Manual for installing and using the Automatic Track Warning System (ATWS) 3000





January 2020

CONTENTS

1.	Introduction	3
	a. Functioning of ATWS 3000	3
2.	Specifications	4
3.	Conditions & safety instructions	5
	a. Conditions for use	5
	b. General instructions	5
	c. Instructions before first use	6
4.	Components	7
	a. DUU 3000 specifications	7
	b. WUM 3000 specifications	8
	c. DUM 3000 specifications	9
5.	Charging the batteries	10
6.	User indicators	11
7.	Function test	12
	a. Preparations	12
	b. Activating the WUM 3000	13
	c. Icons in MTinfo 3000 app	14
	d. Using the DUM 3000	15
	e. Function test	16
	f. Monitoring a project	17
	g. Solving an error on an activated ATWS 3000 project	18
8.	ATWS 3000 example layouts	18
9.	Installation next to the track	19
10.	Service alerts	20
11.	Troubleshooting	20
12.	Service & Maintenance	21
13	Environment & recycling	21
In	conclusion	21

1. INTRODUCTION

This manual describes how to safely install and use the Automatic Track Warning System (ATWS) 3000. The role of the person who plans and designs the ATWS 3000 deployment using MTinfo 3000 is not part of this manual.

This document describes the use of a single ATWS 3000 set, which consists of two DUU 3000 (Detection Units Ultrasonic) and tripods, a DUM 3000 (Detection Unit Manual) and a WUM 3000 (Warning Unit Manual).

It is possible to use more than two DUU 3000's or WUM 3000's, although this is not covered in this manual.

The ATWS 3000 detects traffic and gives an automatic audible and visual warning to track workers. The DUU 3000's detect the traffic and then send this data, wirelessly, to MTinfo 3000 which in turn communicates this to the WUM 3000. For setups that require it, a DUM 3000 can be used to manually strike out oncoming traffic.

1

a. Functioning of ATWS 3000

1. Strike in

A DUU 3000 detects traffic that is approaching the work area.

2. Warning

As soon as the DUU 3000 detects approaching traffic, it will send a signal to the WUM 3000 via MTinfo 3000. The WUM 3000 will give an audible and visual warning to warn users of the oncoming traffic.

3. Strike out

The detection of traffic departing the work area can be done in two ways:

- A second DUU 3000 can be positioned to detect the passing traffic (shown in the image above)
- A DUM 3000 can be used to manually strike the traffic out

This manual is one of two that detail the entire ATWS 3000 system:

- The cloud platform MTinfo 3000 to prepare the ATWS 3000 system for use
- Installing the ATWS 3000

2. SPECIFICATIONS

Application of the ATWS 3000

The ATWS 3000 can be used on any type of railway track (with a maximum line speed not exceeding 110mph or 180kph), **providing that the WUM 3000's audible and visual warnings can be seen and heard properly.** If legislation allows it, ATWS 3000 can be used to work both next to and inside the tracks.

Local rules should be followed at all times.

The WUM 3000 (Warning Unit)

- is IP65 rated (protected from dust and water ingress)
- produces an audible signal of 106 dB(A)
- has an unlimited communication distance, provided that there is mobile network coverage
- has an operating temperature range of -25°C to +70°C.
- has a standby battery life of 48 hours. When activated, it has a 12 hour battery life and can give up to 250 warnings

The DUU 3000 (Ultrasonic Detection Unit)

- is IP65 rated (protected from dust and water ingress)
- has a detection speed of 250ms
- detects passing traffic (not their direction)
- has a detection distance between 1.0m and 3.0m
- has an unlimited communication distance, provided that there is mobile network coverage
- can detect traffic travelling at speeds between 2mph (3kph) and 110mph (180 kph)
- has an operating temperature range of -25 °C to +70 °C
- has a standby battery life of 48 hours. When activated, it has a 12 hour battery life and can detect up to 250 trains
- does not detect trains with a length less than 15m travelling at more than 110mph or 180kph or faster

The DUM 3000 (Manual Strike Out Unit)

- is IP65 rated (protected from dust and water ingress)
- has an unlimited communication distance, provided that there is mobile network coverage
- has an operating temperature range of -25°C to +70°C
- has a standby battery life of 48 hours. When activated, it has a 12 hour battery life and can be used to strike out up to 250 trains

3. CONDITIONS & SAFETY INSTRUCTIONS



WARNING!

