Guide

for

Underwater Vision Profiler 6

And

UVPapp piloting application

Version 2025/10/03

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Contents

1 AVERTISSEMENTS ET RECOMMANDATIONS PRINCIPALES

1.1 Hydroptic and Laboratoire d'Océanographie de Villefranche responsibilities

The LOV (CNRS – Sorbonne University) developed the UVP6-LP (low power) sensor in the framework of The BRIDGES European project in which Hydroptic participated. Thanks to another the French project GOPPI, they also initiated developed the UVP6HF (high frequency) and UVPapp application.

Hydroptic is commercialising the UVP6 under a CNRS – Sorbonne University licence.

UVPapp is provided for free. It permits piloting the instrument, downloading the data, visualising and exporting them. It also facilitates their importation into the EcoPART and EcoTAXA applications maintained for free by LOV. UVPapp also eases the programming of the UVP6 for specific vectors such as the Alseamar SeaExplorer glider.

All additional tools developed by the LOV such as the Glider and float Matlab processing tools available from GITHUB are open source free to use without assistance as they are provided under gpl-3.0 licence : https://www.gnu.org/licenses/gpl-3.0.en.html. These tools proved their efficiency permitting LOV to process more than 6000 glider profiles and recovered BGC-ARGO float datasets. They also permitted to reconstruct daily samples from moored instruments before their importation in EcoPART and EcoTAXA.

The piloting of the gliders or floats or any vector embarking the UVP6 is out of the responsibility of Hydroptic and LOV even if they are happy to assist.

1.2 Training courses

The Plateforme d'Imagerie de Villefranche sur mer (PIQv) provides training courses. We do recommend interested users to register on the website.

1.3 Mass memory and downloading issues

Some UVP6 internal SD card mass memory outages have been reported. They always occur after trying to download the data from a long deployment which created hundreds of thousands vignettes in the instrument memory. The cause of this outage seems to be a power drop created by users when UVPapp was requesting the list of files from the instrument using the GET FILE LIST tool in UVPapp. The consequence is that the data and images cannot be downloaded anymore from the instrument even if the other functions such as the LIVECAMERA mode are working well. If you suspect this problem, please contact Hydroptic.

In order to prevent these problems, NEVER remove the power from the instrument when running a "Get file list" tool in UVPapp but wait for the completion of the task and the display of the list of recorded sequences. If any doubt, it is preferable to keep the instrument powered and ask for assistance from Hydroptic.

1.4 UVPapp and firmware versions

This manual has been updated for the UVPapp piloting applications versions above 2.30.

It is now compatible both for UVP6LP and UVP6HF.

In case UVPapp informs you that the firmware version of the UVP6 is not compatible, ask Hydroptic or PIQv for an upgrade of your instrument or use UVPapp version 1.02.

There is a specific UVP6 firmware requested for NKE CTS5 profiling floats or when the embedded classification of the images is requested. This firmware can be installed by HYDROPTIC or PIQv. The

UVPapp application is not compatible with this firmware and an OctOs specific terminal application is necessary.

1.5 Optical alignment

The arm connecting the camera to the light unit must never be disconnected from the camera as the optical alignment and the sensor calibration will be lost, requiring to return the instrument for adjustment and inter-calibration.

1.6 Camera to light cable

The light cable must never be disconnected when the instrument is powered either on the battery or using the data/octopus cable. Disconnecting this cable voids the instrument warranty and may damage the electronic boards in the camera or the light unit.

1.7 Sun light protection

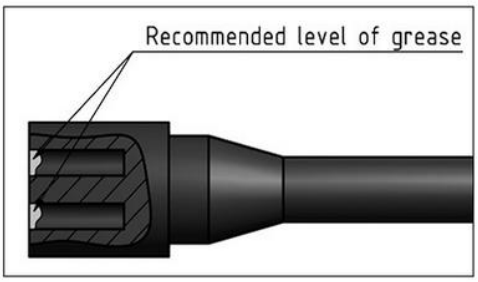
Do not leave instruments in direct sunlight. Direct sunlight can easily increase the internal temperature of the instrument beyond its maximum rating. It may also damage the optics of the light unit.

1.8 Prevention of connector corrosion

It is mandatory to follow the recommendations shown hereafter. A slight corrosion of the connectors might generate UVP6 malfunctions. Small pot of Molykote 44 is provided with the instrument.

See SUBCONN complete recommendations

Greasing and mating above water (dry mate)



- Connectors must be greased with Molykote 44 Medium before every mating
- A layer of grease corresponding to minimum 1/10 of socket depth should be applied to the female connector
- The inner edge of all sockets should be completely covered, and a thin transparent layer of grease left visible on the face of the connector
- After greasing, fully mate the male and female connector in order to secure optimal distribution of grease on pins and in sockets
- To confirm that grease has been sufficiently applied, de-mate and check for grease on every male pin. Then re-mate the connector

1.9 Light unit care

Even if rated and tested for 6000m use, the camera porthole and the glass cylinders of the light unit are fragile. Extreme care must be applied to prevent any scratch or shock on these units. The light must be protected with its socket whenever the UVP6 is not in use. The socket prevents scratches on the glass and optics protection against U.V. If you suspect any damage, stop using UVP and contact Hydroptic.

DANGER : RED LASER DIODE

The light unit emits red light via a laser diode rated class IV. Avoid eye exposure to direct or scattered radiation.

1.10 Black cap Porthole protection

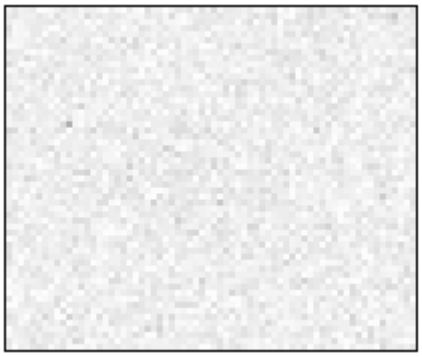
The porthole cap must be on when the UVP6 is not in use. The cap is attached with the Light socket to not forget to remove both protections before deploying the UVP6.

1.11 Efficiency in turbid water (over exposed)

Since the UVP6 is an imaging sensor, turbid water can lead to malfunction and biased results, translated into wrong number or size of objects and/or empty images. This behaviour appears with increasing particle load or turbidity. Two experiments conducted with seabed mud and phytoplankton cultures at Laboratoire d'Océanographie de Villefranche sur mer indicated that the UVP6 results were correct under the values indicated in the table below.

Limit for normal use of UVP6		
Turbidity type	mud	phytoplankton
Transmittance	45%	20%
BBp700 m-1	0.03	0.02
NTU	2.5	2

This type of vignettes indicates that the turbidity is too high for a good functioning of the instrument:

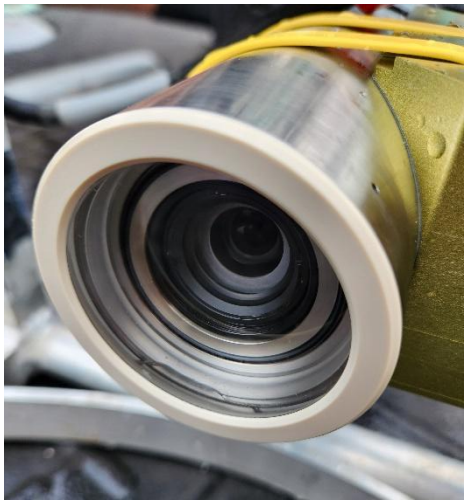


The "OVER_EXPOSED" indications in the sampleId_data.txt files also indicate that the image is probably saturated and could not be processed.

20230707-134750-2,**17.64**,20.44,1:**OVER_EXPOSED**,7.3%

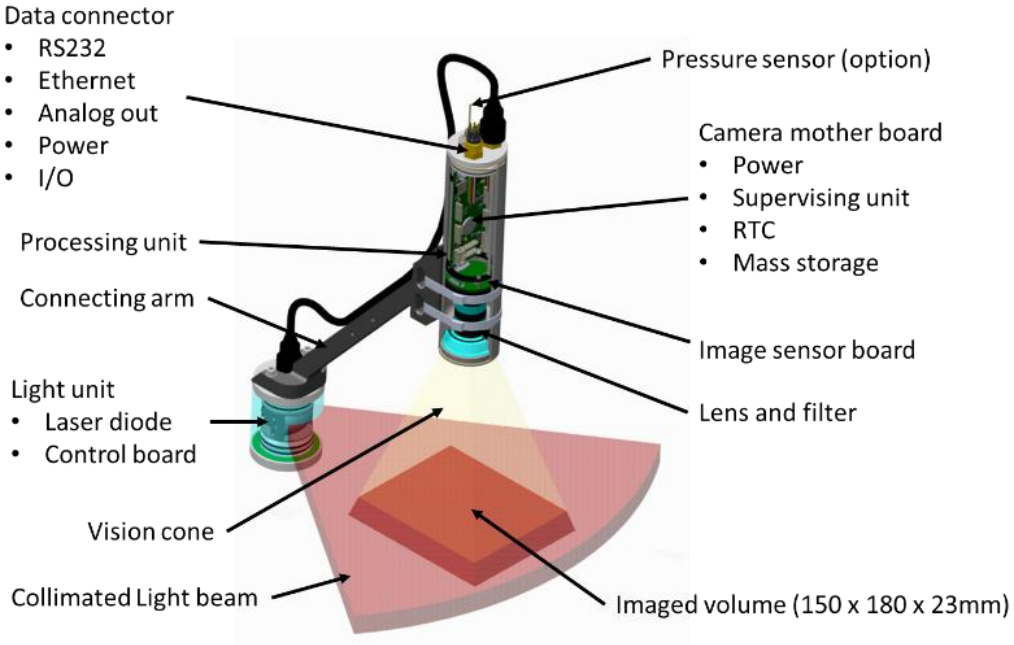
1.12 Remaining water

It is normal to observe some water in the volume between the glass porthole of the camera and its greige retainer ring. This volume is connected with the outside by tiny holes and can be easily flushed with some air.



2 SENSOR DESCRIPTION

2.1 The UVP6



The UVP6 consists of a main camera containing a motherboard with a supervising processor, a mezzanine image processor unit, an image sensor board, a lens and a passband filter centred on 630 nm wavelength and an optional pressure sensor necessary when the hosting vector cannot provide the pressure information to the UVP6. The light unit contains a controlling board, a laser diode and lenses. It is attached at a fixed distance of the camera using a connecting arm.

There are two versions of the UVP6:

- The UVP6LP (Low Power) recommended for most application except CTD and fast AUVs
- The UVP6HF (High Frequency), recommended for CTD and fast AUVs

2.2 Communication

The UVP6 communicates with the UVPapp application or any specifically designed software using the **RS232** link.

The images and data will be downloaded using the **Ethernet** link which is activated only on purpose by UVPapp. This Ethernet connexion also requires the **RS232 link**.

The UVP6HF also provides an **analogue** output to be connected on the CTD input if necessary. This output is not always activated on the UVP6LP. Contact Hydroptic to know if your UVP6LP analogue output is activated.

2.3 Operation modes

The UVP6 has four main types of configuration settings: AUTO, TIME, SUPERVISED, and REMOTE CAMERA, the characteristics of which are summarised in Table 2. The four settings correspond to four types of deployments, on different vectors. The settings are based on a main HW configuration table, ten acquisition tables, and an optional timetable. The HW table contains mainly the instrument configuration (serial numbers of the camera and light…), the main setup, the parameters issued from the tuning and inter-calibration and some functioning settings related to its configuration. The acquisition tables contain the acquisition parameters including the image rate or the triggering method. The timetable permits the selection of an acquisition table for period of 30 minutes of the deployment when the sensor is utilised in TIME mode.

There are many options to allow all interfacing and usage possibilities from very basic start using the power source up to individual image triggering.

Additional documents related to the SUPERVISED piloting of the UVP6 and for the glider integration can be provided on demand.

Main setup	**Options**	**Deployment type**	**Hosting vector**
AUTO UVP6 starts when powered ON, use preset acquisition parameters	**CTD (UVP6-HF only)** UVP6 uses pressure to automatically start and stop acquisition	Vertical profiles, analog output available	CTD profilers
	AUTO UVP6 starts after a preset delay, stops when OFF	Any vector only capable to Power UVP ON and OFF	Gliders AUVs ROVs Short term moorings, landers...
TIME UVP6 starts acquisition according to a timetable loaded in the instrument	**TIME** UVP6 starts after a preset delay and check for programming every 30 min to start acquisition using up to 10 sets of parameters	Long term deployments (week-years)	Medium and long term moorings, landers...

SUPERVISED UVP6 waits for the hosting vector to start acquisition sending a RS232 command to select the acquisition parameters	**CONTINUOUS** UVP6 acquires images at its preset frequency	Any vector capable to send/receive RS232 commands	Gliders (SeaExplorer, SeaGlider) Floats AUVs ROVs Cabled observatories
	PILOTED UVP6 acquires images when triggered by the vector	Any vector capable to send/receive RS232 "frequent" commands to trigger images	Floats (NKE CTS5-USEA) Cabled observatories
REMOTE CAMERA	**REMOTE CAMERA**	Remote camera without image analysis through RS232 and ETHERNET (>100MB)	Experimental and connected station

2.4 Computing the mean power consumption and autonomy of the UVP6 running on battery

2.4.1 UVP6HF

The UVP6HF drains 6 W when in acquisition and 0.02 W in between sequences. It will drain about 2 W during the 14 s required for booting. A brief maximum power of 30W is requested to charge the internal capacitance just when powering ON the UVP6.

2.4.2 UVP6LP

The UVP6LP drains 0.8 W when acquiring and processing images and 0.02 W in between. The typical duration of an image acquisition and process is 0.75 s. The mean power consumption is thus computed according to the image rate of the instrument. Saving full images instead of vignettes will add about 0.6 s to the image acquisition and process.

UVP6 power computing (LP) for Frequency < 0.8 Hz

- Image acquisition and process : P_{on} [W] **~ 0.8**
- Sleep (between images) P_{sleep} [W] **~ 0.02**
- Image acquisition duration T_{on} [sec] **~ 0.7**
- Frequency : F [Hz]
- Battery capacity : $B_{capacity}$ [Wh] **~75 / 1700**
- Single image volume : V_{image} [L] **~ 0.6**
- Mean power : P_{mean} [W]

$$T_{off}\,[sec] = 1/F - T_{on}$$

$$P_{mean}\,[W] = F \times ((P_{on} \times T_{on}) + P_{sleep} \times T_{off})$$

$$\textbf{Theoretical autonomy}\,[h] = B_{capacity} / P_{mean}$$

$$\textbf{Sampled vol}\,[L/h] = V_{image} \times F \times 3600$$

Examples of computing the mean power in Watt for **frequency under 0.8Hz**.

