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Using OSID Diagnostic tool for V4 Firmware

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Content

- Setting up OSID Diagnostic Tool
- Understanding the Fault codes
- Using the OSID Diagnostic Tool
- Analyzing the memory log

Setting up OSID Diagnostic tool

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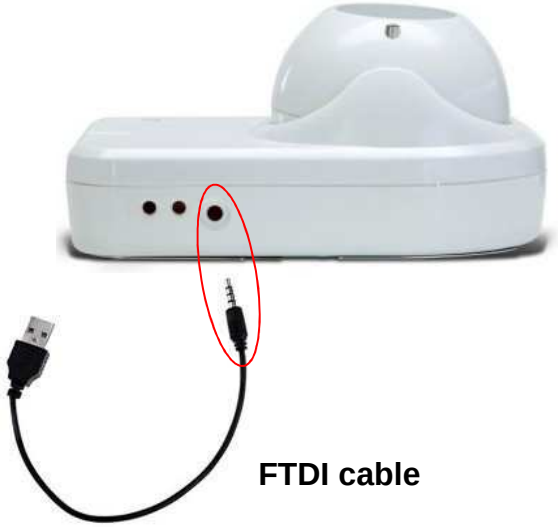
Physical Setup

- Connect FTDI cable between imager and PC
- If > 1.5 m is required, use active USB extension cable(s)
- Maximum total distance Imager-PC is 30 m



FTDI cable

Active USB extender (optional)

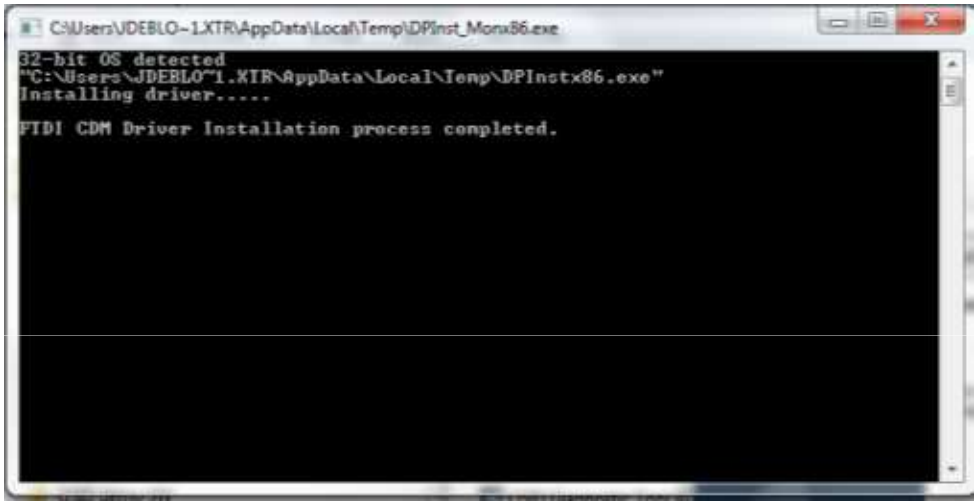
Installing the OSID Diagnostic Tool

•First uninstall all previous versions of OSID Diagnostic. Use the Add or Remove Programs function in Windows

•Rename the downloaded file
Setup OSID Diagnostic v3.xx.yy rename to exe
to
Setup OSID Diagnostic v3.xx.yy.exe
and double click to start the installation of the software

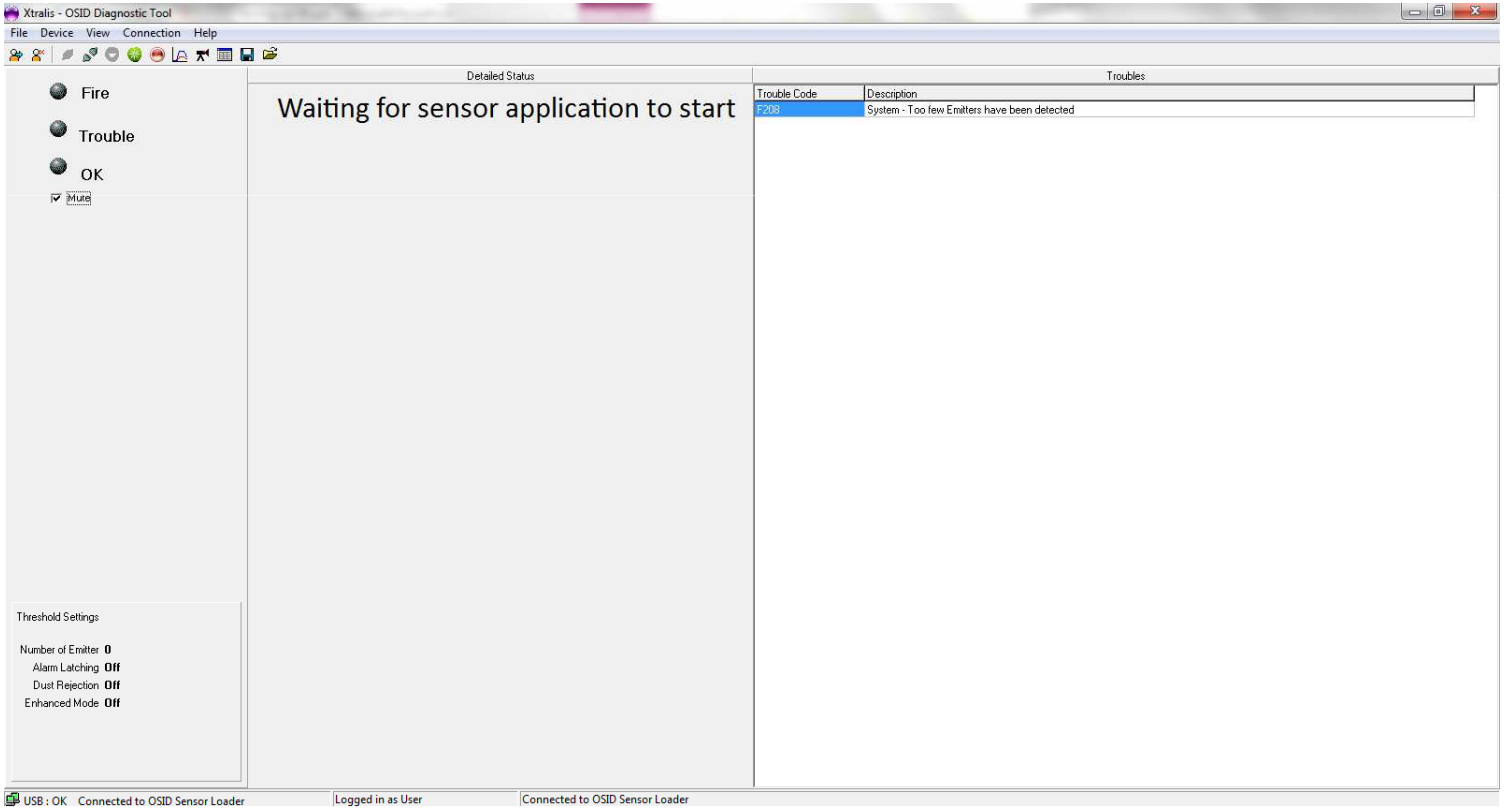
•Make sure FTDI driver is installed

- •If you have not seen this screen during installation, you may need to install the FTDI driver separately

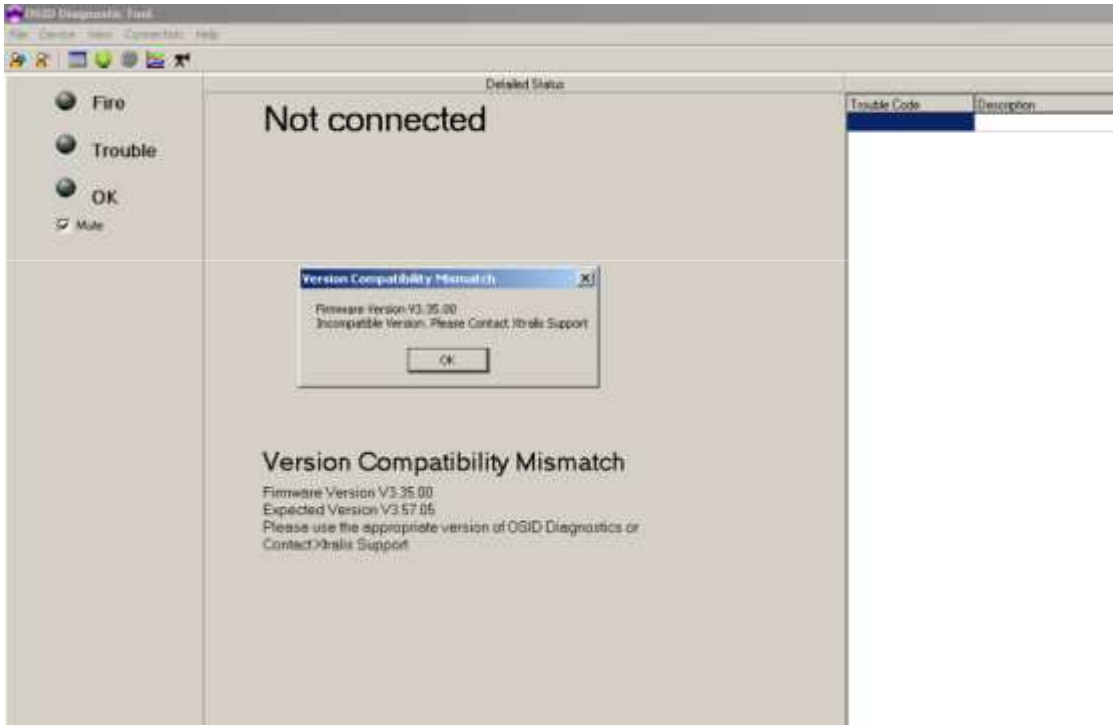


Connecting the Imager to a PC

- Depending on the existing firmware in the imager the program will:
  - Signal a version incompatibility
  - Propose an upgrade
  - Connect and be ready for use