Please read all safety instructions carefully before using the ATWS 3000 to ensure you fully understand the system and how it works. When precautionary measures and safety instructions are not properly followed by the users there is a risk of electrocution, fire or even death.

a. Conditions for use

You may only use ATWS 3000 when the following criteria are met:

- You hold the ATWS 3000 competency, and it is in date
- You have been assigned the appropriate user rights
- You have been authorised to do so
- You are compliant with all relevant legislation
- No trains shorter than 15m travelling at more than 110mph or 180kph or faster will be passing

All incoming tracks must be secured. Be especially vigilant when working in, around switches and crossings and other similar situations

Note, the DUU 3000 cannot detect the direction of a train. Please keep this in mind during the design of your work area.

As a **competent user** you are responsible for:

- usernames and passwords
- managing your password. Sharing your password with others is **not allowed** for safety reasons
- following the guidelines set out in the relevant legislation
- the safety of the ATWS 3000. You should respond to alerts from the ATWS 3000 when something is not working correctly

b. General instructions

- You might encounter situations in which you cannot use ATWS 3000. For more information about such situations, see <u>chapter 11, Troubleshooting</u>
- The ATWS 3000 is not user serviceable. Never perform repairs on any ATWS 3000 device. Please contact Dual Inventive for maintenance and repairs
- Pay attention to the risks, such as OLE's and adjacent tracks, when working on or near the line
- The keys used to switch the ATWS 3000 on and off are interchangeable and can be used for any of the ATWS 3000 devices
- Data about ATWS 3000 is stored in MTinfo 3000. This data can be viewed at any moment by MTinfo 3000 users who hold the appropriate rights

Note, the images shown in this manual could differ slightly from the images you see in the MTinfo 3000 app.

Note, this manual does **not** contain any safety advice regarding the rules and regulations. Please ensure that all relevant rules are followed at all times. For further information, consult your safety advisor for this information.

3. CONTINUATION CONDITIONS & SAFETY INSTRUCTIONS

c. Instructions before first use

- Check whether the ATWS 3000 has the correct certification. Please check our website for the required certificates: <u>www.dualinventive.com</u>
- Always take care of your own safety within the rail environment using the most current applicable legislation
- Always visually inspect the ATWS 3000 for damage and perform a function test.
 Do not use ATWS 3000 if any damage or defects are detected. Please apply a label, quarantine and return to your stores to be sent to Dual Inventive
- Always use the installation procedures set out in this manual for ATWS 3000
- Always start the installation with two fully charged batteries
- The WUM 3000 produces audio warnings of 106dB(A). Wear appropriate ear protection (as per the applicable legislation) when near the WUM 3000
- It is important that no ATWS 3000 device is installed in a position that would visually obstruct objects used for the safe operation of trains, such as signs or signals etc
- All members of the work group must be able to hear the WUM 3000 at all times during work, regardless of any background noise
- Ensure you minimise any potential inconveniences the sound the WUM 3000 emits might cause for the surrounding environment
- The first time you start the MTinfo 3000 app, the app will ask your permission to use the location of your phone. If 'yes' is selected, the MTinfo 3000 app will set the realtime status location automatically to that of your phone. If you select 'no', the MTinfo 3000 app will be unable to use your location and some features may be unavailable, such as 'Location'

ATWS 3000

4. COMPONENTS

A default ATWS 3000 set of Dual Inventive consists of the following units and components:

- 2 DUU 3000, ancillary items and transport case
- 1 WUM 3000, ancillary items and transport case
- 1 DUM 3000, ancillary items and transport case
- Chargers for the DUU 3000, WUM 3000 and the DUM 3000
- Two tripods

a. DUU 3000 specifications

Length	Width	Height	Weight	Battery type	Voltage
300 mm	120 mm	120 mm	2 kg	Lithium-ion	10.8 V

The case and contents of the DUU 3000:

- 2 DUU 3000
- Transport case
- 2 12V chargers
- USB with manual
- Keyring

The DUU 3000 has the following features:

- 1. Ultrasonic sensors
- 2. On/off switch
- 3. Charging port
- 4. Status button
- 5. Battery indicator
- 6. CloudLight

Two tripods are also part of the DUU 3000 set, for placement purposes



4. CONTINUATION COMPONENTS

b. WUM 3000 specifications

Length	Width	Height	Weight	Battery type	Voltage	SPL
270 mm	300 mm	280 mm	9,1 kg	Lithium-ion	10.8 V	106 dB

The transport bag and contents of the WUM 3000:

- 1 WUM 3000
- Transport bag
- 12V charger
- USB with manual
- Keyring

The WUM 3000 has the following features:

- 1. Speakers
- 2. On/off switch
- 3. Charging port
- 4. Status button
- 5. Battery indicators
- 6. CloudLight
- 7. Emergency button
- 8. Warning lights





4. CONTINUATION COMPONENTS

c. DUM 3000 specifications

Length	Width	Height	Weight	Battery type	Voltage
230 mm	123 mm	72 mm	1,4 kg	Lithium-ion	10.8 V

The DUM 3000 is used to manually strike out trains by pushing both of the DUM 3000's buttons simultaneously. A train can either be struck out automatically, or manually using a DUM 3000.

The DUM 3000 consists of:

- 1 DUM 3000
- A strap
- 12V charger
- USB with manual
- Keyring

The DUM 3000 has the following features:

- 1. On/off switch
- 2. Charging port
- 3. Status button
- 4. Battery indicator
- 5. CloudLight
- 6. Detection buttons
- 7. Train counter



The 12V charger for the DUU 3000, DUM 3000 and WUM 3000:



5. CHARGING THE BATTERIES

Instructions prior to use

- The chargers are for inside use only. Always charge the chargers in a dry, indoor environment
- Do not charge the batteries at temperatures below 6°C
- Always place the chargers at least 50mm apart for adequate cooling
- Always check the charger and cables for visible damage before use. DO NOT USE the charger if any damage is detected
- The chargers may only be repaired and maintained by Dual Inventive
- Always transport and store the chargers in a dry environment
- Only use the charger that was supplied for that particular model

Charging the battery

- Connect the power cable to the battery and then connect the charger to the device
- The battery indicator will now start flashing, indicating its power level and that it is being charged
- Once the battery indicator stops blinking, the device is fully charged

It is also possible to connect an external battery to each of the ATWS 3000 devices, for extended usage periods.

6. USER INDICATORS

When ATWS 3000 devices are powered on, users will see the different indicator lights on the back panel to display their status. These indicators are divided into three segments. For more information on these indicators, please see <u>chapter 4 Components</u>.

Status button

When pressed, the CloudLight and battery indicator will illuminate to present the user the current status of the product in hand (the DUU 3000, WUM 3000 or DUM 3000). The display will remain illuminated for 20 seconds and after that they will be turned off again to save power.

CloudLight

The CloudLight shows the current status of device (the DUU 3000, WUM 3000 or DUM 3000). The display will remain illuminated for 20 seconds and after that they will be turned off again to save power. The different statuses are:

- Solid Blue light when the device is online and has no errors
- Pulsing Blue light when the device is not online and has no errors
- Solid Red light when the device is online but has one or more errors
- Pulsing Red light when the device is not online and has one or more errors

In case any one of the devices is not online and/or presents any errors, the WUM 3000 will provide a warning to the user (fail-safe mode). This only applies when the ATWS 3000 project is activated.

Note, the CloudLight will turn off after being in its solid blue state for 20 seconds to save power.

