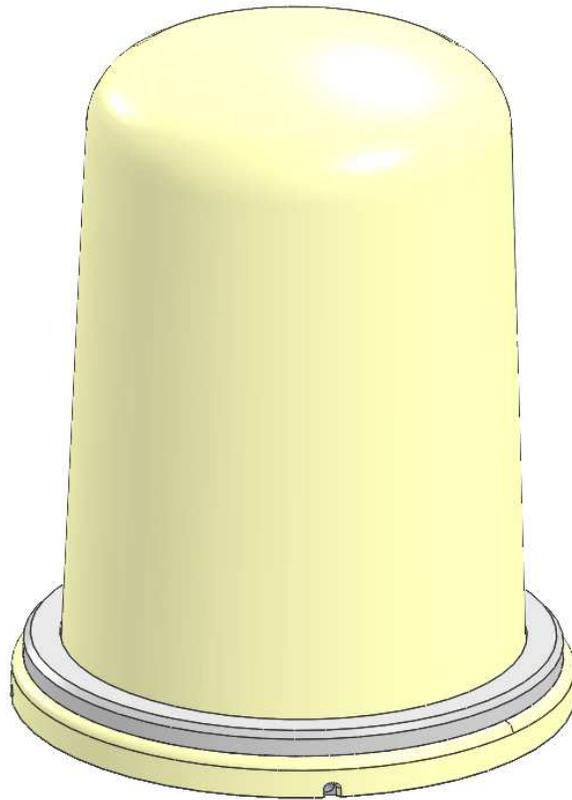


OGIER ELECTRONICS

SCAN-360-IP (POE)

**Installation and Operation Manual
(for website version 2.0)**



Issue B 1 October 2019

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12 Specification

1 Introduction

The Scan-360 Radar provides 360-degree detection of moving targets in user-defined coverage areas at ranges up to 200m. The Radar performs a full scan once per second. On detecting a target e.g. a person, it generates an alarm (both IP and contact closure) and will also direct a paired camera to the target.

The Radar operates in the 24GHz Licence Exempt band, is powered by POE and has an IP interface for camera control and general connectivity. Configuration is done using standard web browsers. Combined with a suitable IP camera, it can provide high-level security for a variety of sites, whether as a stand-alone system with its own local video recording, or as part of a larger more comprehensive surveillance system. Note that suitable IP cameras must be ONVIF compatible and capable of absolute positioning.

Radar configuration is straightforward with an easy to use menu of set-up options including an alignment procedure for the camera, detection zone set-up, an optional operating schedule, user set camera tilt and zoom etc. The web browser interface includes a Live Feed page where targets can be viewed live superimposed on a downloaded map.

The various factors to be considered when assessing the Radar for an installation site and their potential impact are covered in section 3 "Site and Performance Considerations".

New features include:

- * Four different user-set configurations ("Presets") e.g. for target threshold, can be defined. Rather than using the same settings for all detection zones, the most suitable Preset can be chosen for each zone so as to optimise performance for the whole site, zone by zone.
- * Target tracking. Two types are provided - Camera Tracking where the Radar will try to make the camera follow one target rather than moving back and forth between targets OR Target Tracking where the Radar will assign tracks to up to 8 targets and use the camera for one of them.
- * Test Mode. When enabled this "freezes" the Radar sensitivity at the current level so demonstrations or tests can be done repeatedly in the same area without reducing the sensitivity.
- * Support for ADAMS I/O interface units. Radar IP alarms can be configured per detection zone to action output ports on the ADAMS units. Also ADAMS unit inputs can be used to either disable the Radar or stop it moving the camera (see the VMS Events web-page).
- * An improved Status web-page allows easier debugging and an overview of the Radar's parameters.

Note: This manual applies to Scan-360 website version 2.0.

2 Recommended Tools

At a minimum the following tools/items are recommended:

Suitable bracket (not provided)

Laptop (ideally with internet access to download a map)

Spanner suitable for M6 nut for Radar mounting studs

Spirit-level

Ethernet Switch with POE to 802.3af or 802.3at (or separate POE adaptor)

CAT5E Screened cable (type 4 pr FTP with outer foil)

RJ45 connectors/Crimp tool

Soldering iron (if the multi-pole connector is to be used for contact closure alarms)

Note that this document does not cover the installation of the camera, which may require additional tools.

A mating weather-proof RJ45 connector is provided with the Radar, but the multi-pole connector for the contact closure alarm (if required) is not. See section 4 "Radar Installation" for further details on the connectors.

3 Site and Performance Considerations

Field of view

The Radar requires a clear line of sight over the area to be covered. Trees or bushes in the way prevent the Radar identifying targets behind them although it can cope with a degree of obstruction especially for larger targets. The Radar cannot penetrate buildings or walls.

Installation Height

The maximum recommended install height of the Radar (assuming model type is 16/L/010) is 6 metres however it operates most effectively at heights of 2 to 4 metres. As the install height increases the coverage close to the Radar is reduced due to the shape of the antenna beam. If coverage very close to the Radar is essential then the Radar should be mounted as low down as possible e.g. 1m though this may compromise long range performance. As a rough guide in an ideal environment:

<u>Install height</u>	<u>Typical minimum detection distance for man</u> <u>(for radar type 16/L/010)</u>
6m	35-50m
4m	15-25m
2m	10-15m

Unwanted Alarms General

The Radar detects moving objects by analysing the radio signal they reflect. The Radar processing is specially designed to minimise unwanted alarms from vegetation such as trees, long-grass or bushes moving in the wind. Even so, where possible avoid large areas of trees or bushes in the coverage area and keep grass short e.g. < 150mm (6"). The Radar configuration should always be optimised for the site so as to balance target detection with the potential for unwanted alarms.

Unwanted Alarms due to Heavy Rain/Snow

During very heavy rain or snow it is possible that the radar may generate unwanted alarms. Where this is a problem, then raise the "Target Threshold" and/or "Clutter" settings (see Sections 7 and 8). This will reduce the potential for unwanted alarms but will make the Radar less sensitive to targets.

Operation over Water

The Radar has not been formally tested for operation over bodies of water.

Flatness of Terrain

Areas where the terrain rises or drops significantly relative to the install location will have a lower probability of seeing a given target. As a rule of thumb for a 4m install height and at the maximum range of 200m the land should be no more than 3m higher or 6m lower than at the install site - though clearly the impact depends on the size of the target. The effect of variations in terrain is proportionally greater at shorter ranges.

Clutter

All objects generate return signals and so add "clutter" which can reduce the Radar's ability to see real targets. As well as vegetation (see above), buildings or parked vehicles can also mask nearby targets due to the size of the return signal they generate. The Radar processing

is designed to minimise these effects but they can still cause a localised reduction in sensitivity. As a result a man walking close to a building or vehicle can be masked by it.

Reflections/Large Targets

The Radar can be misled by reflections from buildings or high-sided vehicles into detecting a legitimate target at the wrong bearing and so moving the camera in the wrong direction. Also, large moving targets (e.g. a lorry) can generate return signals that are so large they can also cause the Radar to misdirect the camera. These effects are only temporary and the Radar will usually correct on the next rotation.

Probability of Target Detection

Reflections from the ground, foliage, buildings, fences, vehicles etc and the impact of terrain variations and rain mean that the signal received back from the wanted target can both vary considerably itself and at the same time be immersed in “clutter” noise from other objects.

These effects impact on the Radar’s probability of detecting a given target such that it will often detect on some scans but not others. Overall however, for a realistic target crossing an area over a number of Radar scans, the probability of not detecting the target at all is low.

Interference - General

The Radar operates in the license exempt 24GHz band. Other types of equipment operating nearby and using the same band may affect performance at some bearings. Other systems e.g. military or surveillance radars (or airport radars) operate in other frequency bands but can generate very high transmit levels that again can degrade performance and even damage the equipment. Such sites should be avoided but if necessary the Radar can be fitted with additional RF filtering to provide further protection – please contact Ogier Electronics for details.

Mutual Interference

The Radar has an internal GPS receiver internally mounted at the top of the radome. This provides a very precise timing signal that can be used to synchronise the transmissions of multiple Scan-360 Radars and so reduce the effects of mutual interference. To use this facility the Radar must have a clear, unobstructed view of the sky.

Earthing

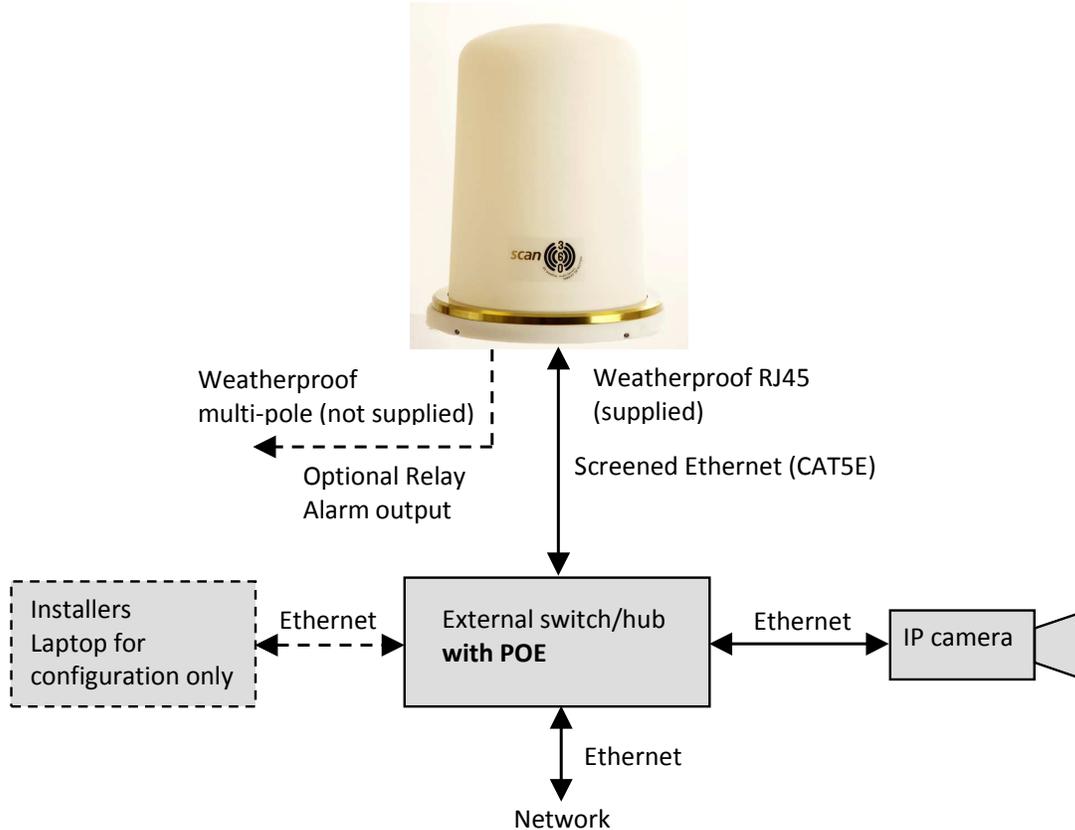
Standard Earthing procedures should be applied where applicable.

Snow/Ice

Keep the Radar radome free of a build-up of snow or ice for optimum performance.

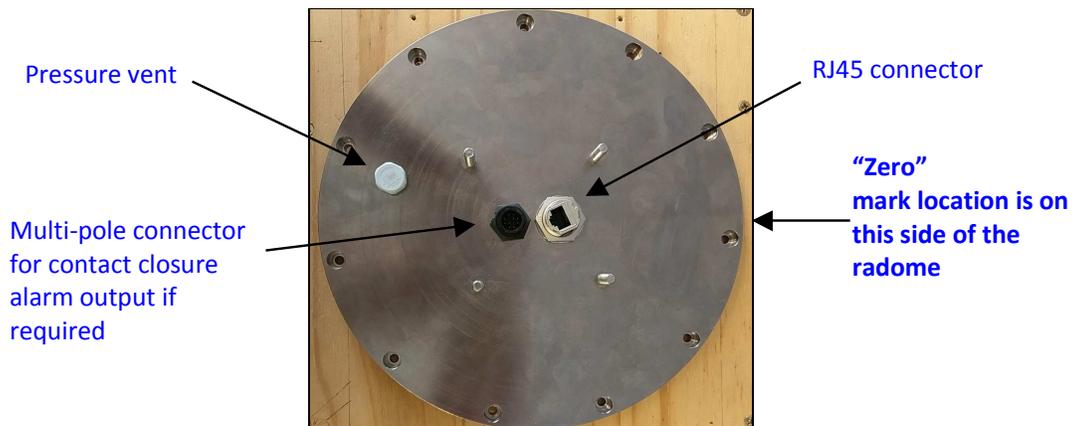
4 Radar installation

The drawing below shows a typical Radar installation.



Bracket, fixings and Radar “Zero” mark location

The Radar measures 310mm high and 248mm in diameter (ignoring studs and connectors). It must be fixed to a solid bracket so the overall structure does not move or vibrate in the wind. The Radar is mounted using the four M6 studs located on the base. The studs are on a standard 101.6mm (4 inch) PCD (Pitch Circle Diameter).



Radar base with 4 M6 fixing studs and “Zero” mark location

The Radar is provided with M6 nuts/washers. Do not over-tighten the nuts. Recommended maximum torque is 4Nm. **When handling do not to bend or impact the studs.**

Installation tolerance and orientation

The Radar must be installed level, no more than +/-1degree from horizontal in all directions.

The maximum recommended install height is 6m. Best performance is at heights of 2 to 4m. As the height increases, coverage close to the Radar may reduce due to the shape of the antenna beams. See section 3 "Site and performance Considerations".

A black line on the edge of the radome indicates the Radar's "Zero" position (see picture of the base above). The "Zero" indicates the direction used when aligning the Radar to the camera. Ideally it should be orientated (use the viewing holes in the Radar base) to a recognisable feature that can be used when doing camera Alignment (see "Alignment" in sections 7 and 8 of this document).

Cabling

Underneath the Radar is a weatherproof RJ45 connector (mating part provided) through which power is supplied using POE (802.3 at or af). All configuration and IP alarms use this network connection. The CAT5 cable should have an outer foil screen for EMC purposes. Be sure that the RJ45 part of the Ethernet connector fully engages.

The Radar also has a 10-way multi-pole connector (mating part **not** supplied) that can be used for a contact-closure alarm interface (see below).

Cables must pass through the centre of the bracket or column to connect to the Radar. This means that they must be attached to the Radar before it is fitted in place.

Connector details

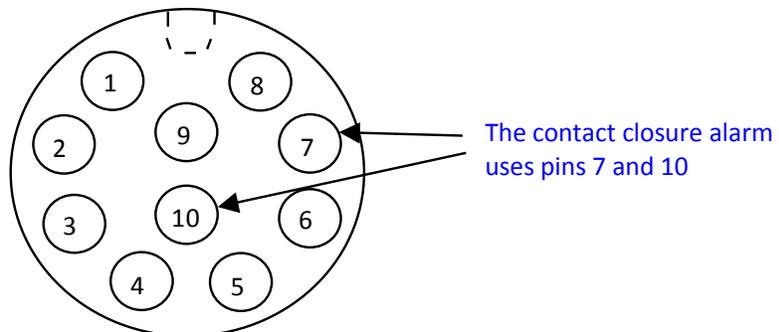
The part number details for the Radar's mating connectors are:

Ethernet RJ45 (supplied):	RS PRO	RS 111-6743
10-way multi-pole (not supplied):	Amphenol LTW	BU-10BFFA-LL7001

Speak to your supplier if spares are required.

Contact Closure Alarm connection

As well as a configurable IP alarm, the Radar has a contact closure relay interface that closes for approx 1 second whenever it identifies and actions a target. The interface uses pins 7 and 10 on the multi-pole connector.



Solder-bucket end view of multi-pole cable connector pin-out (not supplied)

The relay is only suitable for switching relatively light loads and is not suitable for mains voltages. See the specification section for details.

5 Camera information and connection

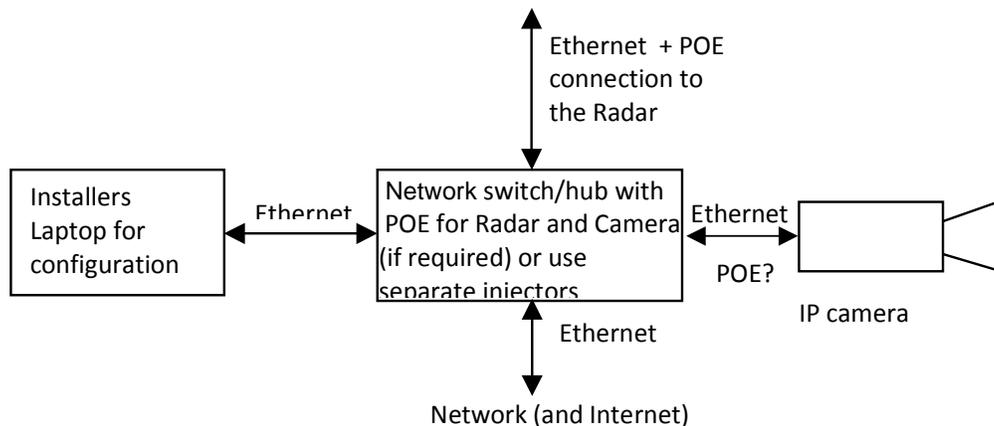
The installation of the camera is not covered in this document. Its installation will be detailed by the manufacturers own documentation. The Radar has been tested with a number of suitable cameras and advice can be provided on camera selection. Cameras must have absolute positioning and be ONVIF compliant.