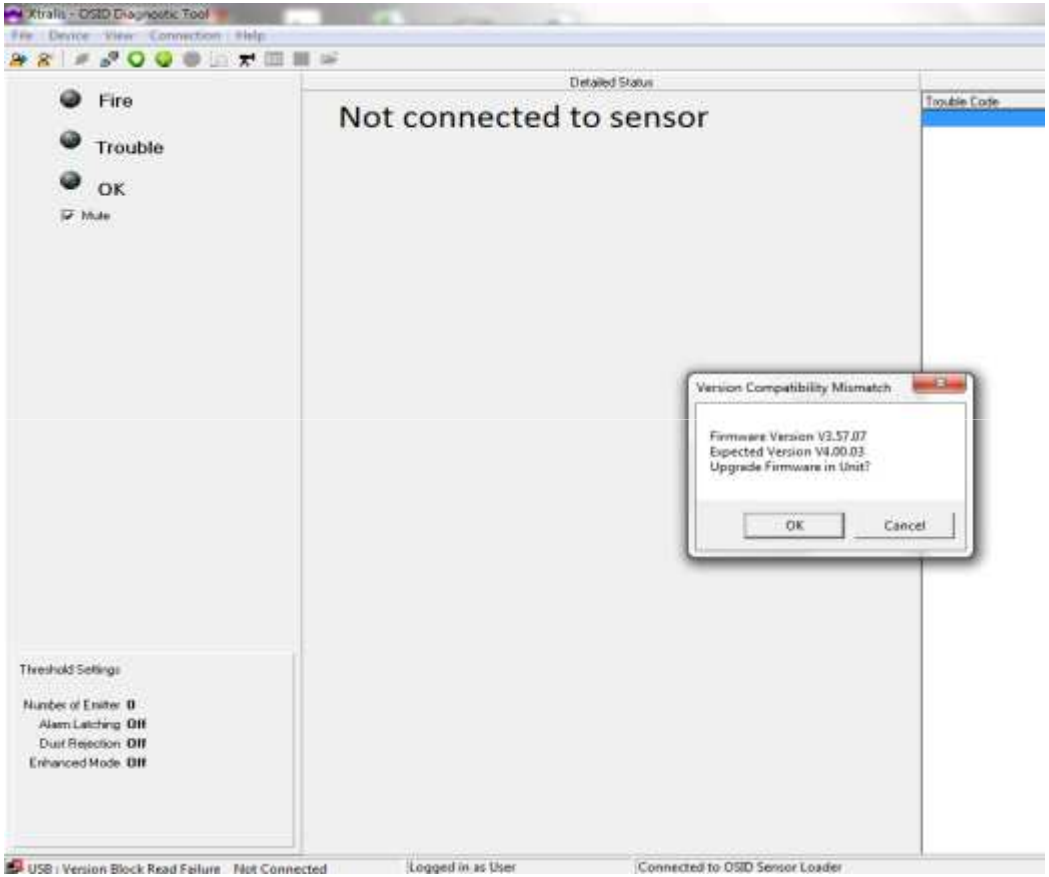


Version incompatibility



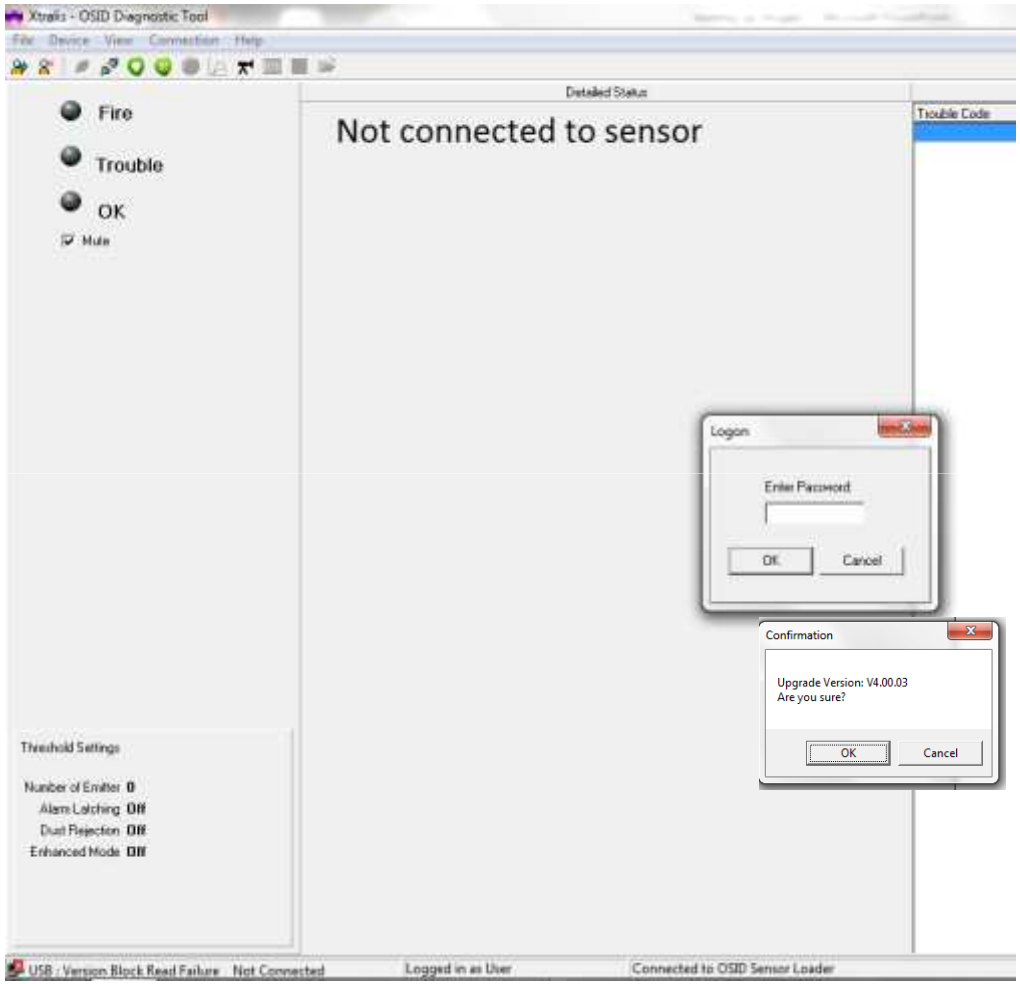
- View of OSID Diagnostic tool connected to an imager with (very) early incompatible hardware and/or software
- Exchange imager or contact Xtralis Support for assistance

Firmware upgrade



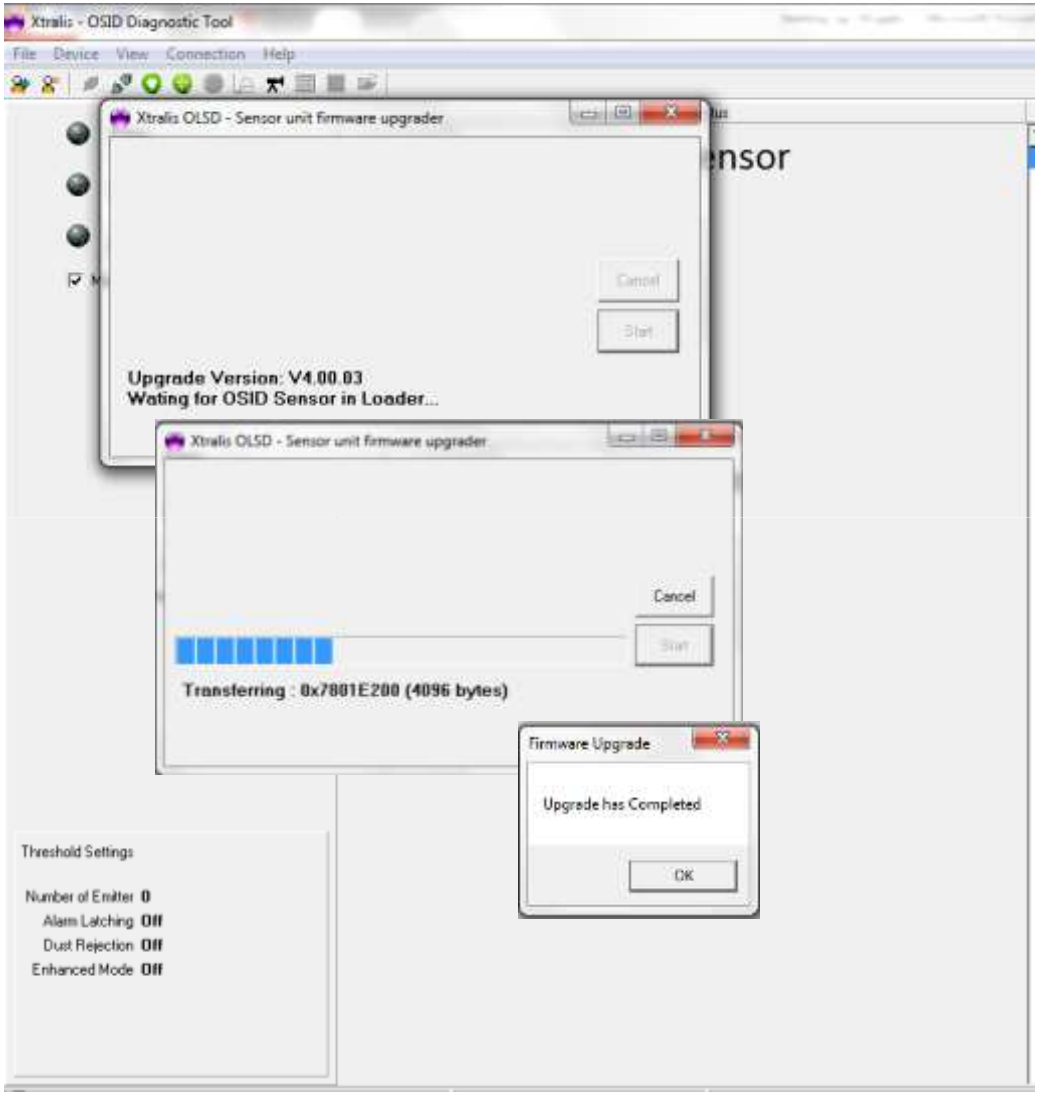
- If the OSID Diagnostic tool version and Firmware version are not matching the program will propose to upgrade
- All Imagers with firmware from **V3.57.05** onwards can be upgraded to V4
- Proceed with the upgrade, follow instructions on screen

