

DRAFT COPY

Scan 360 APIs

The Scan 360 opens up APIs to external programs so that all functions made possible by the web browser can be achieved through these APIs. This document explains how to access each function of the Scan 360.

| | |
|---|----|
| Authorisation / Terminology | 2 |
| Character replacements | 3 |
| Retrieving settings & information | |
| Retrieving configuration settings | 4 |
| Retrieving date and time / Retrieve website version | 5 |
| Retrieving targets | 6 |
| Retrieving system logs | 7 |
| Retrieving details of a previous save | 8 |
| Retrieving diagnostics | 10 |
| Saving settings | |
| Save configuration settings | 11 |
| Save date and time | 12 |
| Restore settings / Reset settings | 13 |
| Camera | |
| Camera movement / Pan camera | 14 |
| Tilt camera / Run a camera auxiliary command | 15 |
| Stop camera / Pause camera / Save alignment | 16 |
| Save tilts and zooms / Track next target | 17 |
| Radar Mode & Firmware | |
| Test mode / Reboot radar | 18 |
| Disable radar | 19 |
| Upload processor , operational and website firmware | 20 |
| Appendix A – Settings List | 21 |
| Appendix B – Target Information | 37 |
| Appendix C – Detection Zones format | 39 |

DRAFT COPY

Scan 360 APIs

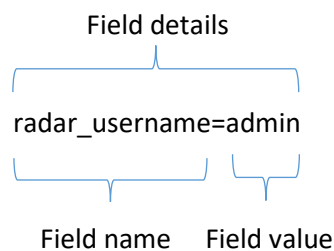
Authorisation

The APIs are called using HTTP POST requests. Each call must use basic authorisation otherwise the request will error. The header will look similar to this:

```
POST http://192.168.1.105/api/get_settings HTTP/1.1
Authorization: Basic YWRtaW46YWRtaW4=
Host: 192.168.1.105
Content-Length: 3
Expect: 100-continue
Connection: Keep-Alive
```

Terminology

Most requests to, or responses from the APIs, involve fields. These fields may represent such things as individual configuration settings, camera commands or filters. A field consists of two parts, the name and the value, and together form the field details. Field details will always be separated by an = character as shown below.



When multiple field details are to be transmitted or received, they will always be ampersand delimited. An example is shown below.

```
radar_username=admin&radar_password=admin&radar_ip_address=192.168.1.105
```

DRAFT COPY

Scan 360 APIs

Character replacement

The radar will replace certain characters when returning data, so they are not misinterpreted. The characters, and their string replacements, are shown below.

| Character | String replacement (quotes not included) |
|------------------|---|
| New line | "\n" |
| Carriage return | "\r" |
| & | "%26" |
| = | "%3D" |
| % | "%25" |

When transmitting data to the radar, the following characters should be replaced otherwise the data may not be read correctly.

| Character | String replacement (quotes should not be included) |
|------------------|---|
| New line | "%0A" |
| Carriage return | "%0D" |
| & | "%26" |
| = | "%3D" |
| % | "%25" |

DRAFT COPY

Scan 360 APIs

Retrieving configuration data

This API will retrieve the radar's configuration data. A comma delimited list of field names should be sent indicating which fields should be returned. These names can represent individual fields, all fields within a category, or everything.

| | |
|---------------|--|
| URL | api/get_settings |
| Input | Comma delimited list of field names. The field names that can be used, and what they'll return are shown in Appendix A . |
| Output | Field details. |

Example 1

Input

perimeter_latitude,radar_clutter_1

Output

perimeter_latitude=51.79571&radar_clutter_1=3

Example 2

Input

camera,vms

Output

camera_alignment=8852&camera_aux_command=tt:WhiteLamp&camera_aux_from=0&camera_aux_to=0camera_ip_address=192.168.1.100&camera_password=9999&camera_port=80&camera_tilts=0.33200,0.30980,0.26540,0.25430,0.22100, -0.01100&camera_tracking=off&camera_username=admin&camera_valid_aux_commands=tt:Wiper,tt:Washer,tt:IRLamp,tt:WhiteLamp&camera_zooms=0.02340,0.02502,0.02652,0.02970,0.03354,0.03600&&adam_inputs=&adam_map=&adam_outputs=&vms_active=off&vms_ip_address=&vms_port=80&vms_protocol=tcp&vms_app=icomply

DRAFT COPY

Scan 360 APIs

Retrieving the current date and time

The current date and time of the radar can be retrieved without specifying any input.

URL *api/get_datetime*

Input *blank*

Output Date and time field details.

Example

Input

blank

Output

datetime_year=19&datetime_month=9&datetime_day=26&datetime_hour=9&datetime_minute=0&datetime_second=30

Retrieve website version

The version of the website firmware on the radar cannot be retrieved using the *api/get_settings* API. Instead it requires its own API call.

URL *api/version_website*

Input *blank*

Output Version of the website.

Example

Input

blank

Output

2.00

DRAFT COPY

Scan 360 APIs

Retrieving targets

The most recent targets detected since the radar was turned on can be retrieved. Filters can be applied to limit the number of targets returned.

URL `api/get_targets`

Input A list of field details, each one representing a filter. If no filters exist, the radar will return the most recent 1000 targets detected. The filters that can be used, and their application are shown below.

| Filter | Application |
|-------------------------|--|
| <code>last</code> | Maximum number of targets to be returned (or <i>all</i> to retrieve every target) |
| <code>since_date</code> | Earliest date to retrieve targets for (ddmmyy) |
| <code>since_time</code> | Earliest time to retrieve targets for (must be used in conjunction with <code>since_date</code>) (hhmm) |
| <code>since_id</code> | Return targets later than this target id (each target has a unique id) |
| <code>to_id</code> | Return targets up to, but not including, this target id |

Output Ampersand delimited list of targets. The details of each target are separated by commas and can be seen in [Appendix B](#). The output will always end with `&more`, which can be ignored.