Battery indicator

The battery indicator lights show how much power the battery of the device has left. These leds have five statuses:

- (3 solid green LEDs): Battery full
- Battery 66% (2 solid green LEDs):
 - Between 33% end 66% Beetween 15% and 33%
- Battery 33% (1 solid green LEDs): • Battery critical (1 solid red LEDs):
 - Between 3% and 15%
- Battery empty/not connected (no LED): Less then 3%

Note, that the battery indicator, like the CloudLight, will turn off after 20 seconds to save power.

If any device presents an error (solid red CloudLight), do NOT use it. Label the device, quarantine it and contact Dual Inventive for support.







7. FUNCTION TEST

a. Preparations

Before you start, check whether the ATWS 3000 devices' calibration is still in date. You can find the 'Next calibration date' sticker on each device.



Functioning

MTinfo 3000 uses the terminology 'Strike In' and 'Strike Out' to describe the action of the DUU 3000.

'Strike In' is when a train arrives at the work area. 'Strike Out' is when a train departs the work area.

Once a train Strikes In, the train counter will increment by 1. If the counter is higher than '0', the WUM 3000 will give an audible and visual warning within 5 seconds. A DUU 3000 can be used to automatically strike in a train.

Once a train Strikes Out, the train counter will decrement by 1. Once all trains have left the worksite and the counter reaches '0', the WUM 3000 alarm will be cancelled. A train can strike out of a worksite in multiple ways:

- 1. A DUU 3000 can be used to automatically strike out a train
- 2. A DUM 3000 can be used to manually strike out a train

Warning! If using a DUU 3000 as a strike out device, there will be a delay of 5 seconds before the alarm is cancelled to allow for empty freight train wagons. This means that once the DUU 3000 has not had a detection for 5 seconds, the train will be struck out.

Warning! If using a DUM 3000 as a strike out device, there will be a delay of 30 seconds after the train strikes in before the device will allow you to strike out. This is for safety purposes, so that a user cannot cancel the alarm on an oncoming train by accident.

It is important to note that the audible warning will only sound once after a train 'strikes in' or an error is detected. The visual signals will, however, continue showing until the train has been struck out or the error is solved. This also applies when a second train 'strikes in' before the first has gone through the 'strike out'. In this case you also will <u>not hear a second audio signal</u>.

Emergency button WUM 3000

There is an emergency button located on top of the WUM 3000.



When pressed, the WUM 3000 will give a continuous audible and visual alarm.

Once the button is reset, the alarm will stop. The WUM 3000 does not have to be on an activated project to use the emergency button.

b. Activating the WUM 3000

Before you can use the WUM 3000 it first needs to be activated via the MTinfo 3000 app. This is done as follows:

- Open the MTinfo 3000 app and log in
- Select the TWS tile (Note, you can only access this tile if you have the proper user rights)
- Select the project that you want to activate
- Select the WUM('s) 3000 you want to activate

All selected WUM('s) 3000 will now run a short self-test by giving a visual and audible alarm. It is important that you are able to observe these tests. If you do not see or hear the alarm, consult chapter 11, Troubleshooting.

Once you have a) seen and heard all of the WUM 3000 warning signals and b) have confirmed that there are no trains in your work area, check both statements in the app and select 'Ok'.
 Type 'ON' and enter your pin code. The WUM('s) 3000 are now activated. In case you do not want to activate the WUM('s) 3000, press cancel.

Deactivating the WUM 3000

To deactivate a WUM 3000:

- Go to the 'Status' tab
- Select the WUM 3000 you wish to deactivate
- Select 'Deactivate', type 'YES', using the buttons that will appear and enter your pin code to deactivate the selected WUM('s) 3000. Type 'NO' to cancel the deactivation. (Note, the letters are not always in the same place.)

Once deactivated, the WUM 3000 will issue a visual and audible warning, to inform everyone that it has been deactivated. Once all WUM 3000 are deactivated, the project will be successfully deactivated.



c. Icons in MTinfo 3000 app

The MTinfo 3000 app uses a series of icons on the bottom left of your screen. This table details what these are used for.

|--|

Notifications

View MTinfo 3000 notifications.