Firmware upgrade



- Proceed with the upgrade, follow instructions on screen
- Password: 1413

Firmware upgrade

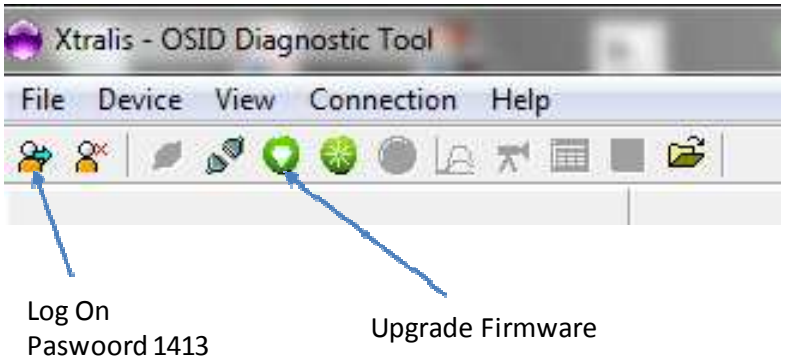


- Upgrade happens automatically
- As from V4 onwards no need for power cycling

HINT

- From V4 onwards - always save the event log before upgrading SW
- An upgrade re-starts the Imager and hence all logs from before this new start will lose their time & date stamps

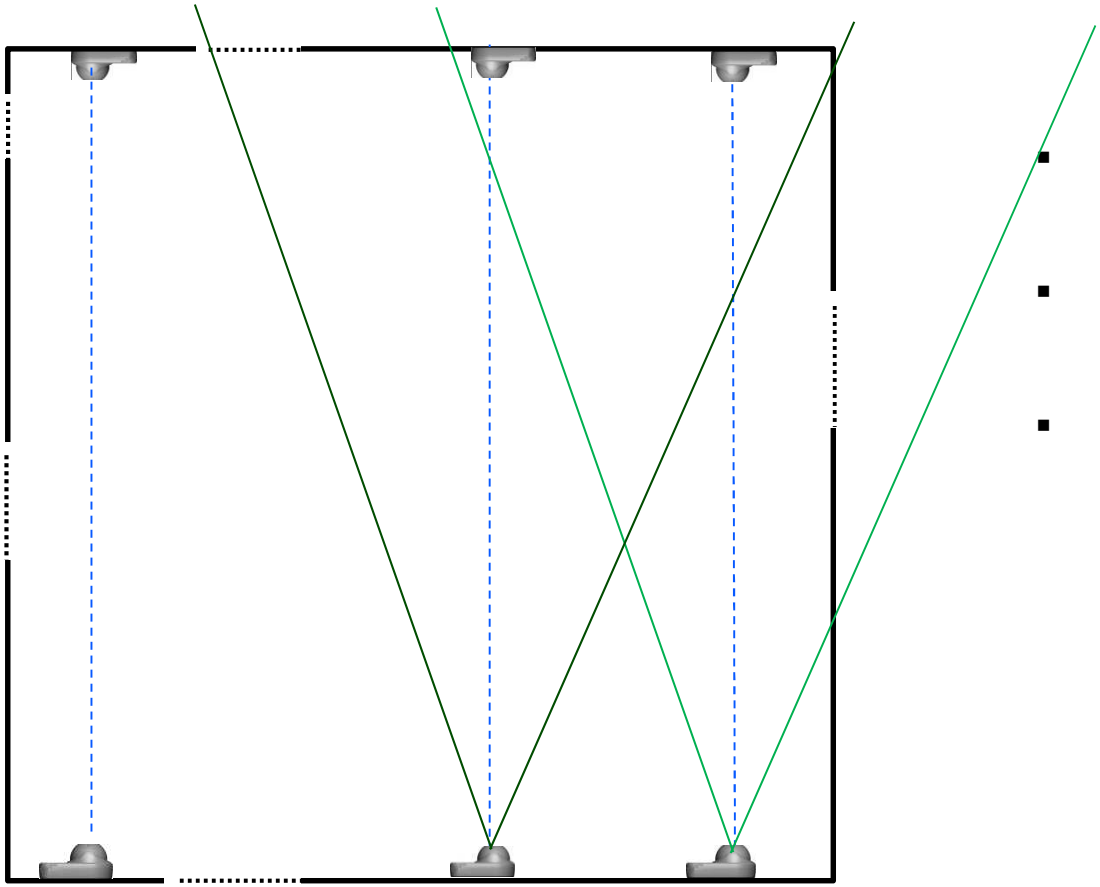
Firmware upgrade



- SW only checks the first digits of the version
- When presenting 4.00.03.19 to an Imager with 4.00.03.16 the tool will not propose an upgrade

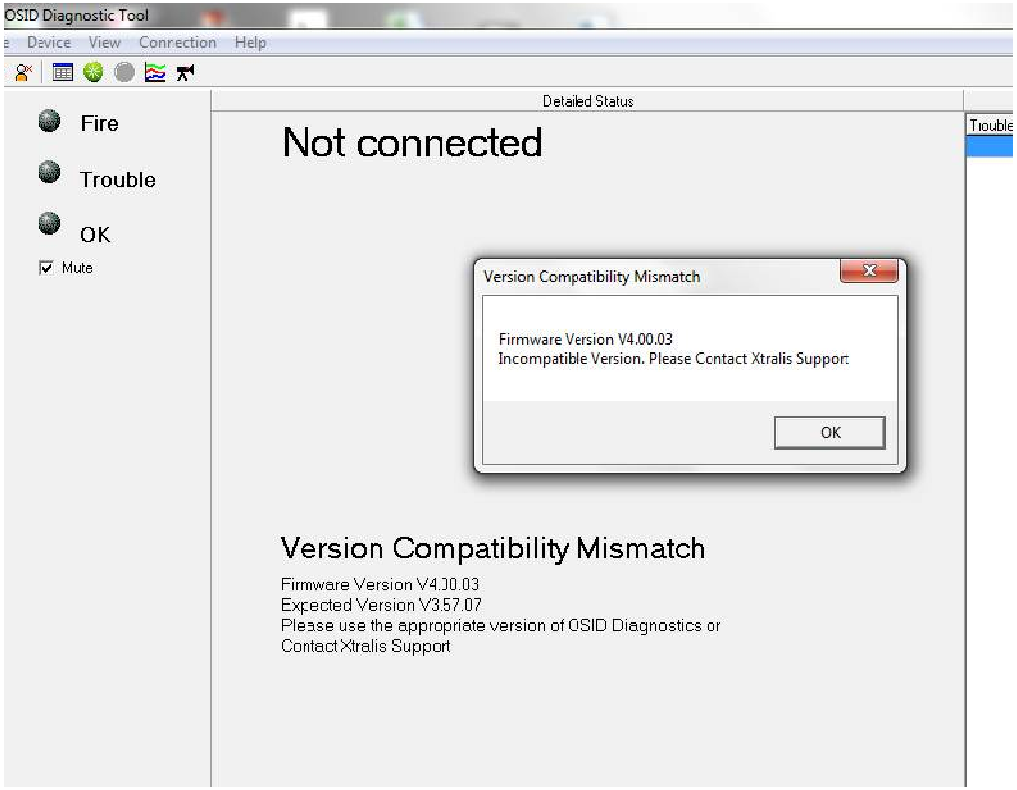
- To upgrade proceed by logging on and click *Upgrade Firmware* icon
- The upgrade process will follow the same cycle as with on automatic proposed upgrade

Upgrading multi-emitter sites



- 90° or 45° imagers can have unwanted emitters in the line of sight i.e. when used for 1 on 1 systems
- Imagers reinitialize after a software upgrade, so unwanted emitters need to be blocked when doing the upgrade
- After the upgrade the imager will remember its own emitter(s) and the position(s), even after a power down

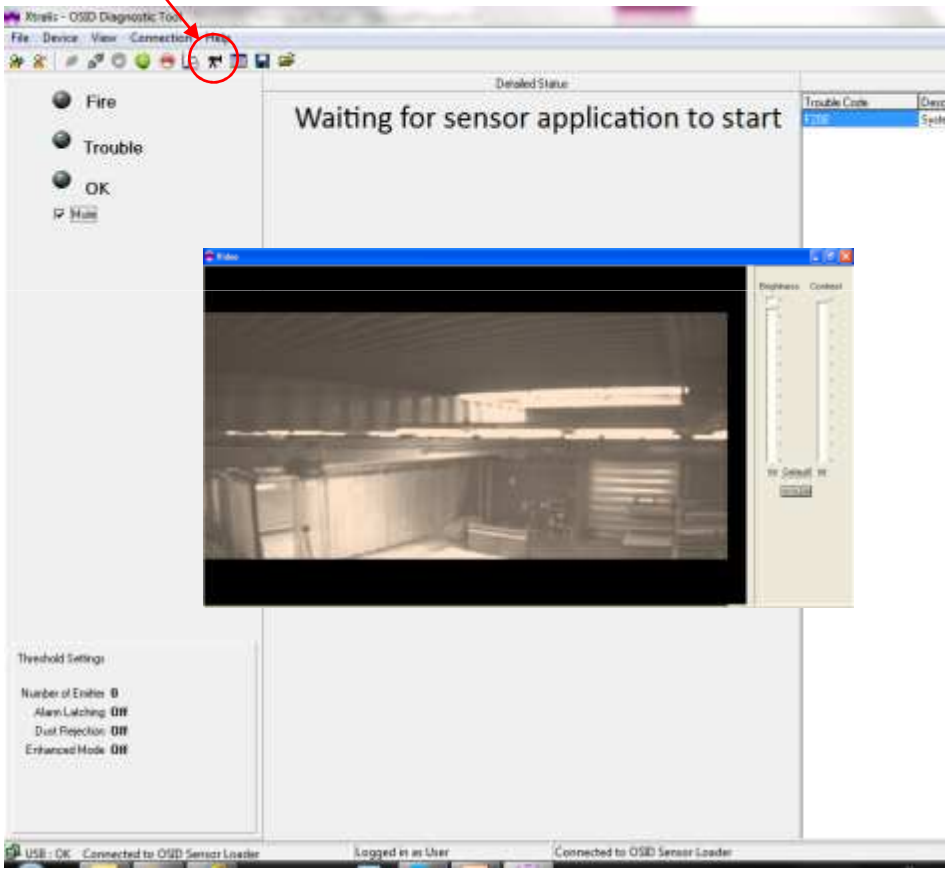
Using earlier OSID Diagnostic versions



- Downgrading firmware to earlier versions is not possible
- Always use the latest version of the OSID Diagnostic tool available on the Xtralis website
  - Access partner Login->Library->OSID by Xtralis Resources-> Software->OSID Diagnostic Software with Instructions
  - Read the Instructions carefully!