Example 1

Input

`last=2&since_date=010117&since_time=0900`

Output

`01/01/17,15:11:36.0,111.17,130,18,74,35,1,7,0,0,0,1,51.772354,-0.323521,twrd&01/01/17,11:03:33.0,111.17,72,12,26,21,0,6,0,0,0,1,51.772842,-0.323807,twrd&more`

Example 2

Input

`since_id=6`

Output

`01/01/17,15:11:36.0,111.17,130,18,74,35,1,7,0,0,0,1,51.772354,-0.323521,twrd&more`

DRAFT COPY

Scan 360 APIs

Retrieving system logs

The next 1000 system logs can be retrieved from the radar. The system logs represent actions made by the user to the radar.

URL api/get_system_logs

Input The default response is to provide the last 1000 system logs. Retrieving earlier logs can be achieved by supplying the latest system log id to return up to, but not include

Output Ampersand delimited list of system logs. The details of each log are separated by commas. The log details and their order in the list are Save Flag,Log Id,Date,Time,Description,Classification

The output will end with 'more' or 'end' to signify whether earlier system logs exist.

The current classifications are:

| | |
|----------|----------------------------|
| camera | A camera action occurred |
| page | A page was visited |
| save | A save occurred |
| upload | A firmware upload occurred |
| security | A security event occurred |
| other | Any other logs |

Example 1

Input

blank

Output

info,683312,27/09/19,11:57:41.8,Save succeeded,save&,683304,27/09/19,11:57:41.8,Saving radar settings,save&more

Example 2

Input

id=683312

Output

,683304,27/09/19,11:57:41.8,Saving radar settings,save&more

DRAFT COPY

Scan 360 APIs

Retrieving the details of a save

Each save is stored (subject to memory space) on the radar, and the details of these saves can be retrieved. The system log id that the save is stored against must be known, and can be found by retrieving the system logs.

URL api/get_system_log_info
Input id=*system log id*
Output Comma delimited list of changes with the following details:

- Setting description
- Value saved
- Value before save (if different)
- 'diff' if a change made, otherwise blank

Blank if no such save

Example

In this example the VMS Active has changed from Yes to No.

Input

Id=683312

Output

```
"Set","Yes","","","Radar DNS","192.168.1.1","","","Radar Gateway","192.168.1.1","","","Radar Hostname","scan360","","","Radar IP Address","192.168.1.105","","","Radar Password","admin","","","Radar Subnet","255.255.255.0","","","Radar DHCP","Off","","","Radar Username","admin","","","Camera Alignment","-0.181000","","","Camera Tilt 1","-0.126555","","","Camera Tilt 2","-0.068777","","","Camera Tilt 3","-0.014555","","","Camera Tilt 4","0.000777","","","Camera Tilt 5","-0.022000","","","Camera Tilt 6","-0.011000","","","Camera Zoom 1","0.017000","","","Camera Zoom 2","0.033793","","","Camera Zoom 3","0.063206","","","Camera Zoom 4","0.097275","","","Camera Zoom 5","0.033540","","","Camera Zoom 6","0.036000","","","Radar Latitude","51.773453","","","Radar Longitude","-0.324162","","","Camera Port","80","","","Radar Offset X","200","","","Radar Offset Y","200","","","Radar Zero Angle","319","","","Detection Zones","Set","","","Radar Target Delay","0","","","VMS Port","1235","","","Camera Aux Command","","","Camera Aux From","00:00","","","Camera Aux To","00:00","","","Camera IP Address","","","Camera Password","9999","","","Camera Username","admin","","","Use Satellite Map","Yes","","","Schedule Mon End","09:00","","","Schedule Mon Start","17:00","","","Schedule Tue End","09:00","","","Schedule Tue Start","17:00","","","Schedule Wed End","09:00","","","Schedule Wed Start","17:00","","","Schedule Thu
```


DRAFT COPY

Scan 360 APIs

End","09:00","","","Schedule Thu Start","17:00","","","Schedule Fri
End","09:00","","","Schedule Fri Start","17:00","","","Schedule Sat
End","09:00","","","Schedule Sat Start","17:00","","","Schedule Sun
End","09:00","","","Schedule Sun Start","17:00","","","Schedule
Active","No","","","VMS Application","Manual","","","VMS IP
Address","192.168.1.221","","","VMS Narrative","Set","","","VMS
Active","No","Yes","diff","VMS Protocol","TCP","","","ADAM Unit Map","Not
set","","","ADAM Input 0","None","","","ADAM Input 1","None","","","ADAM Input
2","None","","","ADAM Input 3","None","","","ADAM Input 4","None","","","ADAM
Input 5","None","","","ADAM Input 6","None","","","ADAM Input
7","None","","","ADAM Input 8","None","","","ADAM Input 9","None","","","ADAM
Input 10","None","","","ADAM Input 11","None","","","ADAM Input
12","None","","","ADAM Input 13","None","","","ADAM Input
14","None","","","ADAM Input 15","None","","","ADAM Output 0","5","","","ADAM
Output 1","5","","","ADAM Output 2","5","","","ADAM Output 3","5","","","ADAM
Output 4","5","","","ADAM Output 5","5","","","ADAM Output 6","5","","","ADAM
Output 7","5","","","ADAM Output 8","5","","","ADAM Output 9","5","","","ADAM
Output 10","5","","","ADAM Output 11","5","","","ADAM Output
12","5","","","ADAM Output 13","5","","","ADAM Output 14","5","","","ADAM
Output 15","5","","","Camera Tracking","No","","","Radar
Adaptive","On","","","Radar Frequency","High","","","Radar Height","3","","","Radar
Size Filter","All","","","Radar Size Value","4","","","Radar Speed
Filter","All","","","Radar Speed Value","4","","","Radar Sync Delay","0","","","Radar
Sync Mode","Internal","","","Radar First Target Alarms","Yes","","","Radar Test
Mode","No","","","Radar Clutter 1","5","","","Radar Threshold 1","2","","","Radar
Clutter 2","5","","","Radar Threshold 2","1","","","Radar Clutter 3","5","","","Radar
Threshold 3","1","","","Radar Clutter 4","5","","","Radar Threshold 4","1","",""

DRAFT COPY

Scan 360 APIs

Retrieving the radar diagnostics

The radar output will show the internal logs produced by the radar. This output is purely for investigative purposes and is not required for the normal running or setup of the radar.

URL `api/get_internal_logs`

Input The default response is to provide the last five minutes of output produced by the radar. The number of minutes can be increased or decreased by providing the *minutes* field detail.