Refresh Refresh the current page.

Download design

Download project designs for the project you're viewing.

d.Using the DUM 3000

- Ensure the DUM 3000 has a properly secured carrying strap
- Always use the strap, ensuring it sits at waist height so that the DUM 3000 can be easily operated
- Turn on the DUM 3000 and wait until it establishes a connection with MTinfo 3000 (see <u>chapter 6, User indicators</u>). This may take up to 1 minute
- When a train is detected by a DUU 3000, the 'Detection blocked' LED will illuminate red. This indicates that you cannot strike out the train which has just been detected. Once this LED turns off, the operator can strike out the train



- When a train strikes in, the train counter will increment by 1. When a train strikes out, the train counter will decrement by 1. The train counter is visible on both the app and the DUM 3000 and will display how many trains are present in your work area
- To strike out a train, pressing both detection buttons simultaneously and then release them. This will cause both the green 'Detection valid' LED and the red 'Detection blocked' LED to illuminate. The green LED indicates that a train has been struck out. The red LED illuminates to notify the operator that a 10 second delay has been started, the purpose of which is to stop the operator from accidentally striking two trains out simultaneously. Trains can still strike in during this delay

Note that every detection restarts the 30 second delay time for safety purposes.

DUM 3000 with no internet connection

In the event that the DUM 3000 loses its connection whilst on an active project, the train counter will display two horizontal lines and the 'Detection Blocked' LED will illuminate. This is to warn the operator that the device currently has no connection and therefore **trains cannot be struck out.**

The system will continue to warn users when a train strikes in or when an error occurs.

As soon as the connection is restored, the train counter will once again display a counter and the 'Detection blocked' LED will no longer be illuminated. The operator can continue to strike trains out again from this point.

e. Function test

Before installing the ATWS 3000 devices, a function test must be performed. This test is required to ensure that all devices are working correctly.

- 1. All testing of the ATWS 3000 devices should be performed in a **position of safety**
- 2. Check that all batteries in all the devices are fully charged before use
- 3. Place the devices as per the project plan
- 4. Make sure the DUU 3000's are installed on the tripods at maximum height



Make sure that the area within 4m of the DUU 3000 is not obstructed. This is to ensure that the DUU 3000 works correctly and does not detect other objects.

5. Turn on the devices (DUU 3000, WUM 3000 etc) and wait for them to establish a connection with MTinfo 3000 (see <u>chapter 6</u>, <u>User indicators</u>). This can take up to 1 minute

Note, before continuing to step 6 the WUM('s) 3000 first need to be activated. Please see <u>chapter 7b. Activating the WUM 3000</u>.

- 6. Stand at a distance between 1m and 3m in front of the strike in device. If the project is functioning correctly, any activated WUM 3000 on the project will emit an audible and visual alarm within 5 seconds
- Next, stand at a distance between 1m and 3m in front of the strike out device. If the project is functioning correctly, any WUM 3000 on the project currently in an alarm state will stop within 5 seconds
- If you are using a DUM 3000 as a strike out, repeat step 6. Instead of standing in front of the strike out device, the DUM 3000 is used to deactivate the alarm instead. This is done by pushing both detection buttons on the DUM 3000 simultaneously and then releasing them. See <u>chapter 7d. Using the DUM 3000</u> for the complete explanation.
- 9. Deactivate the project using the MTinfo 3000 app and turn all devices off

If any device did not function as described in the above steps, D0 NOT use the device. Label the device, quarantine it and contact Dual Inventive for support.

Movement sensor

Each DUU 3000 contains a movement sensor which is activated when powered on. When the device is turned on, the DUU 3000 calibrates itself to its current position and any movement away from this set position (i.e. the tripod is knocked over) will trigger an alarm via the WUM 3000. This alarm is the same as the one issued when a train strikes in, whereby the audible alarm will stop after one full cycle. The visual alarm, however, will continue until the error is resolved.