Imager connected to PC

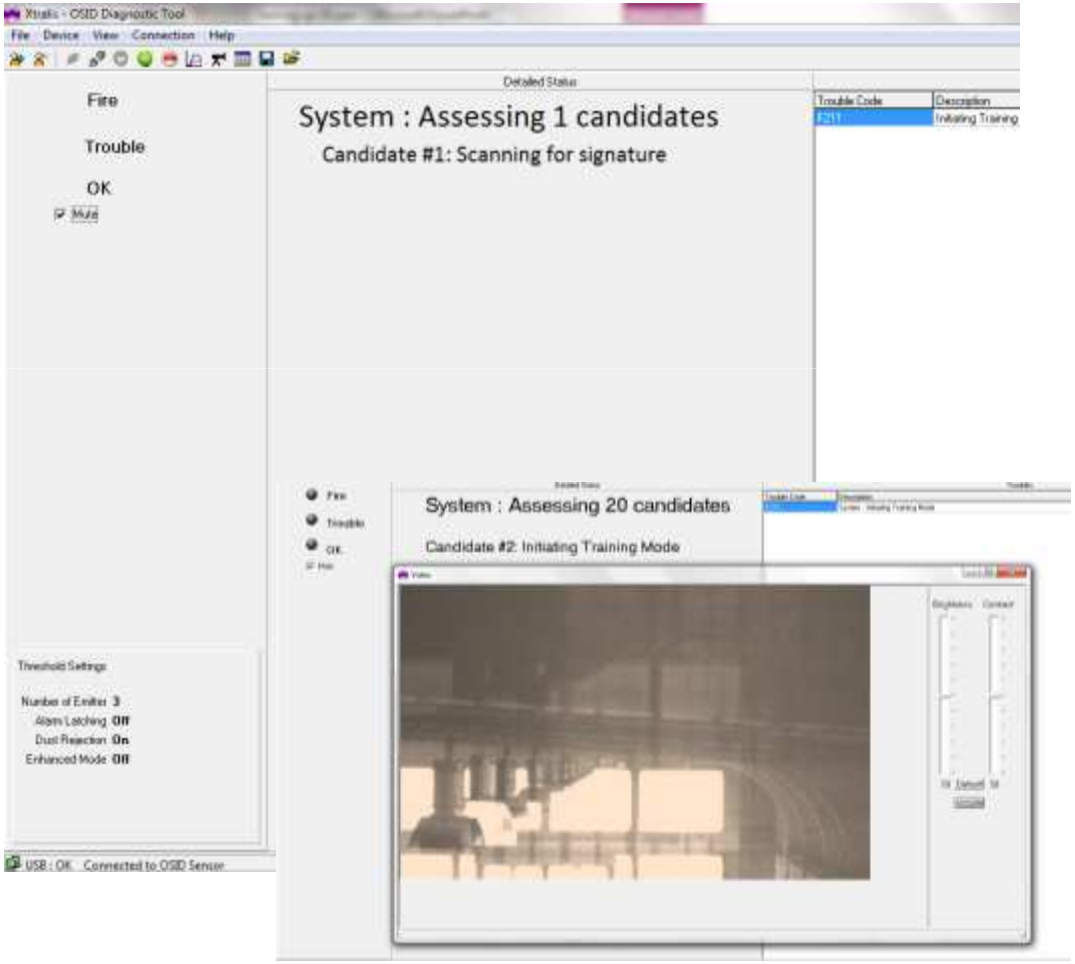
Click on camera icon



- If the Imager is commissioning/initialising, one can look at what the imager is seeing by clicking the camera icon

- Depending on the number of emitters, the Training Mode will take between 3 to 7 minutes

Continuing Initialization

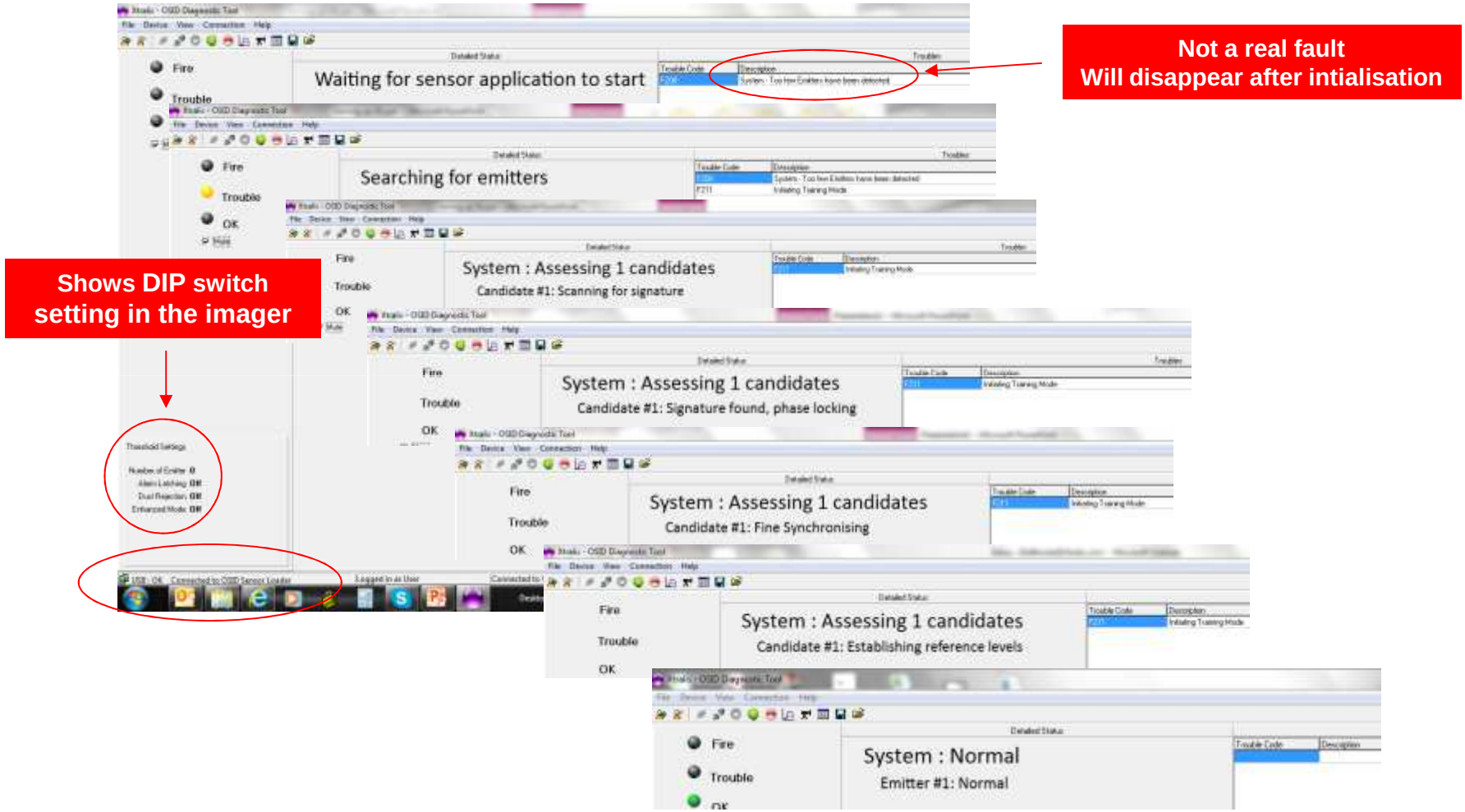


- When there are reflective surfaces in the area; shiny surfaces, windows, mirrors, you can initially have many candidates– **do not worry, the imager will make its way through!**

- The imager will compare emitters (reflections) with the same signature and keep each time the strongest one till it finds the source(s)

- With many reflections this process can take longer 10+ min. but it will end up with the exact amount of emitters that are to be paired with the imager

Initialization process screens



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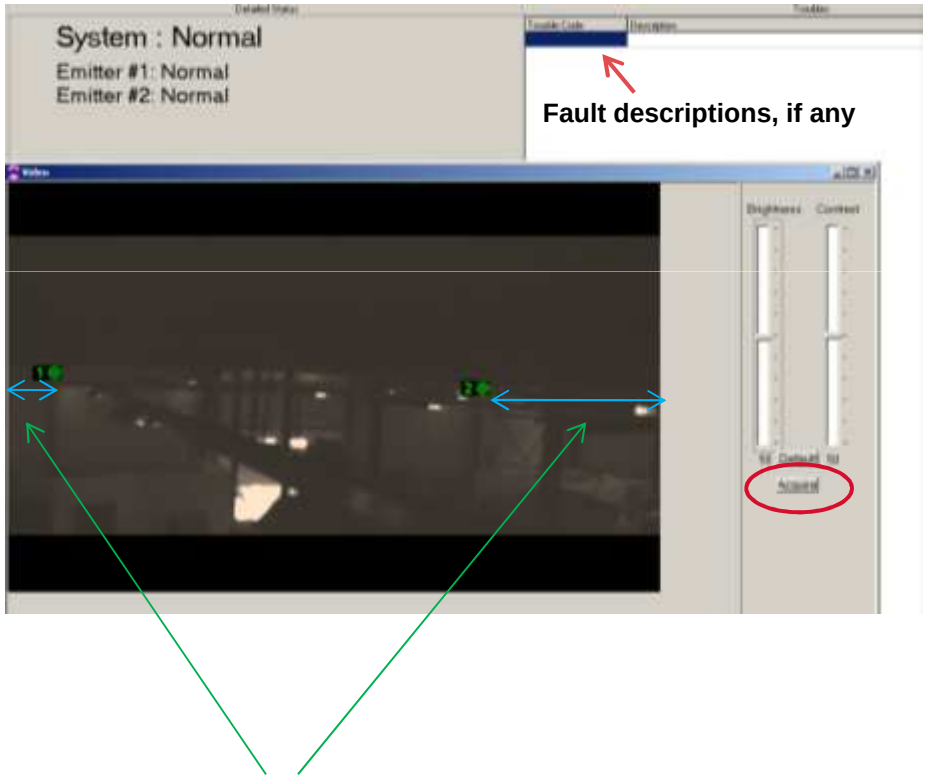
Initialization Finalized



Imager alignment could have been better!