The camera must be installed near to the Radar (usually within a few metres) so that the bearing the Radar instructs the camera to move to when a target is seen is correct.

The Radar requires the camera's network details and its username and password. These must be provided to the Radar using the "Configuration" procedures (see sections 7 and 8).

Camera configuration and connection

The camera's Ethernet cable should be routed to an IP network that (If required) provides POE power for the camera and a network connection to the relevant Radar as well as access to both for the installer. To download a map, the Radar also needs access to the internet. The simple diagram below just assumes a single common POE switch, but in practice the various equipments may be distributed on the network. The camera should be configured to stream its video image so that it can be displayed on the installer's laptop during configuration of the Radar (using either a web browser or a media player e.g. VLC player) – in particular for the camera "Alignment" procedure (see sections 7 and 8).



Typical Switch connections

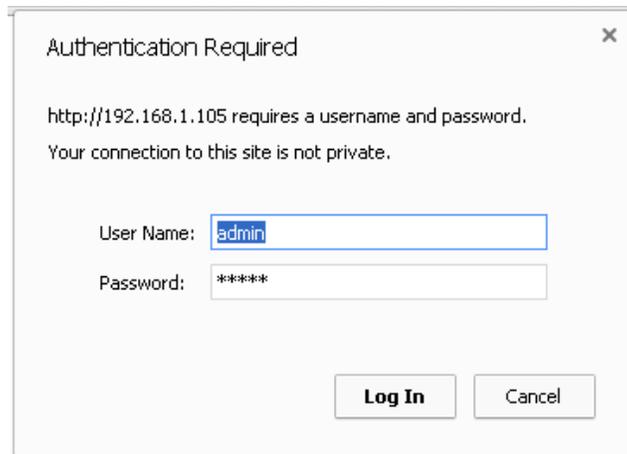
Note that the camera and Radar must be on the same IP address range unless an external switch acts as a router and provides IP address translation.

6 Initial connection to the Radar

Ethernet Set-up

Radar configuration is done using a web browser. A POE enabled network switch or separate POE injector will be required to power the Radar (see section 5 above). If the configuration also involves a camera then the network must allow the laptop, Radar and camera to communicate together. The Radar will also need internet access if a map is to be downloaded.

The Radar's default network IP address is **192.168.1.105**. Set the Laptop to have an IP address on the same IP range and then open the Laptop's web browser (e.g. Chrome, Edge, Firefox, note if Internet Explorer then must be at least version 11) and enter **192.168.1.105** in the address bar. With the Radar powered then if it is using the default IP address an authentication pop-up box should open requesting a valid username and password in order to login (the default is "**admin**" in both cases).



Radar Authentication

Radar Network Settings - Reset to default

If the Authentication pop-up does not appear and the website is unavailable, check the Laptop IP settings and the Ethernet cabling. If these appear correct then the Radar may not be set to the default network settings.

At power-up the Radar is available on a fixed IP address for a brief period before it reverts to its stored values and normal operation. To reset the Radar back to its default network settings:

- a) Disconnect the Radar so it powers down (or turn off power to the POE device).
- b) In the web browser enter the IP address "**192.168.1.205/reset_network**".
- c) Reconnect the Radar (or power up the POE device).
- d) After approximately 8-10 seconds repeatedly try the above address for 10 seconds or so. A message should appear which states that the Radar has been reset to the default network settings. If the message does not appear, then repeat a) to d).
- e) Once the reset message has been seen you can log in to the Radar after waiting a further 20 seconds or so, using the default login details (192.168.1.105 and username/password "admin").

Enabling DHCP

If the network is using DHCP then after accessing the Radar website (see above), select the Network menu option and then a) click on the “Enable DHCP” entry box and then b) enter a Hostname for the Radar for use by the DHCP server. **Then press the “Save” button.**

Access to the Radar website will now only be possible either via the non-fixed IP address given to the Radar by the DHCP server or (depending on the DHCP server capability) using the Radar’s Hostname (enter `http://hostname`). See Section 8. “Further Configuration” for further information on the Radar network configuration options.

7 Initial Configuration

General

At power-up the Radar will enter “Target Mode” and be ready to react to suitable targets after approximately 1 minute assuming it is already configured.

The Radar’s operating parameters can be configured at any time by accessing the relevant configuration page on the web browser.

Assuming the Radar has not already been configured, entering the Radar’s IP address (192.168.1.105 is the default) in the laptop web browser address bar will after login (where “admin” is default username and password) bring up the Status page. Note that for most configuration pages the Radar will still be in “Target Mode” and so respond to targets as normal. However if in the Alignment, Detection Zones or Camera pages, then the camera will not be moved to targets to allow the user to operate the camera undisturbed.

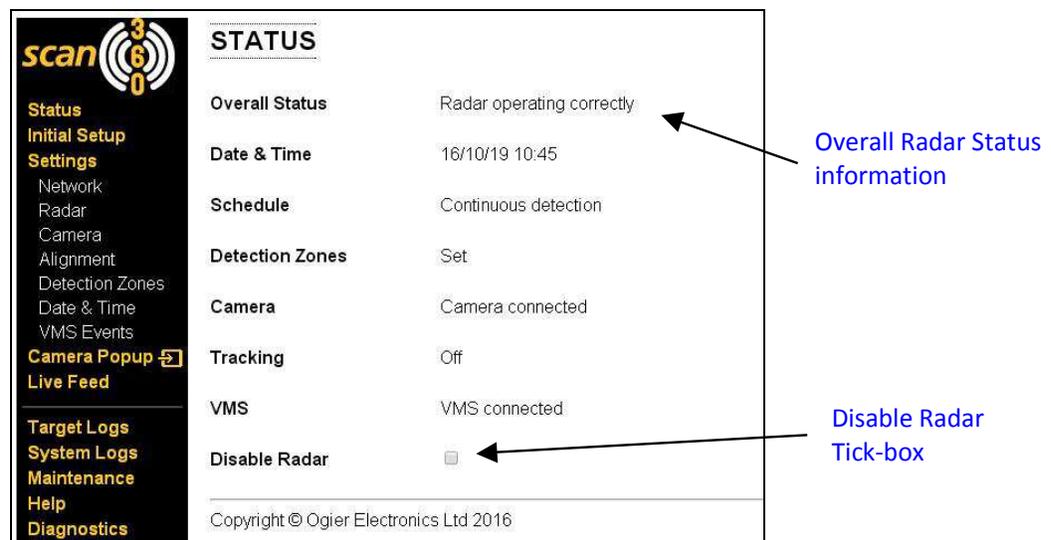
Most pages have help text associated with them. Hovering over the blue question mark beside a menu item will bring up relevant help text. Some icons also have help text.

Before starting configuration for the first time make sure that the camera image can be viewed on the laptop as some of the set-up procedures will require it.

Note 1: To use a downloaded map to make set-up simpler, your laptop needs internet access.

Note2 : Changes made on a web-page have to be stored to the Radar using the Save or Set button on the page – otherwise any changes made may be lost when you navigate away from the page or close down the browser.

Status Page



The screenshot shows the 'STATUS' page of the radar's web interface. On the left is a navigation menu with items like 'Status', 'Initial Setup', 'Settings', 'Network', 'Radar', 'Camera', 'Alignment', 'Detection Zones', 'Date & Time', 'VMS Events', 'Camera Popup', 'Live Feed', 'Target Logs', 'System Logs', 'Maintenance', 'Help', and 'Diagnostics'. The main content area displays the following information:

Parameter	Value
Overall Status	Radar operating correctly
Date & Time	16/10/19 10:45
Schedule	Continuous detection
Detection Zones	Set
Camera	Camera connected
Tracking	Off
VMS	VMS connected
Disable Radar	<input type="checkbox"/>

Arrows point from the text 'Overall Radar Status information' to the 'Overall Status' field and from 'Disable Radar Tick-box' to the 'Disable Radar' checkbox. The footer of the page reads 'Copyright © Ogier Electronics Ltd 2016'.

Status page screenshot

The Status web page is the initial loading screen. It provides an overview of the Radar operation including its “Overall Status”, whether a schedule or detection zones are set and whether a camera is connected or VMS set.

The various Status messages will change state depending on how the Radar is operating and configured. Generally, if the Radar is operating normally and has access to the camera it will show the Overall Status as “Radar operating correctly”. Other possible Status messages are listed in section 11 “Trouble-shooting”.

The various messages on the Status page are:

Overall Status	Shows the overall operational status of the Radar. This message will change depending on the Radars current configuration.
Date & Time	The current time and date used by the Radar. If wrong it can be set via the Settings menu (see below).
Schedule	Indicates whether a timed operating schedule is set or if the Radar is instead operating continuously.
Detection Zones	Whether a detection zone has been set. If no zones are set, then the Radar will not react to targets.
Camera	Whether camera details have been provided and whether the Radar can connect to it.
Tracking	Whether target Tracking has been enabled and if so which type.
VMS	Whether the details of a VMS have been provided.
Disable Radar	If set then the Radar will completely stop responding to targets until unset, even if the web-page is subsequently closed.

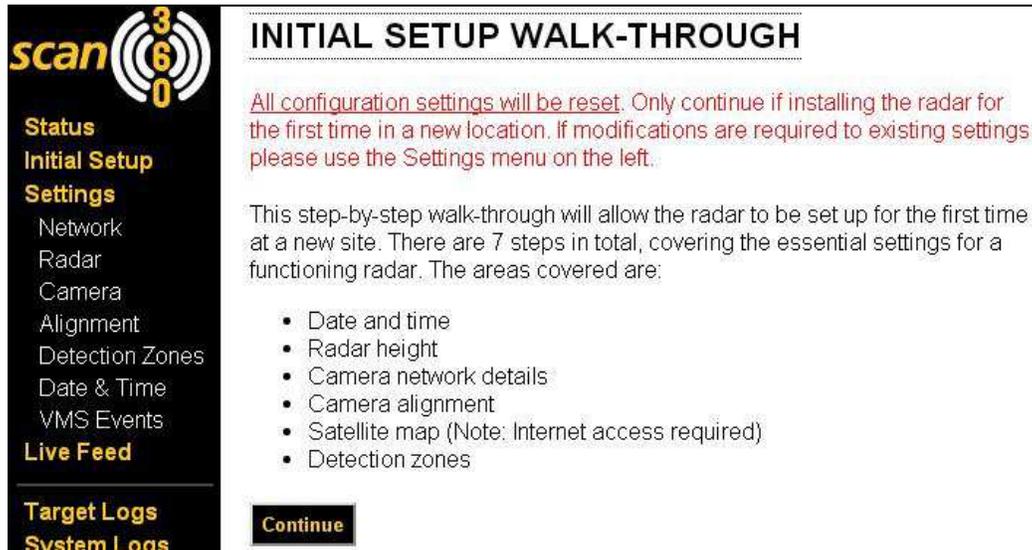
To the left of the page (and all other pages) are Headings in yellow that can be selected. “Settings” also has further sub-heading options shown in white. The principle Headings are:

STATUS	See above.
INITIAL SETUP	Run when first installing the Radar. This is a step-by-step walkthrough to get you up and running.
SETTINGS	Further settings for detailed configuration of the Radar.
CAMERA POPUP	Brings up a small pop-up window with camera movement controls and optional Live Feed page/Alignment page/ Tilt & Zoom page. Takes up less screen room than the full-screen versions allowing for example the camera video to be more easily placed alongside so both can be viewed at the same time.
LIVE FEED	View targets on the screen in real-time.
TARGET LOGS	View details of previous targets.
SYSTEM LOGS	View previous changes to the Radar config/operation.
MAINTENANCE	Upgrade the Radar’s firmware and website, reset the configuration or store/recall it.
HELP	Help for common problems and access to latest manuals.
DIAGNOSTICS	Engineering information for help with debugging.

If in use for the first time then (out of the box) the Radar will be pre-configured with standard values for some parameters. However it is recommended that the “Initial Set-up” procedure be run as this will take you through setting the date and time, connection to and aligning of the camera, download of a map and setting detection zones. Once the necessary changes are made they are stored in non-volatile memory and do not have to be made again.

Initial Set-up Start

The “Initial Set-up” procedure comprises a 7 step walkthrough for basic configuration of a Radar at a new site. **Note that by using the “Initial Set-up”, all previous Radar configuration changes will be lost as the Radar will be initially returned to its default settings. To make individual changes to an existing configuration use the Settings options instead.**



scan (360)

Status
Initial Setup
Settings
Network
Radar
Camera
Alignment
Detection Zones
Date & Time
VMS Events
Live Feed
Target Logs
System Logs

INITIAL SETUP WALK-THROUGH

All configuration settings will be reset. Only continue if installing the radar for the first time in a new location. If modifications are required to existing settings please use the Settings menu on the left.

This step-by-step walk-through will allow the radar to be set up for the first time at a new site. There are 7 steps in total, covering the essential settings for a functioning radar. The areas covered are:

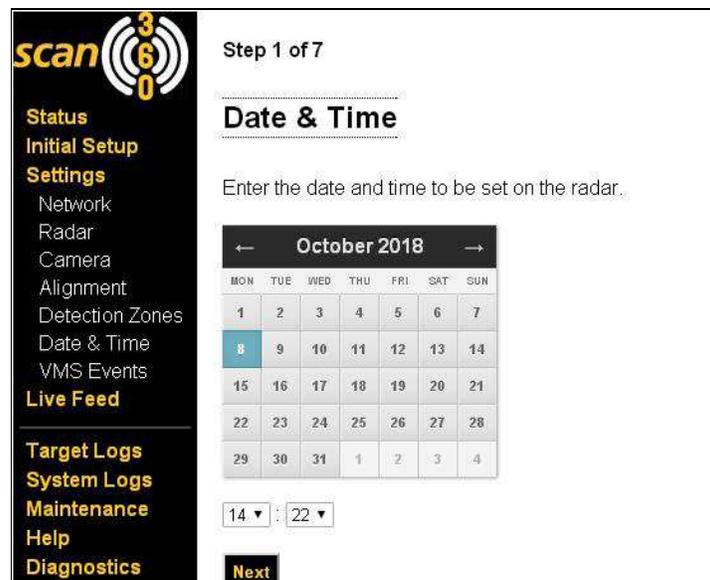
- Date and time
- Radar height
- Camera network details
- Camera alignment
- Satellite map (Note: Internet access required)
- Detection zones

Continue

[Initial Set-up start page](#)

After selecting “Initial Set-up” then if happy to proceed press the **Continue** button (see above) to go to Step 1 - Date and Time.

Initial Set-up Step 1 - Date and Time



scan (360)

Status
Initial Setup
Settings
Network
Radar
Camera
Alignment
Detection Zones
Date & Time
VMS Events
Live Feed
Target Logs
System Logs
Maintenance
Help
Diagnostics

Step 1 of 7

Date & Time

Enter the date and time to be set on the radar.