- typical acquisition at 0.1 Hz saving vignettes : (0.8 x 0.75 + 0.02 x (**10**-0.75))/10 = 0.08 W
- typical acquisition at 0.2 Hz saving vignettes : (0.8 x 0.75 + 0.02 x (**5**-0.75))/**5 =** 0.14 W
- typical acquisition at 0.5 Hz saving vignettes : (0.8 x 0.75 + 0.02 x (**2**-0.75))/**2 =** 0.32 W

The power is always 0.8W above 0.8Hz.

2.5 Battery

An optional battery (75Wh/21.6V) can be provided with the UVP6. It permits medium range operations of both UVP6-LP and UVP6-HF instruments. The battery is equipped with a relief valve, allowing it to be charged without opening the housing.

The housing can anyhow be easily opened for fast replacement of the battery or if needed for plane transportation. The opening is anyhow made at user risk.

In order to keep the battery autonomy, it is recommended to recharge the battery when it is less than 50% of its nominal capacity.

The battery provides more than 10 hours (@25°C) recording with UVP6HF while the duration of the operations with UVP6LP depends on its programming (image rate mainly) and can extend to one month.

This optional battery can be transported in cabin luggage without any limitations.

2.6 Typical flash sequence

The UVP6 sensor sends a series of 3 flashes of 1 sec approximately when the acquisition starts or when the AUTOCHECK test is successfully completed. The observation of these 3 flashes when the UVP6 is supposed to start to acquire data means that the instrument is ready and functional.

Note that the 3 flashes will be displayed after a maximum delay of 2 seconds for the UVP6-LP and 15 seconds for the UVP6HF sensor. The image flashes will then start either immediately or later when a delay is set in AUTO mode or the start pressure passed in CTD mode.

2.7 Black images

Black images are images acquired at regular intervals without activating the light of the UVP6. They permit measuring the instrument noise and to detect the images which are not influenced by the

sunlight at the surface (UVP6LP before 2022 only). **The frequency of the black images is automatically set or default values proposed when programming the instrument for most modes.**

An interval of 50 is recommended for all types of UVP6 (LP and HF) after 2022.

An interval of 10 is recommended at low depths (above 100m) and 40 deeper for UVP6LP before 2022.

2.8 File safe system

The UVP6 has a storage capacitance which is charged when the instrument is powered. This backup power allows the instrument to complete the ongoing image cycle when the power is removed and to safely store the image data. This capacitance is charged when the instrument is powered ON draining more power than the typical power of the instrument. This capacitance is not able to keep maintaining the system during the "Get file list" operation. This is the reason why we do recommend to not power off the instrument during this operation.

2.9 Internal mass storage management

The UVP6 is fitted with more than 400GB of mass storage. 10GB or 5GB are by default reserved for data storage while the remaining space is used to host images. The data storage is thus never limited in usual utilisation. In case the image storage is full, the instrument will continue acquiring and processing images but only data files will be saved in the 10-5GB section.

380GB memory allows to record about 80 000 full images when this option is selected while there is almost no limit for the vignette storage.

An optional 1TB mass storage can be provided to extend the instrument autonomy when storing full images for specific uses.

3 TYPICAL SEQUENCE OF OPERATIONS

This typical sequence of operation is common to all UVP6 usages. Refer to the dedicated chapter of this guide to learn how to proceed for each step.

3.1 At cruise level

- Instrument mounting in its frame or on its hosting platform
- Instrument connection to Power (AC or battery) and UVPapp
    - Instrument programming according to the type of deployment
    - Time synchronisation
    - Delete data to empty the memory
    - Autocheck

3.2 At deployment level

In case of successive profiles in CTD modes, the battery must be disconnected from the UVP between profiles (see below).

- Charge battery (if applicable)
- Time synchronisation
- Porthole and light cleaning
- Deployment (power ON or power piloted by the hosting vector)
- Recovery (power OFF or power piloted by the hosting vector)
- Rinsing with fresh water

3.3 On a daily / regular basis

- Measure the voltage of the battery (if applicable)

- Data download
- Merge sequences (if applicable)
- Sample creation (metadata filling)
- Sample process and data Quality Control
- Data backup
- Delete data in instrument (if necessary)
- Charge battery (if applicable)

3.4 End of cruise

- Instrument removing from host vector or frame (never disassemble camera from arm)
- Instrument cleaning and packing

3.5 UVPapp data processing steps

The data processing steps are listed below as a reminder. The data cannot be processed without filling the metadata first.

- Download data
- Merge sequences (if necessary)
- Fill in sample metadata
- Process data
- Process images
- Export to ODV (optional) and import into ODV
- View vignettes (optional)
- Load on the EcoPART FTP and import in EcoPART and EcoTAXA for image classification

4 GUIDE FOR DIFFERENT USAGES OF THE UVP6

Here we describe the specific usage and programming of the UVP6 sensor to perform deployments at sea.

4.1 Using the **UVP6HF** for vertical profiles (associated with CTD)

The UVP6HF is equipped with a pressure sensor and designed for vertical deployment at high speeds (1-2 m.s-1) associated with CTD or other optical frames.

The typical Hydroptic 75 Wh battery enables an easy operation of the system for casts down to 6000M at the highest acquisition rate thanks to the provided autonomy.

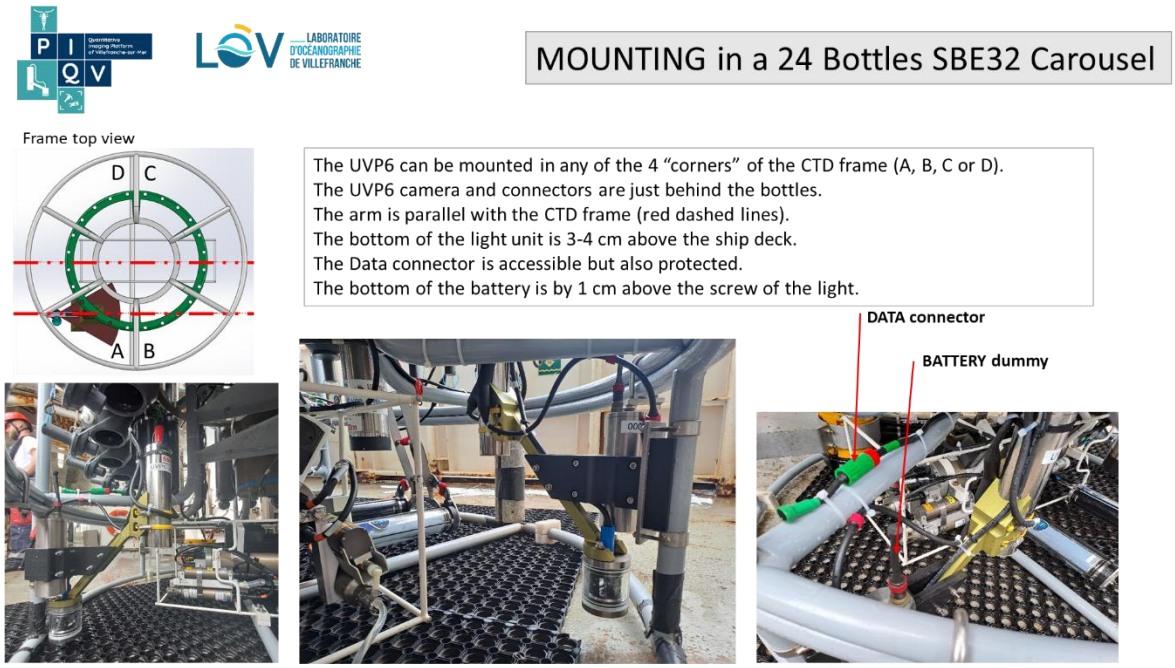
The UVP6 has a huge data storage capacity, allowing it to record tens of profiles without downloading the data.

The UVP6LP (low power), if fitted with a pressure sensor, can also be utilised in CTD mode for profiling but its relatively low (1.3 Hz) acquisition rate prevents acquiring sufficient data for reliable results.

4.1.1 UVP6 installation

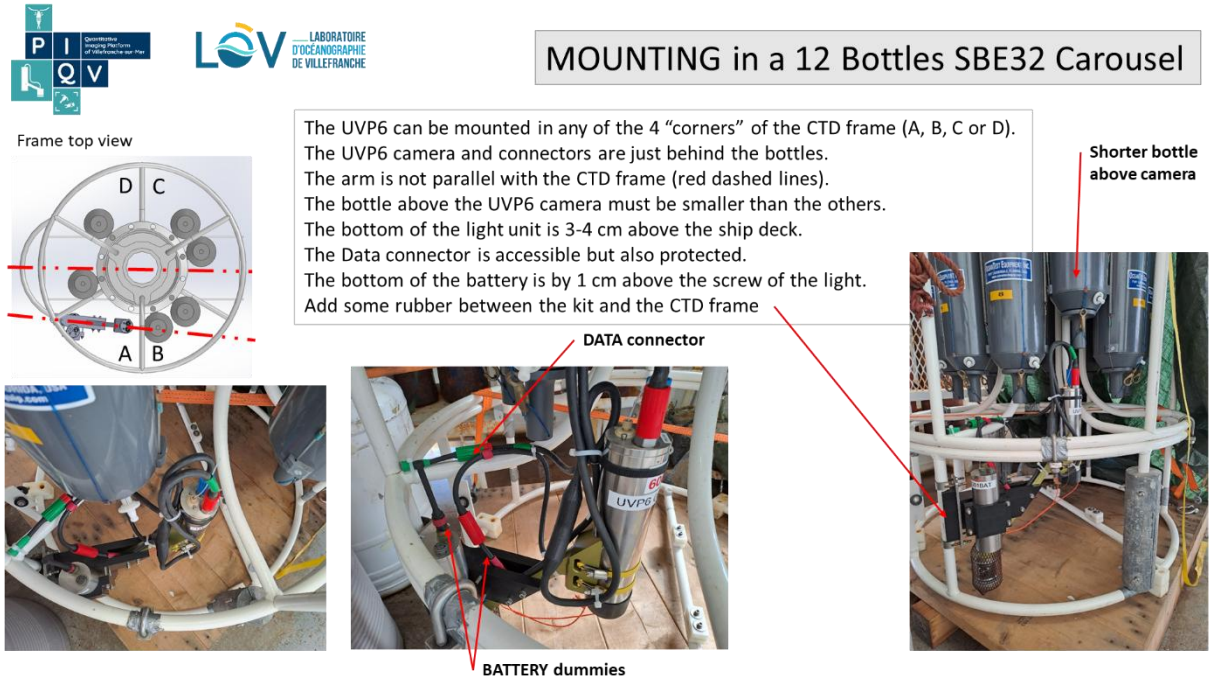
The UVP6 will be mounted in the CTD frame using the specific mounting kit designed for SBE32 carousel and SBE9+ systems. The positioning will be carefully studied to avoid having any structure in the field of view of the camera and to prevent damaging the UVP6 connectors with the NISKIN bottles. The installation of the UVP6 in a 12 bottle frame requires one bottle above the UVP6 to be shorter than the others.

4.1.1.1 Mounting in a 24 bottles carousel (SBE32)



The UVP6 camera will be set behind the bottles. It is recommended to place the other optical sensors of the CTD in the opposite side of the CTD frame to avoid perturbations from the UVP6 red light.

4.1.1.2 Mounting in a 12 bottles carousel (SBE32)



The UVP6 camera will be set below one bottle. This bottle must be shorter than the other bottles to give space to the UVP6 connectors.

It is recommended to place the other optical sensors of the CTD on the opposite side of the CTD frame to avoid perturbations from the UVP6 red light.

The bottom end cap of the UVP6 light unit must be as close as possible to the deck level (2-3 cm above only).

4.1.1.3 Control of the position of the UVP6

It is mandatory to download and check the images of the first profile for artefacts which could be due to a bad positioning of the instrument.

In case you see artefacts (part of the CTD frame) on the images, just change (rotate or descend) the position of the UVP6 till you never get such artefacts.

Example of a vignette focusing on the CTD stainless steel frame

In case you do not perform this check and observe the default afterward, the recorded data and images will not be usable at all.

4.1.2 UVP6 cabling

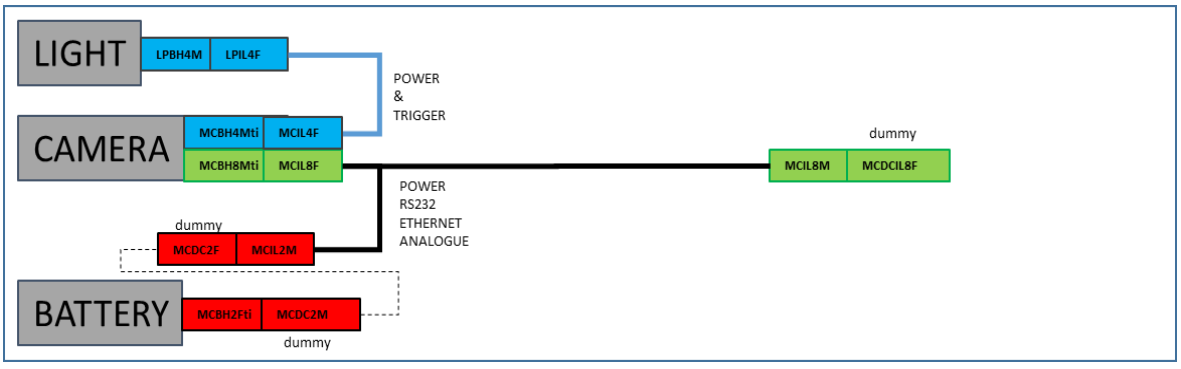
The sensor will be powered via the specific Y cable which connects to the battery.

An optional analogue cable allows the UVP6 to transmit the particle abundance converted as a 0-5vdc signal and to visualize it on the CTD remote graphical interface.

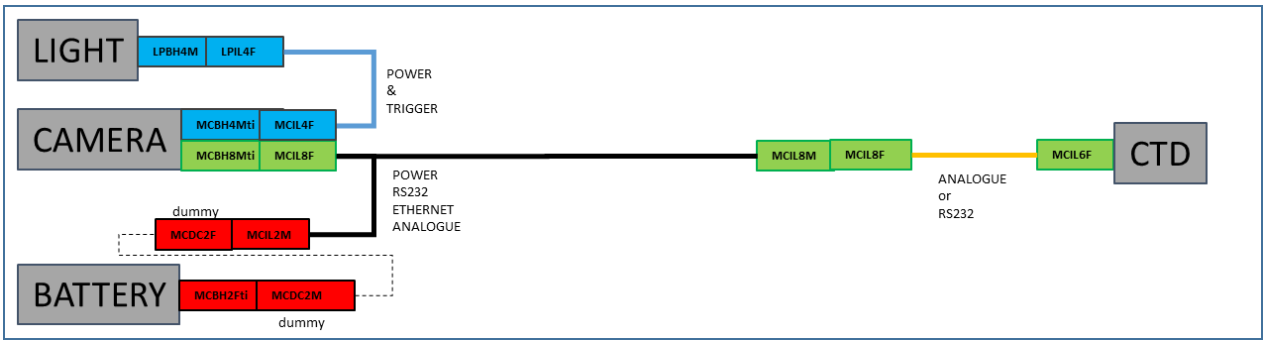
4.1.2.1 On deck standby between profiles

The battery is disconnected.