- The image, when the camera icon is clicked, will now show the location of the various emitters with a green icon and a number
- Numbering of the emitters is from left to right from the point of view of the imager
- If any faults now occur, the Emitter icon(s) will be yellow. Type of fault will show top right of screen and next to the Emitter # n location
- For emitters in alarm the icon will turn red
- For a new image click ‘Acquire’ button, the image does not refresh automatically
- Adjust Brightness and Contrast if required for better visibility.
    - Depending on the light conditions the image may remain poor as the image is filtered for UV and IR only and has no focus function
    - OSID requires no ‘image quality’ to operate as it uses only grey levels for detection purposes

Understanding the Fault codes

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Fault Codes - General

- Imagers come out of factory with all dip switches default set to ‘0’
- Imagers will <u>not</u> initialise till DIP switches are set
- When changing any dip switch setting(s), the system will immediately accept these (without powering down) with exception of adding/removing/relocating emitters.

Fault Code - System Fault codes

"***Internal fault in the Imager. Imager requires replacement***". The detailed nature of these codes is not relevant for the fault finding process. These faults are extremely rare and are listed here for the sake of completeness.

Code	Fault	Description
201	Config Load Failure	Internal fault in the Imager. Imager requires replacement
202	Config Save Failure	Internal fault in the Imager. Imager requires replacement
203	Firmware RAM Corrupt	Internal fault in the Imager. Imager requires replacement
204	Firmware Flash Corrupt	Internal fault in the Imager. Imager requires replacement
205	NAFFS Corruption	Internal fault in the Imager. Imager requires replacement
206	Data RAM Fault	Internal fault in the Imager. Imager requires replacement
207	No emitters found	No Emitters have been detected
208	Not enough emitters	Too few Emitters have been detected compared to the configured number set
209	Too Many emitters	Too many Emitters have been detected compared to the configured number set
210	DIP Switch config bad	DIP switches are set incorrectly (alarm level is not set, number of Emitter(s) are not set, more than one Emitter is set for an OSID 10 degree Imager). **The imager will not initialise as long as all DIP switches are set to 'zero'**

Fault Code - System Fault codes

Code	Fault	Description
211	Commissioning not completed	System has not correctly initialised during Training Mode
212	Imager Pixel Failure	Internal fault in the Imager. Imager requires replacement
213	Imager Card Version Conflict	Internal fault in the Imager. Imager requires replacement
214	FPGA Version Conflict	Internal fault in the Imager. Imager requires replacement
215	Term Card Version Conflict	Internal fault in the Imager. Imager requires replacement
216	Supervisor Version Conflict	Internal fault in the Imager. Imager requires replacement
217	External Reset Overuse	Initiating Training Mode
218	System Cal File Load Failure	Internal fault in the Imager. Imager requires replacement
219	Imager Cal File Load Failure	Internal fault in the Imager. Imager requires replacement
220	Failure to process video	Internal fault in the Imager. Imager requires replacement
232	Internal Fault	Internal fault in the Imager. Imager requires replacement

Fault Code - Emitter fault codes

Code	Fault	Description
101	Signal too Low	Emitter range fault. Emitter is too far away
102	Emitter obscured	Occurs when there are blockage(s) of the light beam between the Emitter and the Imager that are not smoke types, sustained for a certain period and cause a medium attenuation
103	Object intrusion	Occurs when there are blockage(s) of the light beam between the Emitter and the Imager that are not smoke types and that are sustained for a short period and cause a large (almost total) attenuation. An Imager or Emitter severely displaced with misalignments larger than the tolerated amount as specified in OSID Product Guide may also cause an object intrusion fault.
104	Reference Level drifted high	Signal has become much stronger than at initialisation. System is possible badly aligned or was started up in a dusty atmosphere that has now disappeared.
105	Reference Level drifted low	Contamination fault. Emitter and Imager require cleaning, 20% of initial signal strength is lost.
106	Commissioning not completed	System has not correctly initialised during Training Mode
107	PLL not locked	Emitter and Imager have not succeeded in synchronising
108	Imager alignment drift	Imager out of alignment
109	Imager Saturation	Imager cannot discern the signal from the Emitter due to saturation
110	Signal too High	Emitter range fault. Emitter is too close

Fault Code - Emitter fault codes

Code	Fault	Description
111	Emitter alignment drift	Emitter out of alignment
112	Emitter battery life warning	Emitter battery is 13 month or less from its end of life
113	Emitter battery expired	Emitter battery has reached end of commercial life (5 years)
114	Emitter type not supported	Emitter type mismatch. Emitter type is not recognised by the receiver
115	Imager bias of range	Imager cannot discern the signal from the Emitter beam (saturation, excessive vibration)
116	Imager Saturation	Imager cannot discern the signal from the Emitter beam (saturation)
117	Image blocked or unstable	Imager cannot discern the signal from the Emitter beam (intermittent blockages/excessive vibration-missing frames)
118	Emitter battery fail urgent	Emitter battery approaching end of life – nearly flat
119	Emitter battery fail	Emitter battery is no longer operational

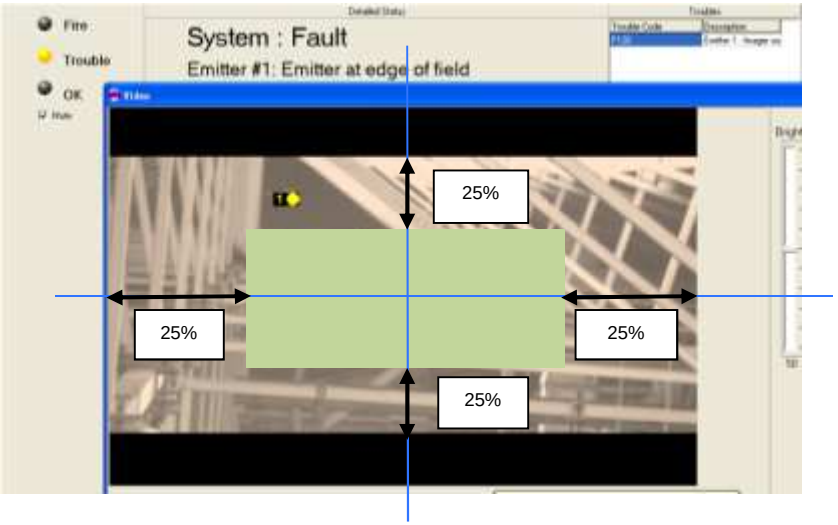
Fault Code - Emitter fault codes

Code	Fault	Description
120	Emitter at edge of field	Imager out of alignment

NOTE: Edge of field alignment with 10° imagers
The opening angle or field of view of an OSI-10 is a lot less than the FOV of a 45° or 90° imager.
In fact an OSI-10 has 7° horizontal and 4° vertical field of view versus 38° and 19° for OSI-45 and 80° and 48° for an OSI-90.

Whilst the 7° and 4° are comfortably larger than traditional beams, the image presented by OSID Diagnostic can be misleading.

Because the angles are less 'tolerant' than 45 and 90° imagers, an emitter with OSI-10 needs to be positioned in the 'green' area of the imager as shown below. If positioned outside the green area an 'Emitter at Edge of Field' fault will be displayed.



Fault Code - Emitter fault codes

Code	Fault	Description
121	Ref Level low	Contamination fault. Emitter and Imager require cleaning
122	Video process failure	Imager cannot discern the signal from the Emitter beam (intermittent blockages/excessive vibration-missing frames)
123	Reference Level not set	Emitter and Imager have not succeeded in synchronising due to inability of setting the reference levels. Imager looks for 50 consecutive pulses that are not interrupted to obtain as accurate a sample of the reference as possible as this is used for all measurements going forward
124	Outlier count too high	Imager cannot discern the signal from the Emitter beam (vibration – object repeatedly in/out beam path)

Using OSID Diagnostic tool

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Controls

Log on

Log off

Connect

Disconnect

Firmware upgrade

System restart/re-initialization

Reset alarm relay (if Alarm Latched was chosen)

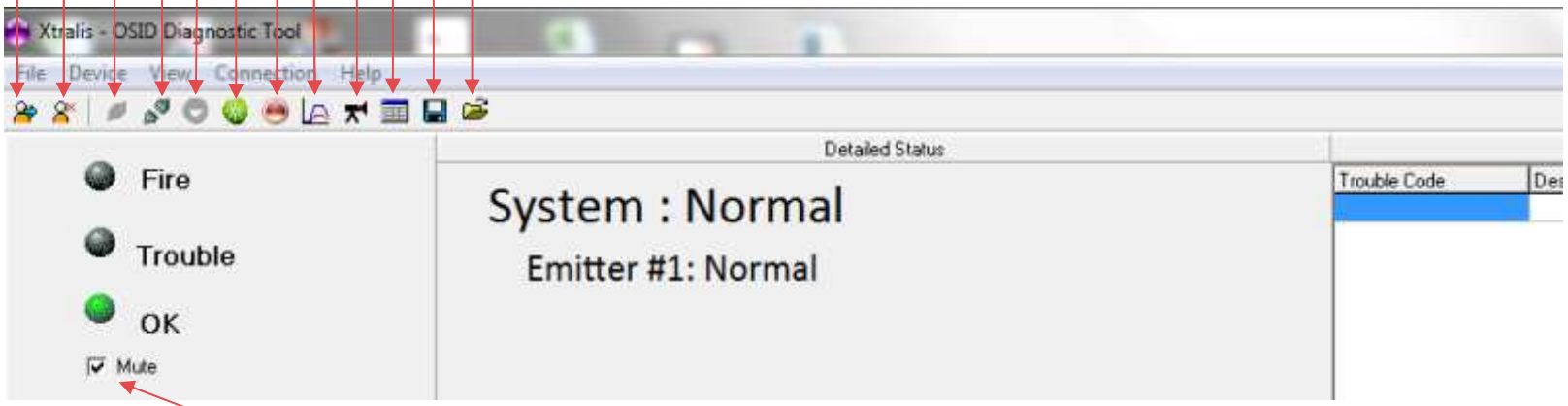
View live graphs

View static video image

Shows event list

Save event log

Import event log file



Mute alarm buzzer

Getting started

- Always save the on-board event log before powering down an imager (if required)
- The Imager has no real time clock so the memory stores events with a counter
- When connecting the PC, the program will use the PC's time and date to create a timeline for the stored events
- Verify that your PC has the correct time and date before connecting.

