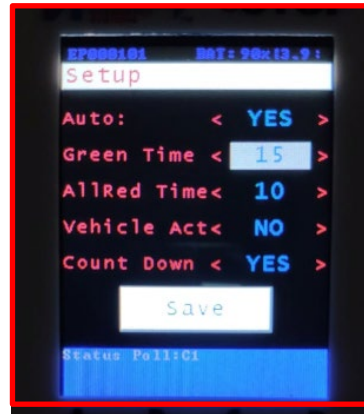
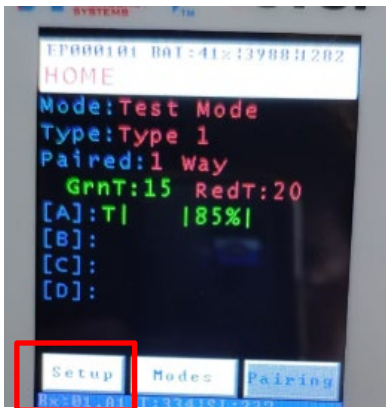
eSTOP Auto™ Operations & Service Manual

eSTOP Auto

Activate Auto Mode - The eSTOP Auto consists of one handheld Remote Controller X (HRCX) and up to 4 eSTOP Auto lantern units. The amber lantern may also provide a counter display to count down the time before the traffic lights turn green. The eSTOP Auto powers up into *Manual mode* just like the standard eSTOP and can be activated into *Auto mode* from manual operational mode by navigating to the modes screen and selecting *Auto Mode*.



Setup Auto and Timing – A GUI setup screen is used to program the HRCX to allow the Auto feature. To enter the setup screen, the HRCX must be in Test Mode. Then, navigate from the home screen to the setup screen, then use the UP/DOWN button to select the parameter boxes, and LEFT/RIGHT to change the parameters. Once done, move the cursor to the save button then press enter to save.



Enabling Auto mode – This allows the HRCX to activate into *Auto mode* and control the Paired eSTOP traffic lights in a timing cycle.

Green Time (GrnT) – Time set for a lantern to stay green.

All Red Time (RedT) – Time set for an all-red time. Red time is the total time minus green time. Red time is generally determined by the time it takes for a vehicle to exit the work site safely.

Enabling Vehicle Actuated - Vehicle actuation allows green time to be extended on the lantern where a vehicle is detected. The extension is by 1 cycle of green time. If vehicles remain detected and there are no vehicles on the opposite end, the green time will continue, extending for up to 5 cycles. (This results in maximum green time of 5x (set green time)). Green extension time will be cut short if there is vehicle detection on the opposite side.

Enabling Count Down – This allows the lanterns to provide countdown status feedback to motorists, indicating the time until the next green state. Note: the lantern does not change to green state after the countdown ends unless there is a command from the HRCX to go Green.

Note: Vehicle actuation and count down cannot both be enabled at the same time.

eSTOP Auto™ Operations & Service Manual

GUI screens

Powered Off screen



When the HRCX is powered off, the screen is completely off, and no LED indicators are on. The power button can be pressed to power on or check the battery status.

Battery Status screen



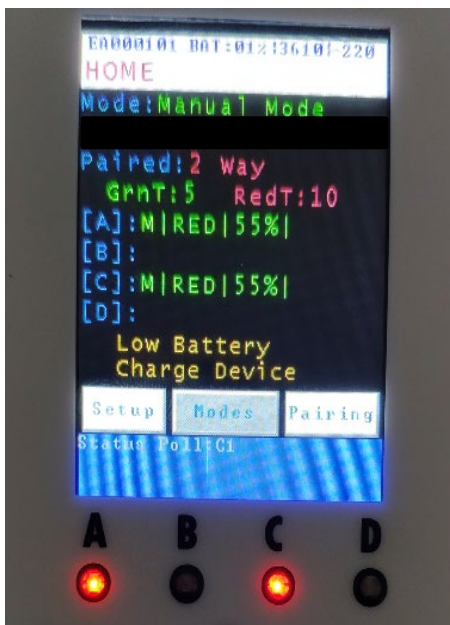
The battery status screen shows the battery status in percentage and the charging states.