In case the analogue output is not connected to the CTD input.



In case the analogue output is connected to the CTD input

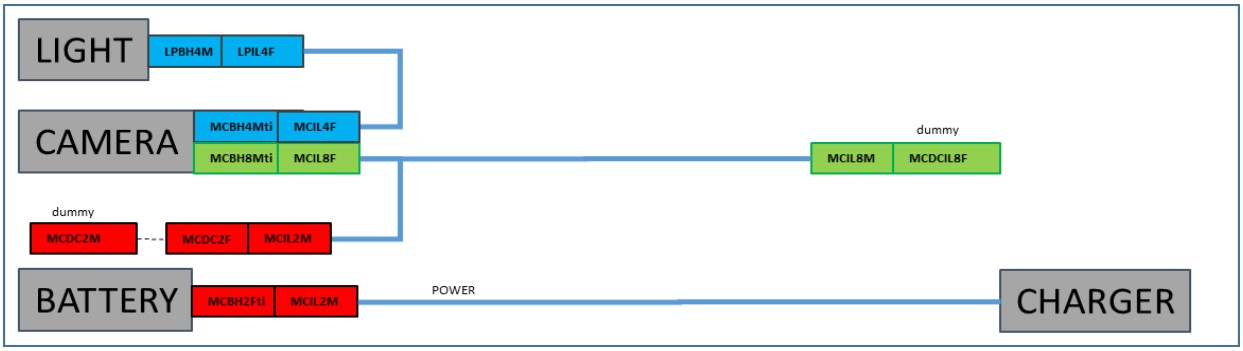


4.1.2.2 Battery charge

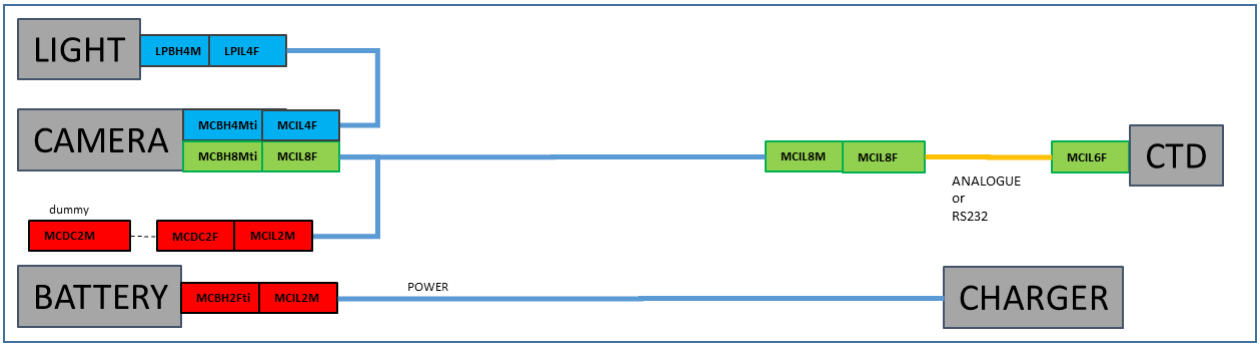
The battery is directly connected to the charger.

Note that the battery can easily be removed from its support and charged in the lab. or exchanged with another unit.

In case the analogue output is not connected to the CTD input.

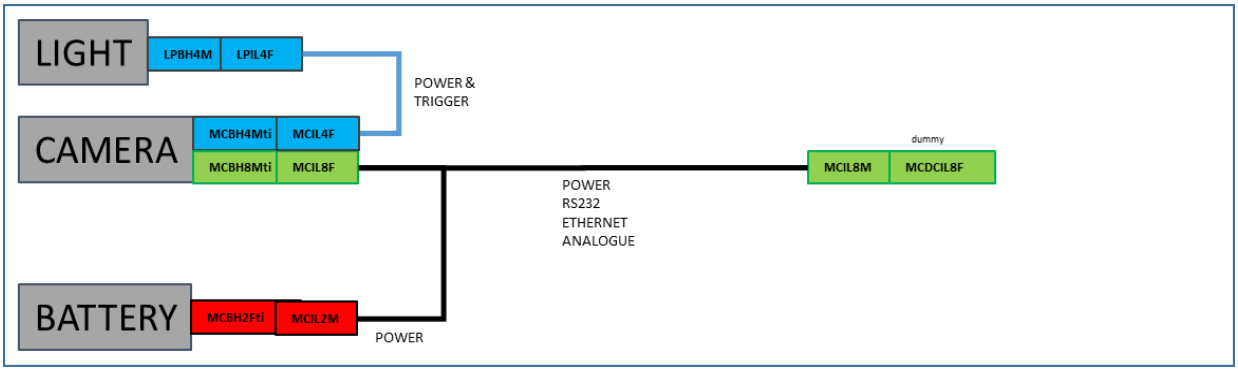


In case the analogue output is connected to the CTD input

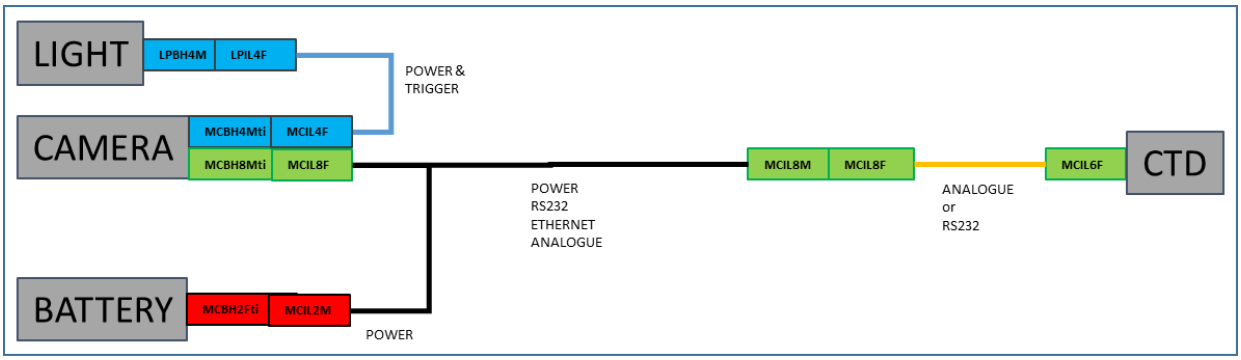


4.1.2.3 Deployment

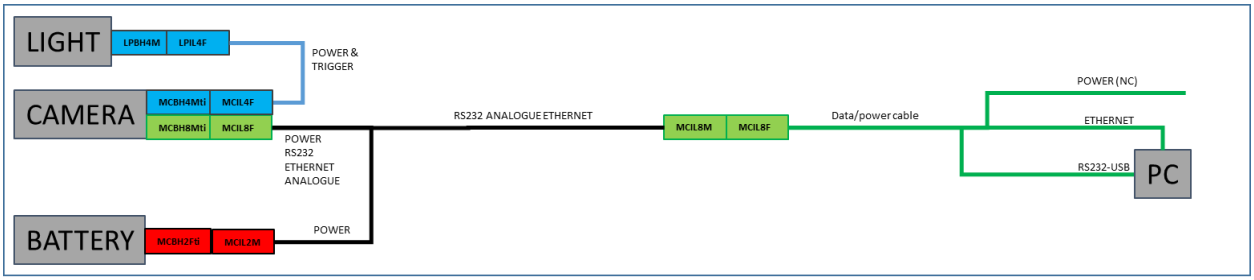
In case the analogue output is not connected to the CTD input.



In case the analogue output is connected to the CTD input



4.1.2.4 Data recovery and UVP6 programming



4.1.3 **UVP6HF** deployment in CTD mode

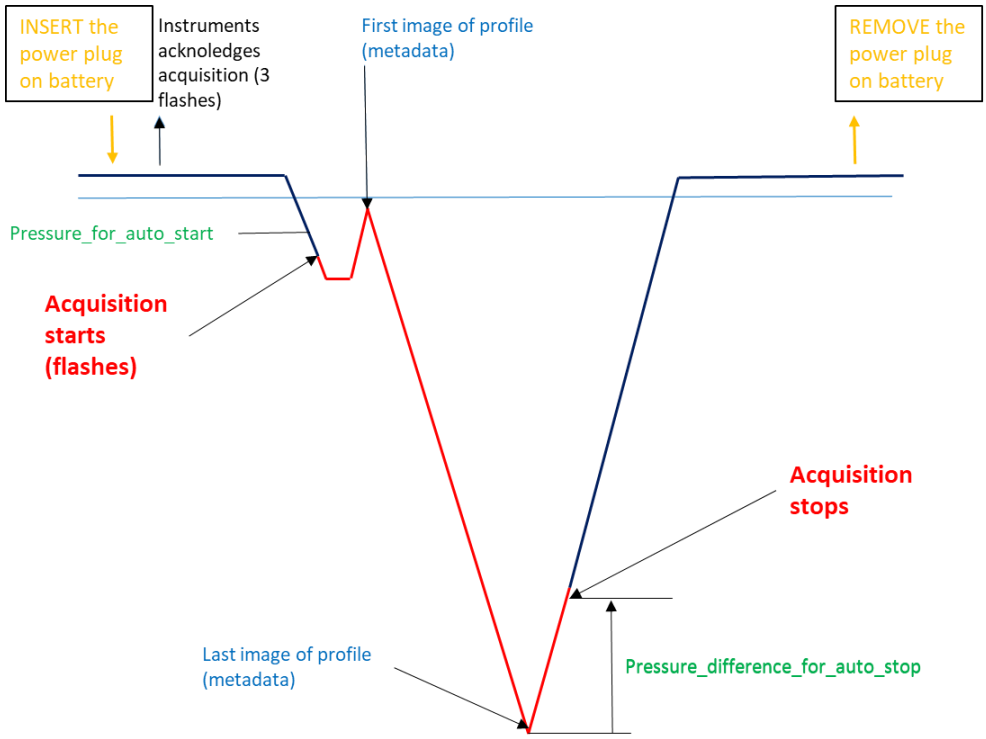
4.1.3.1 Battery autonomy in CTD mode

The standard Hydroptic battery allows recording data during more than 5 hours which corresponds to 2 times the descents down to 6000m or 12 profiles down to 1000m at 1m/s each. **It is anyhow recommended to check and record the battery voltage between the profiles using a voltmeter or the dashboard of the UVPapp.**

In order to facilitate the battery maintenance during long consecutive casts, it can be very useful to use two batteries, one being in charge whilst the second is in operation on the CTD-rosette.

4.1.3.2 Procedure

The UVP6HF will generally be deployed with the CTD. It will benefit from the CTD soaking to start acquisition automatically. You will note the FIRST (beginning of the descent) and END (end of the descent) images that will be necessary to create samples from the recorded sequence. Please note that the 2 pixels data will also help adjusting the FIRST images of the day profiles when the sun perturbates the measurements.



Green : settings of the instrument (UPVPapp)

Blue : metadata to be documented when filling the sample metadata (UVPapp)

Red : instrument acquisition

Black : instrument response

4.1.4 **UVP6HF** programming in CTD mode using UVPapp

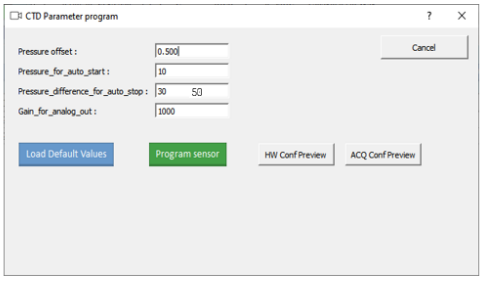
In case of successive profiles in CTD modes, the battery must be disconnected from the UVP (remove the battery plug) during more than 5 min between deployments in order to allow the instrument to reset.

The CTD mode is designed to record data only during the descent of the instrument to image only unperturbed water masses while minimising the use of the battery.

When programmed in CTD mode, the instrument will flash 3 times 14s after being powered on the battery. It will then automatically start acquisition 14 s after passing the "Pressure_for_autostart" depth and stop automatically when raised within the defined "Pressure_difference_for_auto_stop" depth range.

The UVP6HF will always acquire data at its maximum image rate.

The four configurable parameters are :

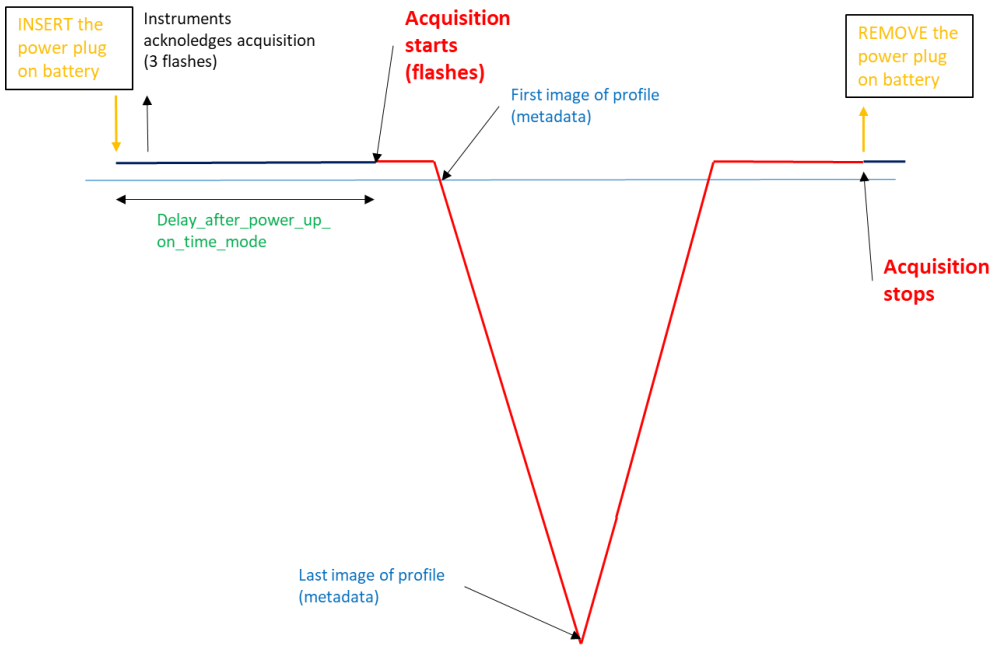


- **Pressure offset** : the vertical distance between the pressure sensor (on top of the camera when in vertical position) and the imaged area (usually set to 0.5m)
- **Pressure for auto start** : pressure allowing the UVP6 to boot and start acquisition (typically 10 dbars for a 20-35m soaking of the CTD)
- **Pressure difference for auto stop** : the pressure difference to stop the acquisition when the UVP6 is raised up at the end of a profile (typically 50m). This value must be higher than the Pressure for auto stop.
- **Gain for analogue out** : the number of particles equivalent to the 5 vdc maximum output of the analogue connexion (a saturation of the output to 5 vdc due to a low gain value will not damage the UVP6 or the CTD input).