Output The current configuration settings (in internal format), followed by the logs generated minute-by-minute.

Example 1

Input

blank

Output

String of diagnostics information

Example 2

Input

`minutes=10`

Output

String of diagnostics information for the past 10 minutes

DRAFT COPY

Scan 360 APIs

Save configuration settings

The configuration settings can be saved to the radar by supplying a list of field details. There is no maximum for the number of settings that can be saved in a single request. In addition, only those settings which have changed need to be sent in the request.

URL api/save_settings

Input List of field details. The field names that can be saved are shown in [Appendix A](#).

Output “Saved” if successful
 Error message if unsuccessful

Example

Input

camera_ip_address=192.168.1.101&camera_username=main_profile&camera_password=123456

Output

Saved

DRAFT COPY

Scan 360 APIs

Save the date and time

The current date and time can be saved to the radar so that logs and schedules work correctly.

URL api/save_datetime

Input List of field details representing the new date and time. The fields are shown below.

| Field | Value |
|------------------|------------------------------------|
| datetime_day | Between 1 and 31 |
| datetime_month | Between 1 and 12 |
| datetime_year | Between 0 and 99 |
| datetime_hour | Between 0 and 23 |
| datetime_minute | Between 0 and 59 |
| datetime_weekday | Between 0 (Sunday) to 6 (Saturday) |

Output "Saved" if successful

Error message if unsuccessful

Example

Input

datetime_day=1&datetime_month=1&datetime_year=17&datetime_hour=9&datetime_minute=0&datetime_weekday=0

Output

Saved

DRAFT COPY

Scan 360 APIs

Restoring to a previous save point

The settings of previous saves can be restored to the radar. The number of saves stored depends on the number of saves made and the level of activity made on the radar. The system log id that the save is stored against must be known, and can be found by retrieving the system logs.

| | |
|---------------|--|
| URL | api/restore_settings |
| Input | id= <i>system log id</i> |
| Output | “Saved” if successful. The settings saved at the time will be restored and the radar will reboot. Error message if unsuccessful |

Example

Input
Id=737402

Output
Saved

Reset settings to their default values

This API will reset all configuration settings to their default values. The date and time will not be affected.

| | |
|---------------|--|
| URL | api/reset_settings |
| Input | <i>blank</i> |
| Output | “Saved” if successful Error message if unsuccessful |

DRAFT COPY

Scan 360 APIs

Camera movement

The camera can be panned left or right, tilted up or down and zoomed in or out.

URL `api/camera_move`

Input `command=direction | speed`

direction left, right, up, down, in or out

speed Floating point number between 0.01 (slow) and 1 (fast)

Output *blank*

Example

Input

`left|0.5`

Output

Camera pans left at half speed

Pan the camera

The camera can be panned to any bearing.

URL `api/camera_pan`

Input `position=bearing`

bearing Angle (to 2dps) between 0 and 359.99 degrees

Output *blank*

Example

Input

`position=180`

Output

Camera pans to 180 degrees

DRAFT COPY

Scan 360 APIs

Tilt and zoom the camera

The camera can be tilted and zoomed to one of six tilt/zoom positions.

URL `api/camera_tilt`

Input `position=range`

| | | |
|--------------|---|------------|
| <i>range</i> | 0 | (0-15m) |
| | 1 | (15-25m) |
| | 2 | (25-50m) |
| | 3 | (50-100m) |
| | 4 | (100-150m) |
| | 5 | (150-200m) |

Output *blank*

Example

Input

`Position=2`

Output

Camera tilts and zooms to the position stored for targets between 25 and 50m

Run a camera auxiliary command

The camera can be instructed to perform an auxiliary command. The list of valid auxiliary commands can be found by retrieving the `camera_valid_aux_commands` setting.

URL `api/camera_auxiliary`

Input `command=auxiliary command`

auxiliary command A valid auxiliary command

Output *blank*

Example

Input

`command=tt:WhiteLamp|On`

Output

Camera turns on white lamps for a set period of time

DRAFT COPY

Scan 360 APIs

Stop the camera

During any operation the camera is doing, it can be told to stop moving

URL *api/camera_stop*

Input *blank*

Output *blank*

Pause the camera from responding to targets

During the process of setting the perimeter, alignment or camera tilts, it is useful to stop the camera from responding to targets so that the operator can move the camera to the desired position. This command will ensure the camera does not response to targets for 3 seconds, within which another request should be made if the camera should be paused for longer.

URL *api/camera_pause*

Input *blank*

Output *blank*

Save the camera alignment

So that the radar can slew the camera to the correct position, the radar and camera need to be aligned. This request will set the camera's current position to be associated with bearing zero of the radar.

URL *api/save_alignment*

Input *blank*

Output "Saved" if successful

 Error message if unsuccessful

Example

Input

blank

Output

Saved

DRAFT COPY

Scan 360 APIs

Save camera tilt & zoom

The current position of the camera's tilt and zoom can be stored in one of the six tilt/zoom settings. Each tilt/zoom setting corresponds to a different range.

| | | | |
|---------------|-------------------------------------|---|------------|
| URL | api/save_tilt_zoom | | |
| Input | position= <i>tilt/zoom position</i> | | |
| | <i>tilt/zoom position</i> | 0 | (0-15m) |
| | | 1 | (15-25m) |
| | | 2 | (25-50m) |
| | | 3 | (50-100m) |
| | | 4 | (100-150m) |
| | | 5 | (150-200m) |
| Output | "Saved" if successful | | |
| | Error message if unsuccessful | | |

Example

Input

position=2

Output

Saved

Track next target

If target tracking has been enabled, the radar can be cycled through targets it tracks. This API call instruct the radar to track the next target in the list.

| | |
|---------------|--------------------------|
| URL | api/track_next |
| Input | <i>blank</i> |
| Output | New track being followed |

Example

Input

blank

Output

2

DRAFT COPY

Scan 360 APIs

Test mode

The radar can be placed into Test mode to aid setting up the detection zones. In test mode changes in the environment, such as targets or clutter, no longer change the radar sensitivity. In addition no tracking takes place.

The radar will remain in test mode for 10 seconds unless the `api/test_mode_stop` command is called, or unless a further call to `api/test_mode` is made, in which case the 10 second timeout is reset.