The logs

Directory ***C: SunshineLog*** is created <u>automatically</u> when an Imager is connected to a PC and contains 2 folders

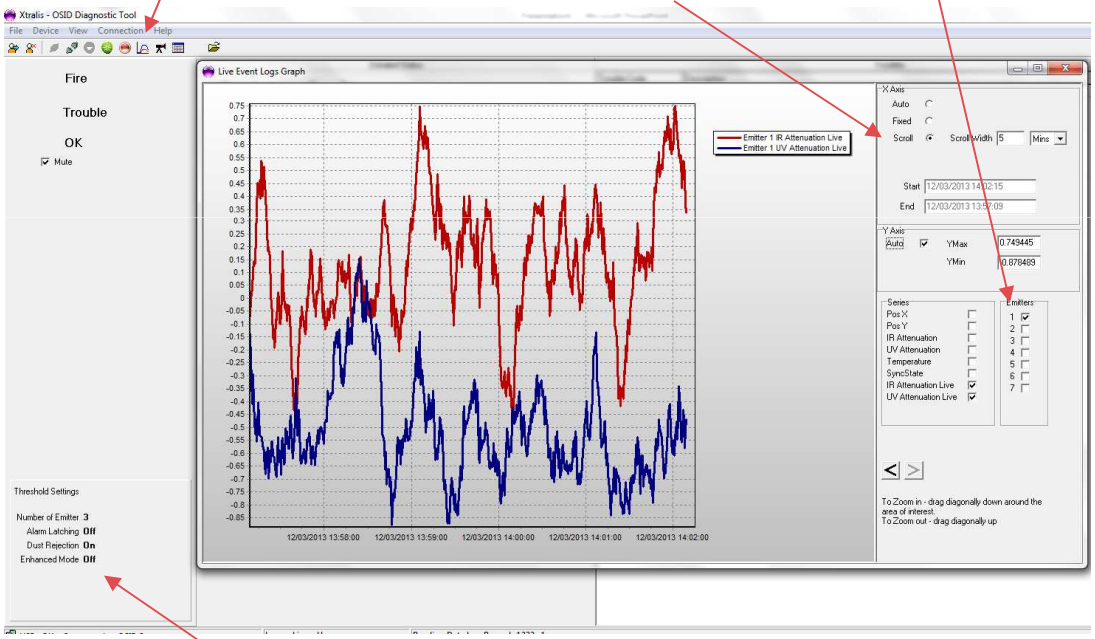
- ***20130329_9002471_Eventlog.dat***
  - To be **manually** saved
  - Off-line, OSID Diagnostic can open any event log saved on your PC.
- ***20130329_9002471_Livedata.dat***
  - Created and saved automatically at OSID Diagnostics start up for as long as the imager remains connected
  - 2 extended data samples per second
  - File size can, depending on the configuration, be several 100 Mb/day
  - A new file is created automatically at 24.00 hrs. as long s the imager stays connected
  - Data to be analyzed by Xtralis support engineers

Diagnostic screens

Click on graph icon

Select Scroll option and width

Select an emitter

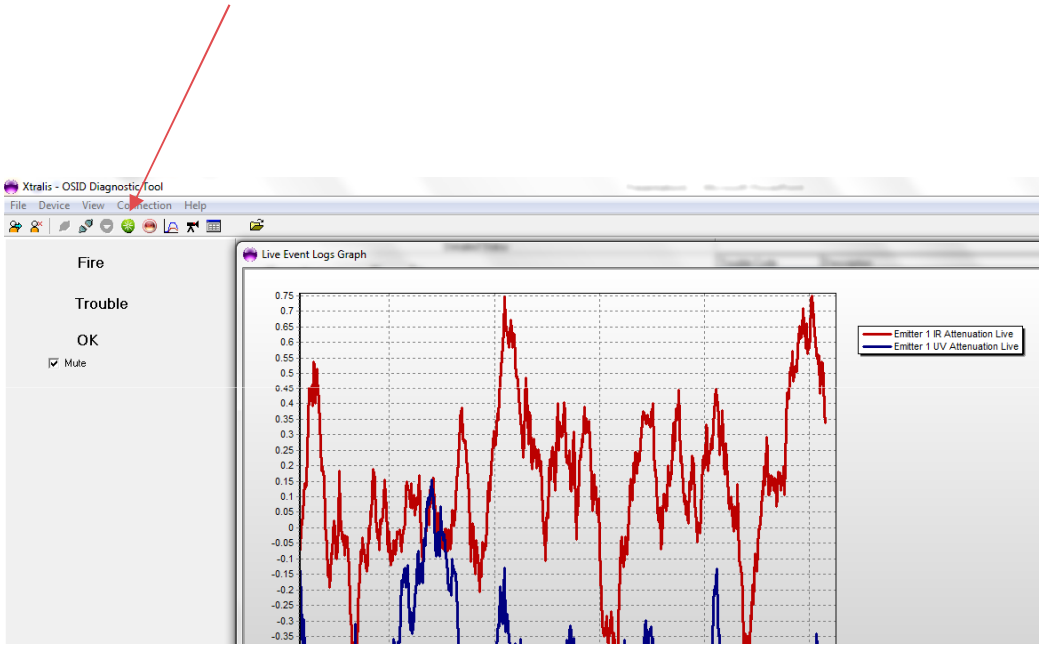


Check if settings are correct according your choice

- Selecting all options at the same time gives a total picture of the various events but less detail
- For analysis select the specific emitter(s) to be visualized
  - Using a single emitter graph at the time shows detail of the IR and the UV signal
  - Select the scroll window that fits your purpose, instant action or view with history

Diagnostic screens

Recommision detector



- '*Recommision detector*' function (re)starts the initialization routine
- This function will clear the part of the memory that holds the emitter(s) position
- Initially blocked emitters with 45° and 90° imagers will become 'visible' again and may need to be blocked again

Analyzing the memory log

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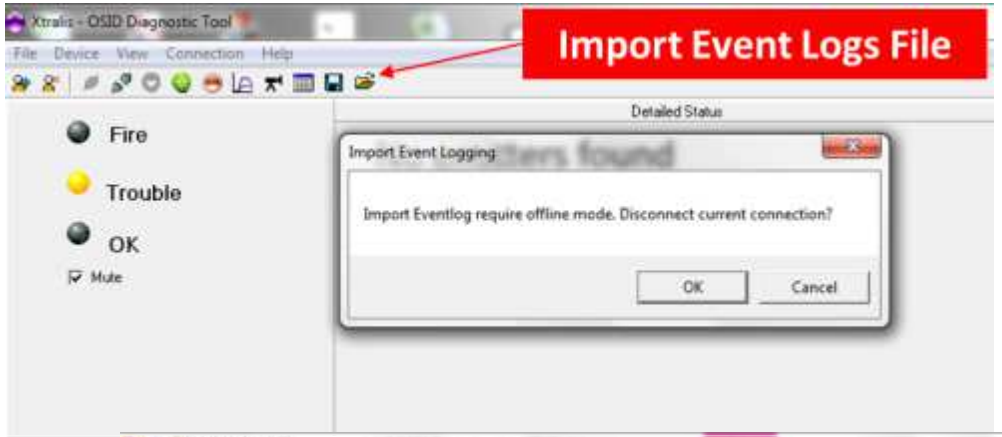
Fetching the event log

Happens automaticaly at connection

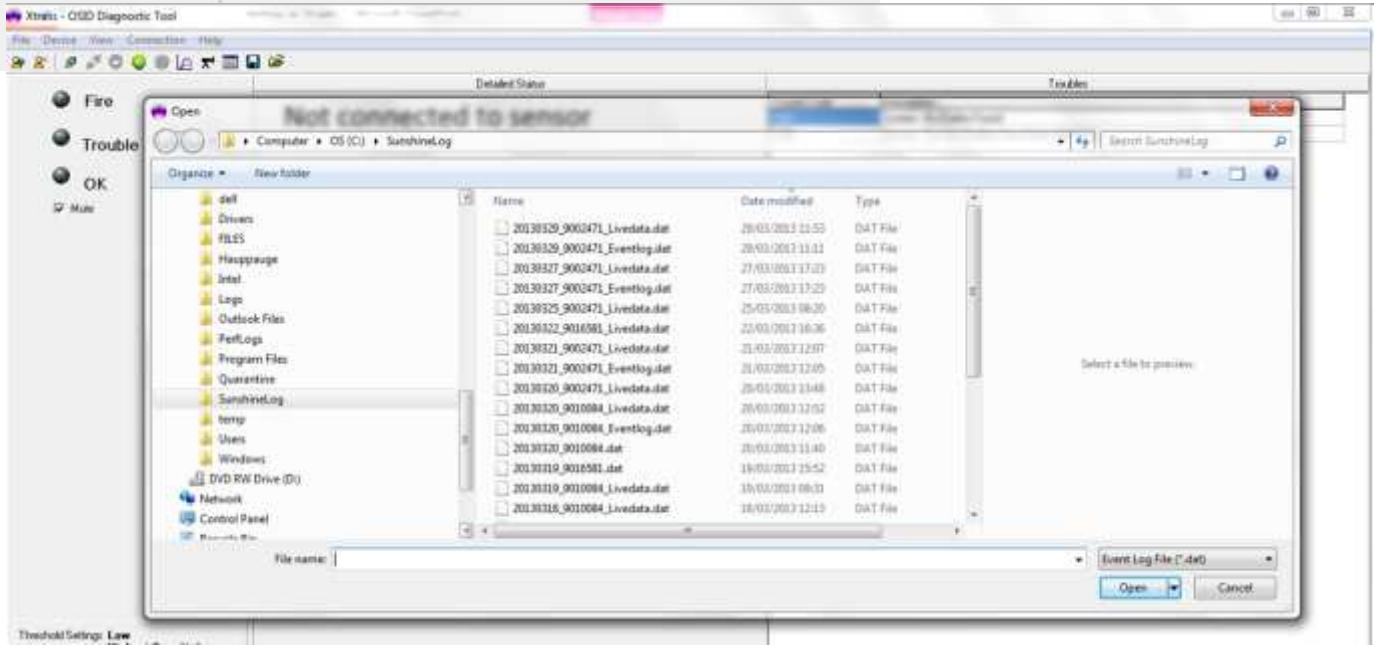
V4 Imagers have an on-board memory /log

- 10k events stored on FIFO base with time & data stamp
- Alarms and faults in the system
- All significant changes in the system
  - UV or/and IR change: ≤ 5%
  - X or/and Y position: ≤ 2 pixels
  - Temperature: ≤ 5°C/41°F