It is solved by an authorised user re-positioning the DUU 3000 and then recalibrating the DUU 3000

by switching it off and then on again, using the key switch. After this, the project will need to be deactivated and activated again. This ensures that the user again checks if no trains are present in the work area while the DUU 3000 was unable to detect trains.

f. Monitoring a project

Once a project is activated, it can be monitored through the MTinfo 3000 app. You can do this using the status, log and devices tabs.

Status

This tab shows the status of the project as a whole. A green indication is given when the train counter is '0' and no errors are present. If the train counter goes above '0' or there are errors, a red indication will be given.

Project deactivation is possible on this tab, via the 'Deactivate' button.

The project design can also be seen here, using the 'Show Design' button (see the manual, ATWS 3000 – Preparation).

Log

The Log tab displays a copy of all the actions taken by any of the ATWS 3000 project's devices. It will display any strike ins or strike outs, warnings and errors alongside a timestamp. Every new entry in the log will appear above the previous entries.

The train counter and project state can also be seen here.

Devices

The Devices tab shows the data of the ATWS 3000 devices real time. The colour of the devices indicates their status:

Black: Device is offline.Red: Device is online but with errors.Blue: Device is online and has no errors



ATWS 3000

g. Solving an error on an activated ATWS 3000 project

In case of an ATWS 3000 device showing an error, or when a DUU 3000 falls over, users will be warned via the WUM 3000 giving audible and visual signals.

The reason for the warning can be seen in the MTinfo 3000 app and in Real Time status on MTinfo 3000.

Furthermore, the device itself with the error will also display a red CloudLight.

To solve these errors, please see chapter 11. Troubleshooting.



Once the error has been solved, the project will need to be reactivated. This needs to be done to ensure that no unnoticed trains have passed any detection units with an error, as that check needs to be performed again. Until then, the CloudLight will show red and the WUM 3000 will continue giving a visual alarm.

When multiple WUM 3000s are added to a single project, if one of the WUM 3000s shows an error, the other WUM 3000s will give an alarm to indicate this.

8. ATWS 3000 EXAMPLE LAYOUTS

ATWS 3000 can be used in different scenarios with different setups. See the images below for example setups in which the ATWS 3000 can be used.



9. INSTALLATION NEXT TO THE TRACK

Once the ATWS 3000 has successfully passed the function test, it must be installed as shown below. Make sure you always install the devices as instructed on the design in the MTinfo 3000 app. Please see the MTinfo 3000 preparation manual for ATWS 3000 for more information on these designs.

Install the DUU 3000's for strike in and out next to the track, as per the below images.
 Make sure the tripods are seated firmly on solid, level ground. The DUU 3000's must be angled towards the train's chassis level and facing the track.
 The distance between the two DUU 3000's (marked as X in this manual) can be found on the

design, as set out by the project designer

It is important to be absolutely certain of the direction of traffic when installing the strike in and strike out devices

• Place the WUM 3000 in the work area near the track workers, at a safe location, with the speakers aimed towards the work area



- Ensure that the DUU 3000 is aimed straight toward the track so that it can detect trains effectively
- Once installed, switch the devices on (DUU 3000, WUM 3000 and DUM 3000). For more information about the user indications, see <u>chapter 6</u>. User indicators
- Activate the project, see <u>chapter 7b. Activating the WUM 3000</u>. Note, make sure no train is currently present in the work area whilst activating the project
- Once activated, please allow one train to pass the work area. This serves as a final test to check that the ATWS 3000 devices have been set up and installed properly (If this isn't possible, please simulate a train by walking past the devices sequentially in the direction of traffic to test if they're working properly)
- Once all of the above is completed, the ATWS 3000 is ready for use

Warning! Please make sure that after placing the devices, the operating keys are removed. This prevents misuse and errors.