This API also functions in the same way as retrieving the targets, with the same inputs and outputs. In this way the same call can be made to keep the radar in test mode and retrieve the most recent targets.

| | |
|---------------|--|
| URL | <code>api/test_mode</code> |
| Input | See Retrieving Targets |
| Output | See Retrieving Targets |

Exit test mode

Test mode can be exited before the 10 second timeout by a call to this API.

| | |
|---------------|---------------------------------|
| URL | <code>api/test_mode_stop</code> |
| Input | <i>blank</i> |
| Output | <i>blank</i> |

Reboot the radar

This request will reboot the radar, which will take approximately 15 seconds to return.

| | |
|---------------|--|
| URL | <code>api/reboot</code> |
| Input | <i>blank</i> |
| Output | “Saved” if successful Error message if unsuccessful |

Example

| |
|---------------|
| Input |
| <i>blank</i> |
| Output |
| Save |

DRAFT COPY

Scan 360 APIs

Disabling the radar

The request will disable or enable the radar from responding to targets. This affects the camera, VMS, alarm relay and the target logs.

| | | |
|---------------|-------------------|-------------------|
| URL | api/disable_radar | |
| Input | on <i>or</i> off | |
| | on | Disable the radar |
| | off | Enable the radar |
| Output | <i>blank</i> | |

Example

Input
on
Output
blank

DRAFT COPY

Scan 360 APIs

Upload new processor firmware

This API will allow new firmware to be installed as and when required.

| | |
|---------------|---|
| URL | api/upload_processor_firmware |
| Input | Bytes of the file |
| Output | “Saved” if successfully uploaded and installed Error message if unsuccessful |

Upload new operational firmware

This API will allow new firmware to be installed as and when required.

| | |
|---------------|---|
| URL | api/upload_operational_firmware |
| Input | Bytes of the file |
| Output | “Saved” if successfully uploaded and set to reboot Error message if unsuccessful |

Upload new website firmware

This API will allow new firmware to be installed as and when required.

| | |
|---------------|---|
| URL | api/upload_website_firmware |
| Input | Bytes of the file |
| Output | “Saved” if successfully uploaded and installed Error message if unsuccessful |

DRAFT COPY

Scan 360 APIs

Appendix A – Settings List

Below is the list of fields that can be retrieved and saved to the radar.

| | |
|------------------------|--|
| Field Name | all |
| Description | Requests the return of all the radar's configuration settings |
| Use | Retrieval Only |
| Fields Returned | <i>All fields returned from</i> about, camera, perimeter, radar, schedule, vms |
| Field Name | about |
| Description | Requests the return of the radar's status |
| Use | Retrieval Only |
| Fields Returned | camera_startus, datetime, datetime_status, operational_version, processor_version, schedule_status, status, tracking_status, uptime, vms_status, zones_status |
| Field Name | camera |
| Description | Requests the return of the radar's camera settings |
| Use | Retrieval Only |
| Fields Returned | camera_alignment, camera_aux_command, camera_aux_from, camera_aux_to, camera_ip_address, camera_password, camera_port, camera_tilts, camera_tracking, camera_username, camera_valid_aux_commands, camera_zooms |
| Field Name | perimeter |
| Description | Requests the return of the radar's detection zone settings |
| Use | Retrieval Only |
| Fields Returned | perimeter_latitude, perimeter_longitude, perimeter_offset_x, perimeter_offset_y, perimeter_use_map, perimeter_zero_angle, perimeter_zones |
| Field Name | radar |
| Description | Requests the return of the radar's network and detection settings |
| Use | Retrieval Only |
| Fields Returned | radar_clutters, radar_dhcp, radar_dns, radar_first_target_alarms, radar_frequency, radar_gateway, radar_height, radar_hostname, radar_ip_address, radar_mac, radar_password, radar_size_filter, radar_size_value, radar_speed_filter, radar_speed_value, radar_subnet, radar_sync_delay, radar_sync_mode, radar_target_delay, radar_thresholds, radar_username |

DRAFT COPY

Scan 360 APIs

| | |
|------------------------|--|
| Field Name | schedule |
| Description | Requests the return of the radar's schedule settings |
| Use | Retrieval Only |
| Fields Returned | schedule_active, schedule_mon_start, schedule_mon_end, schedule_tue_start, schedule_tue_end, schedule_wed_start, schedule_wed_end, schedule_thu_start, schedule_thu_end, schedule_fri_start, schedule_fri_end, schedule_sat_start, schedule_sat_end, schedule_sun_start, schedule_sun_end |
| Field Name | vms |
| Description | Requests the return of the radar's VMS settings |
| Use | Retrieval Only |
| Fields Returned | adam_inputs, adam_map, adam_outputs, vms_active, vms_app, vms_ip_address, vms_port, vms_protocol <i>Depending on vms_app: vms_adam_password, vms_adam_username or vms_narrative or vms_milestone or vms_synergy or vms_wavestore_camera, vms_wavestore_password, vms_wavestore_username or vms_vast_2</i> |
| Field Name | camera_status |
| Description | Requests the return of the camera's status |
| Use | Retrieval Only |
| Fields Returned | camera_status, camera_status_type |
| Values | Camera connected <i>or</i> Inactivated by ADAM unit <i>or</i> Inactivated by the user <i>or</i> Initialising <i>or</i> No camera details entered <i>or</i> No connection to [hostname] <i>or</i> [User defined message set while pausing the camera] |
| Field Name | camera_status_type |
| Description | Short description on the health of the camera |
| Use | Returned when camera_status requested |
| Values | error <i>or</i> info <i>or</i> ok <i>or</i> unknown |
| Field Name | datetime_status |
| Description | Requests the return of the internal date and time status |
| Use | Retrieval Only |
| Fields Returned | datetime_status, datetime_status_type |
| Values | [dd/mm/yy hh:mm] <i>or</i> [dd/mm/yy hh:mm] Check Date/Time as clock stopped during last power cycle |

DRAFT COPY

Scan 360 APIs

Field Name datetime_status_type
Description Short description on the health of the internal date and time
Use Returned when datetime_status requested
Values error *or* info *or* ok *or* unknown