WARNING: when using the CTD mode, the CTD must not be descended deeper than the "Pressure_difference_for_auto_stop" parameter during the pre-profile rinsing of the sensors. The UVP6 would otherwise end acquisition when raising up to the surface after the CTD soaking and never restart till the battery is disconnected for **5 minutes** and the starting procedure restarted.

4.1.5 UVP6HF deployment in AUTO mode (vertical profiles)

This mode is recommended only for very shallow profiles where the Pressure difference for auto stop value will not be reached.



Green : settings of the instrument (UPVPapp)

Blue : metadata to be documented when filling the sample metadata (UVPapp)

Red : instrument acquisition

Black : instrument response

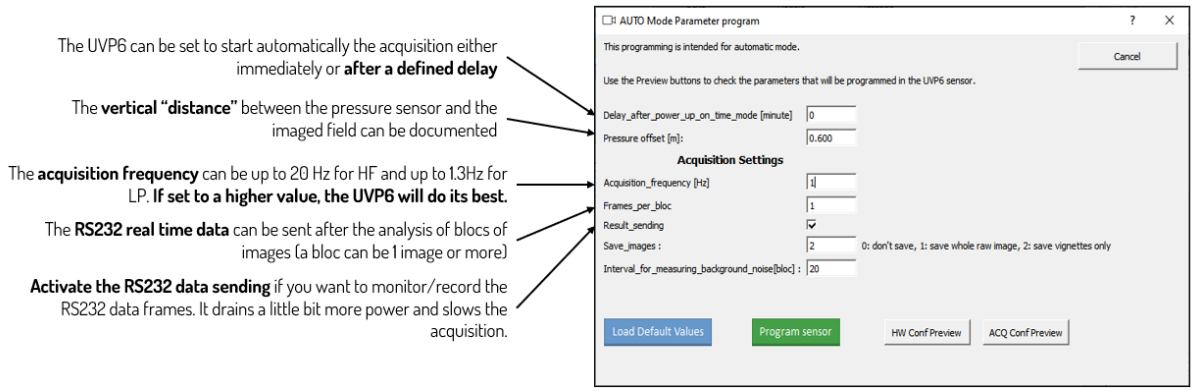
4.1.6 UVP6HF programming in AUTO mode using UVPapp

In case of successive profiles in AUTO modes, the battery or power must be disconnected from the UVP (remove the battery plug) during more than 5 min between deployments in order to allow the instrument to reset.

The AUTO mode can also be utilised for vertical profiles. When programmed in AUTO mode, the instrument will flash 3 times 14s after being powered on the battery. It will then automatically start acquisition either immediately or just after the preset delay. The instrument will stop acquisition when the power is removed by disconnecting the battery.

This mode is really less efficient than the CTD mode as it records data also during the ascent and drains more power thus.

The AUTO mode permits the UVP6 to start using preset parameters just after being powered or after a preset delay. The sensor will then stop acquisition when the power is removed.



These parameters offer customization options in AUTO mode, allowing users to set delays, manage pressure offset, and adjust acquisition settings based on specific needs, ensuring flexibility and adaptability in various applications.

4.2 Using the **UVP6LP** on a NKE CTS5 float

All UVP6 delivered with NKE CTS5 float are preset to be piloted via the float. They do not have any pressure sensor as the depth is transmitted by the float. They also have a specific firmware which allows the embedded classification of the images.

The acquisition will be set via the NKE graphical interface as for all sensors. We thus recommend to refer to NKE instructions for their operation via the float which will trigger each image acquisition and never try to reprogram the UVP6 using UVPapp.

The data will be transmitted after averaging by depth or time slices and transmitted to the data centres where they will be downloaded by users or automatically by the EcoPART application.

Because these sensors will usually not be recovered and because we want to avoid any possibility of changes in the instrument settings, these sensors are usually provided without any data/Octopus cable. In case of recovery, the sensors should be sent back for maintenance, inter-calibration and data download before re-configuration for further float deployment.

UVPapp cannot longer be utilised to reprogram a UVP6 for CTS5 floats as a specific firmware needs to be set in the UVP6 to be piloted by the float.

As for the Glider data, the LOV proposes a Matlab set of tools available on GitHub which permit to process the data from recovered floats. Contact the Plateforme d'Imagerie Quantitative de Villefranche for the associated services.

4.3 Using the **UVP6LP** on gliders

The UVP6 **must be equipped with a pressure sensor.** The ALSEAMAR Seaexplore glider is the only one providing an on-the-shelf integration. We can, on request, provide a document detailing the updated situation of the integration of the UVP6 on the Seaexplorer, Seaglider and Slocum gliders.

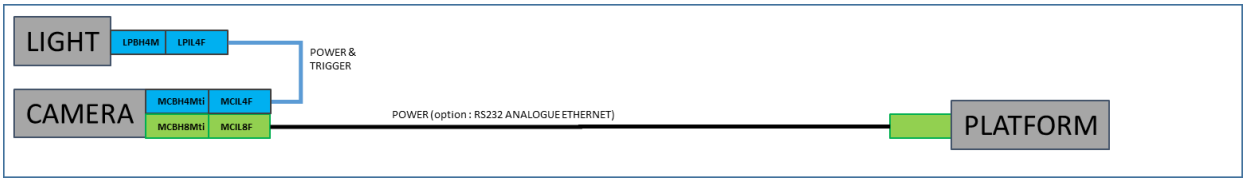
The operational steps are :

1. UVPapp Project Setup: Utilise UVPapp to create a project and program the UVP6 for the specific glider type, ensuring tasks such as emptying memory and Autocheck are performed.
2. Glider Assembly: Mount the UVP6 on the glider using the specific kit and cable provided either by the glider manufacturer or Hydroptic (e.g., SLOCUM).
3. Glider Programming: Program the glider according to its manual, specifying actions such as stopping acquisition at the surface and at the bottom to allow an easy data post processing.
4. Deployment Process: Deploy the glider and recover it after the mission. Be carful with the UVP6 during the manoeuvre. Some data may be displayed on the glider GUI (Glimpse for Seaexplorer) during deployment.
5. Data Download Using UVPapp: Utilise UVPapp to download the data (refer to the UVPapp section of this manual for detailed instructions).
6. Data Management: Get the glider data and metadata, saving them in the correct location and format within the UVP6 project.
7. Get the glider data and metadata and save them at the right place and using the right format in the UVP6 project (see below)
8. Backup Procedure: Make a backup copy of the downloaded data to ensure the conservation of the original data integrity.
9. Raw Data Cleaning: Clean the raw folder by removing sequences acquired before the glider deployment.
10. Sequence Filtering (Seaexplorer): Remove unnecessary sequences recorded at the surface or at the bottom (specific to Seaexplorer gliders).
11. Sequence Merging: If multiple sequences were acquired during descent or ascent, use UVPapp to merge them per ascending or descending profile.
12. MATLAB Tool Usage: Utilise provided MATLAB tools to automatically create samples by merging glider and UVP6 data.
13. Data Quality Check: Check the first and last images of the samples using UVPapp. Recover samples that may not have been created correctly by the MATLAB tool. Pay special attention to ascent/day samples and verify or correct LAT/LON values.
14. Data Import to EcoPART and EcoTAXA: Import data into EcoPART and EcoTAXA using the dedicated manuals.

Matlab Tool Warnings: Be cautious and read the warnings about the MATLAB tools in Chapter 1 of this manual.

4.3.1 Using the **UVP6LP** on a SeaExplorer glider

4.3.1.1 Cabling and mounting



Any UVP6LP sensor **equipped with an optional pressure sensor** can be utilized on a SeaExplorer glider (ALSEAMAR company). The instrument will be mounted in the nose of the glider using the ALSEAMAR provided mounting.

Please check the instrument driver and firmware compatibility with both the Alseamar and the Hydroptic company.

4.3.1.2 Programming the UVP6

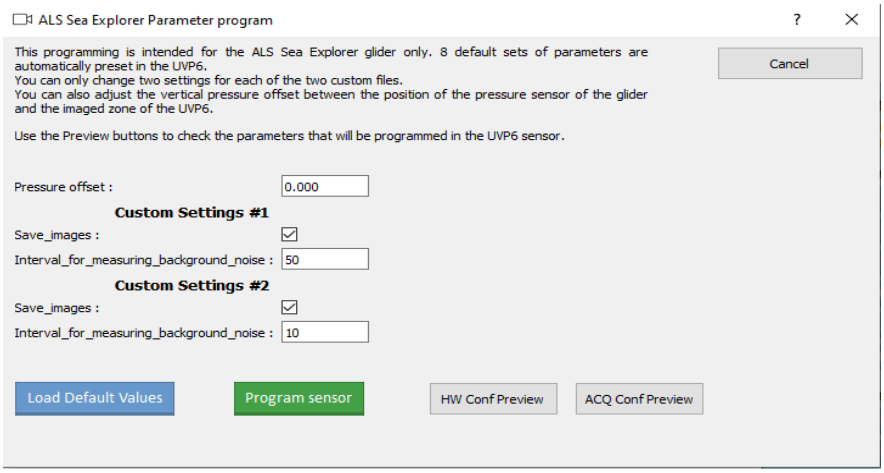
The UVP6 will be programmed with UVPapp using the specific ALS programming and then piloted via the glider tools.

The ALS glider mode is a specific SUPERVISED mode (see below).

The only parameters that can be changed is the Pressure offset being the vertical distance between the pressure sensor and the imaged area. It is usually set to 0 on SeaExplorer gliders where the camera and the light are placed horizontally.

In addition, two custom files can be set for specific use of the sensor. Only the type of recorded images and the interval for measuring the background images can be set.

The glider must be programmed in order to stop the UVP6 acquisition at the surface (during transmission) and at the bottom in order to ease the automatic processing of the sequences. If any useless sequence has been recorded at the bottom, delete it using UVPapp (after doing a backup).



Tips for programming the UVP6 on gliders :

- The glider must be programmed to **stop the UVP6 acquisition at the surface** (during satellite transmission) and **at the bottom** in order to ease the automatic processing of the sequences.
- We recommend to keep the **same configuration for a whole deployment/cruise/project** to keep the same sampling effort and allow an easier analysis of the data.
- Depending on the available power, **we recommend to use the highest sampling rate.**

Same sampling rate configuration

Depth slice	Images per bloc	UVP6 images bloc frequency	Background noise measurement interval	UVP6 config	Mean power consumption
all	1 image/bloc	0.3Hz	1 black every 10	ACQ_ALS_022H	0.22W

Depth adapted configuration

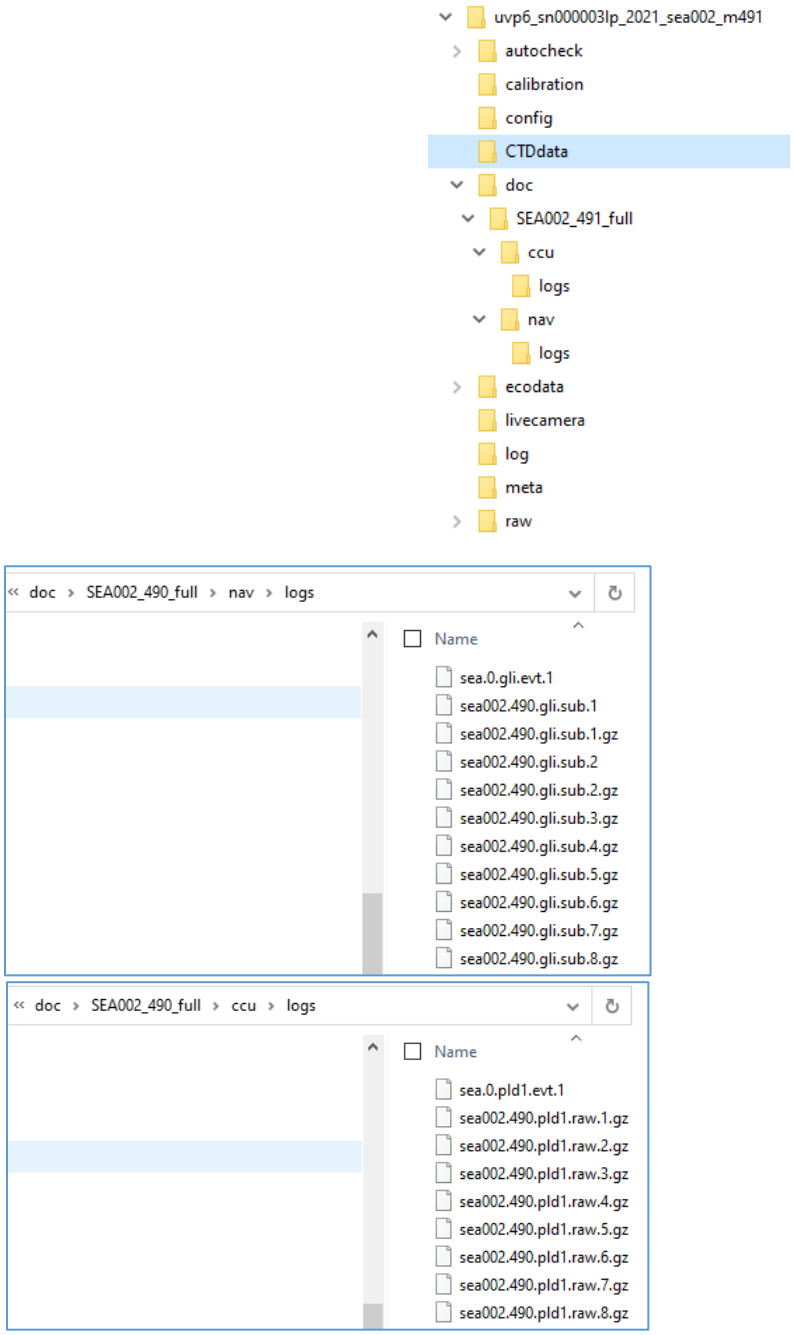
Depth slice	Images per bloc	UVP6 images bloc frequency	Background noise measurement interval	UVP6 config	Mean power consumption
0 – 150m	1 image/bloc	2Hz	1 black every 10	ACQ_ALS_002L	0.8W
>150m	1 image/bloc	0.2Hz	1 black every 50	ACQ_ALS_052L	0.14W

4.3.1.3 Project tips for Seaexplorer glider datasets

It is recommended to create the project using the following naming convention: **uvp6_snxxxxxxlp-YYYY_seaNNN_mKKK_cruise** where xxxxxx is the UVP6 serial number, NNN is the SeaExplorer serial number and KKK is the glider deployment reference. The cruise acronym is optional but recommended.