10. SERVICE ALERTS

Users can opt-in to receive service alerts via SMS or push-notifications. In order to receive these, your phone number needs to be linked to your MTinfo 3000 account. If you are logged in on the MTinfo 3000 app and have given the app permission to send push notifications, you will start to receive these. If not, you will receive these via SMS.

Please see the overview below for the notifications that you can receive. These are sent to every operator on the project:

Notification	Explanation
Project 'x' has been activated	The project has been activated with the MTinfo 3000 app. This notification is sent to every operator on the project.
Project 'x' has been deactivated	The project has been deactivated with the MTinfo 3000 app. This notification is sent to every operator on the project.
DUU 3000 'x' tilt error	The allowed tilt threshold was exceeded. Please reposition the DUU 3000, restart it and reactivate the ATWS 3000 project.
Device 3000 'x' internal error	The device has an internal error. Restart the device and check its status. If this does not solve the issue, please label the device, quarantine it and contact Dual Inventive for support.
The battery of device 'x' is almost empty	The device's battery is almost empty. Please charge it as soon as possible.

11. TROUBLESHOOTING

During use of ATWS 3000, users can encounter situations which prevent the system from functioning as expected. See the overview below for what to do during these situations.

Situation	Explanation and solution
DUU 3000/WUM 3000/DUM 3000 shows a red CloudLight.	A device on the project is not switched on or calibrated properly or has experienced an internal error. Please try again. If this does not solve the issue, contact Dual Inventive.
DUU 3000 is not calibrated properly.	Reposition the DUU 3000. Turn the DUU 3000 off and then on again and reactivate the project. The DUU 3000 has now been recalibrated.
DUU 3000/WUM 3000/DUM 3000 empty battery.	The battery of the DUU 3000, WUM 3000 or DUM 3000 is empty. Please charge it as soon as possible.
WUM 3000 gives visual and audio warnings but no train is in the work area.	Check that all devices on the project are online and not displaying any errors. If this does not solve the problem, please restart all the devices and activate the project again. In case this does not solve the problem, please contact Dual Inventive.
Device stays off after turning it on.	WUM 3000/DUM 3000/DUU 3000 is not switched on properly. Please try again and check the device's batteries. In case this does not solve the problem, please contact Dual Inventive.
Device stays on after turning it off.	WUM 3000/DUU 3000/DUM 3000 is not switched off properly. Please try again. In case this does not solve the problem, please contact Dual Inventive.

12. SERVICE & MAINTENANCE

Always use the transport cases to transport the ATWS 3000 devices when possible. Once every two years, the ATWS 3000 needs to be checked and serviced by Dual Inventive. The 'next certification date' stickers indicate when this is due. For more information, please contact us, quoting the device ID number.

For service and repair please contact your local Dual Inventive representative.

13. ENVIRONMENT & RECYCLING



Equipment disposal

The ATWS 3000, the LI-ion batteries and peripherals, such as chargers, are not domestic waste. For more detailed information about recycling the equipment, please contact the local authorities or Dual Inventive.

IN CONCLUSION

If you encounter any problems when using our products or are unsure of anything in this manual, please report this to us via info@dualinventive.com, or by phone. Ultimately, customer satisfaction and your safety are our top priority and therefore we take all feedback very seriously. We use this to improve the safety and design of our products. On behalf of the Dual Inventive team, we wish you all the best.

For marketing materials, please visit our website where they have been made available by Dual Inventive. Please visit <u>www.dualinventive.com</u>

Ti Duallnventive Ubiquitous Rail

Dual Inventive Nederland BV

Belgiëstraat 5 5061 KG Oisterwijk Phone +31 (0) 13 533 9969 Fax +31 (0) 13 533 9970 E-mail <u>info@dualinventive.com</u> Internet <u>www.dualinventive.eu</u>

Dual Inventive Limited

Drake House Decoy Bank North, DN4 5JR Doncaster, South Yorkshire, UK Phone +44 (0) 132 238140

Copyright. Copying or other forms of reproduction of this document, fully or parts of it, is only allowed with prior permission of Dual Inventive.