Field Name schedule_status
Description Requests the return of the schedule's status
Use Retrieval Only
Fields Returned schedule_status, schedule_status_type
Values Continuous detection *or*
Set. Outside operating hours *or*
Set. Within operating hours

Field Name schedule_status_type
Description Indicates the health of the camera
Use Returned when schedule_status requested
Values error *or* info *or* ok *or* unknown

Field Name status
Description Requests the return of the radar's overall status
Use Retrieval Only
Fields Returned status, status_type
Values Radar not operating correctly *or*
Radar operating correctly *or*
Target detection disabled as outside operating hours *or*
Target detection disabled. Detector busy *or*
Target detection disabled. Installing processor firmware *or*
Target detection disabled. Radar disabled by the ADAM unit *or*
Target detection disabled. Radar disabled by the operator *or*
Target detection disabled. Running startup procedure

Field Name status_type
Description Short description on the overall health of the radar
Use Returned when status requested
Values error *or* info *or* ok *or* unknown

Field Name tracking_status
Description Requests the return of the tracking status
Use Retrieval Only
Fields Returned tracking_status, tracking_status_type
Values Camera tracking enabled *or*
Off *or*
Off (Test Mode enabled) *or*
Target tracking enabled

DRAFT COPY

Scan 360 APIs

Field Name tracking_status_type
Description Short description on the health of the tracking software
Use Returned when tracking_status requested
Values error *or* info *or* ok *or* unknown

Field Name uptime
Description Requests the return of the radar's total uptime
Use Retrieval Only
Values *Time in seconds*

Field Name version_operational
Description Requests the return of the operational firmware version
Use Retrieval Only
Values *Text*

Field Name version_processor
Description Requests the return of the processor firmware version
Use Retrieval Only
Values *Text*

Field Name vms_status
Description Requests the return of the VMS's status
Use Retrieval Only
Fields Returned vms_status, vms_status_type
Values DNS lookup failed for [*hostname*] *or*
No connection to [*hostname*] *or*
No VMS details entered *or*
VMS connected

Field Name vms_status_type
Description Short description on the health of the VMS
Use Returned when vms_status requested
Values error *or* info *or* ok *or* unknown

Field Name zones_status
Description Requests the return of the detection zone's status
Use Retrieval Only
Fields Returned zones_status, zones_status_type
Values No detection zones created
Set

DRAFT COPY

Scan 360 APIs

| | |
|--------------------|--|
| Field Name | zones_status_type |
| Description | Short description on the health of the camera |
| Use | Returned when zones_status requested |
| Values | error or info or ok or unknown |
| Field Name | camera_alignment |
| Description | Angle of the camera alignment |
| Use | Retrieve and Save |
| Values | <i>Degrees to 2 decimal places</i> |
| Field Name | camera_aux_command |
| Description | Auxiliary command to be activated when a target is detected |
| Use | Retrieve and Save |
| Values | <i>Text up to 30 characters</i> |
| Field Name | camera_aux_from |
| Description | Hour the auxiliary command is active from (set start and end times to 0 for continuous operation) |
| Use | Retrieve and Save |
| Values | <i>0 to 23</i> |
| Field Name | camera_aux_to |
| Description | Hour the auxiliary command is active to (set start and end times to 0 for continuous operation) |
| Use | Retrieve and Save |
| Values | <i>0 to 23</i> |
| Field Name | camera_ip_address |
| Description | Camera IP address or hostname |
| Use | Retrieve and Save |
| Values | <i>Text up to 20 characters</i> |
| Field Name | camera_password |
| Description | Camera password |
| Use | Retrieve and Save |
| Values | <i>Text up to 20 characters</i> |
| Field Name | camera_port |
| Description | Camera port number |
| Use | Retrieve and Save |
| Values | <i>0 to 65535</i> |

DRAFT COPY

Scan 360 APIs

| | |
|--------------------|--|
| Field Name | camera_tilt_1 |
| Description | ONVIF tilt value for range 0-15m |
| Use | Saving Only |
| Values | <i>Floating point number</i> |
| Field Name | camera_tilt_2 |
| Description | ONVIF tilt value for range 15-25m |
| Use | Saving Only |
| Values | <i>Floating point number</i> |
| Field Name | camera_tilt_3 |
| Description | ONVIF tilt value for range 25-50m |
| Use | Saving Only |
| Values | <i>Floating point number</i> |
| Field Name | camera_tilt_4 |
| Description | ONVIF tilt value for range 50-100m |
| Use | Saving Only |
| Values | <i>Floating point number</i> |
| Field Name | camera_tilt_5 |
| Description | ONVIF tilt value for range 100-150m |
| Use | Saving Only |
| Values | <i>Floating point number</i> |
| Field Name | camera_tilt_6 |
| Description | ONVIF tilt value for range 150-200m |
| Use | Saving Only |
| Values | <i>Floating point number</i> |
| Field Name | camera_tilts |
| Description | List of ONVIF tilt values for each of the 6 ranges |
| Use | Retrieve and Save |
| Values | <i>6 comma delimited floating point values</i> |
| Field Name | camera_tracking |
| Description | Type of camera tracking enabled |
| Use | Retrieve and Save |
| Values | camera <i>or</i> target <i>or</i> off |

DRAFT COPY

Scan 360 APIs

| | |
|--------------------|---|
| Field Name | camera_username |
| Description | Camera username |
| Use | Retrieve and Save |
| Values | <i>Text up to 20 characters</i> |
| Field Name | camera_valid_aux_commands |
| Description | List of auxiliary commands the camera supports |
| Use | Retrieval Only |
| Values | <i>Comma delimited list of auxiliary commands</i> |
| Field Name | camera_zoom_1 |
| Description | ONVIF zoom value for range 0-15m |
| Use | Saving Only |
| Values | <i>Floating point number</i> |
| Field Name | camera_zoom_2 |
| Description | ONVIF zoom value for range 15-25m |
| Use | Saving Only |
| Values | <i>Floating point number</i> |
| Field Name | camera_zoom_3 |
| Description | ONVIF zoom value for range 25-50m |
| Use | Saving Only |
| Values | <i>Floating point number</i> |
| Field Name | camera_zoom_4 |
| Description | ONVIF zoom value for range 50-100m |
| Use | Saving Only |
| Values | <i>Floating point number</i> |
| Field Name | camera_zoom_5 |
| Description | ONVIF zoom value for range 100-150m |
| Use | Saving Only |
| Values | <i>Floating point number</i> |
| Field Name | camera_zoom_6 |
| Description | ONVIF zoom value for range 150-200m |
| Use | Saving Only |
| Values | <i>Floating point number</i> |