This naming convention and folder arrangement is mandatory to run the Matlab tools and rapidly create the samples for UVPapp. Users can anyhow do all operations manually using UVPapp.

The glider downloaded data will be placed in the doc folder of the project following structure to allow the Matlab tool to prepare the data. The navigation and science data (gz files) will be placed in the logs folders (*gli.sub* in ccu/logs and *pld*raw* in ccu/logs).



4.3.1.4 Samples metadata standards

For data quality the samples metadata must follow those standards:

- Sample id = Yo_####n_missionID with #### for the number of the yo using 4 digits, n is ‘a’ or ‘d’ for ascent or descent and missionID the unique mission identifier, with the glider id if necessary.
- Station id = empty = “”
- ARGO sample id = name of the corresponding metadata glider file.

4.3.1.5 UVP6 data cleaning

All downloaded sequences recorded prior to the first glider dive must be removed from the raw folder (check the content of their *_data.txt files and the presence of an images.zip archive.

4.3.2 Using the UVP6LP on a Seaglider glider managed by the CSCS company

There is no on-the-shelf possible usage of the UVP6 on the Seaglider. Contact CSCS company.

4.4 Using the **UVP6LP** on a mooring/lander

The UVP6 LP is suitable for this type of deployments thanks to its possibility to adjust the mean power using the acquisition rate.

The short deployments (up to one month according to the image rate) can be done using the optional 75 Wh battery or a larger battery (Contact Hydroptic for battery recommendations).

The instrument will usually be installed with its camera in horizontal position or facing down to avoid the deposit of particles on its porthole and image blurring. The light must be set on top to also avoid any deposit on its active surface.

There are so many possibilities of installation of the UVP on so many different platforms that they cannot be described in this guide. Please refer to the UVP6 frame annexe and/or contact Hydroptic.

Two operation modes can be utilised when the UVP6 cannot be piloted by the platform.

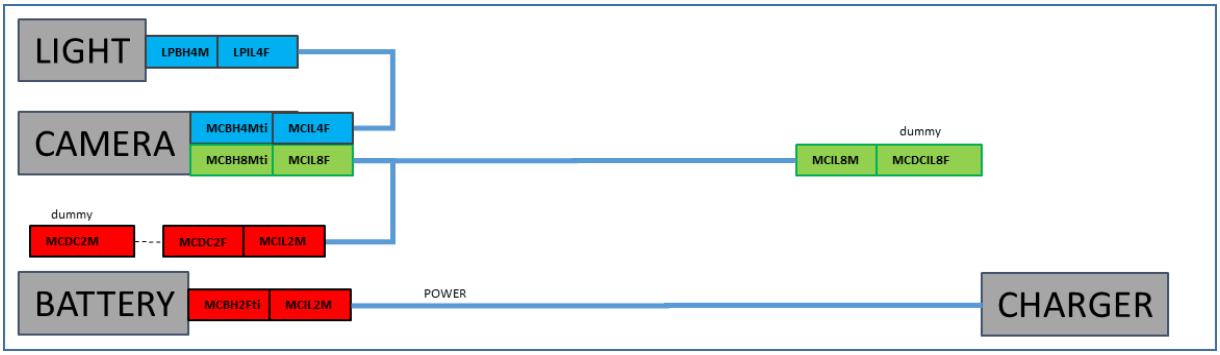
The AUTO mode will permit acquiring data continuously using a unique set of parameters and adjusting the frequency to manage the autonomy of the battery. The TIME mode permits to change the configuration of the image acquisition and process according to time and optimise the use of the battery resources by adjusting the frequency for the period of time. We do recommend using TIME mode.

We do recommend to use the TIME mode as it creates successive sequences in the memory instead of a unique huge sequence.

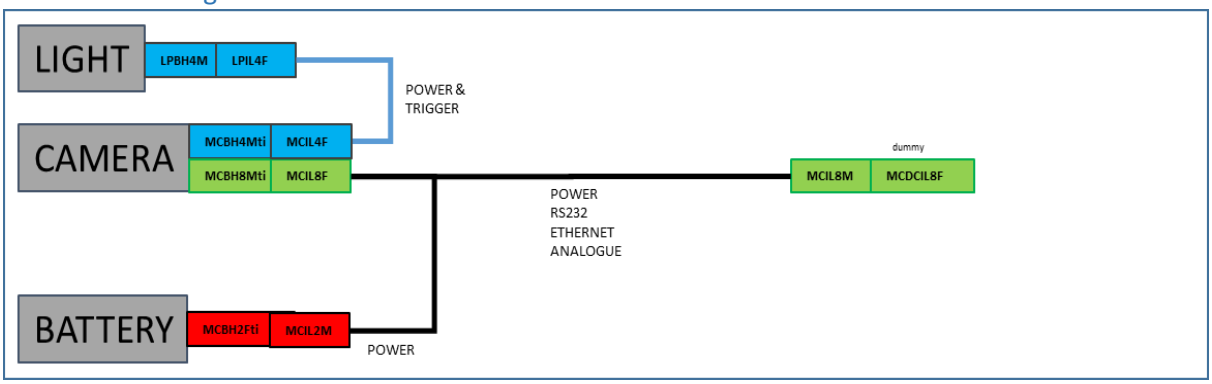
4.4.1 UVP6 cabling

These schematics apply only for the optional battery and cable provided by Hydroptic.

4.4.1.1 Battery charge



4.4.1.2 Running the UVP6



4.4.2 Programming the UVP6 in AUTO mode

Check the related chapter in the CTD section of the manual both for the cabling and the programming.

4.4.3 Programming the UVP6 in TIME mode

The Time programming is highly recommended to secure the acquisition reset at given intervals and optimize the battery usage. The acquisition will then start at the first programmed time following the deployment. As for most programming modes, the instrument will flash 3 times when powered and then sleep till it starts acquisition.

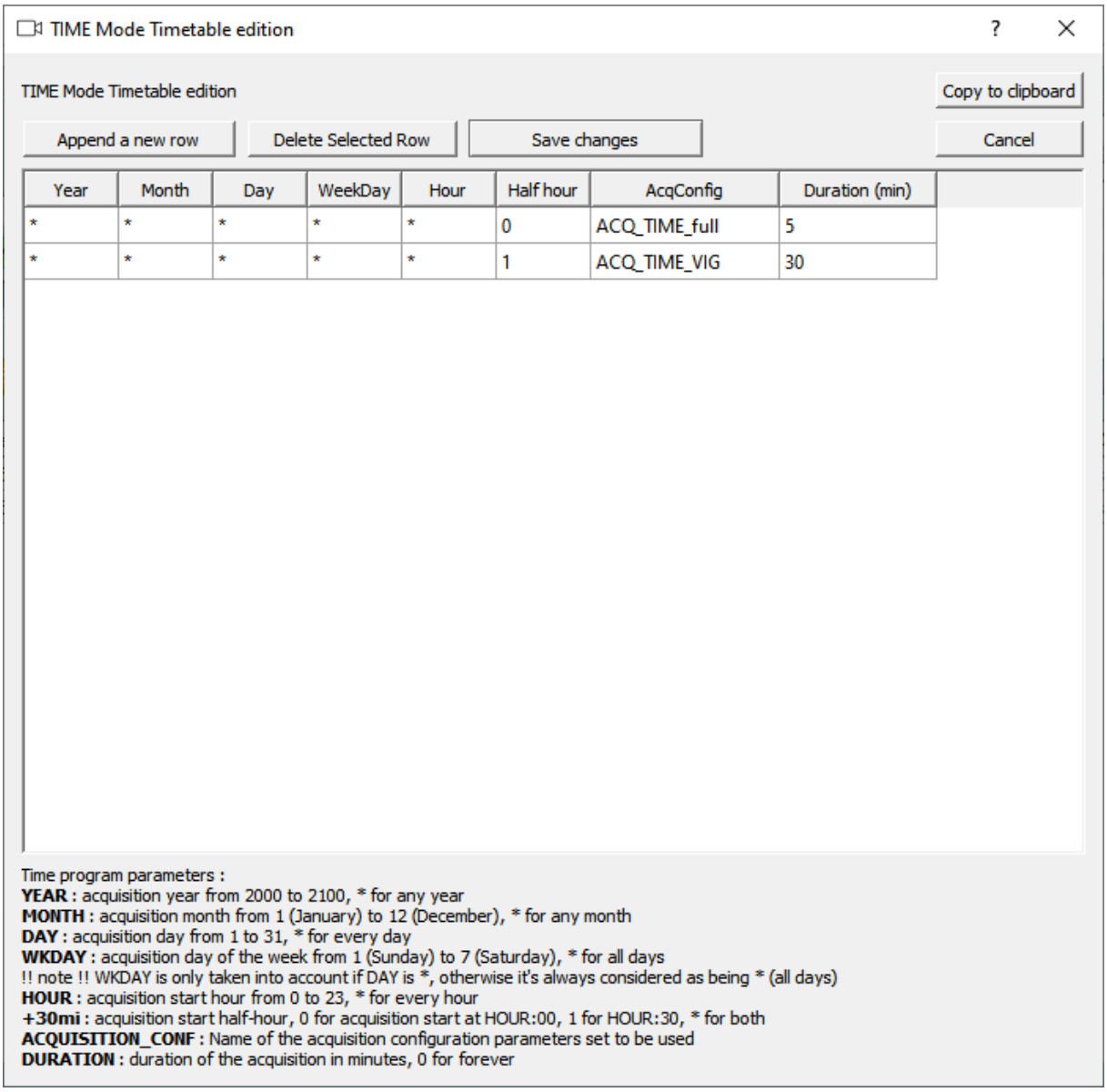
The time mode allows you to program up to 10 acquisition files for an infinite period of time. The minimum interval to change settings is 30 minutes allowing a very high flexibility in the programming.

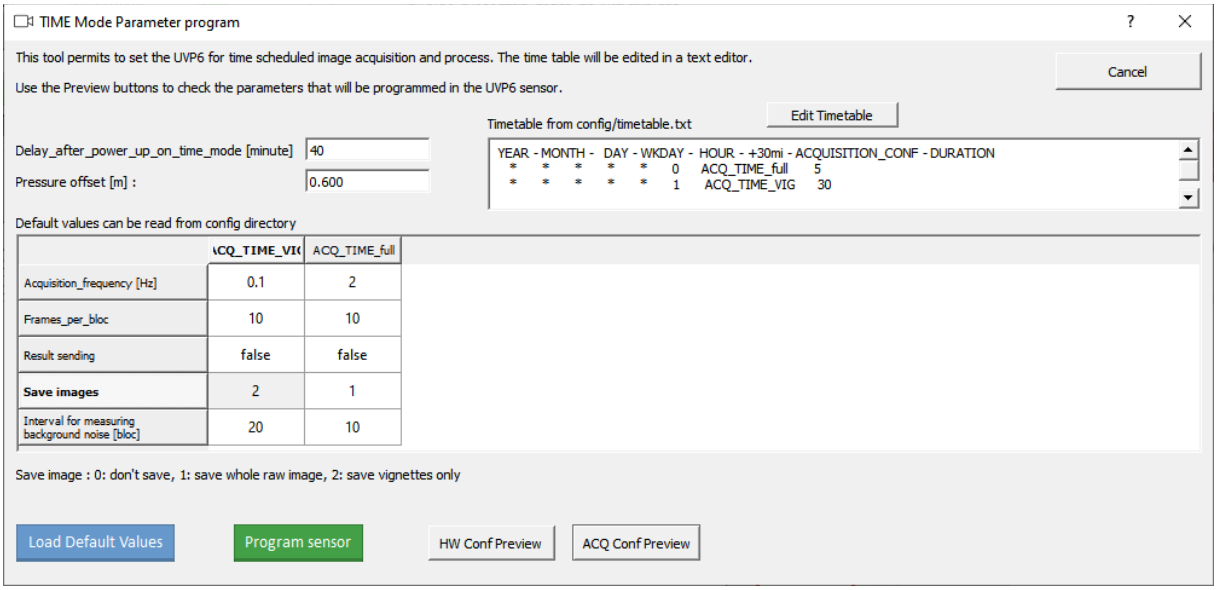
The interface allows you to first set a timetable specifying the acquisition methods (AcqConfig) and their duration and then set some essential parameters for each of them.

The instrument checks the timetable every 30 minutes during one minute to detect if there is an acquisition to start, meaning that two acquisitions must not overlap. If two acquisitions are slated for the same time or if the first one is not finished, the second will be ignored.

It is recommended to test the programming on the instrument prior to deployment to be sure that it will work according to your desire by starting acquisition for a period of time covering the timetable settings and then downloading the data.

The acquisition will not stop until the specified duration of each sequence is achieved and thus not check nor run the next programmed sequences. Be thus careful when setting this duration parameter.


TIME Mode Timetable edition
TIME Mode Timetable edition
Copy to clipboard
Append a new row
Delete Selected Row
Save changes
Cancel
Year Month Day WeekDay Hour Half hour AcqConfig Duration (min)
* * * * * 0 ACQ_TIME_full 5
* * * * * 1 ACQ_TIME_VIG 30
Time program parameters :
YEAR : acquisition year from 2000 to 2100, * for any year
MONTH : acquisition month from 1 (January) to 12 (December), * for any month
DAY : acquisition day from 1 to 31, * for every day
WKDAY : acquisition day of the week from 1 (Sunday) to 7 (Saturday), * for all days
!! note !! WKDAY is only taken into account if DAY is *, otherwise it's always considered as being * (all days)
HOUR : acquisition start hour from 0 to 23, * for every hour
+30mi : acquisition start half-hour, 0 for acquisition start at HOUR:00, 1 for HOUR:30, * for both
ACQUISITION_CONF : Name of the acquisition configuration parameters set to be used
DURATION : duration of the acquisition in minutes, 0 for forever

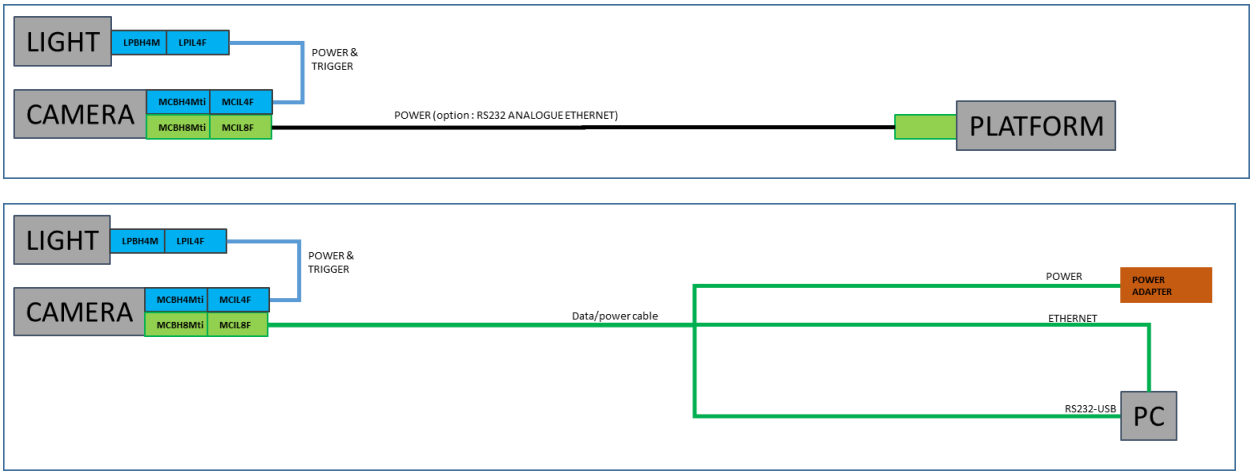

TIME Mode Parameter program
This tool permits to set the UVP6 for time scheduled image acquisition and process. The time table will be edited in a text editor.
Use the Preview buttons to check the parameters that will be programmed in the UVP6 sensor.
Cancel
Edit Timetable
Timetable from config/timetable.txt
Delay_after_power_up_on_time_mode [minute] 40
Pressure offset [m] : 0.600
YEAR - MONTH - DAY - WKDAY - HOUR - +30mi - ACQUISITION_CONF - DURATION
* * * * * 0 ACQ_TIME_full 5
* * * * * 1 ACQ_TIME_VIG 30
Default values can be read from config directory
ACQ_TIME_full
Acquisition_frequency [Hz] 0.1 2
Frames_per_bloc 10 10
Result sending false false
Save images 2 1
Interval for measuring background noise [bloc] 20 10
Save image : 0: don't save, 1: save whole raw image, 2: save vignettes only
Load Default Values
Program sensor
HW Conf Preview
ACQ Conf Preview

If you recover an instrument after a long deployment, be very careful about the downloading procedure and refer to the warning about the mass memory of the instrument at the beginning of this manual.

