**HTTP API**

**Main real-time log file**

GET /plastone/last\_detects.log

Returns last detected signals, supports http range requests, so could be queried from last known position. It is essentialy a log file served by nginx web-server. This file is periodically (once per hour) truncated from head in order to contain only data from last hour. Because of this start of file can be "corrupted" and should be ignored till first header or meta line (started with markers ------- and ++++)

Example response:

---------------------------------------------- 2020-12-02T10:07:53.902Z 2421 1024 10 256 16 56 2.0 17 48 40 130 TX/RX 1606903673538

2406.6 9.8 72 23 ["!!!Ocusync 10MHz"] {"lens":[[9.75,4],[7,1],[7.5,1]],"pauses":[[4.25,5]],"periods":[[14,4],[11.75,1]]} [[0,104],[162,133],[353,134],[544,134],[736,133],[927,97]]

2398.8 2.4 48 21 ["??? UNKNOWN"] {"lens":[[0.25,33],[0.5,12],[1.25,5],[0.75,3],[1,2],[2,1],[3.25,1],[3.75,1],[1.5,1]],"pauses":[[0.25,28],[0.5,11],[1,6],[0.75,5],[2.25,2],[1.25,2],[2,1],[3.25,1],[1.75,1],[1.5,1]],"periods":[[0.5,14],[0.75,13],[1,7],[1.5,7],[1.75,4],[1.25,4],[2,2],[2.75,2],[2.25,2],[6,1],[4.25,1],[3.75,1]]} [[0,45],[57,8],[68,26],[105,4],[155,4],[162,16],[182,50],[263,5],[272,7],[295,4],[306,4],[313,3],[324,8],[335,4],[348,4],[355,9],[374,3],[385,4],[392,5],[407,3],[418,4],[449,7],[479,3],[486,3],[496,15],[519,9],[536,16],[559,4],[570,7],[582,12],[600,11],[627,4],[635,4],[644,3],[650,7],[688,5],[696,5],[705,3],[711,3],[726,6],[735,3],[741,4],[748,6],[769,4],[782,4],[790,5],[807,16],[827,21],[851,8],[862,8],[882,5],[908,5],[921,3],[928,5],[936,8],[948,16],[969,17],[990,4],[1006,7]]

---------------------------------------------- 2020-12-02T10:07:56.296Z 2370 1024 11 256 16 56 3.4 20 48 40 130 RX2 1606903676226

---------------------------------------------- 2020-12-02T10:07:56.488Z 2420 1024 12 256 16 56 2.0 40 48 40 130 RX2 1606903676226

2406.8 9.8 70 54 ["!!!Ocusync 10MHz"] {"lens":[[9.75,5],[3.5,1]],"pauses":[[4.25,5]],"periods":[[14,5]]} [[18,134],[209,134],[401,134],[592,134],[784,134],[975,49]]

---------------------------------------------- 2020-12-02T10:07:56.586Z 2421 1024 10 256 16 56 2.0 17 48 40 130 TX/RX 1606903676226

2406.6 9.8 70 22 ["!!!Ocusync 10MHz"] {"lens":[[9.75,5],[3.75,1]],"pauses":[[4.25,5]],"periods":[[14,5]]} [[15,134],[207,133],[398,134],[590,133],[781,134],[972,52]]

---------------------------------------------- 2020-12-02T10:07:58.992Z 2370 1024 12 256 16 56 3.4 20 48 40 130 RX2 1606903678922

The scanning process is essentially occurs by taking screenshots of approx 70 ms of samples and analyzing it for known patterns. So each portion of data consist of header starting with --------------- marker and 0 or multiple lines of detects

Header format are the following fields, SPACE-separated:

* timestamp (ISO format)
* frequency
* height of screenshot (1024 by default)
* noise level - average noise level
* fft Window - (256)
* fft integration factor (16)
* inputRate - 56 MHz
* squelch - squelch level configured for this scan
* threshold - signal/noise threshold level determined
* gain - input gain level configured for this scan
* fft gain - gain set for fft conversion (40)
* fft shift - fft shift level (30)
* antenna - antenna used for this scan
* scanid - linked with scanid in scan\_changed meta (see below for details), essentially a timestamp when scan config was last changed

Each detect line is TAB-separated and consists of following fields

* frequency - center frequency of detected signal in MHz
* bandwidth - width of detected signal in MHz
* dutyPercent - duty percent of detected signal in percents (%)
* power - power of signal normalized to 0-254 range
* labels - array of strings identifying this signal, each label can start with marker
  + !!! - signal is drone
  + ??? - unknown signal
  + --- - incomplete or other ignorable signal
* timeStats - calculated time measurements of signal, consists of detected repeatable patters of signal periods, lens and pauses
* ranges - detailed info about each signal in time domain

There are also can be meta lines in addition to normal data lines They have the following format:+++\t${type}\t${json\_data} In other words they start with '+++' marker, then TAB symbol, then metadata type (for now it's only scan\_changed), then TAB and then JSON formatted string. For scan\_changed type it looks like following example:

+++ scan\_changed {"scanid":1606903676226,"config":{"frequencies":[[2370,56,48,"RX2",3.4],[2371,56,48,"TX/RX",3.4],[2420,56,48,"RX2",2],[2421,56,48,"TX/RX",2],[2460,56,48,"RX2",2],[2461,56,48,"TX/RX",2],[2500,56,48,"RX2",2.1],[2501,56,48,"TX/RX",2.1],[5660,56,55,"RX2",2],[5661,56,55,"TX/RX",2],[5700,56,55,"RX2",2],[5701,56,55,"TX/RX",2],[5740,56,55,"RX2",2],[5741,56,55,"TX/RX",2],[5780,56,55,"RX2",2],[5781,56,55,"TX/RX",2],[5820,56,55,"RX2",2],[5821,56,55,"TX/RX",2],[5860,56,55,"RX2",2],[5861,56,55,"TX/RX",2],[5900,56,55,"RX2",2],[5901,56,55,"TX/RX",2],[5940,56,55,"RX2",2],[5941,56,55,"TX/RX",2]]}}

JSON data field consists of "scanid" (essentially a timestamp) and "config" - array of arrays [scan\_frequency, inputRate, gain, antenna, squelch]

scan\_changed line is inserted on boot or when the scan config has been changed.

**per hour detect files**

GET /per\_hour/2020-02-28-14-00.txt

Each non-empty screenshot is written to separate file per hour basis and stored for 2 days Format is the same as main log with empty scans removed and only scans that has some signals are present

**fft screenshots**

GET ffts/2020-02-28/14-53/14-53-11-784\_2440.fft.pgm

Returns detailed fft data for screenshot. Files are stored in directories per day (2020-02-28), per minute(14-53). The filename is date from main log header line (14-53-11-784) plus frequency (\_2440)

**MQTT API**

Each line of main log file is optionally published as message to preconfigured MQTT broker to preconfiured topic. First header line published as message and then each detect line. The simplest possible processing is search for !!! (drone detected) in message payload and turn on jammer if found.

**RELAY OUTPUT NC/NO**

Relay Output will be activated when the Jammers have to be turned on. Maximum rating of Relay outputs:

- AC 250V 5A

- DC 30V 5A