DRAFT COPY

Scan 360 APIs

| | |
|--------------------|--|
| Field Name | camera_zooms |
| Description | List of ONVIF zoom values for each of the 6 ranges |
| Use | Retrieve and Save |
| Values | <i>6 comma delimited floating point values</i> |
| Field Name | gps |
| Description | Current GPS position of the radar |
| Use | Retrieval Only |
| Values | <i>Comma separated floating point latitude and longitude</i> |
| Field Name | last_target_id |
| Description | Id for the last target detected |
| Use | Retrieval Only |
| Values | <i>Whole number</i> |
| Field Name | perimeter_longitude |
| Description | Longitude for the satellite map used during setup |
| Use | Retrieve and Save |
| Values | <i>Floating point number</i> |
| Field Name | perimeter_offset_x |
| Description | X location of the radar on the satellite map. Centre X position is 200 |
| Use | Retrieve and Save |
| Values | <i>0 to 400</i> |
| Field Name | perimeter_offset_y |
| Description | Y location of the radar on the satellite map. Centre Y position is 200 |
| Use | Retrieve and Save |
| Values | <i>0 to 400</i> |
| Field Name | perimeter_use_map |
| Description | Whether to use a satellite map |
| Use | Retrieve and Save |
| Values | <i>yes or no</i> |
| Field Name | perimeter_zero_angle |
| Description | Angle of the radar's zero position on the satellite map |
| Use | Retrieve and Save |
| Values | <i>Degrees to 0 decimal places</i> |
| Field Name | perimeter_zones |
| Description | Detection zones |
| Use | Retrieve and Save |
| Values | <i>See Appendix C</i> |

DRAFT COPY

Scan 360 APIs

| | |
|--------------------|--|
| Field Name | radar_clutter_1 |
| Description | Clutter filter for the 1 st clutter/threshold setting |
| Use | Retrieve and Save |
| Values | <i>0 to 8</i> |
| Field Name | radar_clutter_2 |
| Description | Clutter filter for the 2 nd clutter/threshold setting |
| Use | Retrieve and Save |
| Values | <i>0 to 8</i> |
| Field Name | radar_clutter_3 |
| Description | Clutter filter for the 3 rd clutter/threshold setting |
| Use | Retrieve and Save |
| Values | <i>0 to 8</i> |
| Field Name | radar_clutter_4 |
| Description | Clutter filter for the 4 th clutter/threshold setting |
| Use | Retrieve and Save |
| Values | <i>0 to 8</i> |
| Field Name | radar_clutters |
| Description | List of clutters for each of the 4 clutter/threshold settings |
| Use | Retrieve and Save |
| Values | <i>4 comma delimited numbers between 0 and 8</i> |
| Field Name | radar_dhcp |
| Description | Whether the radar has DHCP enabled |
| Use | Retrieve and Save |
| Values | <i>on or off</i> |
| Field Name | radar_dns |
| Description | Primary DNS server |
| Use | Retrieve and Save |
| Values | <i>IPv4 address</i> |
| Field Name | radar_first_target_alarms |
| Description | Whether isolated targets are responded to |
| Use | Retrieve and Save |
| Values | <i>on or off</i> |
| Field Name | radar_frequency |
| Description | Frequency of the radar |
| Use | Retrieve and Save |
| Values | <i>high or low</i> |

DRAFT COPY

Scan 360 APIs

| | |
|--------------------|---|
| Field Name | radar_gateway |
| Description | Default gateway |
| Use | Retrieve and Save |
| Values | <i>IPv4 address</i> |
| Field Name | radar_height |
| Description | Installed height of the radar |
| Use | Retrieve and Save |
| Values | <i>Metres between 1 to 8</i> |
| Field Name | radar_hostname |
| Description | Radar hostname |
| Use | Retrieve and Save |
| Values | <i>Text up to 20 characters</i> |
| Field Name | radar_ip_address |
| Description | Radar IP address when DHCP is disabled |
| Use | Retrieve and Save |
| Values | <i>IPv4 address</i> |
| Field Name | radar_mac |
| Description | MAC address of the radar |
| Use | Retrieval Only |
| Values | <i>MAC address</i> |
| Field Name | radar_password |
| Description | Radar password |
| Use | Retrieve and Save |
| Values | <i>Text up to 20 characters</i> |
| Field Name | radar_size_filter |
| Description | Target filter active based on size of target |
| Use | Retrieve and Save |
| Values | <i>all or large or small</i> |
| Field Name | radar_size_value |
| Description | Value of the size filter to use |
| Use | Retrieve and Save |
| Values | <i>1 to 10</i> |
| Field Name | radar_speed_filter |
| Description | Target filter active based on speed of target |
| Use | Retrieve and Save |
| Values | <i>all or fast or slow</i> |

DRAFT COPY

Scan 360 APIs

| | |
|--------------------|---|
| Field Name | radar_speed_value |
| Description | Value of the speed filter to use |
| Use | Retrieve and Save |
| Values | <i>1 to 10</i> |
| Field Name | radar_subnet |
| Description | Subnet mask |
| Use | Retrieve and Save |
| Values | <i>IPv4 address</i> |
| Field Name | radar_sync_delay |
| Description | Value of the sync delay to use |
| Use | Retrieve and Save |
| Values | <i>0 to 8</i> |
| Field Name | radar_sync_mode |
| Description | Sync mode to use with other nearby radars |
| Use | Retrieve and Save |
| Values | <i>internal or external</i> |
| Field Name | radar_target_delay |
| Description | Delay to use when low priority targets are detected following high priority targets |
| Use | Retrieve and Save |
| Values | <i>Seconds between 0 and 600 to 1 decimal place</i> |
| Field Name | radar_test_mode |
| Description | Whether test mode is active |
| Use | Retrieval Only |
| Values | <i>on or off</i> |
| Field Name | radar_threshold_1 |
| Description | Target detection threshold for the 1 st clutter/threshold setting |
| Use | Retrieve and Save |
| Values | <i>0 to 8</i> |
| Field Name | radar_threshold_2 |
| Description | Target detection threshold for the 2 nd clutter/threshold setting |
| Use | Retrieve and Save |
| Values | <i>0 to 8</i> |
| Field Name | radar_threshold_3 |
| Description | Target detection threshold for the 3 rd clutter/threshold setting |
| Use | Retrieve and Save |
| Values | <i>0 to 8</i> |