Opening the event log

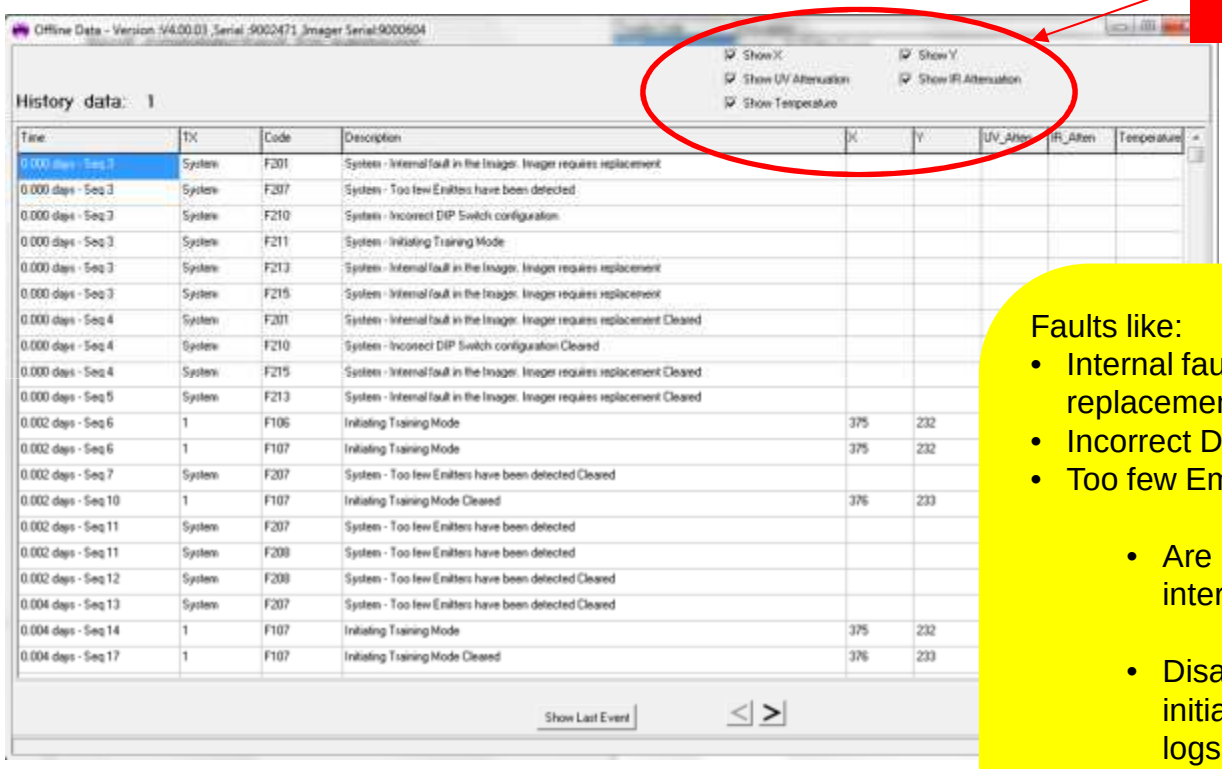


- Event log can only be imported when using the PC in off-line mode
- Sunshine log file will open and you can select the specific file.
- You can only open files with the Eventlog.dat extension.



Event log file

Select the data you wish to analyse

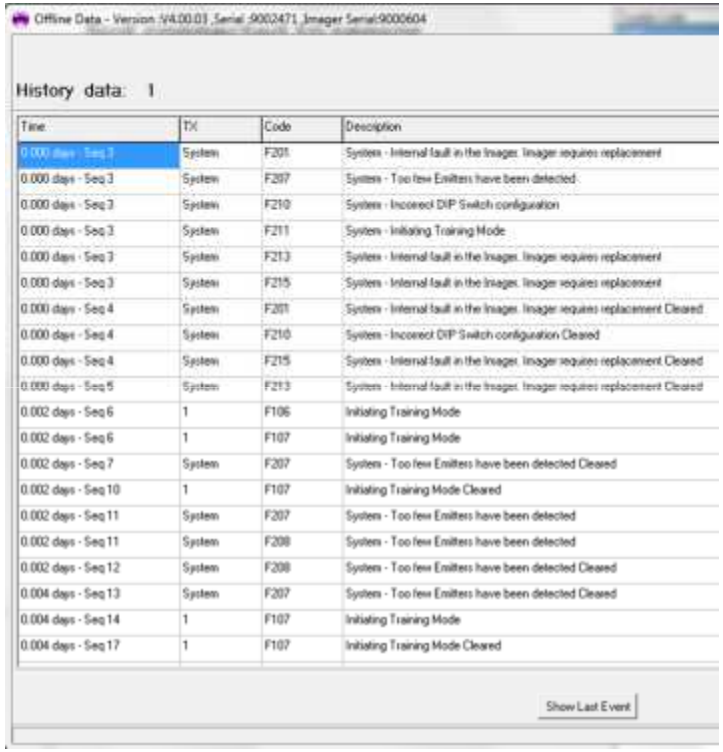


Faults like:

- Internal fault in the Imager. Imager requires replacement
- Incorrect DIP Switch configuration
- Too few Emitters have been detected

  - Are not REAL faults but generated internally every time at Initialisation
  - Disappear immediately after the initialisation but show up in the event logs.
  - These are only real faults if they occur after of the initialisation process.

Event log file



Offline Data - Version: V4.00.03 ,Serial :9002471 ,Imager Serial:9000604

History data: 1

Time	TX	Code	Description
0.000 days - Seq 3	System	F201	System - Internal fault in the Imager. Imager requires replacement
0.000 days - Seq 3	System	F207	System - Too few Emitters have been detected
0.000 days - Seq 3	System	F210	System - Incorrect DIP Switch configuration
0.000 days - Seq 3	System	F211	System - Initiating Training Mode
0.000 days - Seq 3	System	F213	System - Internal fault in the Imager. Imager requires replacement
0.000 days - Seq 3	System	F215	System - Internal fault in the Imager. Imager requires replacement
0.000 days - Seq 4	System	F201	System - Internal fault in the Imager. Imager requires replacement Cleared
0.000 days - Seq 4	System	F210	System - Incorrect DIP Switch configuration Cleared
0.000 days - Seq 4	System	F215	System - Internal fault in the Imager. Imager requires replacement Cleared
0.000 days - Seq 5	System	F213	System - Internal fault in the Imager. Imager requires replacement Cleared
0.002 days - Seq 6	1	F106	Initiating Training Mode
0.002 days - Seq 6	1	F107	Initiating Training Mode
0.002 days - Seq 7	System	F207	System - Too few Emitters have been detected Cleared
0.002 days - Seq 10	1	F107	Initiating Training Mode Cleared
0.002 days - Seq 11	System	F207	System - Too few Emitters have been detected
0.002 days - Seq 11	System	F208	System - Too few Emitters have been detected
0.002 days - Seq 12	System	F208	System - Too few Emitters have been detected Cleared
0.004 days - Seq 13	System	F207	System - Too few Emitters have been detected Cleared
0.004 days - Seq 14	1	F107	Initiating Training Mode
0.004 days - Seq 17	1	F107	Initiating Training Mode Cleared

Show Last Event

History data: n

- Each time the imager is powered down a new *history data* block is created

Time

- Column displays date and time or sequences, or a mix of both
- Sequences occur when the Imager was powered down, otherwise Time & Date stamp

TX

- Column displays the originator of the fault and alarm
- System or specific Emitter (1-7)

Code

- Column displays the fault and alarm code
- Alarm codes representation:
    - A1: Normal smoke alarm
    - A2: Oxygen deprived smoke alarm
    - A3: 6 dB alarm

Description

- Column explains the fault type (see earlier in presentation)