This screen can be switched on for 10 seconds when the HRC is powered off, by quick pressing the power button.

When the HRCX is plugged into a charger the battery status screen stays on permanently, until the charging cable is unplugged.

Home Screen

This screen provides the options to navigate between different screens and shows operational status.



The device ID and battery status percentage is shown at the top of the screen.

The current mode is highlighted in the tabs above of the status line.

If Auto is enabled, the GrnT, and RedT will be shown on the screen, and starts counting down once activated to *Auto Mode*.

Each paired Lantern (in respect to a Button A/B/C/D) provides a status. The status include:

Modes: M – manual, T – Test, A – Auto, N-unknown

Led States: RED, GRN, YEL, Blank

Lantern Battery Status: xx% (55%)

If the HRC is in critical low battery, a “Low Battery Charge Device” warning message is shown in orange.

eSTOP Auto™ Operations & Service Manual

User manual – eSTOP DVR camera system

Only for applicable eSTOP

eSTOP camera and DVR placement

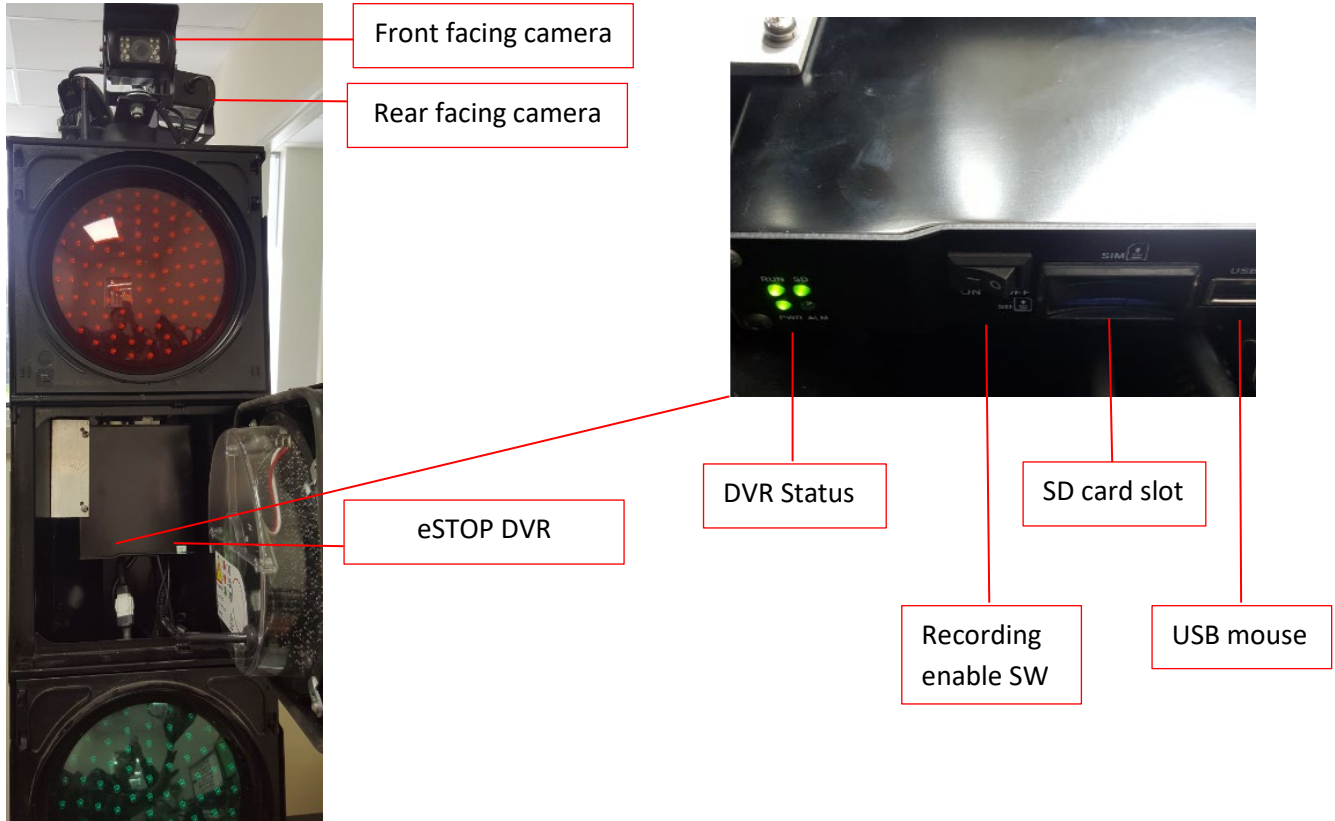
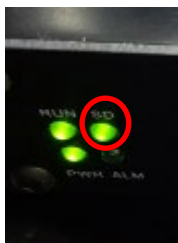