DRAFT COPY

Scan 360 APIs

| | |
|--------------------|--|
| Field Name | radar_threshold_4 |
| Description | Target detection threshold for the 4 th clutter/threshold setting |
| Use | Retrieve and Save |
| Values | <i>0 to 8</i> |
| Field Name | radar_thresholds |
| Description | List of target detection thresholds for each of the 4 clutter/threshold settings |
| Use | Retrieve and Save |
| Values | <i>4 comma delimited numbers between 0 and 8</i> |
| Field Name | radar_username |
| Description | Radar username |
| Use | Retrieve and Save |
| Values | <i>Text up to 20 characters</i> |
| Field Name | schedule_switch |
| Description | Whether the schedule is enabled |
| Use | Retrieve and Save |
| Values | <i>on or off</i> |
| Field Name | schedule_mon_start |
| Description | Hour the radar becomes active on Monday |
| Use | Retrieve and Save |
| Values | <i>0 to 24</i> |
| Field Name | schedule_mon_end |
| Description | Hour the radar becomes inactive on Monday |
| Use | Retrieve and Save |
| Values | <i>0 to 24</i> |
| Field Name | schedule_tue_start |
| Description | Hour the radar becomes active on Tuesday |
| Use | Retrieve and Save |
| Values | <i>0 to 24</i> |
| Field Name | schedule_tue_end |
| Description | Hour the radar becomes inactive on Tuesday |
| Use | Retrieve and Save |
| Values | <i>0 to 24</i> |
| Field Name | schedule_wed_start |
| Description | Hour the radar becomes active on Wednesday |
| Use | Retrieve and Save |
| Values | <i>0 to 24</i> |

DRAFT COPY

Scan 360 APIs

Field Name schedule_wed_end
Description Hour the radar becomes inactive on Wednesday
Use Retrieve and Save
Values 0 to 24

Field Name schedule_thu_start
Description Hour the radar becomes active on Thursday
Use Retrieve and Save
Values 0 to 24

Field Name schedule_thu_end
Description Hour the radar becomes inactive on Thursday
Use Retrieve and Save
Values 0 to 24

Field Name schedule_fri_start
Description Hour the radar becomes active on Friday
Use Retrieve and Save
Values 0 to 24

Field Name schedule_fri_end
Description Hour the radar becomes inactive on Friday
Use Retrieve and Save
Values 0 to 24

Field Name schedule_sat_start
Description Hour the radar becomes active on Saturday
Use Retrieve and Save
Values 0 to 24

Field Name schedule_sat_end
Description Hour the radar becomes inactive on Saturday
Use Retrieve and Save
Values 0 to 24

Field Name schedule_sun_start
Description Hour the radar becomes active on Sunday
Use Retrieve and Save
Values 0 to 24

Field Name schedule_sun_end
Description Hour the radar becomes inactive on Sunday
Use Retrieve and Save
Values 0 to 24

DRAFT COPY

Scan 360 APIs

| | |
|--------------------|---|
| Field Name | track_id_following |
| Description | Id for the track currently being followed (only applicable if target tracking enabled) |
| Use | Retrieval Only |
| Values | 0 to 7 |
| Field Name | adam_inputs |
| Description | List of actions to take when a DI is activated on an ADAMs unit. vms_app must be set to adam and vms_active must be set to on |
| Use | Retrieve and Save |
| Values | <i>Comma delimited list of actions for up to 16 DI camera off or radar off or none</i> |
| Field Name | adam_map |
| Description | List of mappings of detection zones and the DO to activate on an ADAMs unit when a target is detected. vms_app must be set to adam and vms_active must be set to on |
| Use | Retrieve and Save |
| Values | <i>Pipe delimited list of mappings. Each mapping is a zone number and DO number separated by a comma. Up to 50 mappings can be made and up to 16 DO can be handled.</i> |
| Field Name | adam_outputs |
| Description | List of timeouts for activated DO on an ADAMs unit. vms_app must be set to adam and vms_active must be set to on |
| Use | Retrieve and Save |
| Values | <i>Comma delimited list of timeouts for up to 16 DO. Seconds between 0 and 600 to 1 decimal place</i> |
| Field Name | vms_active |
| Description | Whether the VMS is active |
| Use | Retrieve and Save |
| Values | on or off |
| Field Name | vms_adam_password |
| Description | ADAMs unit password used if vms_app set to adam |
| Use | Retrieve and Save |
| Values | <i>Text up to 50 characters</i> |
| Field Name | vms_adam_username |
| Description | ADAMs unit username used if vms_app set to adam |
| Use | Retrieve and Save |
| Values | <i>Text up to 50 characters</i> |

DRAFT COPY

Scan 360 APIs

| | |
|--------------------|---|
| Field Name | vms_app |
| Description | VMS application to transmit to |
| Use | Retrieve and Save |
| Values | adam <i>or</i> manual <i>or</i> icomply <i>or</i> milestone <i>or</i> synergy <i>or</i> vast2 <i>or</i> wavestore |
| Field Name | vms_ip_address |
| Description | VMS IP address or hostname |
| Use | Retrieve and Save |
| Values | <i>Text up to 20 characters</i> |
| Field Name | vms_milestone |
| Description | Milestone message sent if vms_app set to milestone |
| Use | Retrieve and Save |
| Values | <i>Text up to 128 characters</i> |
| Field Name | vms_narrative |
| Description | TCPIP message sent if vms_app set to manual |
| Use | Retrieve and Save |
| Values | <i>Text up to 128 characters</i> |
| Field Name | vms_port |
| Description | VMS port number to use |
| Use | Retrieve and Save |
| Values | <i>0 to 65535</i> |
| Field Name | vms_protocol |
| Description | Transmission protocol to use |
| Use | Retrieve and Save |
| Values | tcp <i>or</i> udp |
| Field Name | vms_synergy |
| Description | Synergy message sent if vms_app set to synergy |
| Use | Retrieve and Save |
| Values | <i>Text up to 128 characters</i> |
| Field Name | vms_wavestore_camera |
| Description | Wavestore camera number used is vms_app set to wavestore |
| Use | Retrieve and Save |
| Values | <i>0 to 65535</i> |
| Field Name | vms_wavestore_password |
| Description | Wavestore password used is vms_app set to wavestore |
| Use | Retrieve and Save |
| Values | <i>Text up to 50 characters</i> |