← October 2018 →

MON	TUE	WED	THU	FRI	SAT	SUN
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	1	2	3	4

14 : 22

Next

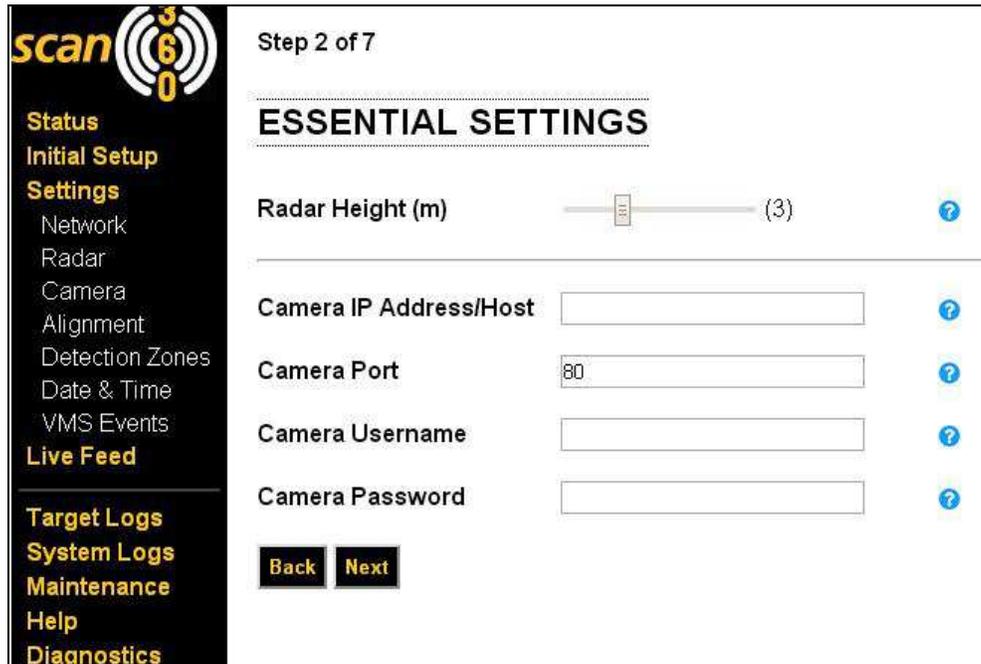
[Initial Set-up step 1: Set Date and Time](#)

Check the date and time shown. If correct (during Initial Set-up it is taken from the laptop used for the configuration) just press the Next button. Otherwise use the calendar shown to set the correct date (use the left/right arrows to change the month, then use the mouse to select the day) and then the two drop-down boxes to set the time in hours and minutes.

Note that the Radar’s internal real-time clock is maintained in the event of a power-outage by a back-up capacitor. However if the Radar has not been powered recently then the time may need resetting again.

When the date and time are correct then press **Next** to move to Step 2 – Essential Settings.

Initial Set-up Step 2 - Essential Settings



Initial Set-up step 2: Radar Height and Camera network settings

First adjust the “Radar Height” slider value to be the approximate height in metres of the Radar when installed.

Second, enter the camera network settings:

Camera IP Address/Host	Either the IP Address of the camera xxx.xxx.xxx.xxx or its hostname if using DHCP
Camera Port	Network port used by the camera for HTTP interface (usually 80)
Camera Username	Login username for the camera*
Camera Password	Login password for the camera*

* These are usually the normal login details, but some cameras (in particular HikVision and Dahua) have additional ONVIF login details in which case it is these ONVIF login details that are required.

When ready press **Next** to go to Step 3 – Camera Alignment.

Initial Set-up

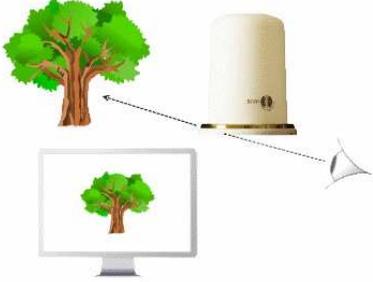
Step 3 - Camera Alignment

Step 3 of 7

CAMERA ALIGNMENT

In order for the camera to pan to the correct location when a target is detected, the position of the camera needs to be aligned with the radar. If there is no camera for the radar to control this step can be ignored.

Move the camera using the controls on the right until the camera picture displays the same as the view through the radar alignment viewing holes. When the two views match press Set.



Initialising connection to the camera. This message will disappear once camera initialisation is complete. It usually takes 20 seconds to initialise a connection to the camera. If the initialisation takes longer please check the physical connection and details entered

[Back](#) [Next](#)

Navigation controls: Up, Down, Left, Right, Home, Search (+), Search (-)

Initial Set-up step 3: Camera Alignment

When the Camera Alignment page is first displayed, the red text at the bottom indicates whether the Radar can communicate with the camera using the details previously entered. If there is a problem then:

a) if after 20 seconds the red text remains saying "Initialising connection to the camera....." then this suggests that the Radar can talk to the camera but either the username/password that the Radar has for the camera is wrong (in which case go back to Step 2 and check) or the camera may not have fully started yet (wait and see).

Or

b) if the red text changes to read "No connection to the camera. Please check the physical connection and details entered" then this suggests either the IP address entered for the camera is wrong (in which case go back to Step 2 and check) or the physical network connections are wrong (check cabling and power etc) or the camera is in the early stages of initialisation after power-up (wait and see).

If all is well and the Radar can connect to the camera then the red text will disappear and you are then able to continue with the camera alignment process.

To align the camera first make sure you can view the camera video stream on the laptop (either using another web browser window or a media player such as VLC Player).

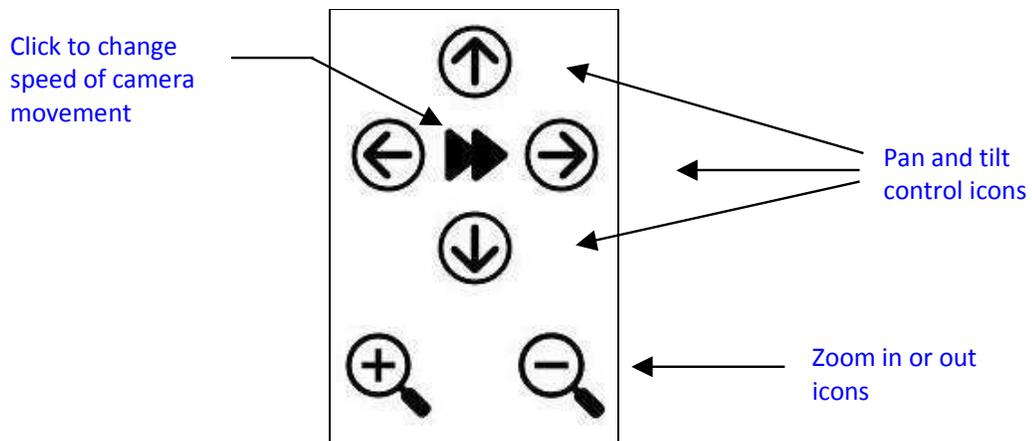
In order that the Radar knows what coordinates to give to the camera so it can be steered to the correct bearing, the Radar and Camera must be calibrated or aligned together. Note that if at some later time the Camera or Radar are replaced or moved on their mounts then the alignment procedure must be repeated.

- a) From directly behind the Radar but **ON THE OPPOSITE SIDE TO THE ZERO MARKER** (see section, 4. Radar Installation, for a picture of the base showing the Zero Marker location), look through one of the two Alignment viewing holes in the base of the Radar. This direction is the “Zero Bearing”.



Alignment viewing holes

- b) Pick out an object or feature in the distance that can be seen roughly in the centre of the viewing hole. If there is nothing suitable then place something in the view or have someone stand at a suitable location (typically 50 to 100m away).
- c) While viewing the camera picture, use the icons on the right hand side of the screen (see below) to line up the camera image exactly on the same feature that was identified through the radar viewing hole. Note that the speed of movement can be changed from fast to slow and back again by clicking on the double arrows in the centre of the icons – this allows for finer control when needed.



Camera control icons on RHS of web-page

- d) Once the camera is centred correctly then press Next to proceed to Step 4 – Map.

Initial Set-up Step 4 - Map

Step 4 of 7

MAP

A satellite map can greatly improve the speed and accuracy of setting up detection zones. If there is internet access please enter the location of the radar to download a satellite map.

Clicking 'No map' will allow the detection zones to be set up without a map, and will skip 2 steps in the process.

Determine automatically ?

or

Geographical Location ?

or

Address ?

Back **Download map** **No map**

Initial Set-up step 4: Map

To make the setting of detection zones easier and for use when viewing targets in Live View, a satellite map image can be imported from Google maps. Note: to download or view the map at any time the Laptop must have access to the internet. This is because the Radar only stores the coordinates of the map not the map image itself. Each time the map is required, the Laptop/PC has to re-import it using the saved coordinates.

There are 3 ways to get the correct map:

Determine automatically: The Radar has a GPS receiver under its radome which can provide the Radar's location if the Radar has a clear view of the sky. Click the selection box to get map coordinates this way (note that it can take several minutes from power-up for the GPS receiver to acquire the satellites).

Geographical Location: Enter Latitude and then Longitude separated by a comma, such as 51.773265, -0.323975.

Address: Type in the address e.g. 12 Sandridge Park, AL3 6PH.

After choosing one of the above methods, click the 'Download map' button to import the map and proceed to step 5 – Radar Position. If the map does not appear then either a) internet access is unavailable b) The GPS receiver cannot acquire the satellites or c) the address or location coordinates entered are incorrect or insufficient.

Note that once a map is downloaded then in all pages where it is used thereafter it will appear automatically without having to re-enter the address/location details **as long as there is internet access.**

Alternatively to proceed without downloading a map, just press the "No map" button. This will skip steps 5 and 6 relating to locating the Radar and camera on the map.

Initial Set-up Step 5 - Radar Position

Step 5 of 7

RADAR POSITION

Click on the map to position the radar.

The map may re-center itself to fit with the new position of the radar.

When the radar is in the correct location click Next to continue.

Back Next

Initial Set-up step 5: Radar Position

Follow the text on the web-page to position the Radar icon in the correct location on the map. The two buttons below the text can be used to zoom in and out of the map.

When the Radar icon is in the correct location, press **Next** to go to Step 6 – Set Zero Position.

Initial Set-up Step 6 - Set Zero Position

Step 6 of 7

SET ZERO POSITION

Drag the green circle so that the green line points in the same direction as the radar.

To aid alignment the radar has a notch on its base signifying which direction it's pointing.

When the radar is aligned on the map in the correct direction click Next to continue.

Back Next

Initial Set-up step 6: Set Zero Position

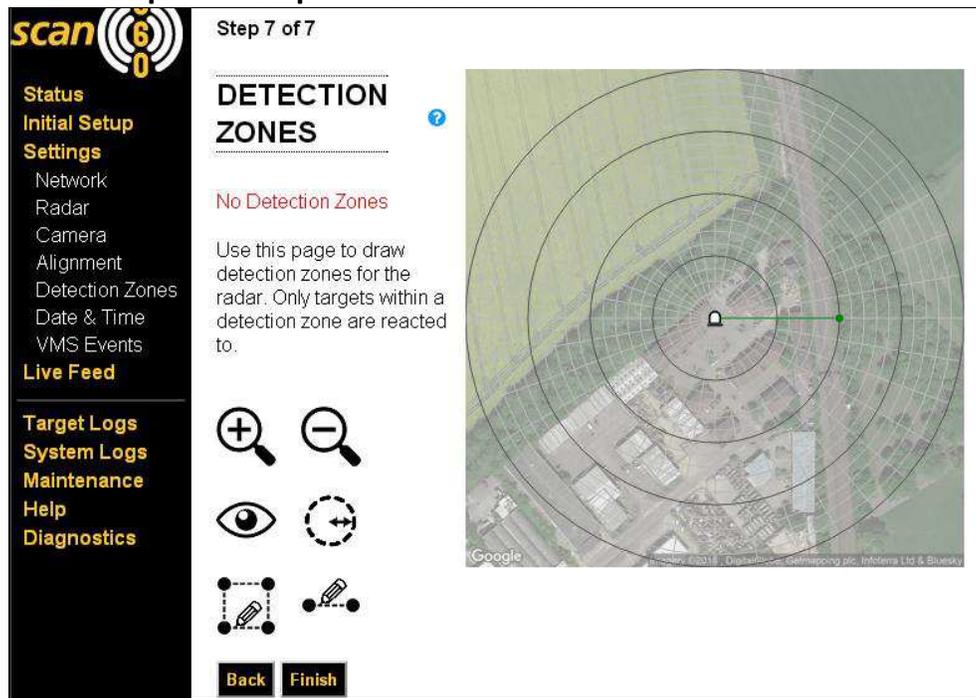
If using a map the Radar must know which direction it is pointing relative to it i.e. where the “Zero Bearing” is on the display.

The green line ending in a green dot indicates the direction that the Radar thinks the “Zero” is aligned in. This must be rotated to point in the same direction as the actual “Zero” mark

(i.e. in the direction of the view through the radome sighting holes) on the radome that was used in the camera Alignment process of Step 3 above. Click on the green dot, hold down the mouse button and rotate to the correct angle. Note that when clicking on the Zero line, the camera is automatically panned to that position so the view can be checked against that expected.

Once the line is correctly orientated, click the **Next** button to go to Step 7 – Detection zones.

Initial Set-up Step 7 - Detection zones



Initial Set-up step 7: Detection zones

Detection zones define the areas where the Radar will react to targets and also the areas that it will ignore. At this stage, no detection zones have been set-up and so the Radar will not react to targets anywhere.

The Radar has 4 “Presets”, each of which has its own adjustable value for “Target Threshold” and “Clutter” (see Radar Settings in section 8 Further Configuration). These values determine the sensitivity of the Radar in the zones where the Preset is used. The user can set different Presets to give different degrees of sensitivity and robustness. Any of the 4 Presets can then be applied to a detection zone so as to optimise the Radars performance in different areas for target detection and unwanted alarms. For example where there are no trees or long grass then a detection zone might use a Preset with low Target Threshold and Clutter value as unwanted alarms are less likely. Elsewhere if trees or bushes are present a zone can be created that uses a Preset with a higher Target Threshold and Clutter value.

Note that all zones will use Preset 1 unless the user selects a different choice i.e. Preset 1 is the default for detection zones. The Presets will all be set to factory defaults during initial set-up. They can be adjusted later via the Settings/Radar menu.

Detection zones are given one of three priority levels, Low, High or Exclude:

High	If a target is seen in a High priority zone then that target takes precedence over any targets seen in Low priority zones (which will be ignored) for the duration of the “Target Delay” time set in the Radar Settings page. These zones are coloured a deep pink on the display.
Low	If a target is seen in a Low priority zone then the Radar will react to it as long as no High Priority targets (if there are High priority zones) have been seen within the “Target Delay” time set in the Radar Settings page. These zones are coloured a light pink on the display.
Exclude	Targets seen in excluded zones are ignored (no VMS alarm, no contact closure alarm and no camera movement). These zones are not coloured on the display.

The following initially assumes that a map has been downloaded – at the end of this section there is a description of how to set zones if no map is available.

When a map is used, any zones created are fixed relative to the map, not the Radar Zero mark orientation. The opposite is true when there is no map. So for example if a map is used and afterward the Radar is physically rotated on its bracket then the zones do not need to be redrawn. Only the graphical representation of the Radar orientation (the green line) has to be adjusted so the Radar knows where its Zero is relative to the zones on the map. Whereas if the same was done in the case where no map was used then the zones would have to be deleted and drawn anew as the actual physical area they cover on the ground would now be different.

At the start of Step 7, if a map has been downloaded then it will be shown. Also shown will be the Radar location icon and the orientation of the Radar “Zero” (green line). There will also be a “spiders-web” grid which has circles every 10m from the Radar (out to 200m) and radial “spoke-lines” every 10degrees. The colour of the grid can be changed to make it easier to see and it can also be removed entirely – to make changes to the grid then select the “eye” icon and following the instructions.

There are 3 different drawing tool icons used for creating new zones:



Draw a circular zone centred on the Radar.

To use, select the icon then select the priority level for the zone from the pop-up menu. Now click on the map at the required distance from the Radar and the new zone will appear. Note that individual points in the circle perimeter can afterwards be moved if required.



Draw a free-hand shape.

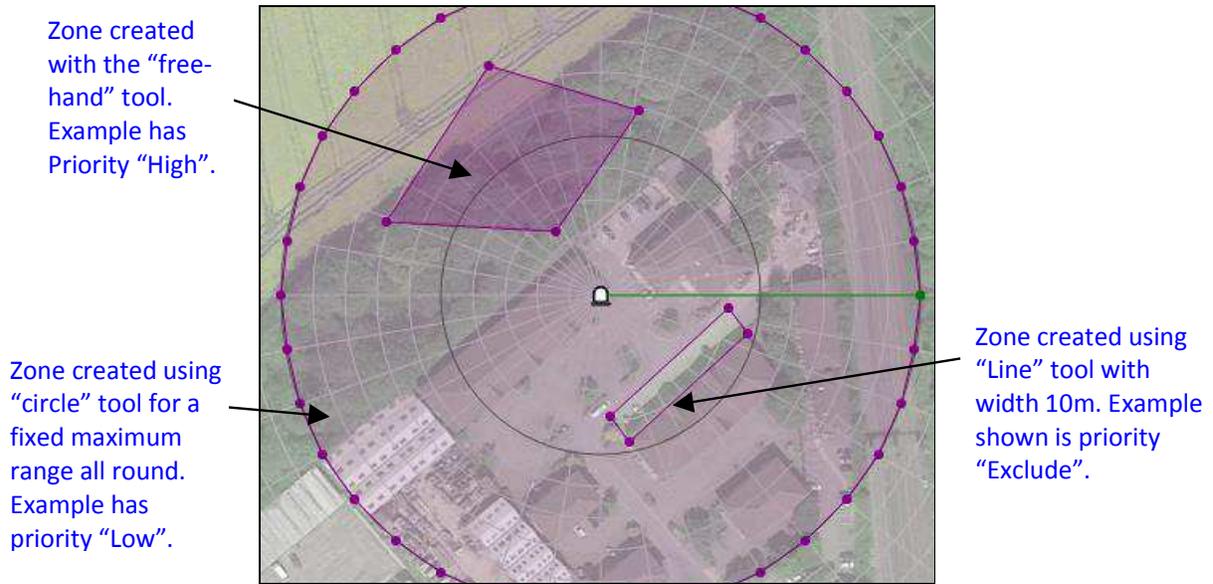
To use, select the icon, then select the priority level for the zone from the pop-up menu. Now click on the map at the first point on the perimeter of the new zone, then the next and so on. When the last point is done, you must **click on the green tick below the priority options to “close” the shape**. Note that there is an undo icon (next to the green tick) that will remove the last point entered. If at any time you decide you don’t want the zone you are creating then click the “X” icon above the zone priority list and all points will be deleted.