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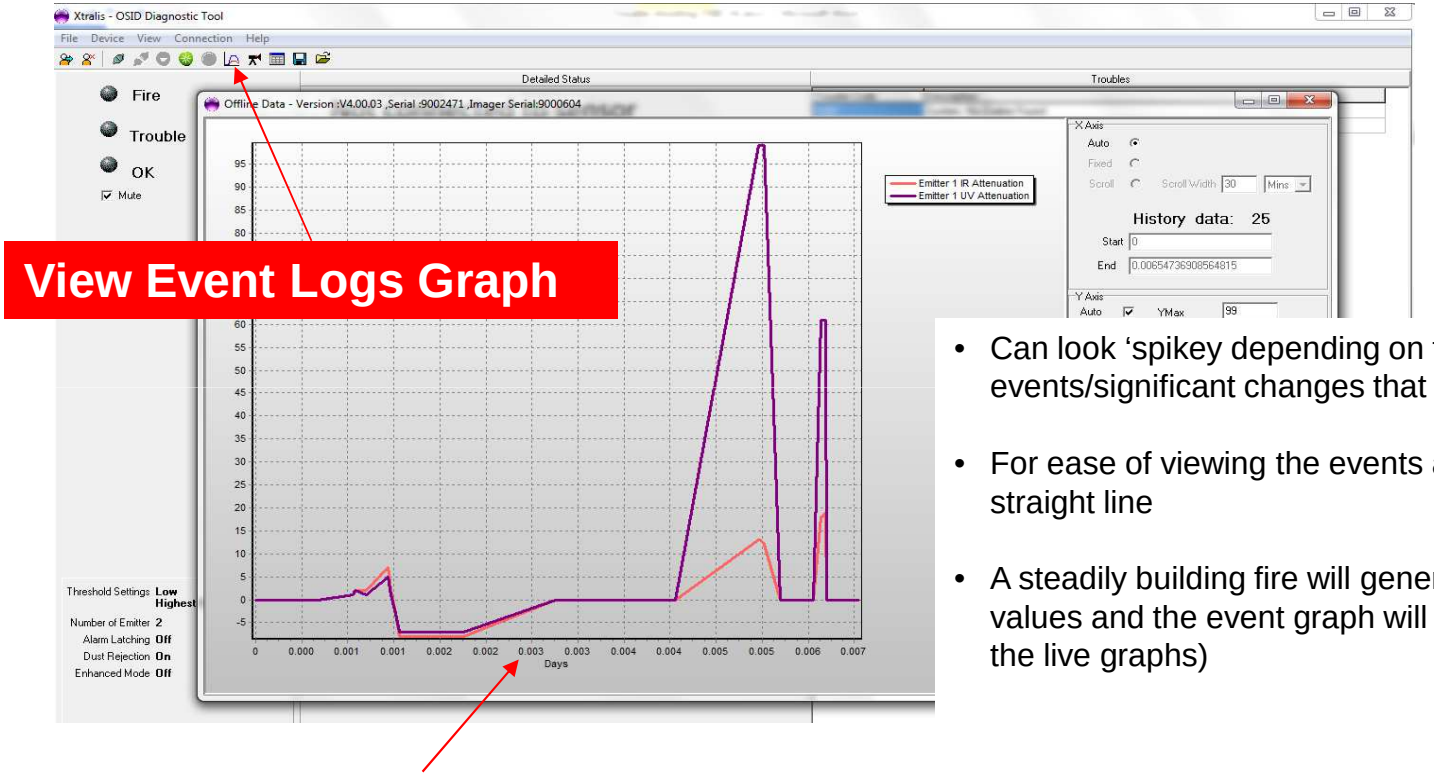
Creating graphs from the event log

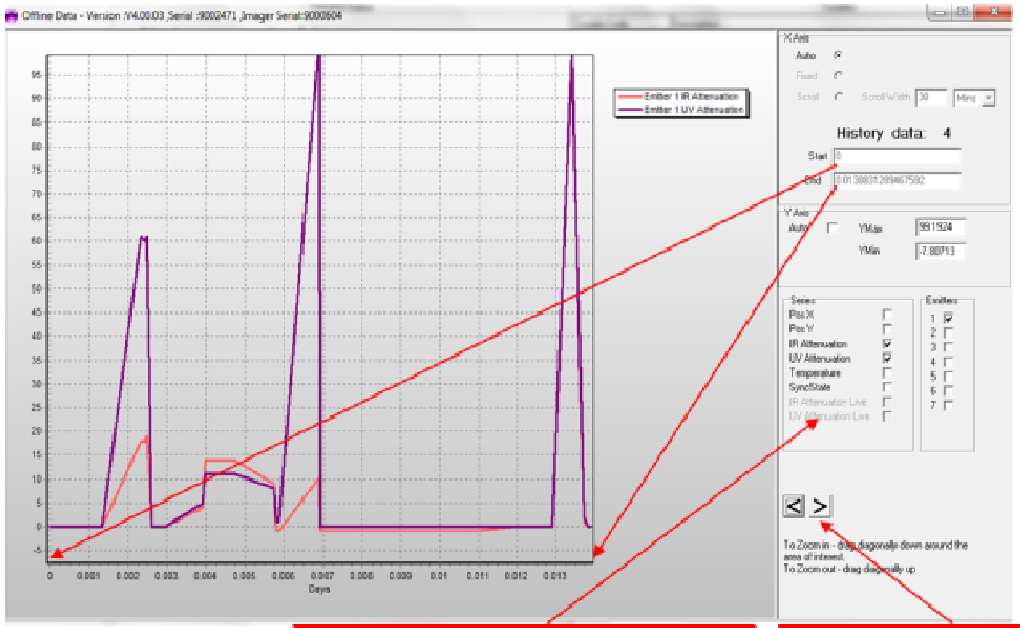


View Event Logs Graph

- Can look 'spikey depending on the number of events/significant changes that have occurred
- For ease of viewing the events are connected with a straight line
- A steadily building fire will generate faster changing values and the event graph will look smoother (similar to the live graphs)

- In this example the Imager was powered down, hence the 'Days' axis rather than time & date axis
- The part after the power down will come with time & date

Settings in the graph field



Live attenuation is greyed out when in the event log

Move forward and backward in the log

- A *History data* block is created each time an imager is powered down
- Some blocks can be empty if no 'significant' changes have happend during the period
- Corresponds to the *History data* block in the log file

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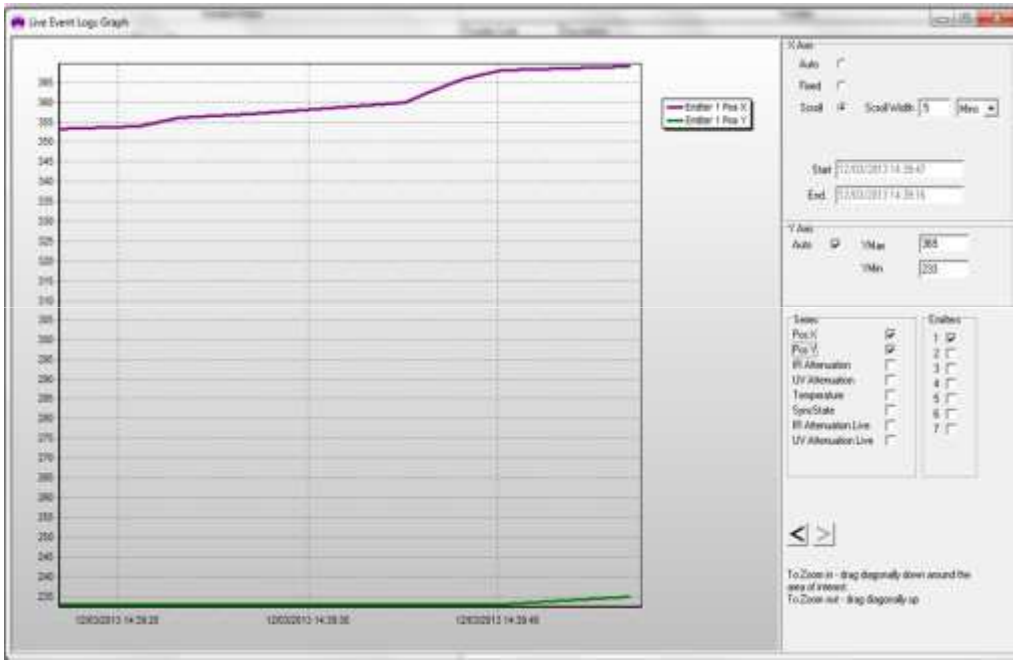
x-y position



- Represents the x-y position of the Emitter(s) on the CMOS imaging chip
- In this example
  - Imager moved significantly over a period of 30 seconds
- In most cases both lines will be just flat
  - Not meaning nothing moved but that the changes were not significant (< 2 pixels) - hence a straight line connects the first and last readings

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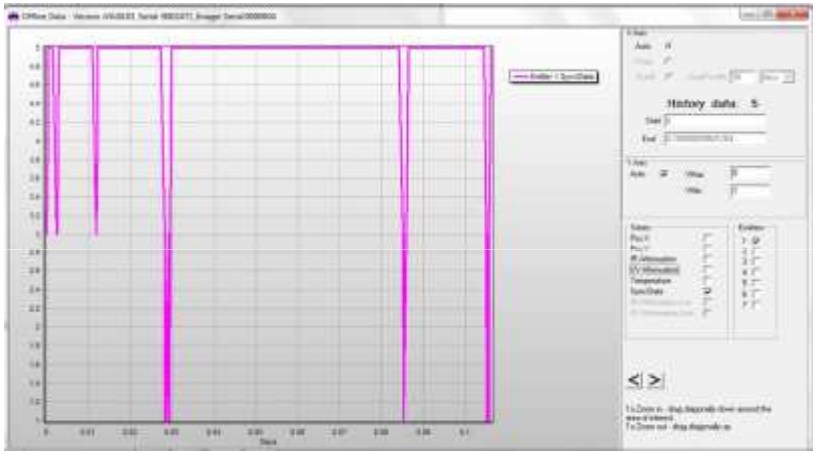
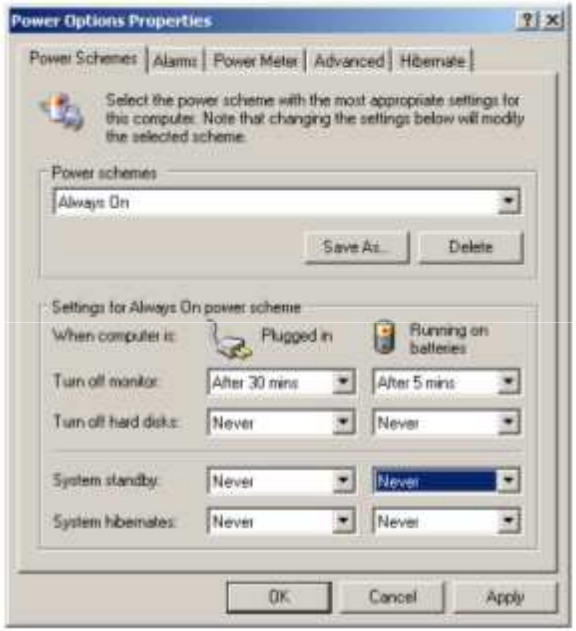
SyncState



There are 5 Synchronisation States.

1 - Emitter lost (i.e. 100% obscured < 1 min)
2 - Initial state
3 - Emitter found and synchronising
4 - Emitter synchronisation is settling
5 - Emitter synchronisation locked and settled (all is OK)

Logging with PC



When more detail of a site is preferred rather than only significant changes from the Imager's memory log, a PC can be left on site connected permanently to an imager for continuous logging

- Make sure that the hard disc is never turned off nor that system hibernates
- PCs have trouble maintaining long term communication with an imager through the USB port.
- Restart the PC and OSID Diagnostic at least every 2 weeks.

END