4.5 Using the UVP6 as a remote camera

If connected to shore via an RS232 and Ethernet connection, the UVP6 can be manually either piloted using the RS232 commands or the UVPapp application and pre-set using the AUTO or the SUPERVISED modes.

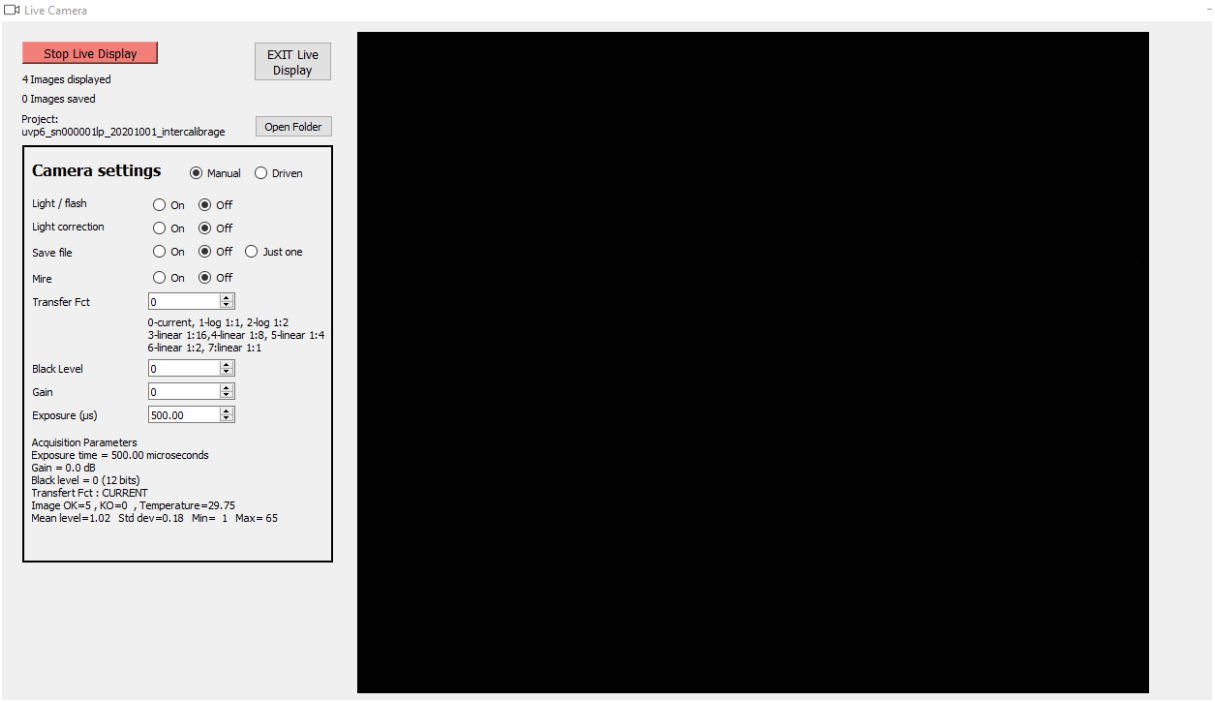
4.5.1 Cabling



4.5.2 UVP6 running in Livecamera mode

The instrument can also be utilised using the LIVECAMERA mode to record the images on the piloting computer. In that later case, users must be aware that the acquisition settings are not controlled and no tool is provided for the image analysis. We thus recommend using the remote connection to control the instrument using one of the programming modes and download the data and images at regular intervals.

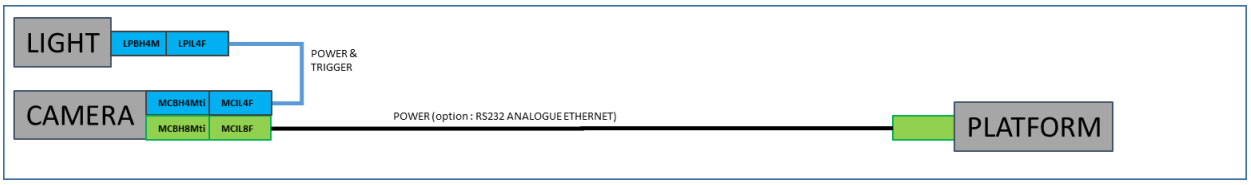
The live camera tool allows the use of the UVP6 sensor as a remote camera and the storage of the images in the project in real time using the Ethernet link.



4.6 Using the UVP6 on smart platforms (SUPERVISED mode)

A smart platform is capable of communicating with the UVP6 using the RS232 serial interface. There are many possibilities of piloting and users should contact Hydroptic to select the more suitable configurations for their platform. Gliders and profiling floats are examples of smart platforms (see dedicated chapters).

4.6.1 Cabling

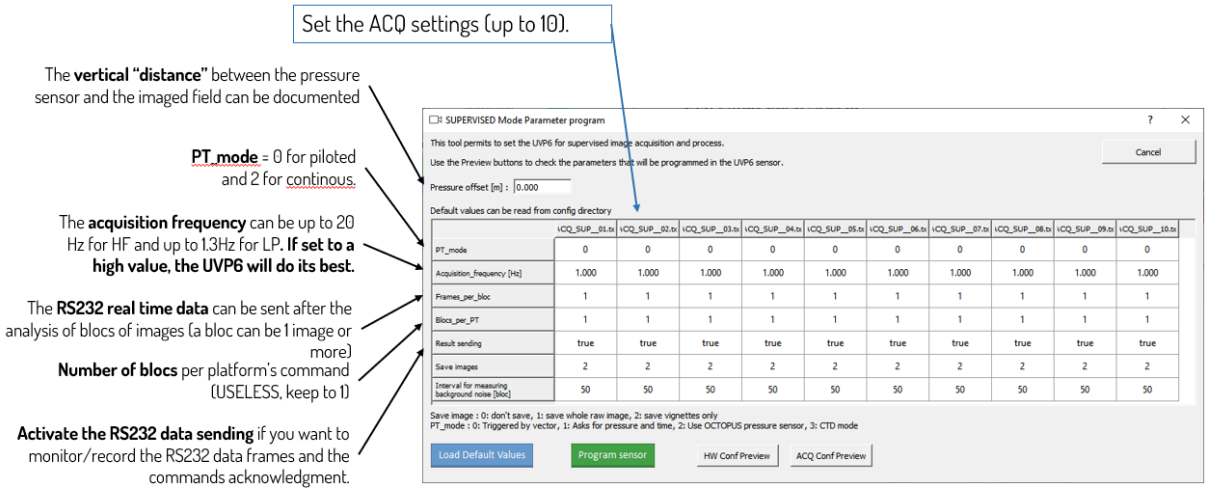


4.6.2 Programming the UVP6 in SUPERVISED mode

The tool permits to set 10 sets of parameters and save them in the UVP6. The user will then start acquisition, sending a RS232 start message which selects one of the pre-set lists and stop it at the end of the sequence using a stop message (see RS232 messages in the annexe).

This mode opens many possibilities of usages of the UVP6 and is reserved to experts even if we limited the adjustable settings in the 10 sets of parameters. The only general parameters that can be changed is the Pressure offset being the vertical distance between the pressure sensor (when available) and the imaged area. The acquisition settings that can be changed are :

The useful RS232 commands are described in the RS232 section of this guide. **An even more detailed reference manual can also be provided on demand to detail the UVP6 piloting in SUPERVISED mode and the management of the data transmitted by the UVP6 in real time.**

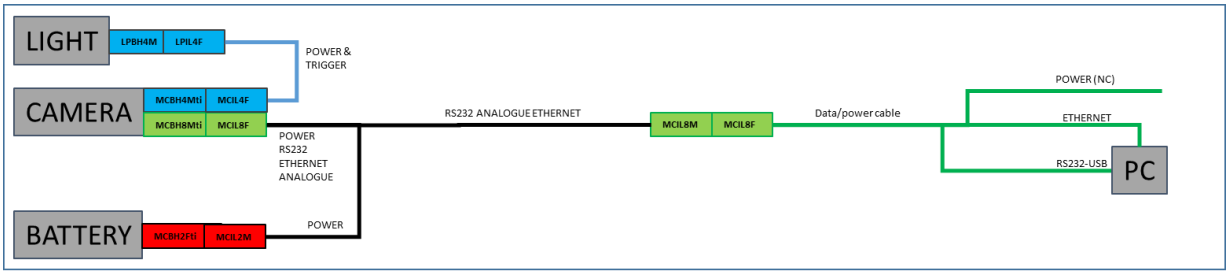


4.7 UVP6 parameterization (piloting) and data download

4.7.1 Cabling

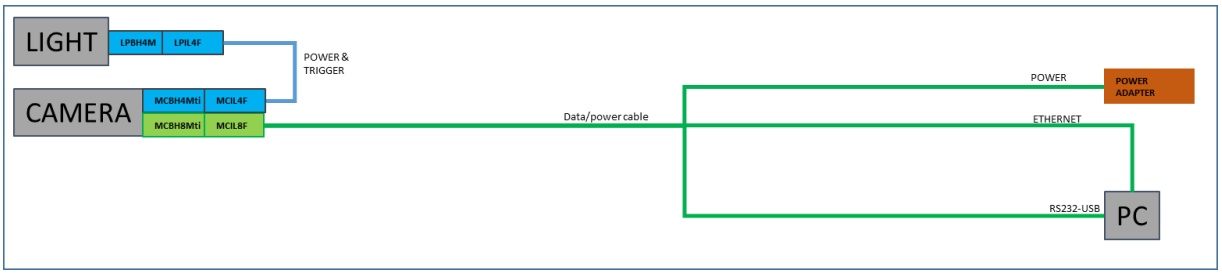
The data download or instrument parameterization requires the connection to a personal computer via the RS232 serial link and an Ethernet connection (for data download). The power will be provided either by the UVP6 battery or from the AC adapter provided with the data cable.

4.7.2 Using the battery

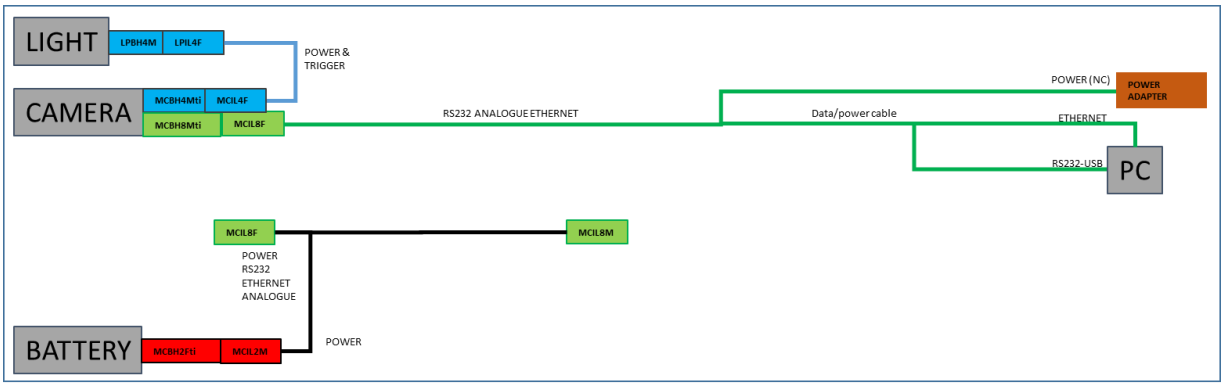


4.7.3 Using the AC power

No battery installed



A battery is installed and not utilized for data download or programming. Do not use the Y battery cable if using the AC power as the battery power will be utilized.



5 UVPapp general information

Go to the HELP menu and configure you connexion to the UVP6 first (see below).

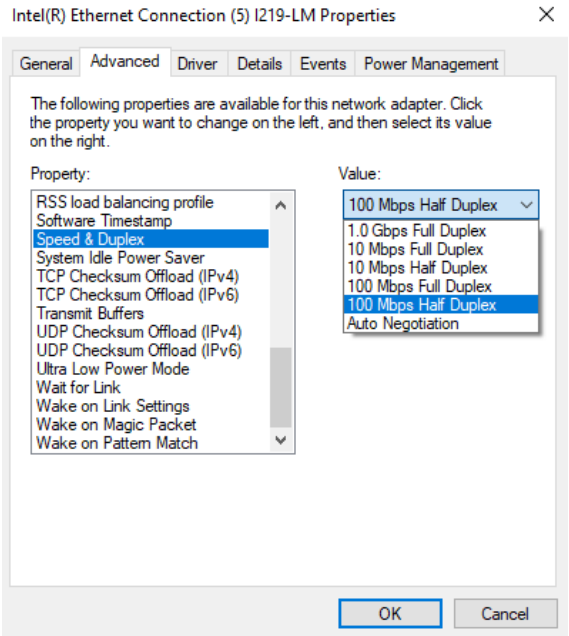
5.1 Computer configuration

UVPapp runs ONLY on Windows 10 and 11 operating systems.

The PC firewall must allow UVPapp to communicate via the Ethernet. In case of doubt, just disable the firewall.