Draw a line with width.

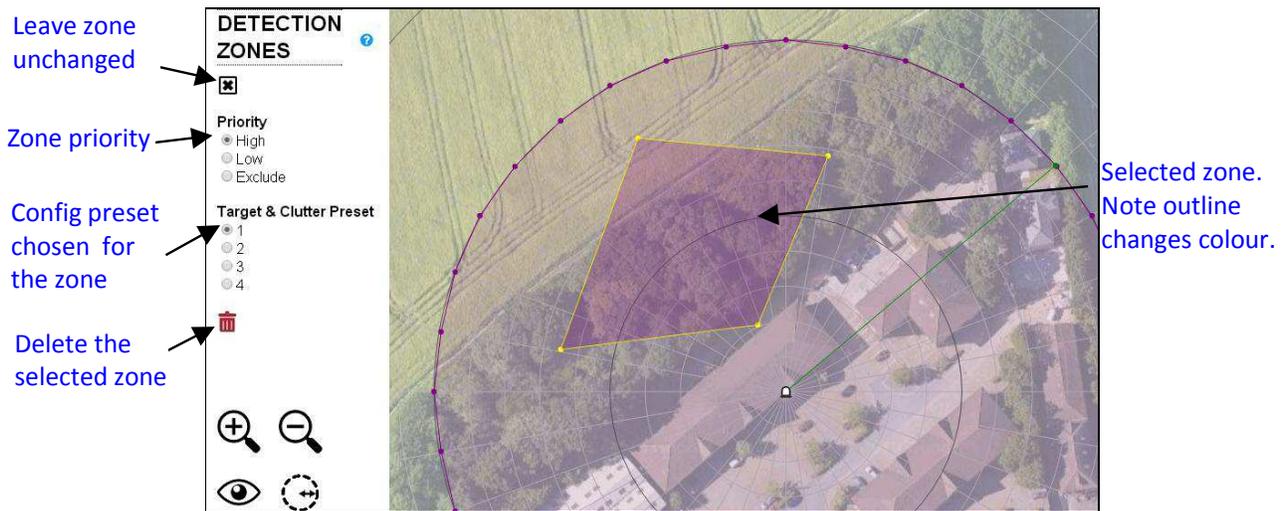
To use, select the icon, then enter a width for the line in the box that appears above the priority options. Select a priority for the zone and then click on the map at the point where the line should start and then where it should end. A rectangular zone of the dimensions required will show on the display.

As an example, in the screenshot below all three types of zone have been created. Firstly a circular zone (fixed range) with priority level "Low", then an irregular "free-hand" zone with priority level "High" and lastly a line, which is set as an "exclusion zone" with a width of 10m. Note the colouring of the zones to indicate the priority level.



Detection zone examples

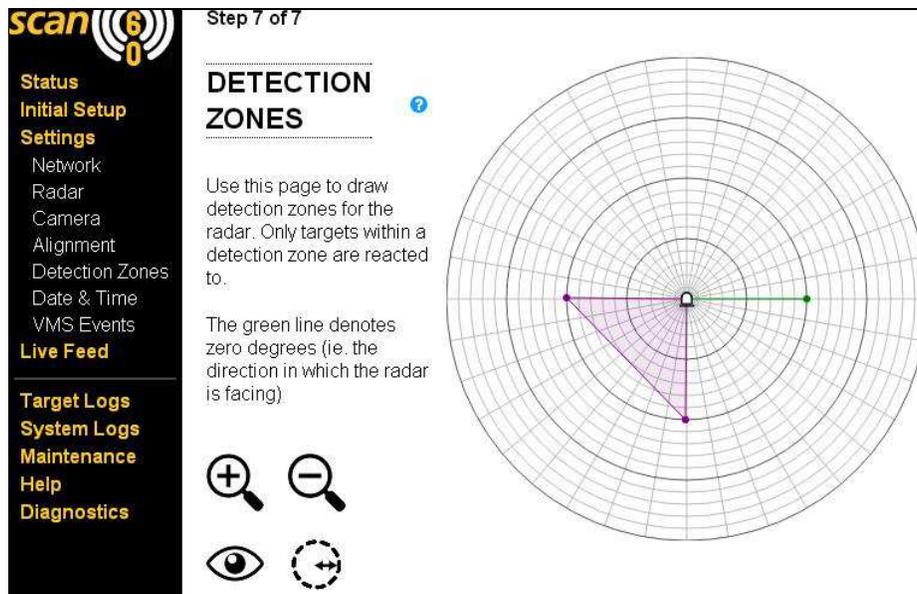
Zones can be edited or deleted after they are created. To change the shape of a zone then click and drag on one of the points that form it. To modify configuration of a zone click anywhere inside it. Its outline will change colour and the priority and configuration options will appear allowing you to change them - see the screenshot below. To delete the zone entirely use the "Bin" icon. To leave the zone unchanged press the "X" icon.



Detection zone editing or deleting

The zone boundary is usually defined by a solid, unmoving structure such as a building. Alternatively trees/bushes may form a natural barrier or may want to be excluded to lower the risk of unwanted alarms. The zone perimeter may also be determined by a boundary (e.g. fence or road) that is to be excluded from the coverage area to avoid unwanted alarms from cars or people passing by legitimately. Further tips and suggestions for how to set the zones are discussed in Section 8 – Further Configuration.

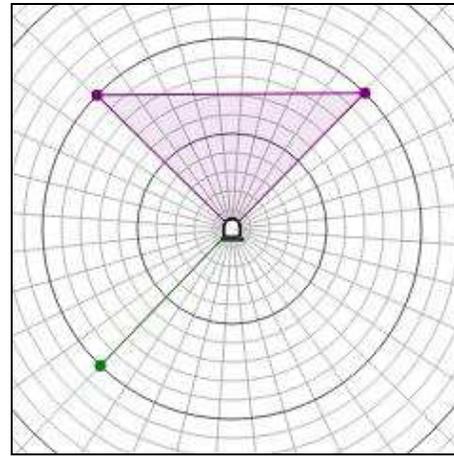
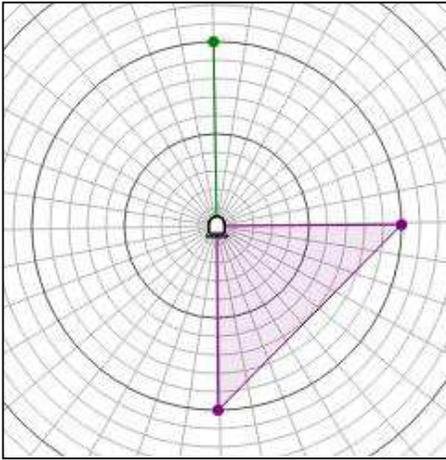
In the case where no map has been downloaded then the zones have to be created on a blank view with only the grid and radar shown (see below).



Detection zones example – No Map

When creating zones without a map, the location of the zones relates to the Radar Zero direction represented by the green line. But because there is no map (and so the zones are not drawn using the map contours) the orientation of the green line does not really matter and it can be rotated (grab the end of the line) to whichever direction makes it easiest to visualise how the grid view relates to the actual orientation of the Radars Zero bearing – note that any zones created will rotate with it as they are fixed relative to it, unlike when a map is present.

When no map is used it is important to understand that it makes no difference to the actual physical detection zone on the ground which way the green line used to indicate the Radars Zero bearing is orientated on the grid – it is only there to help the installer visualise the zones they want to create. The physical detection zone in the example shown above will always start at an angle 90deg round from the Radars installed Zero Bearing and stop at 180deg round, no matter how the orientation is presented on the grid. For this reason, the two other examples shown below are the same as the one shown above.



No Map - further representations which are actually the same

Further guidance on setting zones is in "Section 8 – Further Configuration ".

Once the zones are as you want them, then click on the **Finish** button to exit Initial Set-up.

At this stage the Radar should be operating, detecting targets that occur in the detection zones and steering the camera to them. However further changes to the configuration are available beyond those covered in Initial Set-up including:

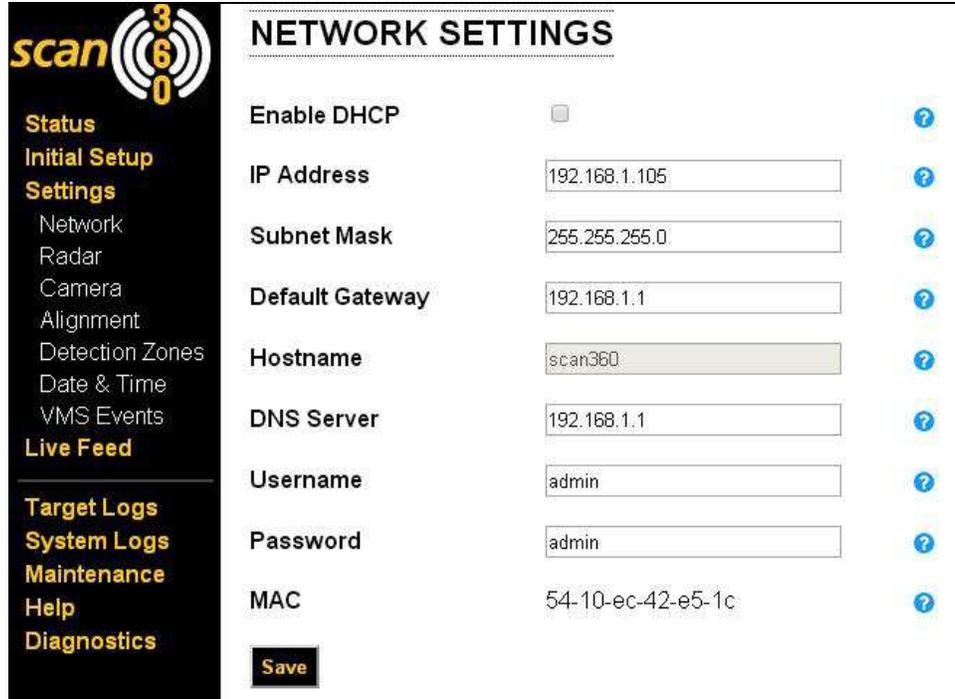
- Fine tuning of the Radar performance
- Setting of camera tilt and zoom values for different target ranges
- Setting up of alarms to a VMS
- Setting of an operating schedule

These, along with other diagnostic, logging and viewing options are covered in the following sections.

8 Further Configuration

Network Settings

Select the “Network” sub-heading to access the Radar’s Network Settings page.



The screenshot shows the 'NETWORK SETTINGS' page. On the left is a navigation menu with categories: Status, Initial Setup, Settings (with sub-items: Network, Radar, Camera, Alignment, Detection Zones, Date & Time, VMS Events), Live Feed, Target Logs, System Logs, Maintenance, Help, and Diagnostics. The main content area contains the following settings:

Setting	Value	Action
Enable DHCP	<input type="checkbox"/>	?
IP Address	192.168.1.105	?
Subnet Mask	255.255.255.0	?
Default Gateway	192.168.1.1	?
Hostname	scan360	?
DNS Server	192.168.1.1	?
Username	admin	?
Password	admin	?
MAC	54-10-ec-42-e5-1c	?

A 'Save' button is located at the bottom left of the settings area.

The Network Settings page

Various Radar related network settings can be changed here. These are:

Enable DHCP	On/Off
IP Address	xxx.xxx.xxx.xxx
Subnet Mask	YYY.YYY.YYY.YYY
Default Gateway	zzz.zzz.zzz.zzz
Hostname	name of the Radar on the network
DNS Server	aaa.aaa.aaa.aaa
Username	username for login to Radar – max 20 characters
Password	password for login to Radar – max 20 characters

A description of each of these is below. **You must click ‘Save’ to save any changes to this screen.**

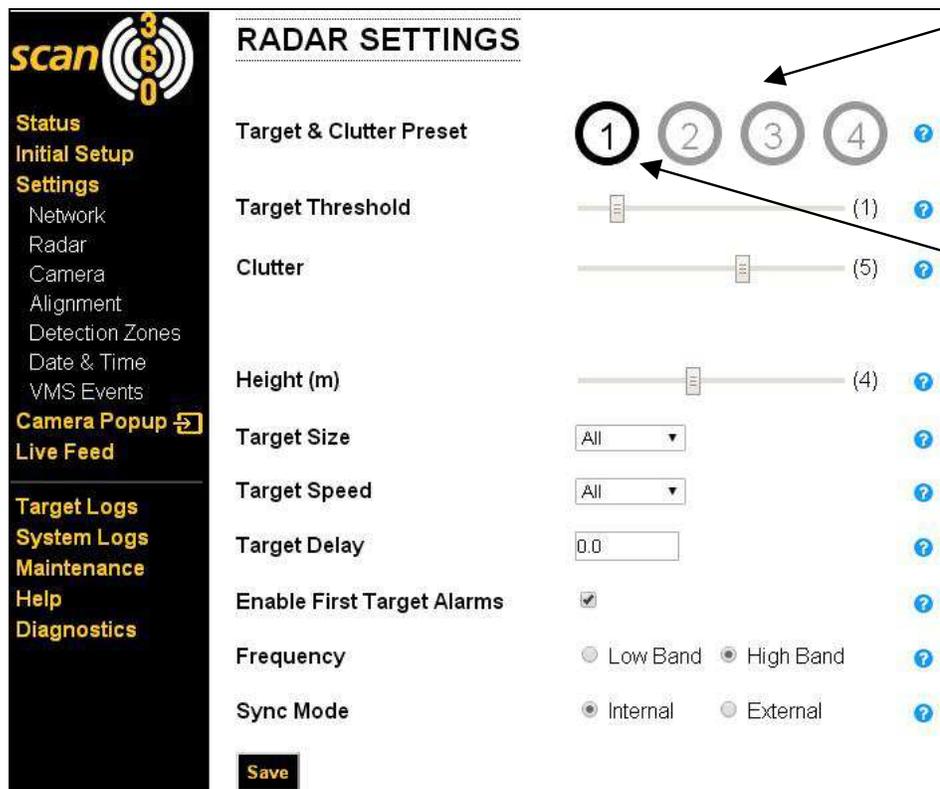
Enable DHCP Sets whether the Radar uses the static IP address entered in the IP Address field or gets an IP Address from a network DHCP server. If using a DHCP server then the Hostname (see below) should be used to access the Radar web page rather than the IP Address listed.

IP Address The network IP address of the Radar if not using DHCP.

Subnet Mask	The subnet mask for the Radar if not using DHCP.
Default Gateway	The IP Address of the network Default Gateway. If unsure then leave as default.
Hostname	The name which identifies the Radar on a network if using DHCP.
DNS Server	The IP address of the network DNS Server. If unsure then leave as default.
Username	The security username to be entered when logging in to the Radar. This is a maximum of 20 characters. It can be blank.
Password	The security password to be entered when logging in to the Radar. This is a maximum of 20 characters. It can be blank.
MAC	This is the MAC address of the Radar (cannot be altered).

Radar Settings

Select the "Radar" sub-heading to access the Radar's operational performance settings page.



Target Threshold and Clutter settings can be set for each of the 4 Presets if required.

Select the Preset by clicking the number. The selected Preset is circled in black.

The Radar Settings page

The various Radar related operational settings can be changed here. These are:

Target Threshold	0 to 8 (for each "Preset")
Clutter	0 to 8 (for each "Preset")
Height	1 to 8 metres
Target Size	All, Small or Large

Target Speed	All, Slow or Fast
Target Delay	0 to 600 seconds
First Target Alarms	Enabled/Disabled
Frequency	Low or High Band
Sync Mode	Internal or External

A description of each of these is below. **You must click ‘Save’ to save any changes to this screen.**

Target Threshold Target Threshold is the basic setting that determines the threshold level for detection of targets. The lower the value the more sensitive the Radar is to targets. However as the Threshold is lowered the probability of unwanted alarms (e.g. due to trees moving or heavy rain) rises. So setting the value is a compromise between good target detection and unwanted alarms and will depend on the site and the user requirements. A typical compromise value is 2.