DRAFT COPY

Scan 360 APIs

| | |
|--------------------|---|
| Field Name | vms_wavestore_username |
| Description | Wavestore username used is vms_app set to wavestore |
| Use | Retrieve and Save |
| Values | <i>Text up to 50 characters</i> |

| | |
|--------------------|--|
| Field Name | vms_vast2 |
| Description | VAST2 message sent if vms_app set to vast2 |
| Use | Retrieve and Save |
| Values | <i>Text up to 128 characters</i> |

DRAFT COPY

Scan 360 APIs

Appendix B – Target Information

Detections by the radar are stored as individual targets, and when target tracking is enabled these targets are assigned to tracks. Up to 8 tracks can be active at any one time and are numbered 0 to 7. Each target is returned by the radar as a list of 16 comma delimited values which define the target. These values are displayed below in the order they appear on the output.

Description Target date
Format dd/mm/yy

Description Target time
Format hh:mm:ss.m

Description Target bearing in degrees
Format To 2 decimal places

Description Target range in metres
Format Whole number

Description Radial speed of the target. This is not output in units such as m/s, but as a range where 0 is slow and 30 is fast. The radial speed changes depending on the angle of travel relative to the radar.
Format Whole number between 0 and 30, or a dash if the speed is unknown

Description Reflected signal size of the target. This is not output in units such as m², but as a range where 0 is small and 220 is large. Factors such as orientation and material composition of the target will have an impact on the signal reflected.
Format Whole number between 0 and 220

Description Internal Info. For internal purposes only
Format Whole number between 0 and 255

Description Alarmed flag
Format 0 – Radar did not alarm. 1 – Radar alarmed on detection

Description Target Id
Format Whole number

Description Track Id that the target has been assigned to. Only applicable if target tracking is enabled
Format Whole number between 0 and 7

DRAFT COPY

Scan 360 APIs

| | |
|--------------------|--|
| Description | New Track. Only applicable if target tracking is enabled |
| Format | 0 – Target is part of an existing track. 1 – This is the first target for this track. |
| Description | Following. Only applicable if target or camera tracking is enabled |
| Format | 0 – Camera did not move to the target. 1 – Camera moved to the target. |
| Description | Individual target |
| Format | 0 – Target is part of a track. 1 – Target is not part of a track (ie. target tracking is disabled) |
| Description | Latitude of the target. Only applicable if a satellite map is used |
| Format | Floating point number |
| Description | Longitude of the target. Only applicable if a satellite map is used |
| Format | Floating point number |
| Description | Direction of the target |
| Format | twrd – Target travelling toward the radar. away – Target travelling away from the radar. A dash if the direction is unknown. |

Appendix C – Detection Zones format

Detection zones can be retrieved and saved to the radar using the field name `perimeter_zones`. Each detection zone contains its priority, number of points, clutter/threshold setting and points in a pipe delimited format.

The details of each zone are:

Priority [*comma*] Number of Points [*comma*] Clutter/Threshold setting [*pipe*] X,Y of point 1 [*pipe*] X,Y of point 2...

The priority can either be 0 – exclude, 1 – low or 2 – high

Clutter/Threshold setting is a number between 1 and 4

The X and Y of a point changes depending on whether a satellite image is present or not:

If no satellite image is present, x and y is the position of the point relative to the radar where the radar is at position 0,0 and zero bearing is horizontally right.

If a satellite image is present, x and y is the position of the point where the radar is at position `perimeter_offset_x`, `perimeter_offset_y`.

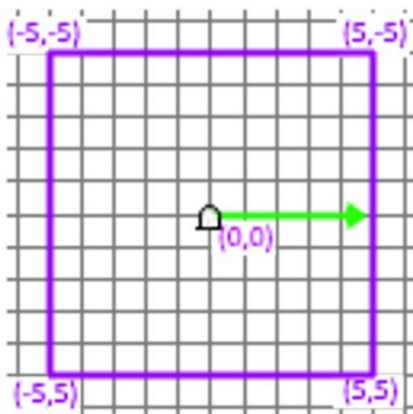
Example 1

No satellite image is present.

Low priority

Using the 1st Clutter/Threshold setting

The zone is a 10m x 10m box containing the radar at its centre



1,4,1|-5,-5|5,-5|5,5|-5,5

DRAFT COPY

Scan 360 APIs

Example 2

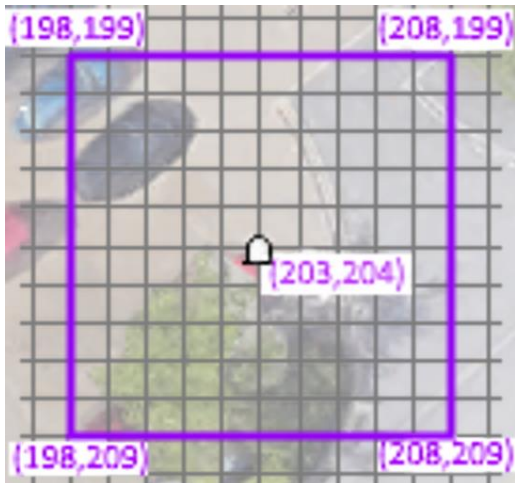
Satellite image present

High priority

Using the 3rd Clutter/Threshold setting

The radar is at position 203,204 (ie perimeter_offset_x = 203 and perimeter_offset_y = 204)

The zone is a 10m x 10m box containing the radar at it's centre



2,4,3|198,199|208,199|208,209|198,209