The Ethernet link of the UVP6HF is sensitive:

- Adding an Ethernet switch between the PC and the UVP6 data cable does facilitate the Ethernet communication of UVP6HF when cabled with the Y battery cable.
- See the UVPapp IP address configuration chapter to set your PC
- In case of Ethernet communication issue, it is suggested to try to set the Ethernet as below to force the Speed & Duplex to 100 Mbps Half Duplex :



5.2 Link with EcoPART and EcoTAXA

The UVPapp is designed to pilot the sensor and to prepare and process the data to be later imported in the EcoPART application for Particulate data access and in EcoTAXA for image off-line classification.

https://EcoTAXA.obs-vlfr.fr/

https://EcoTAXA.obs-vlfr.fr/part/

5.3 Versioning and resources

This section applies to version 2.00 and above of UVPapp2. The application is regularly improved, some changes may occur in the different screens and some new tools may be implemented.

Any comments about the use of the application or ideas for improvement are welcome. Please send them to:

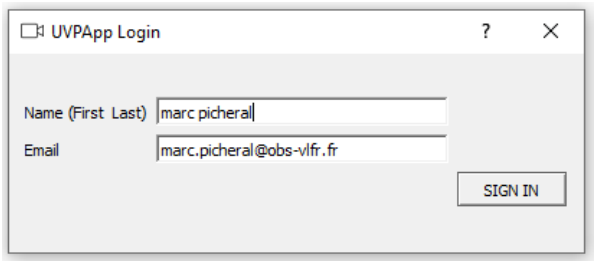
marc.picheral@imev-mer.fr

camille.catalano@imev-mer.fr

sylvain.fevre@hydroptic.com

5.4 Login

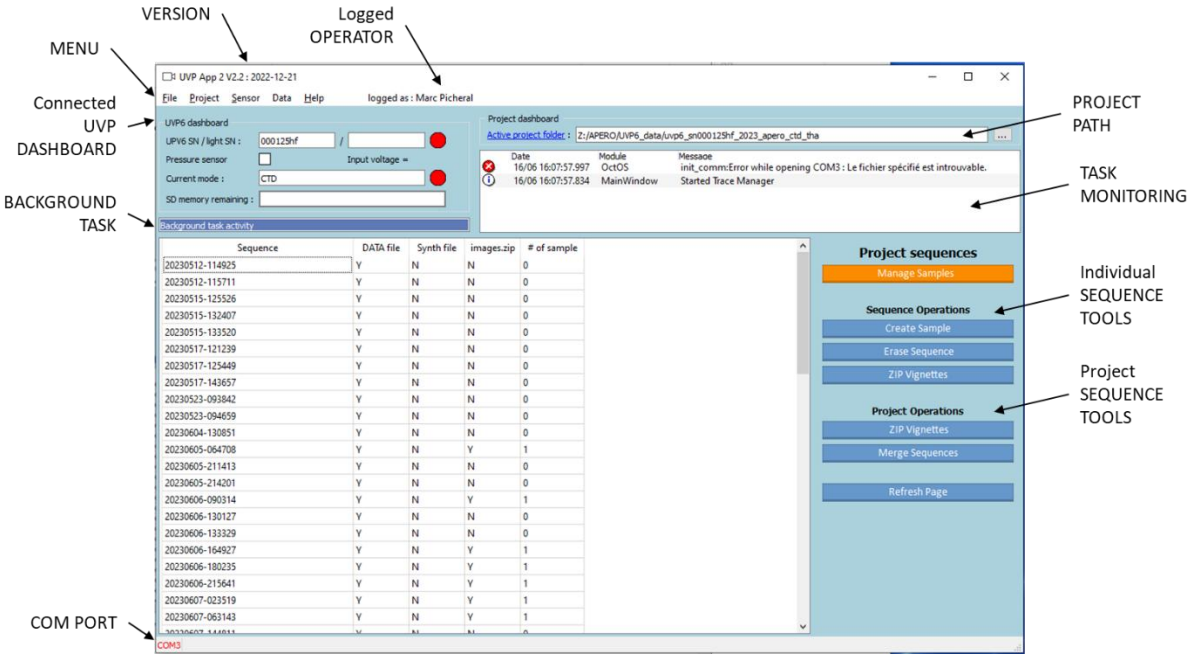
There is no login protection in UVPapp but it is highly recommended to log in using your personal name and email. This information will be stored in the instrument when programming and in the datasets for the traceability of the different operations.



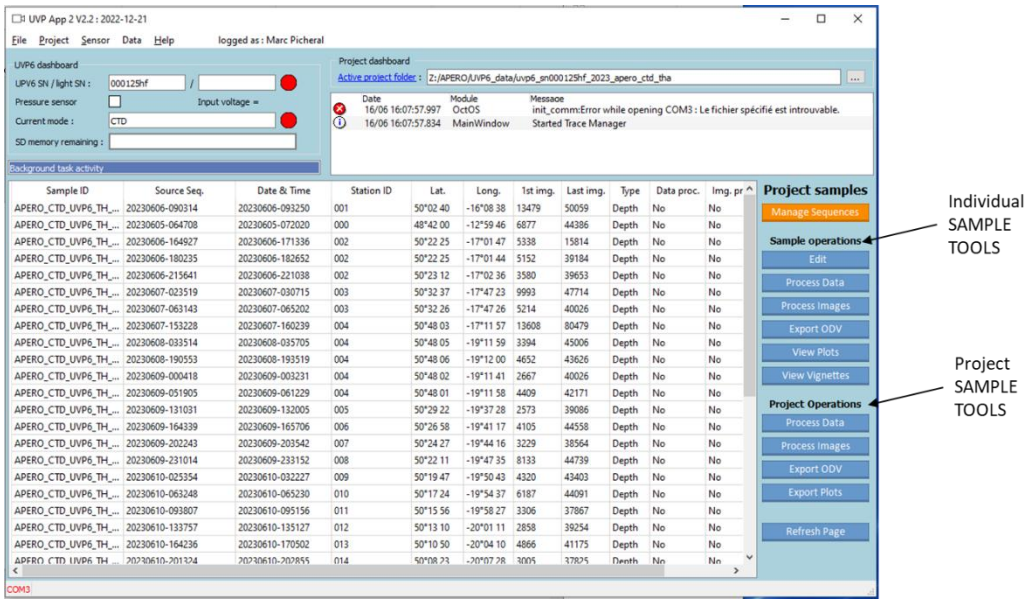
5.5 Main page description

The main page contains different sections plus a main area displaying either Sequence or Sample information and tools.

5.5.1 Sequence area displayed



5.5.2 Sample area displayed

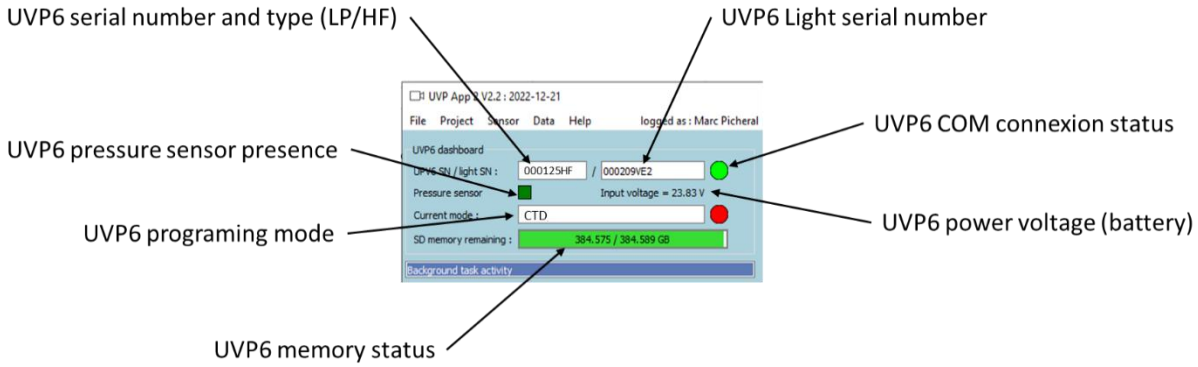


5.5.3 UVP6 dashboard

The sensor dashboard indicates the information of the connected sensor if a sensor is connected, or the information of the sensor defined for a project when a project is selected, and no sensor connected.

It also indicates the remaining memory in the instrument which should be monitored between deployments.

If a sensor is connected and powered and its information not displayed, try the “Connect to sensor” tool in the *Sensor* menu to get the information from the sensor.



5.5.3.1 Battery voltage value

Once the sensor is connected, it becomes possible to check the battery voltage. However, it's important to note that the value displayed on the dashboard might not be dynamically updated. The initially displayed value corresponds to the voltage reading taken at the start of the processing unit when the connection was first established.

To update the voltage value, initiate a reboot command from the sensor menu, followed by a connect sensor command. For UVP6 HF, consider adding 0.2V to the displayed value, and potentially more if using an extended data/Octopus cable.

5.5.4 Background task monitoring

The bottom window of the *UVP6 dashboard* indicates the background task activity of the application (data download, data processing, image processing…). The application cannot be stopped when tasks are pending. See the File menu to ask to quit at the end of the on-going task without waiting for the completion of a list of tasks.

5.5.5 Project dashboard

The *project dashboard* indicates the path of the active project and enables one to open one in Windows Explorer.

5.5.6 Activity dashboard

The time, the date and the description of all on-going actions by the application is described in this board.

5.5.7 Sample/Sequence management

The *Sequences management area* provides information on the downloaded sequences of the selected project and access to dedicated sequence tools.

The *Samples management board* indicates the metadata of all created samples (from project sequences). It allows editing the metadata of the samples and deleting them and gives access to the dedicated sample tools.

Switching between those two boards is made with the *Manage Sequences*/*Manage Samples* button.

5.5.7.1 Sequences processing tools

The *Sequences management board* displays the list of project sequences and a list of buttons: the dedicated sequences tools.

With these tools it is possible to:

- Create samples from the sequences : double click on a sequence to open the create-sample tool
- ZIP vignettes if not done during download (essential for images process)
- Erase sequence (quasi empty sequences are often created when an instrument set in AUTO mode is powered ON before being connected to UVPapp for data download)
- Merge sequences

5.5.7.2 Samples processing tools

The *Samples management board* displays the list of created samples and a list of buttons: the dedicated samples tools.

With these tools it is possible to:

- Process the data and images of one or all project samples, generating the files in the ECODATA folder of the projects. These files will later be imported in EcoPART and in EcoTAXA for image classification
- Show the vignettes of the sample
- Make profile plots
- Export to ODV format

Note : depending on the version of UVPapp, the position of the vignettes from the original UVP6 acquired image is indicated in the TSV file of the “sample_images.zip” archive of the ecodata folder

which permits to “re-construct” partially the original image in case of over-segmentation of transparent objects. The field names are “object_vig_left_position” and “object_vig_top_position” for the top left corners of the vignettes.

5.5.7.3 Create-sample tool

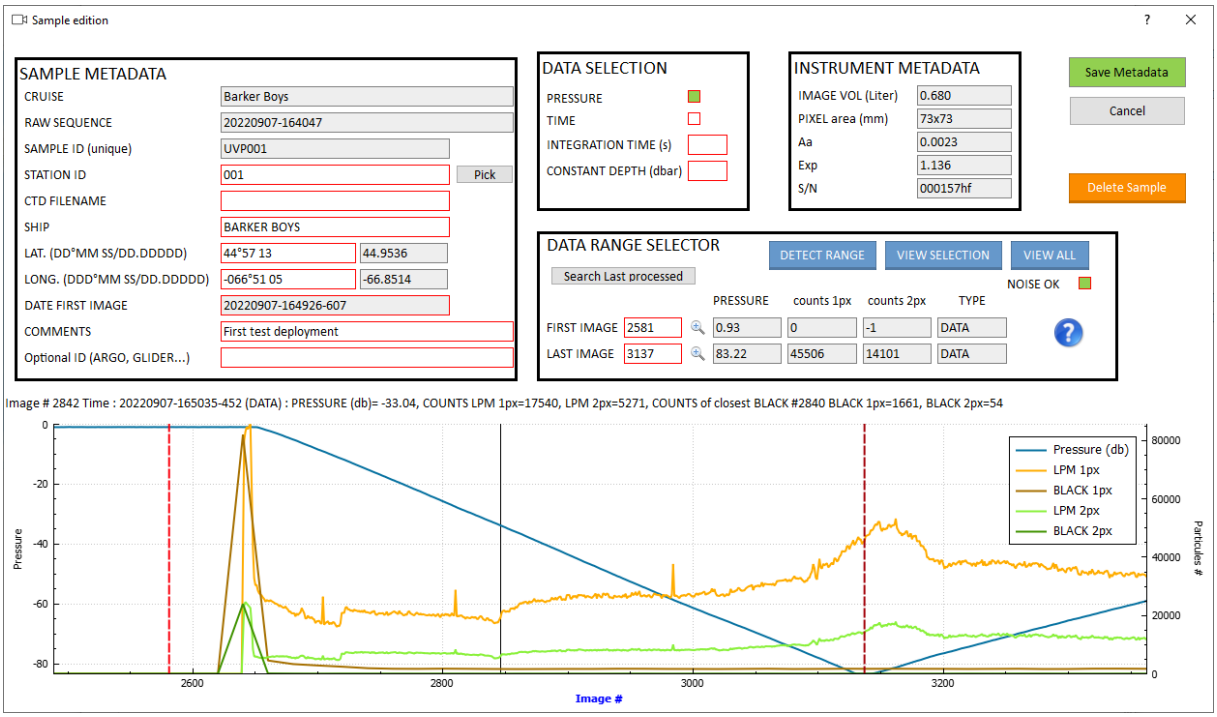
This tool allows creating one or more samples (profiles or time series) from a sequence of data downloaded from the sensor or merged from the downloaded sequences. A graphical interface separated in different sections permits to:

- Fill in SAMPLE METADATA : the operator will carefully fill in the different fields taking care of the sample naming to allow an easy later management of the resulting files
- Select options for DATA SELECTION : the operator will define the type of dataset between TIME and DEPTH options. In case of Depth profile, the data integration level will be automatically set to 1 decibar while the value can be set for Time samples. In that later case, the mean pressure of the sample can be manually entered in case the sensor was not fitted with a pressure sensor.
- Check INSTRUMENT METADATA
- Select the DATA RANGE : the data range will be manually defined with the help of the graphical interface or trying the available tools (blue buttons). Dash lines indicate the beginning and the end of the data sample for a profile. The first and last images numbers can also be adjusted by hand. You can zoom on axes and move the cursors to shift the scales. The user must keep data of the chosen depth range and when the black data are constant meaning that they are not influenced by the sun at the surface.

Once saved, the sample will appear in the sample management window of the application.