Note that a different Target Threshold can be set for each of 4 configuration presets any of which can be applied to a detection zone. The Target Threshold displayed is for the currently selected preset as shown at the top of the page with a black circle around it.

Clutter “Clutter” in the coverage area, whether from static objects such as buildings or parked vehicles, or moving objects such as trees in wind, makes it difficult to spot real targets close by. In particular moving “clutter” can cause unwanted alarms.

A high “Clutter” setting will reduce the likelihood of moving clutter causing unwanted alarms. However this can make the Radar less sensitive to targets.

A typical compromise value is 5. If unwanted alarms occur e.g. due to trees or grass then the value should be raised. For zones with little moving clutter (open concrete areas with no vegetation) or where any unwanted alarms are not an issue, then the value can be lower.

Note that a different Clutter setting can be set for each of 4 configuration presets any of which can be applied to a detection zone. The Clutter value displayed is for the currently selected preset as shown at the top of the page with a black circle around it.

Height The installed height of the Radar in metres.

Target Size This is not related to the targets physical size, but instead the size of the signal it reflects. If this is set to Small or Large then the Radar uses the parameter as an approximate way of filtering out those targets which are smaller or larger than a value depending on a pop-up slider, see below.

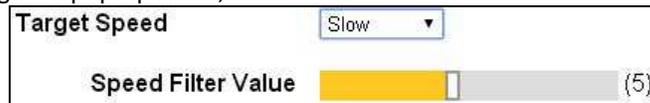
The image shows a user interface for configuring the 'Target Size'. At the top, there is a label 'Target Size' and a dropdown menu currently showing 'Small'. Below this is a slider control labeled 'Size Filter Value'. The slider has a yellow bar indicating the current value, which is 5, as shown by the '(5)' at the end of the slider track.

In the example above, targets “smaller” than the equivalent of “5” will be accepted (the yellow segment), any larger are rejected. If the Target Size selection is set to “All” then no filtering is done and no targets will be rejected due to their “size”.

Note: This “size filtering” is only approximate and will not be 100% accurate as the return signal from a target can vary greatly, but it may be useful in reducing the impact of targets above or below a certain level if not removing them entirely.

Target Speed

If this is set to Slow or Fast then the Radar uses the measured Doppler shift from a targets reflected signal as an approximate way of filtering out those which are moving slower or faster than a value depending on a pop-up slider, see below.



In the example above, targets found to be moving “slower” than the equivalent of “5” will be accepted (the yellow segment), any others rejected. If the Target Speed selection is set to “All” then no filtering is done and no targets will be rejected due to their “speed”.

Note: This “speed filtering” is only approximate as the measured speed is not corrected for the angle of motion, but it may be useful in reducing the impact of some targets if not removing them entirely.

Target delay

Target delay is the number of seconds that the Radar should wait after seeing a Target in a High Priority zone before it will start to react (i.e. move the camera, set the Contact Closure alarm, send out an IP alarm) to a new Target in a Low Priority zone. If either there are a) no High Priority zones or b) only High Priority zones, then this setting has no impact.

First Target Alarms

With **enabled** then the Radar will react immediately when any target is seen. If **disabled** then the Radar will ignore the very first time a target is seen if there has been no other recent target. This can reduce occasional unwanted alarms due to intermittent events e.g. a tree in high wind, but it can mean that a new target has to be seen twice before the Radar will react.

Frequency

The radar can operate in two frequency bands, Low Band or High Band. Generally either can be used, but where there are two radars installed then setting them to different frequency bands avoids mutual interference.

Sync Mode

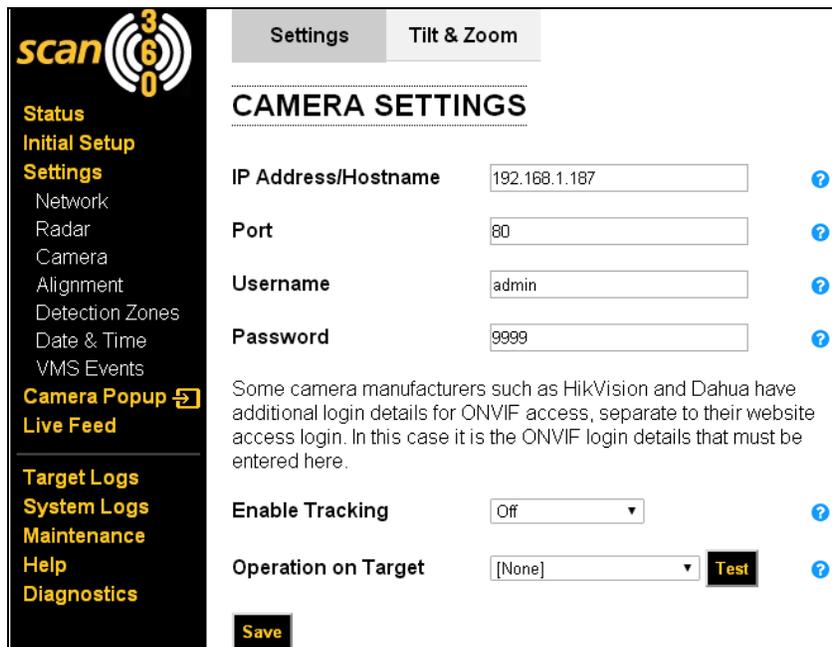
Internal Sync should always be selected unless there are multiple radars in the area. If there are multiple Radars in the same area then External Sync, which uses GPS Satellite signals to synchronise the Radars, can be selected to prevent them from mutually interfering (assuming that the Radars have a clear view of the sky).

The circumstances when External Sync is required and its configuration are not covered in this manual. If you have a multi-radar site and think External Sync is required please contact your equipment supplier or visit the scan-360 website.

Camera Settings (including Target Tracking)

Select the “Camera” sub-heading to access the Camera settings including Target Tracking and the Camera Tilt and Zoom settings pages. Note that while in these pages the Radar will not react to targets as the user may be using the camera as part of the procedure.

There are two parts to Camera settings, these are selectable using the two tabs at the top of the page titled “Settings” and “Tilt & Zoom”.



The Camera Settings page

Via the “Settings” tab all network related settings can be entered or changed. Target Tracking (of which there are two types) can be enabled or disabled. Also any auxiliary camera related operation can be set that is required when a target is “actioned”. The options are:

IP Address/Hostname	Either the IP Address of the camera xxx.xxx.xxx.xxx or its hostname if using DHCP
Port	Network port used by the camera for HTTP interface (usually 80)
Username	Login username for the camera*
Password	Login password for the camera*
Enable Tracking	Select whether the Radar does Camera Tracking, Target Tracking or none at all.
Operation on Target	Sets the camera to perform an auxiliary action when a target is “actioned”

A description of each of these is below.

IP Address/Hostname This is the network IP Address used by the camera or alternatively if the network is using a DHCP server then it is the network hostname used to identify the camera

Port This is the network port used by the camera for ONVIF commands and responses from the Radar etc. This is usually port 80 but check with the camera manufacturer if uncertain.

Username This is generally the username used when accessing the camera login screen. The Radar requires this so it can control the camera. *

Password This is generally the password used when accessing the camera login screen. The Radar requires this so it can control the camera. *

Enable Tracking Select either Off, Camera Tracking or Target Tracking.

If set to Off (default) then the Radar will move the camera whenever it detects a target. If there are multiple targets this can mean that the camera will move back and forth between them.

If set to **Camera Tracking**, then even if there are multiple detected targets the Radar will try to only point the camera at one of them (until it is no longer seen or is mistaken for another target). In the Live Feed page no tracking paths will be shown. In Camera Tracking mode the target the Radar chooses for the camera to move to cannot be changed by the user.

If set to **Target Tracking**, then the Radar will try to assign a track to each of up to 8 detected targets. The Radar will only point the camera in response to detected targets that are allocated to one of the tracks (until the target is not seen for a period when a timeout occurs or the target is allocated to another track). The track selected for the camera to follow is generally the first track that the Radar establishes after the last selected track timed-out. In the Live Feed page tracking paths that the Radar is using will be shown as different coloured lines connecting the crosses indicating where each target was detected. In Target Tracking mode the target the Radar chooses for the camera to move to can be changed on the Live Feed page.

Note that the state of the Enable Tracking setting is shown at the top of the Live Feed map view. It is also shown on the Status page.

Operation on Target This sets the camera to perform an auxiliary operation when a target is detected e.g. to turn on the camera lights. The various options available for the particular camera will be shown in the drop-down box [note – if any of the above camera network details are changed then the drop-down options will disappear until a) the Save button is pressed and b) the page is refreshed and c) the camera re-establishes communication with the Radar].

Whichever option is selected can be tested using the Test button. Note: the detailed set-up of the auxiliary operation must be done directly using the camera's own config web-pages.

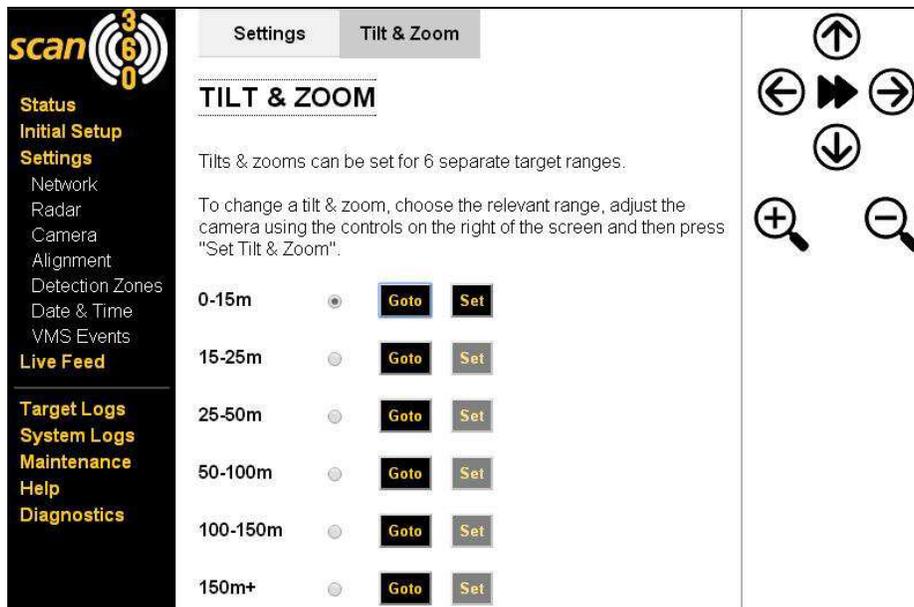
The time of day when the auxiliary operation is performed (if a target is seen) can be set using the "Run From" and "Run To" time settings which will pop-up when an option is chosen – for example this can be used to stop the camera lights coming on during the day.

* These are usually the normal login details, but some cameras have additional ONVIF login details in which case it is these ONVIF login details that are required.

You must click 'Save' to save any changes to this screen.

Tilt and Zoom settings:

In "Tilt & Zoom" the camera can be adjusted to optimise the view at different target ranges.



The "Tilt & Zoom" Camera settings page

To set-up the view for one of the 6 ranges shown (0-15m, 15-25m, 25-50m, 50-100m, 100-150m, 150m+) select the appropriate grey button. This will cause the "Set" buttons for the other ranges to be disabled (but it does not cause the camera to move). While viewing the camera picture (use a web browser or media player e.g. VLC player), adjust the camera view using the controls on the right of the screen to get the tilt and/or zoom required - **then press the "Set" button.**

Alternatively to see the camera settings for a particular range, press the relevant "Goto" button and the camera will adopt the currently stored pan and tilt for that range. You can cycle through all the camera views for the different ranges just by selecting the appropriate "Goto" button. If a view needs to be altered just use the camera controls to get the desired view and then save by pressing the "Set" button. Repeat for the other ranges.

Camera Alignment

If the camera alignment needs to be amended then select the "Alignment" sub-heading.

Follow the instructions already described in “Step 3 of Initial Set-up” in “Section 7 Initial Configuration” above.

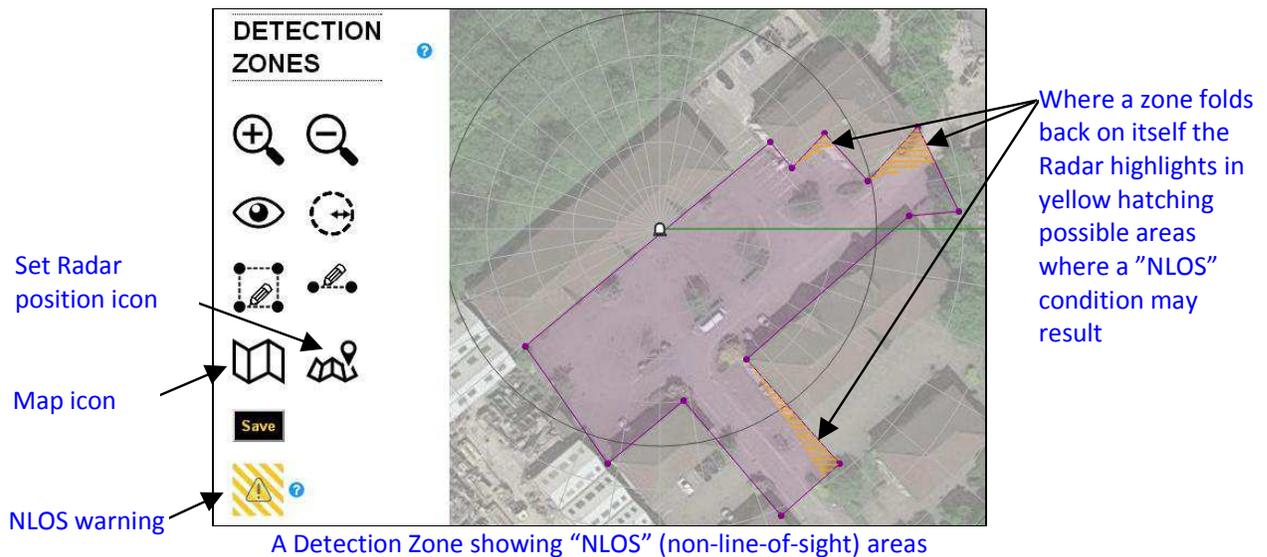
Note that while in this web page the Radar will not move the camera to targets as the user may be using the camera.

Detection Zones

If Detection Zones need to be amended then select the “Detection Zones” sub-heading.

Note that while in this web page the Radar will not move the camera to targets as the user may be using the camera. For a map to be displayed the Laptop must have internet access.

Basic instructions for creating Detection Zones are already described in “Step 7 of Initial Set-up” in “Section 7 Initial Configuration” above. The Detection Zone page accessed through the sub-heading includes two further icons, one that allows a new map to be imported (or the current map to be removed) and another for re-positioning the Radar on the map (see screenshot below).



To change or remove the map, click on the Map icon. Two further icons will pop-up, one for importing a new map and another for removing the existing map – click on whichever is appropriate (or press “X” to exit without change). If importing a new map (note all zones will be deleted) then the “Map” web page will load – see “Initial Set-up Step 4” for further details. After the new map is downloaded, you will be asked to set the Radar position (same as “Initial Set-up Step 5”) and the Radar Zero Position (same as “Initial Set-up Step 6”).

To change the position of the Radar at any time, click the “Set Radar Position” icon (see above screenshot) and then click on the map where the new location is required.

If the Radar Zero Position also needs changing then grab the green-line indicating the current orientation and rotate it as required.

You must press “Save” for changes to be stored.

NLOS Warning:

The screenshot above shows a yellow warning icon (see NLOS warning). This icon shows if a free-hand zone is added which because of its shape (perhaps the zone is formed around the contours of a building) may include areas where the Radar has Non-Line-Of-Sight (NLOS).

If a detection zone includes areas that the Radar cannot see (NLOS) e.g. which are behind a building, then reflections from the building to targets elsewhere can cause the Radar to place those targets incorrectly in the NLOS areas, so generating unwanted alarms.

On the map/grid view the areas assessed by the Radar as possible NLOS areas will show with yellow cross-hatching (see screenshot above). The zone shape should be reviewed to see if these areas really are NLOS and part of the zone is obstructed by a structure e.g. a building. If the zone shape is then modified (pick a node point on the profile and drag to the new location) the hatched yellow NLOS areas will adjust to help gauge what changes are needed.

Note: The NLOS warning feature that the Radar provides is not infallible and the user should always check themselves that the zones drawn are free from NLOS issues.

ADAMS unit port allocation:

If an ADAMS unit is selected in the VMS Settings web-page, then the Detection Zones web-page when loaded will show additional options when a zone is selected or created.