Figure 1. eSTOP Camera and DVR

Recording

The eSTOP DVR is set up to record automatically when the eSTOP traffic light powers on. There is a 1 minute delay for the DVR to complete startup and start recording.



A Green light under SD status indicates the DVR is recording.

eSTOP Auto™ Operations & Service Manual

Stop recording

Recordings can be stopped by switching off the power or switching the recording off. Enable SW as shown in figure one.

Adjusting Camera Angle



Figure 2. Camera rotations

Depending on where the eSTOP is placed, the camera can be rotated horizontally and vertically to suit viewing angle of the traffic.

Using a LCD and DVR video output



Figure 3. DVR output and LCD

By plugging in the LCD to the DVR's video output connector shown in figure 3 above, the videos of the cameras can be viewed live. This allows camera positions to be adjusted effectively, video play back and indications of recording status.

eSTOP Auto™ Operations & Service Manual

DVR custom setting

While the LCD is plugged in, a USB mouse can also be plugged in to the USB port shown in figure 1. This allows custom settings of the DVR (a right-click to enter the settings menu).

Time stamp

The DVR has an internal battery to keep time in track when eSTOP power is off. The time should be adjusted to the local time by entering the settings menu.

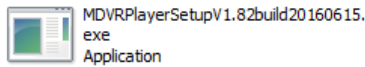
Play back video

Video play back can be done by accessing the DVR menu using the LCD and a mouse.

This can also be achieved by using a Windows computer and the PC software to read back the video storage on the SD card. The SD card is located on the bottom of the DVR as shown in figure 1.

Using the MDVR player to play back video

Installing the software



The MDVR player software can be found in the CD provide or contact supplier for a copy of the MDVR software. Or download from google drive below:

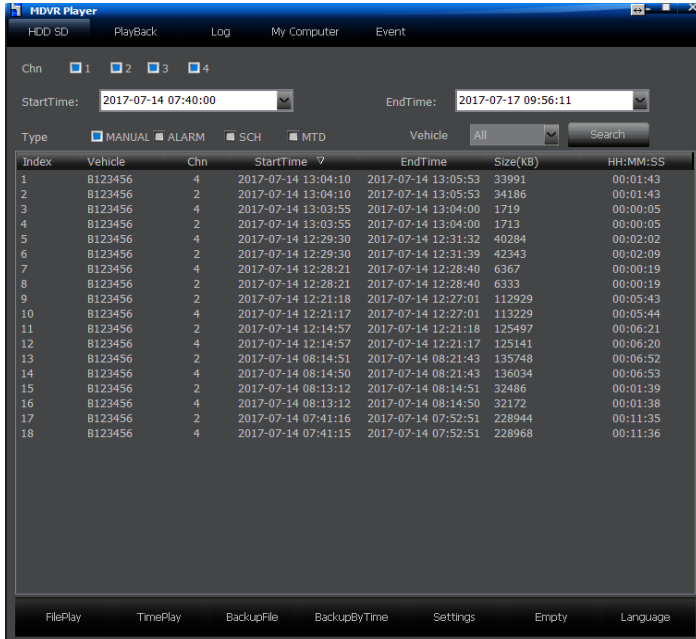
<https://drive.google.com/drive/folders/1mdSDaauaRsrbOA3rruHFpllehOipbgky?usp=sharing>

Open the installer file shown above and follow the setup wizards to complete installation.



Once the software is installed and shortcut icon shown above is create on the desktop. Open this software.