When a zone is selected can choose which ADAMS ports will action when a target is seen in that zone



A Detection Zone with ADAMS unit port selection option

To choose which ADAMS unit ports will be activated when a target is seen in a zone, first select the zone. The Priority, Preset and Digital Outputs drop-down boxes will appear. Use the scroll bar for the Digital Outputs box to view the different output ports and for each check the box beside the port number if you want that port to action when a target is seen in the selected detection zone.

Further Zone related guidance:

- * Where a building or wall forms the border, the detection zone perimeter should extend just to the front of the structure. The detection zone should not be extended further than necessary so as to try and stop target signals reflected from the structure misleading the Radar. By keeping the perimeter as tight as possible then such reflections will be rejected as out of range.
- * Where zones overlap, the priority of the overlap area is set to that of the last zone drawn. The same is also true of the Preset used (which determines the Target Threshold and Clutter values applied for the zone).
- * Exclusion zones can be used to mask off objects in the environment (e.g. a tree) if they are occasionally generating unwanted alarms. Alternatively an active zone can be drawn around the area and a Preset applied with a higher Target Threshold and/or Clutter level than used elsewhere (see Radar settings).

Date and Time/ Schedule

If either a) the Radar current Date and Time need amending or b) the Radar operating schedule needs setting or amending, then select the “Date & Time” sub-heading.

This has two options selected by the tabs at the top of the page and titled “Date & Time” and “Schedule” – see the screenshot below.

Setting the Date and Time is essentially done in the same way as in Initial Set-up Step 1 (see Section 7) except that the date and time initially shown will be that currently in use by the Radar, rather than that imported from the laptop/PC.

To make a change, use the calendar shown to set the correct date (the left/right arrows change the month, use the mouse to select the day) and then use the two drop-down boxes to set the time in hours and minutes. When the date and time are correct then **Save**.

The screenshot shows the 'Date & Time' settings page. The left sidebar contains navigation options: Status, Initial Setup, Settings (Network, Radar, Camera, Alignment, Detection Zones, Date & Time, VMS Events), Live Feed, Target Logs, System Logs, Maintenance, Help, and Diagnostics. The main content area has two tabs: 'Date & Time' and 'Schedule'. Under 'Date & Time', there is a text box explaining that the current date and time held by the radar is displayed below, and a new date and time can be entered or the radar synchronized to the PC. Below this is a calendar for October 2018 with the 9th selected. Under the calendar are two drop-down boxes for hours (17) and minutes (32). At the bottom are 'Save' and 'Sync to PC' buttons.

“Date & Time” settings page

Alternatively the Radar can adopt the time on the Laptop/PC by pressing “Sync to PC”.

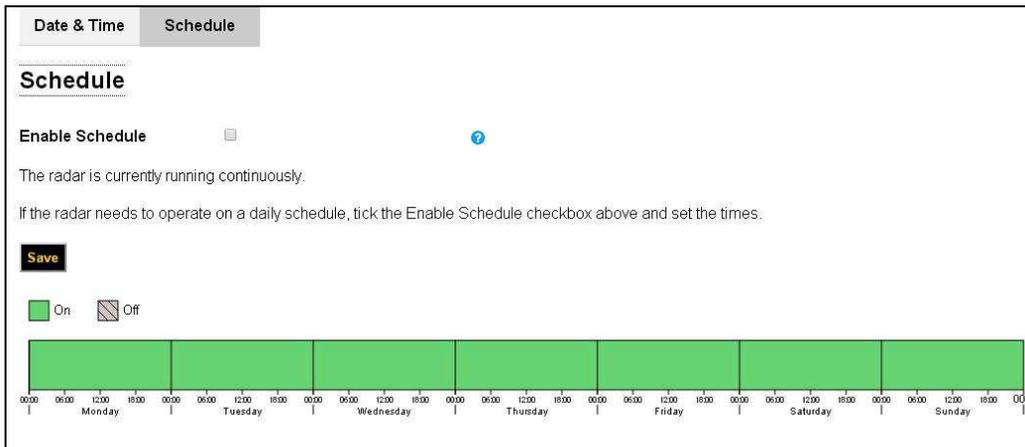
Note that the internal real-time clock is maintained in the event of a power-outage by a back-up capacitor. However if the Radar has not been powered recently then the time may need resetting again if it is powered down soon after first use.

Setting a Schedule:

To set a schedule, click on the "Schedule" Tab at the top of the Date & Time web-page.

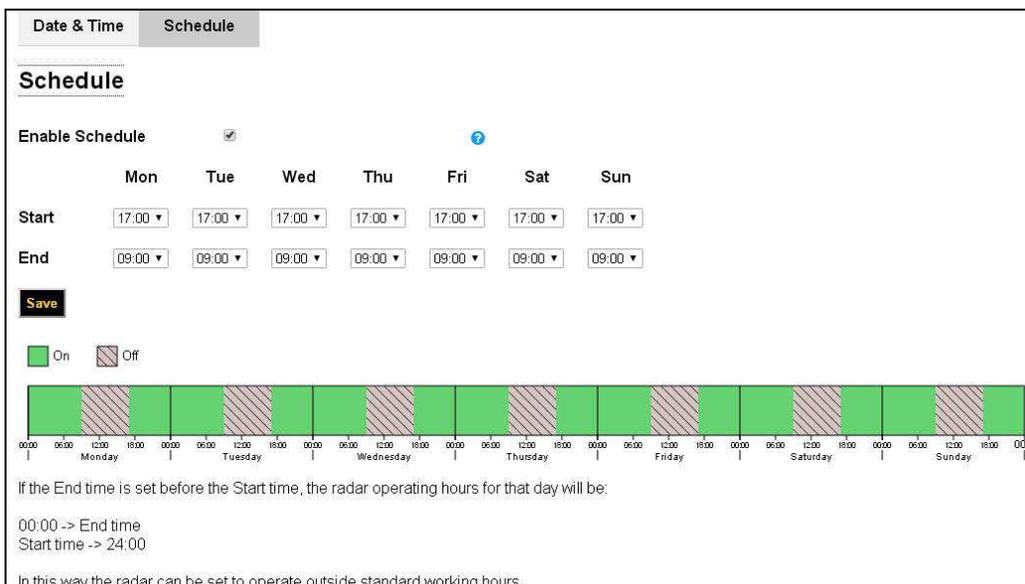
If a Schedule is not enabled then the Radar will be in continuous operation. The screenshot below shows the Radar when the Schedule is disabled.

A graphic representation of the current operating hours for each day of the week is shown, with green indicating active and grey inactive.



Schedule web page when in 24/7 operation

If the Radar is to be operated to a Schedule then select the Enable Schedule check-box. This will bring up additional options that allow the setting of "Start" and "End" times for Radar operation for each day of the week (see screenshot below).



Schedule web page when Schedule is enabled

Use the drop-down “Start” and “End” boxes for each day to set that day’s operational hours. The graphical representation will change to reflect the hours selected.

Note that to get operation overnight, if the “End” time is set to be before the “Start” time for that day, then the Radar will operate from midnight at the start of that day up to the “End” time and then from the “Start” time until midnight at the end of the day (See screenshot above).

Note: you must press “Save” to put any changes into effect and store them.

VMS Events (inc ADAMS unit)

To set-up or to change the Radar alarms sent to a VMS or ADAMS unit then select the “VMS Events” sub-heading.

All VMS related alarm settings can be set here. These are

Enable VMS	Set On to enable VMS alerts
IP Address/Hostname	Either the IP Address of the VMS or its hostname if using DHCP
Port	Network port used by the VMS
Protocol	Select UDP or TCP protocol
VMS	Select the VMS from the list *. If the VMS used is not shown, then select Advanced Options below
Advanced Options	For other VMS, the alarm message generated by the Radar can be configured here

* Once the VMS is chosen additional field boxes will appear which are VMS dependant – see your VMS documentation for details of what is required.

A further description of each of these is below. You must click ‘Save’ to save changes.

When a VMS is chosen, additional field entry boxes will appear. These are VMS dependant.

Example VMS configuration

Enable VMS	Setting to On enables VMS alerts to the IP address and Port specified elsewhere on this web page. Setting to Off will stop VMS alerts being generated
IP Address/Hostname	This is the network IP Address used by the VMS (or ADAMS unit) or alternatively if the network is using a DHCP server then it is the network hostname used to identify the VMS
Port	This is the network port set-up on the VMS (or ADAMS unit) for external events e.g. from the Radar.
Protocol	Select either UDP or TCP IP protocol as appropriate for the VMS configuration.
VMS	The drop-down list shows those VMS systems that the Radar already has preset message formats for – these entry fields will appear once the VMS is selected (see ADAMS unit set-up below). Refer to the VMS documentation for additional information. If the VMS used is not shown then select Advanced Options - this will allow the Radar output message format to be customised.
Advanced Options	If the VMS used is not one for which the Radar has a preset alarm message format then select Advanced Options (with Active set to On). This will bring up a text entry box allowing the alarm message generated by the Radar to be specified. The message can include details of the target seen if required – see the screenshot below.

Enter the VMS message in the textbox. To choose from a list of VMS's, select 'VMS list'

Message 

The following text can be placed in the message, and will be replaced with the corresponding target details when the event is raised:

- %BEARING%** Target bearing (in degrees, to 2 decimal places)
- %RANGE%** Target range (in metres)
- %SPEED%** Target speed (0 to 99)
- %SIZE%** Target size (0 to 300)
- %DATE%** Date of target (dd/mm/yy)
- %TIME%** Time of target (hh:mm)

[VMS list](#)

Save

VMS Events Advanced options screenshot

Adams unit:

If an ADAMS unit is selected as the VMS then the view below will appear.

VMS SETTINGS

Enable VMS	<input checked="" type="checkbox"/>	?
IP Address/Hostname	<input type="text" value="192.168.1.82"/>	?
Port	<input type="text" value="1234"/>	?
Protocol	<input type="text" value="TCP"/>	?
Choose the VMS to transmit targets to. If the VMS is not in the list, or a bespoke transmission is required, select 'Advanced options'		
VMS	<input type="text" value="ADAM"/>	?
Username	<input type="text"/>	?
Password	<input type="text"/>	?
DI 0 <input type="text" value="0"/> Action	<input type="text" value="No Action"/>	?
DO 0 <input type="text" value="0"/> Timeout	<input type="text" value="1"/>	?

Choose the ADAMS input or output port to be configured (only 1 of each type is shown at a time though there may be many ports available.)

VMS – ADAMS unit screenshot

To set-up an ADAMS unit, after entering the IP details at the top of the page, enter the Username and Password for the unit.

If ADAMS unit inputs are to be used to control the Radar operation, select an input using the DI dropdown box and then select the Action required to be either “Camera off” or “Radar off”. In the “Camera off” state then the Camera will not be moved by the Radar in response to targets while the selected ADAMS input port is active. In the “Radar off” state then the Radar will not respond to targets at all while the selected ADAMS input port is active. Note that only one input at a time can be set-up using the DI box even though multiple ports can be available. To set-up a different port change the DI dropdown box number and then change the action required. Be sure to Save at the end.

If the Radar is to control an ADAMS output port (on a per detection zone basis), then select the port from the DO dropdown box and then select the Timeout period. To set-up a different port change the DI dropdown box number and then set the timeout required for it. You can scroll through the ports to check how each is set by using the DO button. When a target alarm occurs, the Radar will set the relevant ports to active for the periods specified. Be sure to Save at the end.

The different ADAMS output ports can be assigned to different detection zones using the Detection Zones web-page (see the Further Settings: Detection Zones section above).

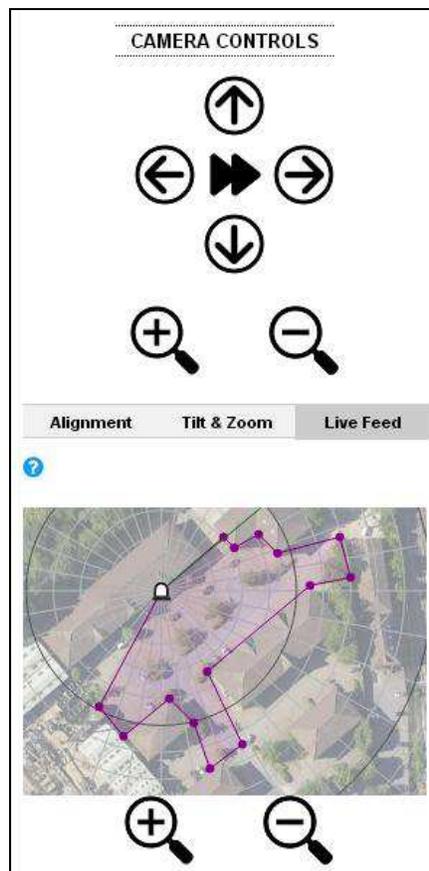
9 Camera Pop-up, Live View, Logs, Maintenance, Help and Diagnostics

Camera Pop-up

Camera Pop-up is intended to make it easier to do Camera Alignment and set Camera Tilt and Zoom settings by using a smaller window design that can be arranged more easily beside the camera video on the screen.

Live view:

When Camera Pop-up is selected then a small window appears which contains a miniature view of the Live Feed and also the camera controls. The Live Feed view will plot targets as they occur and show target tracks if Target Tracking is enabled. It can be zoomed in and out using the icons below it.



Camera Pop-up Initial Live View screenshot

Camera Alignment:

To do Camera Alignment select the Alignment tab. Now move the camera using the icons until the camera video shows the relevant feature in the middle of the view and then press Set. For a full discussion of Camera Alignment see "Step 3 of Initial Set-up" in "Section 7 Initial Configuration" above.

Note that while this window is open the Radar will not move the camera to targets as the user may be using the camera.

Tilt and Zoom:

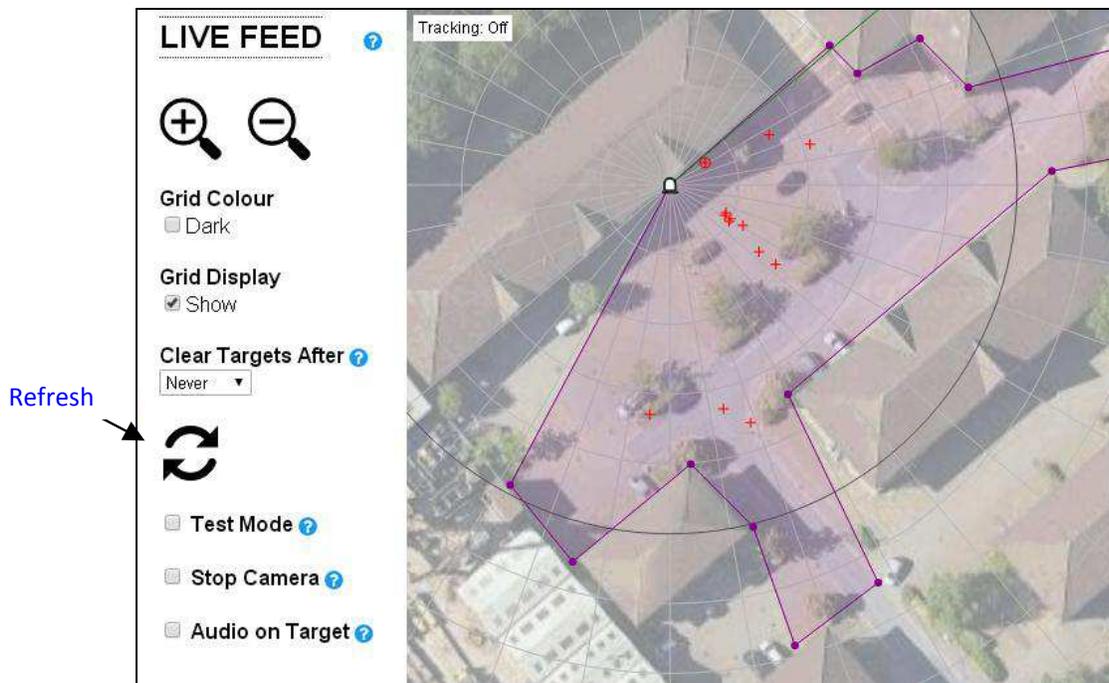
To set the Camera Tilt and Zoom for different target ranges select the Tilt & Zoom tab. Select the range for which the Tilt/Zoom is to be adjusted. Now selecting the Goto button for that range will make the Radar set the camera to the current Tilt and Zoom settings for the selected range. To adjust the tilt and/or zoom use the camera controls to get what is required and then press the relevant Set button to store the new values.

For a full discussion of Camera Tilt and Zoom settings see “Camera Settings” in “Section 8 Further Configuration” above.

Note that while this window is open the Radar will not move the camera to targets as the user may be using the camera.

Live Feed

It is possible to view the targets “actioned” by the Radar (i.e. generally when the camera, VMS alarm or contact closure alarm have been set) in “real time” on a map view of the area – the Radar will still continue to operate as normal (steering the camera and generating alarms). To do this, select the “Live Feed” Heading. Note that this is not necessarily all the targets the Radar has seen, just the ones it has “actioned”.



Live View screenshot (no Tracking)

The spider-web view of the Radar zones (see above) will be shown along with any previously downloaded map (if the Laptop/PC has internet access), with the green line/dot indicating the Radar Zero bearing and with the detection zones shown. Targets will appear as red crosses with the most recent shown with a red circle around it.

The view can be zoomed in or out and the spider-web grid lines shown, removed or changed in intensity using the icons on the left of the screen.

Clear Targets After:

As the number of old targets displayed increases the display will get over-crowded. The view can be refreshed using the icon indicated in the screenshot view above. Alternatively targets that have been shown for more than a set time can be automatically deleted by clicking on the drop-down box under the heading "Clear Targets After" and selecting one of the options.

Stop Camera:

If you want to pause the Camera motion so as to be able to take control of the camera without the Radar interfering then select "Stop Camera". Note that when you leave the Live View page this automatically disengages allowing the Radar to move the camera again.

Audio on Target:

To get an audio alert when a target is "actioned", select "Audio on Target" and an audible beep will occur for each target if the Laptop/PC has the facility and is set-up accordingly.

Test Mode:

There is also an option to put the Radar into a Test Mode. In normal operation, activity (e.g. people or vehicles) causes the Radar to become less sensitive in that area. The higher the Clutter value (see Radar settings) for the zone affected, the bigger the impact of activity on the Radar sensitivity and the slower it recovers to normal afterwards. Test Mode stops the Radar adjusting its sensitivity – this means you can keep walking/testing over the same area without changing the way the Radar reacts.

Note that when Test Mode is enabled, the sensitivity stays as it was at the time. So if it may already have been affected by activity you should wait a few minutes before enabling it.

Test Mode is useful if demonstrating the Radar, or if you are installing or testing the Radar it can allow a better idea of how it will perform when an area is less busy with activity.

Test Mode is automatically disabled on leaving the Live Feed web-page.

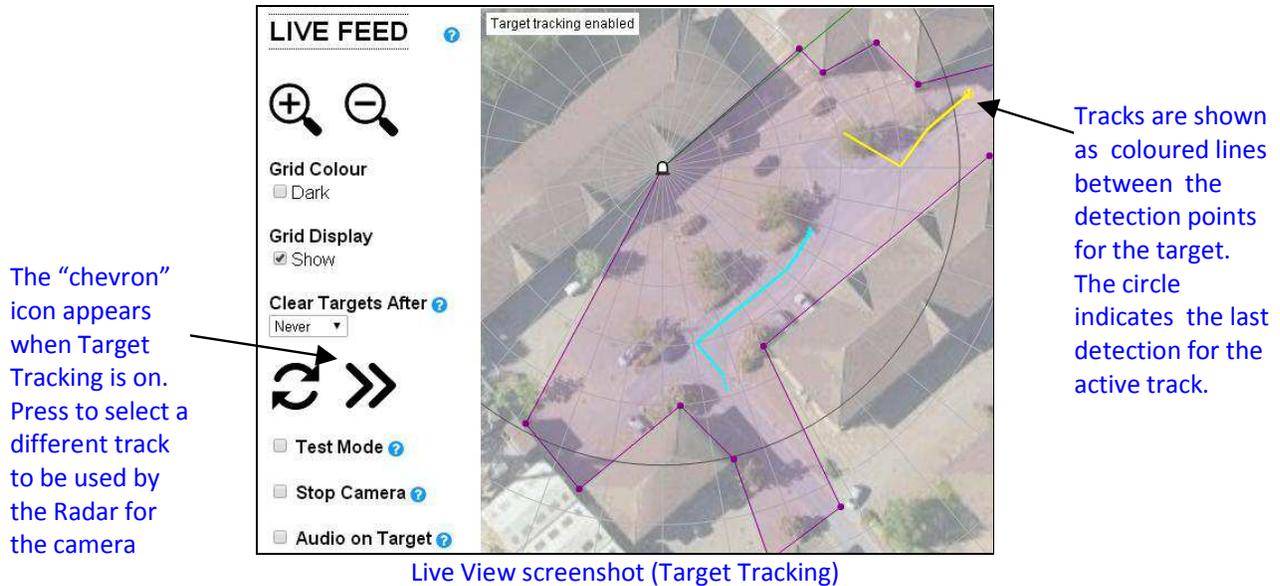
Note that when in Test Mode, Tracking is disabled.

Target Tracking:

If Target Tracking is enabled (See Camera settings), then a message stating this is displayed at the top of the Live Feed map view.

When a target is being tracked, as well as the normal crosses on the Live Feed map indicating where a target has been seen, the Radar draws a coloured line between the target points forming a trail. Multiple tracks for different targets are shown in different colours. The current track whose target the Radar is steering the camera toward is the one for which the last active point is drawn with a circle around it.

Once a target has not been seen for around 5 seconds then its track is removed from the display. The track used by the Radar for pointing the camera can be selected by pressing the "chevron" icon (see below) – this will cycle between the available tracks.



Target Logs

The Radar keeps a Log containing details of up to the last 5000 or so targets that it has identified, this includes both targets that have been "actioned" (camera moved, VMS alarm sent, contact closure alarm set) and those that haven't (e.g. because they were Low priority or the wrong size or speed). This log can be useful if unwanted alarms are seen in order to establish what may be the cause as well as providing information for operational debugging. The log is stored in non-volatile memory so will not be lost if the Radar loses power or is switched off.

To see the Target Log select the Target Log heading from the list of options. This will load the details of the last 1000 target which you can then scroll through – at the bottom is a button to load more targets if necessary.

Alarm	Date	Time	Bearing (degrees)	Range (m)	Speed	Size	Info
Yes	18/10/19	14:25:56.6	113.82	45	2	129	35
Yes	18/10/19	14:25:55.6	116.46	43	-	81	35
Yes	18/10/19	14:25:54.6	111.17	43	1	51	35
Yes	18/10/19	14:25:16.6	113.82	36	7	33	35
Yes	18/10/19	14:25:15.6	108.52	31	5	66	35
Yes	18/10/19	14:25:12.4	79.41	27	2	48	35
Yes	18/10/19	14:25:10.4	50.29	34	6	49	35
Yes	18/10/19	14:25:09.4	42.35	37	7	38	35
Yes	18/10/19	14:25:08.4	34.41	51	-	44	35
Yes	18/10/19	14:24:03.6	134.99	10	2	23	35
Yes	18/10/19	14:24:01.6	132.35	13	3	15	35
Yes	18/10/19	14:24:00.6	132.35	15	3	11	35
Yes	18/10/19	14:23:56.6	124.40	22	2	16	35
Yes	18/10/19	14:23:52.6	121.76	28	2	22	35
Yes	18/10/19	14:23:51.6	119.11	31	-	19	35
Yes	18/10/19	14:23:51.4	44.99	43	1	79	35
Yes	18/10/19	14:23:28.6	108.52	40	5	60	35
Yes	18/10/19	14:23:27.6	111.17	36	5	70	35
Yes	18/10/19	14:23:26.6	111.17	33	5	86	35
Yes	18/10/19	14:23:26.6	111.17	28	3	27	35

Target Log screenshot

The Log starts with the latest targets seen, previous targets can be seen using the scroll bar.

The information shown for each target is firstly whether it generated an alarm (i.e. was it “actioned”), then the date and time it occurred, the approximate bearing in degrees relative to the Radar Zero bearing, the target Range (in metres), an indication of Target radial speed (unless “-“ which indicates that the target speed was not established), and an indicator of the Size of the reflected Radar signal (not its physical size). The Info column is for Engineering purposes only.

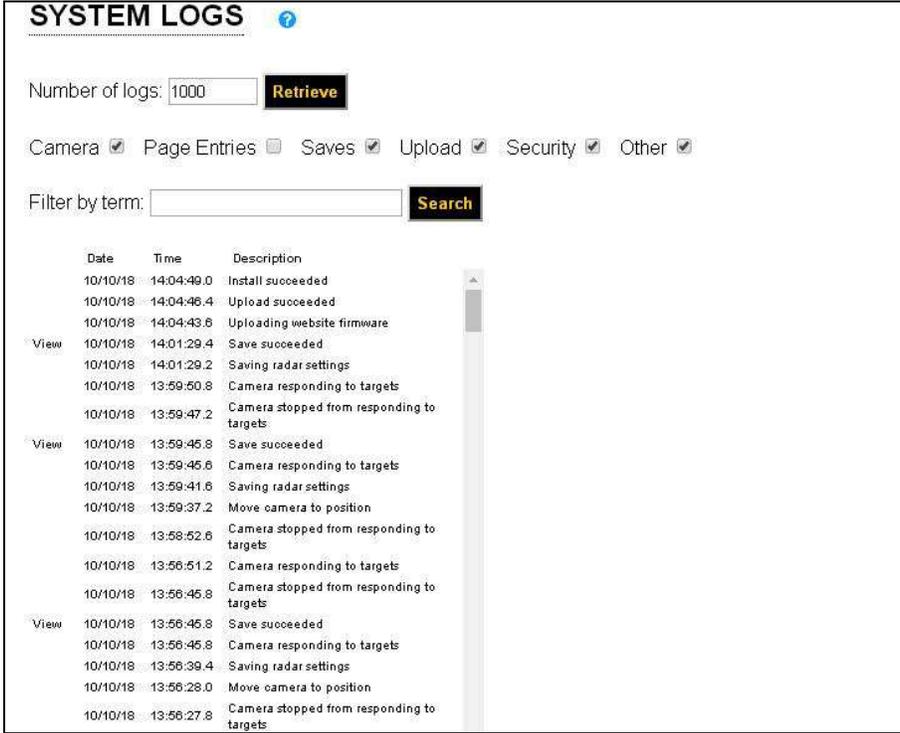
The Speed shown relates to the “Target Speed” setting in the Radar Settings page by a factor of 2. So for example if “Slow” targets are selected in Radar Settings and a value set to 1, then only targets with a “Speed” as measured by the Radar (radial speed) of 2 or less will be accepted (also those when the speed could not be determined).

The Size shown relates to the “Target Size” setting in the Radar Settings page by a factor of 20 and then plus 5. This means that for example if “Small” targets are selected in Radar Settings and a value set to 1, then only targets with a size as measured by the Radar of 25 or less will be accepted. If set to a value of 2 then only targets of “Size” 45 or less will be accepted. Note that the Size value is limited to a displayed value of 220.

Note that the Log is only updated when the web browser page is refreshed.

System Logs

The Radar keeps a log of various system related changes and events as they occur. This allows the user to see if changes to configurations have been made and if so what and when, when firmware changes were made, if the camera is responding to targets, when web pages were entered etc.



SYSTEM LOGS ⓘ

Number of logs: **Retrieve**

Camera Page Entries Saves Upload Security Other

Filter by term: **Search**

	Date	Time	Description
	10/10/18	14:04:49.0	Install succeeded
	10/10/18	14:04:46.4	Upload succeeded
	10/10/18	14:04:43.6	Uploading website firmware
View	10/10/18	14:01:29.4	Save succeeded
	10/10/18	14:01:29.2	Saving radar settings
	10/10/18	13:59:50.8	Camera responding to targets
	10/10/18	13:59:47.2	Camera stopped from responding to targets
View	10/10/18	13:59:45.8	Save succeeded
	10/10/18	13:59:45.6	Camera responding to targets
	10/10/18	13:59:41.6	Saving radar settings
	10/10/18	13:59:37.2	Move camera to position
	10/10/18	13:58:52.6	Camera stopped from responding to targets
	10/10/18	13:56:51.2	Camera responding to targets
	10/10/18	13:56:45.8	Camera stopped from responding to targets
View	10/10/18	13:56:45.8	Save succeeded
	10/10/18	13:56:45.8	Camera responding to targets
	10/10/18	13:56:39.4	Saving radar settings
	10/10/18	13:56:28.0	Move camera to position
	10/10/18	13:56:27.8	Camera stopped from responding to targets

System Log screenshot

The type of entries that are displayed can be selected using the various tick boxes at the top of the page (Camera related, Page entries, Saves, Uploads, Security related, Other) – this makes it easier if searching for particular types of event.

There is also a Search facility – enter a term and press the Search button for relevant entries.

The date and time of each entry in the log is stated. Whenever a change of configuration is made and Saved, the Radars configuration at that time can be reviewed by clicking on the entry. This brings up (to the RHS of the page) the various Radar configuration settings after the change was made, with the parameters that were altered highlighted in yellow (see screenshot below – in this case the Radar position and Zero orientation were changed and zones added). The list of configuration parameters can be scrolled up or down. **At the bottom is a “Restore” button – clicking on this will set the Radar back to the configuration settings shown under “Value” (not “Previous Value”).** This can be useful if configuration changes have been made in error that you want to roll back.

SYSTEM LOGS ?

Number of logs: **Retrieve**

Camera Page Entries Saves Upload Security Other

Filter by term: **Search**

Date	Time	Description	Field	Value	Previous Value
10/10/18	14:04:40.0	Install succeeded	Camera Tilt 3	-0.066000	
10/10/18	14:04:46.4	Upload succeeded	Camera Tilt 4	-0.044000	
10/10/18	14:04:43.6	Uploading website firmware	Camera Tilt 5	-0.022000	
View	10/10/18	14:01:29.4	Camera Tilt 6	-0.011000	
	10/10/18	14:01:29.2	Camera Zoom 1	0.023400	
View	10/10/18	13:59:46.8	Camera Zoom 2	0.026020	
	10/10/18	13:59:41.6	Camera Zoom 3	0.026520	
View	10/10/18	13:56:46.8	Camera Zoom 4	0.029700	
	10/10/18	13:56:39.4	Camera Zoom 5	0.033540	
	10/10/18	13:35:41.4	Camera Zoom 6	0.036000	
	10/10/18	13:35:40.2	Perimeter Latitude	51.773441	51.772670
	10/10/18	13:35:25.4	Perimeter Longitude	-0.324215	-0.324070
	10/10/18	12:04:00.8	Camera Port	80	
	10/10/18	12:04:01.6	Perimeter Offset X	200	
View	10/10/18	11:38:02.6	Perimeter Offset Y	200	
	10/10/18	11:37:57.8	Perimeter Zero Angle	326	0
	10/10/18	11:13:21.2	Perimeter Zones	Set	None set
View	10/10/18	11:13:20.0	Radar Target Delay	0	
	10/10/18	11:13:08.8	VMS Port	80	
	10/10/18	11:13:07.6	Camera Aux Command		
	10/10/18	11:12:42.0	Camera Aux From	00:00	
	10/10/18	11:12:40.8	Camera Aux To	00:00	
	10/10/18	11:10:54.4	Camera IP Address	192.168.1.187	
	10/10/18	11:10:53.2	Camera Password	9999	
	10/10/18	11:10:28.6	Camera Username	admin	
View	10/10/18	10:11:40.6	Perimeter Use Map	Yes	

System Log screenshot showing previous changes made to config

Lastly the Log can be saved. Enter the number of logs to be stored and then press the “Retrieve” button. This is really intended for debugging purposes.

Maintenance

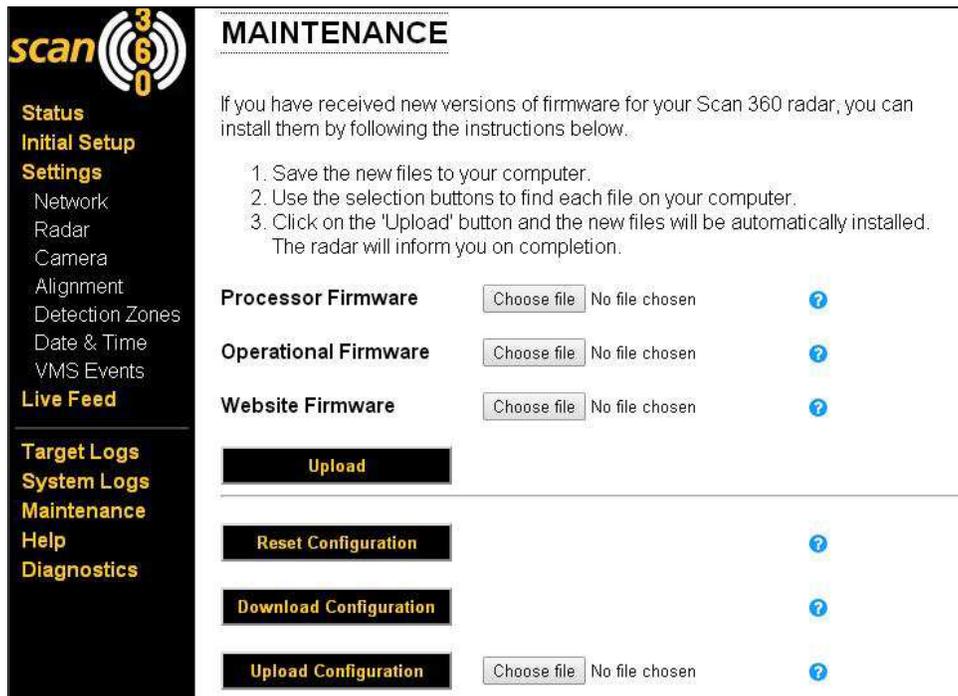
Select the “Maintenance” Heading from the list of options in order to:

- Upload new Radar firmware or website files
- Reset the Radar operational configuration to use default values
- Upload a different Radar configuration

Download the current Radar configuration

The Radar Processor firmware, Radar Operational firmware or the Radar website can be updated to newer issues as and when they are made available via your equipment supplier or potentially direct from the manufacturers website.