Search footage by time



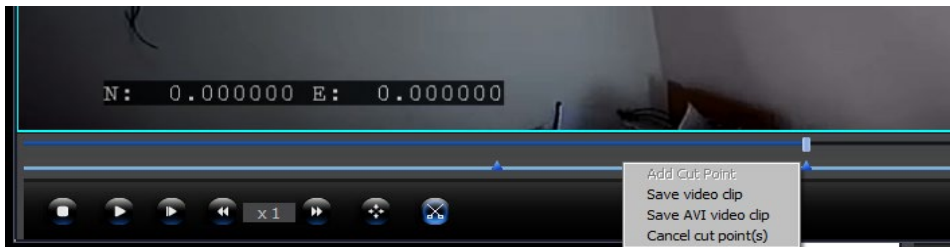
If the DVR SD card is plugged into the PC, the *StartTime and EndTime on the software shown above can be set to search the time period of the video required.*

Double click on any of the video files listed to play.

The files can be backed up using the BackupFile or BackupByTime buttons on the bottom menu bar.

Cut clips to backup

When the video is being played, clicking on the cut icon shown below allows the video to be cut with a starting and end point.



A time line will appear on the bottom of the video when the cut icon is clicked.

Right click on the line to set starting and end point of the clip.

Then right click in between the 2 points to back up the clip as AVI format.

Batteries - Care, Safe Handling and Charging

When power to the battery is low (3.6v or less), a low battery message will show in amber. **The HRCX must be charged.** Running the HRCX at low voltage for prolonged periods may degrade the battery's integrity and reduce the HRCX's transmitter power and will affect the reliability of the system.

DO only use the battery supplied. If replacement batteries are required, please contact Arrowes for the correct battery.

DO store batteries in their original packing, in a dry place and at room temperature.

DO charge battery to 80+% if storing for long term.

DO keep all batteries in a safe place away from children and pets.

A. Charging the Batteries

1. **The HRCX Battery**

The HRCX can be charged from any USB device including the one attached to the lantern base (the screw cap and USB connection are located at the base of the eSTOP™).

When the HRCX is switched off and the USB is attached to a charging device the 'Battery Status' screen will remain on until the cable is unplugged.

2. **The eSTOP™ Lantern Battery**

The eSTOP™ is fitted with a light weight LifePo4 battery. To charge, remove the connector at the top box of the battery and connect to the battery charger that is supplied by Arrowes.

The battery is charged to 240AC outlet charger. An indication LED on the charger shows the charging status

-Red indicates charging

-Green indicates charging complete

Note: using any other non LiFePo4 charger could damage the battery and degrade the life expectancy of the battery.

B. Battery Status

1. **The HRCX**

When the HRCX is off, pressing the power button will bring up the battery status screen for 10 seconds. Once powered on the battery status is shown on the top of the screen. The battery status is shown in percentage.

(Note: the battery status screen is only active when the HRCX is switched off)

2. The eSTOP™ Lantern

The status of the lantern battery is shown on the paired lantern status of the GUI. Once the lantern has established communication, the lantern's battery status is shown in percentages.

The lantern status indicators will indicate battery status according to its respective paired units.

C. Safe Manual Handling for Batteries



- Do not immerse the battery in water, and keep the battery in a cool dry surrounding.
- Do not use or leave the battery near a heat source such as fire or heater.
- Use only the battery charger specifically supplied when recharging.
- Do not reverse the position and negative terminals.
- Do not connect the battery directly to an electrical outlet.
- Do not discard the battery in fire or a heater.
- Do not short-circuit the battery by directly connecting the positive and negative terminals with metal objects.
- Do not strike, trample or throw the battery.
- Do not directly solder the battery and pierce the battery with a nail or other sharp objects.
- Do not use or leave the battery at high temperature. Otherwise, it can overheat or its performance will be degenerate and its service life will be decreased.
- Do not use the battery in a location where static electricity and magnetic field is high, otherwise the safety devices may be damaged.
- If the battery has leaked, and the electrolyte gets into the eyes, do not rub the eyes, instead, rinse the eyes with clean water, and immediately seek medical attention. Otherwise, it may injure eyes.
- If the battery gives an odour, generates heat, becomes discoloured or deformed, or in any way appears abnormal during use, recharging or storage, immediately remove it from the device or battery charger and stop using it.
- In case the battery terminals are dirty, clean the terminals with a dry cloth before use. Otherwise suboptimal performance may occur due to the poor connection with the instrument.
- Be aware discarded batteries may cause fire or explode, tape the battery terminals to insulate them.
- These lithium batteries should be recycled. Look for companies who will buy them or your local battery recycling centre for disposal options.