Select “Choose file” for the appropriate update type and then locate the file. Repeat if there is more than one type of Upload to be done. When ready press the Upload button. A pop-up box will show indicating if the file has been uploaded to the Radar and then if it has been verified and installed, this may take a minute or so. After the process is complete the Radar will load the Status page. No configuration changes will generally have been made and the Radar will recommence operation typically 30 seconds or so later.



Maintenance web-page screenshot

To reset the Radar operational and configuration parameters back to their default settings (everything except the Radars network settings), press the “Reset Configuration” button.

To Download the Radar configuration to your PC so it can be stored and Uploaded at a later date either into a replacement Radar or to restore a previous set-up, press the “Download Configuration” button. This will create a .dat file containing all the Radar configuration details.

To Upload the Radar configuration so it can be restored into a replacement Radar or to restore a previous set-up, first select the Choose file button next to the “Upload Configuration” button and locate previously stored .dat file, then press the “Upload Configuration” button. All the Radar’s configuration details will be restored to the previously downloaded settings. Note that the Radar network settings will also be changed if different.

Help

Select the “Help” Heading from the options and click on the “+” icon next to one of the topics listed to get Help text relating to that topic.

Diagnostics

The Diagnostics web page is for Debugging and Engineering purposes. Analysing the Diagnostics information can be a useful way to analyse in depth what the Radar has been doing. The Diagnostics data can be downloaded and stored for further analysis using the “Retrieve” (first set number of minutes to be downloaded) or “Retrieve all” buttons.

10 Operation and Performance Check

If the Radar has already been correctly configured on a previous occasion then on any subsequent restart, after around 15 seconds it will enter “Target Mode” and approximately 30 seconds later it should start full operation and react to suitable targets.

Correct operation of the Radar should be checked in particular to ensure that:

- a) the camera moves to target as expected.
- b) zoom and tilt are optimum for different target ranges.
- c) detection zone locations and settings are correct.
- d) unwanted alarms are absent/minimal.

Performance is best tested with a vehicle as will be more easily picked up by the Radar than a person walking. Also at large sites, testing performance by walking all round the area can take a long time. Testing is best done with two people, one providing the target and the other observing the movement of the camera. Consider using Test Mode (see Section 9, Live View) to avoid the Radar sensitivity changing while you test (see below).

Other points to make when testing the Radar:

1. The Radar reacts best when the target is moving away or toward it rather than around it due to the larger radial velocity of the target causing a larger Doppler shift in the reflected signal. So just walking/driving around the boundary in a circle will not necessarily be a good test.
2. Unless Test Mode has been selected (see Section 9, Live View) then once a targets crosses an area the Radar will be temporarily (a few minutes) less sensitive in that area. So testing should not be repeated over the same small patch as this will give an unrealistic impression of the performance.
3. Gauging the level of unwanted alarms can be difficult especially if the coverage area contains vegetation such as long grass, trees or bushes that can move in the wind. In this case, particularly if it is a still day, don't be tempted to lower the “Target Threshold” or “Clutter” settings too far (see the Configuration sections).

Create different detection zones for areas that have different characteristics or requirements and then apply suitable Presets (for Target Threshold and Clutter) so as to get the best overall site performance.

4. Close-in performance depends on the installed height. It can be improved by lowering the installed height (though this may impact longer range performance if there is obscuration). Consider creating a detection zone near the Radar using a Preset with low “Target Threshold” or “Clutter” settings – this can improve nearby sensitivity but won't raise the risk of unwanted alarms in other zones.

Close-in detection may also be artificially improved by setting the “Height” in the “Radar Settings” web-page to a higher value than the Radar is actually installed at.

If any aspect of the operation is not optimum then reconnect the laptop, launch the Radar website and then follow the relevant instructions from the configuration sections above. In particular if the camera is always moving to the wrong bearing then the Alignment (camera calibration) routine should be repeated.

11 Trouble-shooting

No Radar web page access

If Radar web pages are not available on the laptop browser a minute after power-up then:

1. Check that a compatible fixed IP address has been set for the laptop (see section 6 “Initial connection to the Radar” and also the TCP/IP settings in the laptop “Control Panel”) and that it is connected to the network.
2. If the Radar has been set for DHCP then try to bring up the web page by using the Radars given Hostname e.g. http://abcdefg (default hostname is currently scan360).
3. Check that the Radar’s Ethernet cable is correctly crimped and inserted to the RJ45 connector on the Radar base and that the Radar is provided with a suitable working POE source (e.g. a POE Switch or Injector).
4. If there is still no connection then it may be necessary to reset the network settings of the Radar using the “Radar Network Settings - Reset to Default” procedure (see section 6). Once done the Radars IP address is reset to **192.168.1.105**, the username and password are both reset to “**admin**” and DHCP is set to Off.

If there is still no connection to the Radar (and the Ethernet cable, Switch and POE source have already been replaced) then the Radar itself may have a fault and you should contact your supplier concerning any repairs/replacements.

Camera not moving during Configuration

If the camera does not move in response to commands during the relevant configuration procedures (e.g. Alignment, Detection Zone setting, Camera and Tilt/Zoom settings etc) then check the following:

- 1 The camera address, port, username and password that the Radar shows in the Camera Settings page are set correctly and that the Radar and camera are on the same IP network range (unless using a router). Note: Username and Password are usually the camera’s normal login details, but some cameras have additional “ONVIF” login details in which case it is these “ONVIF” login details that are required.
- 2 The cabling of the external Ethernet network switch and POE source is such that the Radar is connected to the camera as well as the laptop and that the camera has power.
- 3 Use the laptop to connect directly to the camera to check that it is operational.
- 4 If the camera still does not respond to the Radar but it does respond correctly to the laptop then the Radar may have a fault and you should contact your supplier concerning any repairs/replacements.

Radar not responding to Targets

If the Radar can control the camera during configuration (see above) but, after a few minutes of operation, the camera is not moving at all in response to significant targets (vehicles) then check the following:

- 1 If using a Schedule check using the configuration “Date & Time” web page that the Radar is set to the correct Scheduled operating hours and that the time is set correctly.
- 2 Check that the laptop is not using any of the web pages (Alignment, Detection Zones, Camera or Tilt and Zoom Settings) that stop the Radar moving the camera in response to targets, including the Camera pop-up window.
- 3 On the Status web-page check that the Disable Radar box is not set.
- 4 On the laptop check on the Detection Zones web page that the detection zones are correctly placed, of the correct priority and that the target is within the active zone.

- If a map is used then also check that the Radar location on the map and the orientation of the green “Zero bearing” line are correct.
- 5 On the laptop check on the “Radar Settings” web page that the Preset for the relevant detection zone does not have “Target Threshold” and “Clutter” settings set too high (see section 8 “Further Configuration”).
 - 6 On the laptop check using the “Radar Settings” web page that the “Sync Mode” is set to “Internal” and not “External” by mistake.
 - 7 Check the Status web-page for any error messages (see Status messages below).
 - 8 Restart the Radar and see if this clears the fault.

If the Radar still does not respond then the Radar may have a fault and you should contact your supplier concerning any repairs/replacements.

Date/Time wrong

The Radar date and time should be set (if incorrect) during the configuration process if the Radar target log is to be used or if a schedule is to be applied. If at a later point the date/time is then found to be wrong this is due to a power outage. Note that the internal hold-up capacitor (there is no battery to replace) lasts for around 48hrs if fully charged.

Radar giving unwanted alarms

Unwanted alarms can be due to several different effects. These are covered separately below.

1. Check that the detection zones are set for the correct areas and that the “Zero bearing” position and the Radar location are correctly indicated on the detection zones map (see the configuration sections above).
2. Check that the Radar’s view to all detection zones is unobstructed and that there are no “Non-Line-Of-Sight” issues that may cause reflected targets to appear in the wrong places (see “Detection Zones” in section 8 “Further Configuration”).
3. Unwanted alarms due to trees, bushes or long grass can be reduced by raising the Radar “Target Threshold” and/or “Clutter” settings for the applicable Preset used for the detection zone or using a different Preset with more robust settings – see the Radar Settings menu (section 8 “Further Configuration”).

Alternatively if possible apply an “Excluded” detection zone over and around the relevant area so they cannot generate alarms anymore (see “Detection Zones” in section 8 “Further Configuration”). If possible keep grass short i.e. < 150mm or 6” long.

A further option is to **disable** “First Target Alarms” in the Radar Settings menu. This stops the Radar reacting to isolated one-off target detections and can be very effective in reducing unwanted alarms.

4. Unwanted alarms due to heavy rain can be reduced by raising the “Target Threshold” and/or “Clutter” setting in the configuration web page Radar Settings – see section 8 “Further Configuration”. Also try **disabling** “First Target Alarms” in the Radar Settings menu

VMS not receiving Radar Alarms

If the Radar is detecting targets but the VMS is not receiving any alarms then check:

1. On the Radars VMS Events web page check that the “Enable VMS” select box is set.
2. That the IP Address (or Hostname if using DHCP) for the VMS is correct and that the network port shown for the VMS is correct.

3. That the correct VMS variant is selected and that the VMS dependant message content exactly matches that expected by the VMS.

If the VMS is still not receiving alarms from the Radar (and it is known that the Radar is seeing targets) then check the network connections and any routing between the two and consult the documentation for the VMS to be sure that it is correctly set-up. If necessary, contact the VMS supplier for additional help.

Camera not steered to targets correctly

If the camera consistently points in the wrong direction when a target is detected then the camera "Alignment" routine should be repeated – see section 8 "Further Configuration".

Restore configuration

If the Radar configuration is inadvertently modified then you can restore previous configurations through the "System Log" web page by using the "Restore" facility – see section 9 "System Log".

Alternatively if the configuration was previously downloaded and stored on your Laptop/PC, you can use the "Maintenance" web page to upload it back to the Radar to restore the old configuration – see section 9 above.

Status Page messages

The status page shows 8 different categories of status messages. These can indicate if the Radar has basic configurations that have not been set and if there are connectivity or other issues. If there is a perceived problem a yellow warning triangle will appear next to the relevant message title.

The possible messages for each of the 8 categories are listed below with their implications:

"Overall Status" messages:

- A "Target detection disabled. Radar disabled by the ADAM unit"
- B "Target detection disabled. Detector busy"
- C "Radar not operating correctly. See warnings below"
- D "Target detection disabled. Installing processor firmware"
- E "Radar operating correctly"
- F "Target detection disabled as outside operating hours"
- G "Target detection disabled. Running startup procedure"
- H "Target detection disabled. Radar disabled by the operator"

Interpretation:

- A An ADAMS unit associated with the Radar has an Input configured which has caused a message to be sent to the Radar to disable it.
- B A temporary internal process is underway or there is an internal error.
- C A configuration or connection issue is present. A further message related to the problem should be displayed in one of the other message categories.
- D A firmware update is underway.
- E The Radar has a configuration that includes settings in all the basic categories (e.g. a detection zone has been created), the Radar has successfully connected to the user specified camera and is not disabled by a Schedule.
- F A Schedule is active and the Radar's current date and time settings match an OFF period in that Schedule. As a result Target detection is disabled.

- G The Radar is starting-up.
- H The operator has disabled the Radar either via the buttons on the Status webpage or Live Feed web-page.

“Date and Time” messages:

- A “Check Date/Time as clock stopped during last power cycle”

Interpretation:

- A The Radar has been powered down for some time and as a result the internal date and time is corrupted. Go to the Date and Time web-page and set the time if a Schedule is to be used.

“Schedule” messages:

- A “Continuous detection”
- B “Set. Within operating hours”
- C “Set. Outside operating hours”

Interpretation:

- A No Schedule is set so the Radar will operate continuously.
- B A Schedule is set and the Radar’s time and date correspond to an operating period of the Schedule. All other issues aside the Radar will react to targets.
- C A Schedule is set and the Radar’s time and date are currently outside the Schedules operating periods. The Radar will not react to targets at this time.

“Detection Zones” messages:

- A Set
- B No detection zones created

Interpretation:

- A At least one detection zone has been created. All other issues aside then the Radar will react to targets in those zones.
- B No detection zones have been created and so the Radar will not react to targets. There must be at least one detection zone set-up for the Radar. Go to the Detection Zones web-page or use the Initial Set-up procedure.

“Camera” messages:

- A Camera connected
- B Initialising
- C No connection to XXX.XXX.X.XX
- D No camera details entered
- E Inactivated by the user
- F DNS lookup failed for XXXXXXX

Interpretation:

- A The Radar has successfully connected to the camera specified by the user.
- B The Radar is in the process of trying to connect to the specified camera.
- C The Radar cannot connect to the camera at the specified IP address. This could be due to an incorrect IP address, incorrectly entered camera username or password or a network connectivity or cable problem.
- D The camera IP address has not been provided to the Radar yet. Go to the Camera web-page and enter the camera details.

- E A Radar web-page is open in another browser tab which allows the user to move the camera i.e. the Camera, Alignment or Detection Zones web-pages is open. To avoid the Radar moving the camera during these procedures, camera movement by the Radar in response to targets is inactivated. When the relevant web-page is closed the Radar will return to normal operation.
- F The Radar cannot find the Hostname provided for the Camera. Check the DNS server, network connections and the camera details provided in the Camera web-page.

“Tracking” messages:

- A Off
- B Camera tracking enabled
- C Target tracking enabled
- D Off (Test mode enabled)

Interpretation:

- A Tracking is off (see the Camera web-page) and so the Radar will move the camera to targets as they are seen without trying to follow one in particular.
- B Camera tracking is enabled (see the Camera web-page) and so even if there are multiple detected targets the Radar will try to only point the camera at one of them (until it is no longer seen or is mistaken for another target).
- C Target tracking is enabled (see the Camera web-page) and so the Radar will try to assign a track to each of up to 8 detected targets. The Radar will only point the camera in response to detected targets that are allocated to one of the tracks. The track selected for the camera to be aimed at is generally the first track that the Radar establishes after the last selected track timed-out.
- D The Radar is in Test Mode (see the Live Feed web-page) and so Tracking is disabled whether or not it is selected in the Camera web-page.

“VMS” messages:

- A VMS connected
- B No VMS details entered
- C DNS lookup failed for XXXXXXX

Interpretation:

- A The Radar is able to connect to the IP address provided by the user for the VMS. Note that this does not mean that the VMS is receiving Radar messages as the Radar cannot tell if this is the case. If the VMS is not responding to Radar alarms then check the VMS web-page settings.
- B No VMS details have been given to the Radar. Go to the VMS web-page and enter the details required.
- C The Radar cannot find the Hostname provided for the VMS. Check the DNS server, network connections and the VMS details provided in the VMS Events web-page.

“Disable Radar”:

When the Disable Radar box is ticked the Radar will not respond to targets at all. **This remains the case even if the web-page is closed down.**

12 Specification

Operating Frequency Band:	24.05 to 24.25GHz (licence exempt ISM band)
Technology:	FMCW Radar
EIRP:	+20dBm
Polarisation:	Linear
Scan-rate:	360degrees per second
Maximum range:	200m
Target angular resolution	approx 2.6deg
Target range resolution	1.5m
Installation height	2 to 4 metres recommended, maximum 6m
Detection Zones	Multiple. Free-form, user defined.
External Interfaces	
Network	Ethernet 100Mbps, RJ45 port
ALARM output	Volt free contact (relay). Max applied voltage 24V. Max current 30mA. Active Impedance 45ohm nominal, Inactive impedance > 100Kohms.
Multiple Radar Sync method	Internal GPS
Power Supply Voltage	POE (802.3af or at)
Power consumption	10W nominal
Hold-up for RTC	Internal capacitor (provides > 48 hours fully charged)
Mechanical:	
Dimensions	248mm diameter max, 310mm tall (ignoring studs/connectors)
Weight	3.3Kg
Fixings	4 off M6 studs on a standard 101.6mm (4 inch) PCD
Operating Temperature	-20 to +55deg C (optional -40 deg C with internal heater)
Approvals	EN300440 RF EN301489 EMC IEC60950 Safety
Routine Maintenance	None
RF Hazard	None (< 0.5mW/sq cm average at the antenna)