Maintenance of the eSTOP™

1. When power to the battery is low the “status indicator” will show amber. **The HRCX must be charged.** Running the HRCX at low voltage for prolonged periods may degrade the battery’s integrity and reduce the HRCX’s transmitter power and will affect the reliability of the system.
2. **Turn all battery units off when not in use** (both the Lantern and the HRCX unit).
3. The Lantern should be wiped with a damp cloth to remove dirt/dust which may form.

IMPORTANT – As a safety precaution, in case of communication failure/out of range, the lantern will default to RED

Troubleshooting

If troubleshooting does not solve the issues, contacting the manufacturer is advised.

Soft Reset

HRCX – Assuming battery is not low. In the event of no response from the HRCX, or any unexpected error, press down both Power and Signal buttons at the same time to soft reset the HRCX. A sequence of flashing all LED indicators on the HRCX will take place and the HRCX will restart. The HRCX should then operate as usual.

eSTOP™ Lantern – Assuming battery is not low. In the event of unknown error or faults, soft reset the eSTOP™ lantern by powering it off and on again. The power switch is located on the bottom of the lantern unit.

Battery check

HRCX – in power off mode. Pressing the Power button on the HRCX will show the battery status of the HRCX. Refer to “Charging the HRCX battery” section A of “Care and Safe Handling of Batteries” for more detail.

eSTOP™ Lantern – when the lantern is synced to the HRCX during **test mode**, wait for the paired lantern to establish comms, and the battery status will be shown in percentage. Refer to section B of “Care and Safe Handling of Batteries” for more detail.

Faults

Coms fail – check that the distance of the eSTOP™ from HRCX does not exceed the maximum operating distance. Check that the correct unit is being paired or pair the units again. Perform a system soft reset.

Tilted – check the Lantern is not on tilt over 20 degrees from vertical. Place lantern in its operating vertical position then perform a soft reset to recalibrate its orientation.

Low Battery – use the battery check procedures to check the battery status. Charge the batteries if they are low.

Lantern fault – Use LED test procedures to check the LED fault. If the eSTOP™ operates but an individual LED module remains faulty, contact manufacturer for replacements. An individual LED module can be removed by releasing the latches located on the top left or right corner, then disconnect the connector attached to the module cable.

Repairs & Servicing

All repairs and servicing of the eSTOP™ shall be performed by Arrowes Roding Safety or its authorised service center.

Any services/repairs/modification or use of parts not approved by Arrowes Roding Safety voids any warranty and may affect the safe performance of the eSTOP™.

Safe Transportation of the eSTOP™

The eSTOP™ shall be suitably packed to accommodate bumpy rides on roads and some instances rough terrain, ensuring the load is fully secure and stable. The units shall be suitably protected and prevented from being knocked against each other or other equipment during transportation.

The Hand Remote Control X, battery chargers, USB socket & cables shall be stored in the carry case provided.

Arrowes Roding Safety has designed a secure cage system to transport the Lantern with the existing traffic control equipment loads to avoid additional freight costs. Contact Arrowes Roding Safety for more information.

Material Life

Materials/parts used in the production of the eSTOP™ have been selected based on the manufacturer's claim or technical guidance on the material life to meet the requirement of MRTS254.

The lanterns used are type approved by QLD DTMR and meets with AS2144. The manufacturer of the lantern has claimed that it has a service life of at least 20 years.

The mechanical components and structure of the eSTOP™ use steel and aluminum. The type used has material life of at least 20 years.

Dulux X15 orange is used, this meets with requirements of AS2700.

Warranty

The eSTOP Auto™ is supplied with a limited ex factory warranty for 12 months.