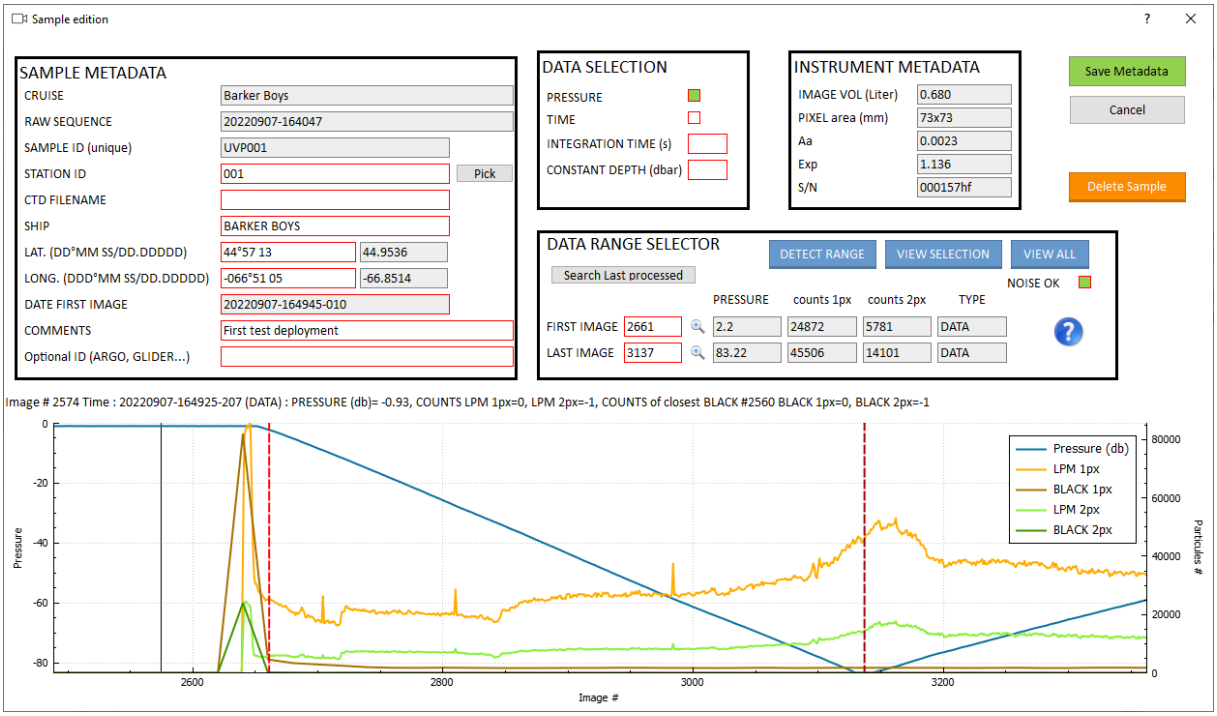
5.5.7.3.1 Case 1 : **wrong** first image selection

The first image is defined before the BLACK 2px signal becomes flat thus including corrupted data at the start of the sample. It is also set before the descent starts.



5.5.7.3.2 Case 2 : **good** first image selection

The first image is defined after the BLACK 2px signal becomes flat (no influence of the sunlight) and after the descent starts.



5.6 UVPapp menus

5.6.1 File drop-down menu

The *File menu* allows to open an existing project but also to ask the application to stop and exit at the end of the task being processed when a list of tasks is pending.

If a sensor is connected, the user can select only projects related to the same serial number.

5.6.2 Project drop-down menu

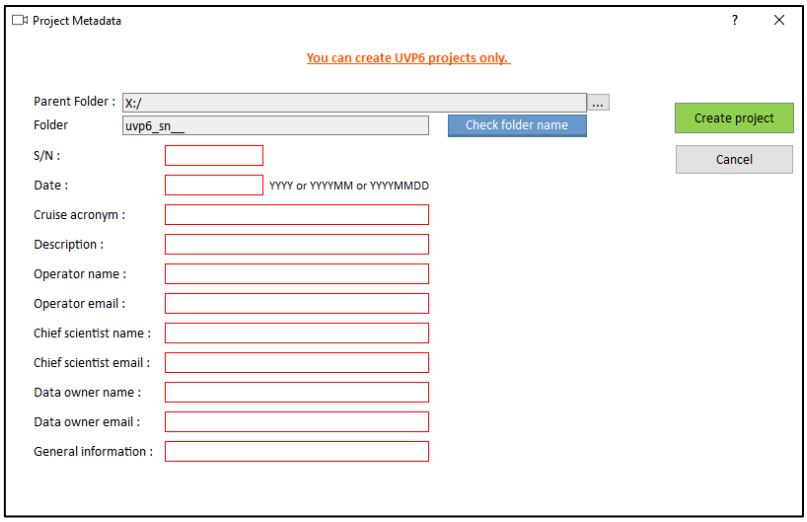
5.6.2.1 Create new project

5.6.2.2 Project metadata settings

This page enables the creation of a new project. It is important to carefully fill in all the information which will follow the data in EcoPART and EcoTAXA. The instrument serial number will automatically be filled if a UVP6 is connected to UVPapp.

The project name cannot be modified via the application. The default name is a standard for all UVP projects.

The project name must be unique; therefore, the date and the cruise acronym are used in the name of the project. **A Unique project name AND a unique cruise name are mandatory for quality of the data.**



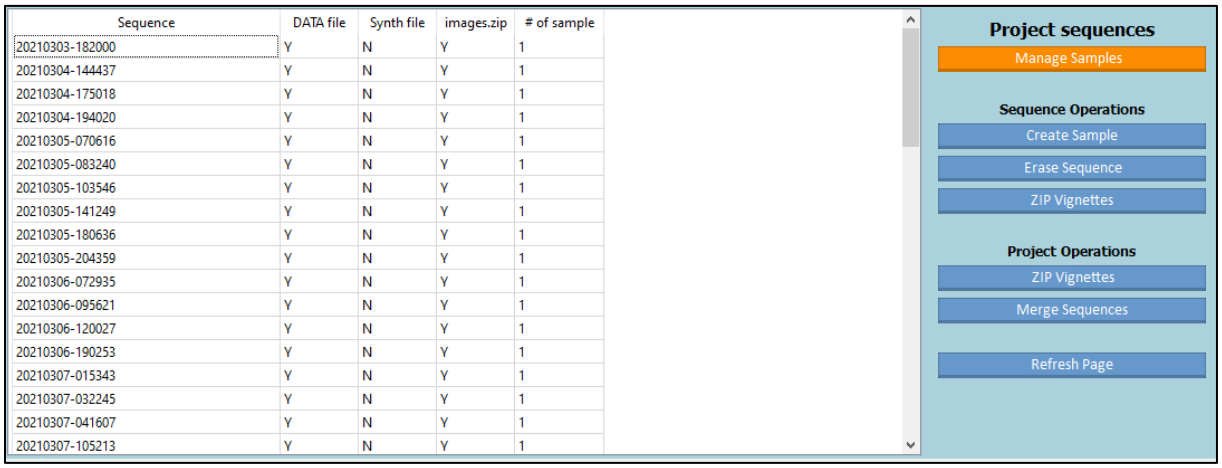
5.6.2.3 Project folders

UVPapp will create the project folder which contains the following subfolders as a minimum:

- calibration : users can store here the instrument calibration reports
- config : contains the acquisition and hardware settings downloaded from the sensor and the archives of the previous programming. This folder is checked at every connection to the sensor to check the consistency with the sensor internal settings.
- CTDdata : a folder where users can place the data downloaded from the CTD which may be associated with the UVP6 in the same frame. The filename of the CTD data can be documented in the sample metadata form.
- doc : users can store any document related to the project (cruise plans, scans…)
- ecodata : the folder will contain the particle and image archives of each sample to be imported in EcoTAXA
- log : the sample may contain logs of the application tasks
- meta : contains the table of metadata of the samples
- raw : the folder contains the sequences downloaded from the instrument or, later, merged.
- results : the folder contains graphs and tables produced by the data processing

5.6.2.4 Manage downloaded sequences

It permits to display the *Sequences management area* with the list of project sequences and the associated tools.



The Data files and images.zip files should be set to Y when the files have successfully been downloaded from the instrument. The Synth files are usually set to N because they are not recorded by the UVP6. The # of the sample informs users about the number of samples which have been created from the sequence.

The ZIP vignettes tool is useful only for raw images downloaded apart from UVPapp.

5.6.2.5 Merge sequences

When acquired with different settings a same profile or time series is within multiple sequences. This tool allows an easy merging of these sequences to “merged” sequences from which samples will be easily created.

The merging must be done prior to the creation of the samples.

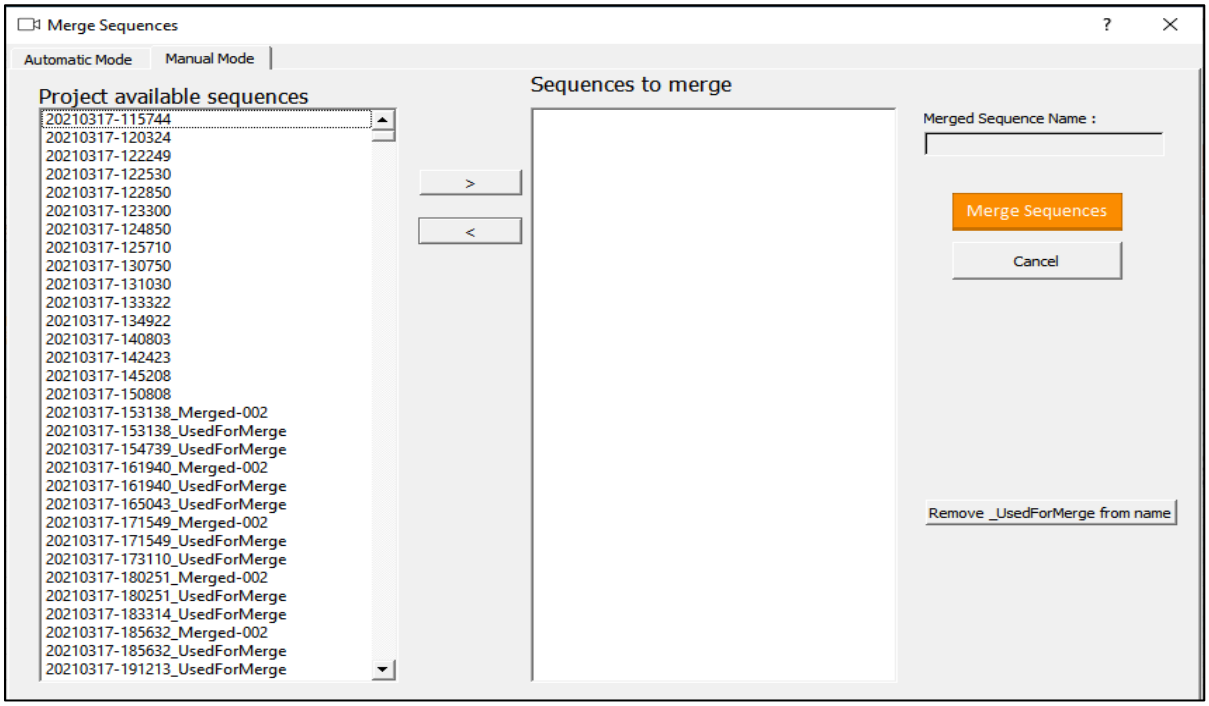
This tool is very efficient to process data recovered from float deployment, time series, glider sections…

It is recommended to back up the data prior merging them as there is no tool to automatically undo the merging of sequences.

The merge can be done manually or with the automatic tool.

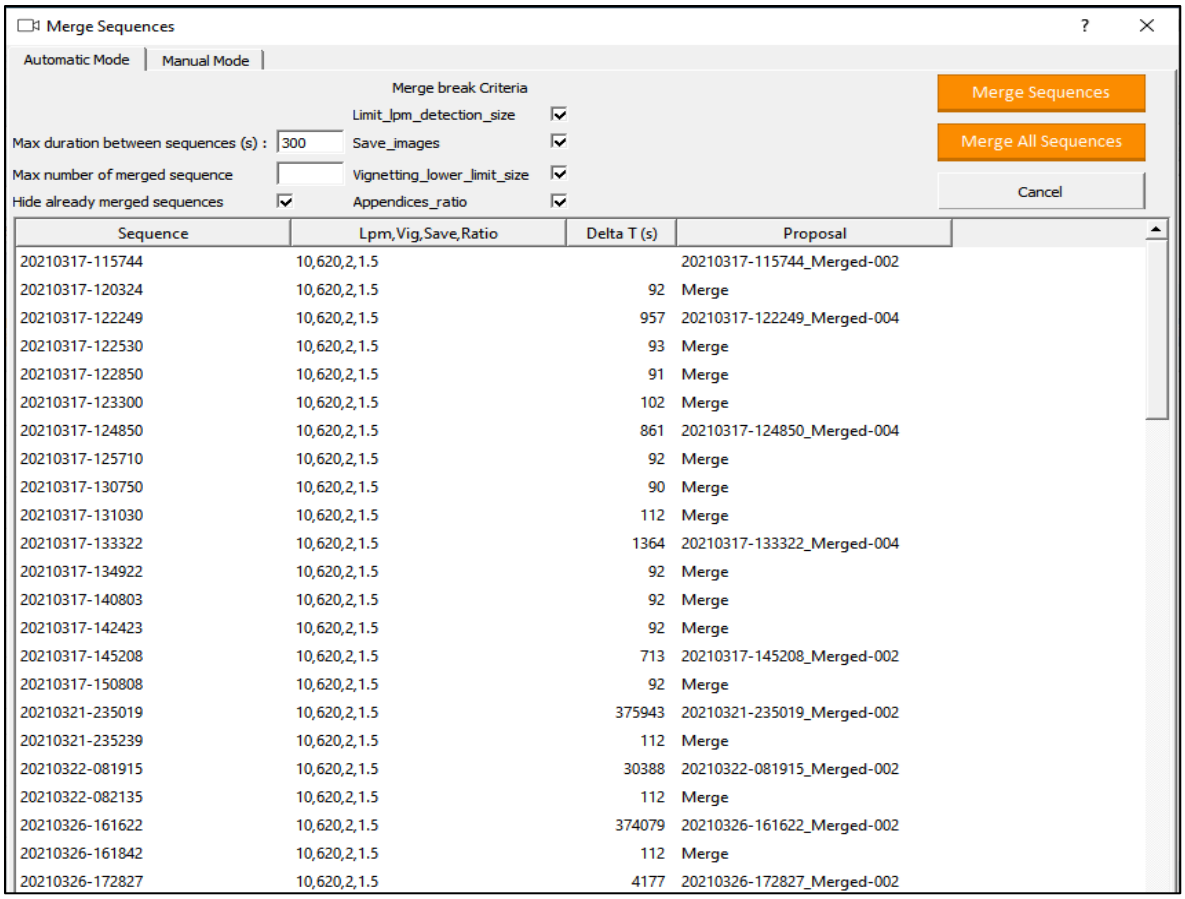
5.6.2.6 Manual merge

The manual merge permits to manually select the sequences to be merged.



5.6.2.7 Automatic merge

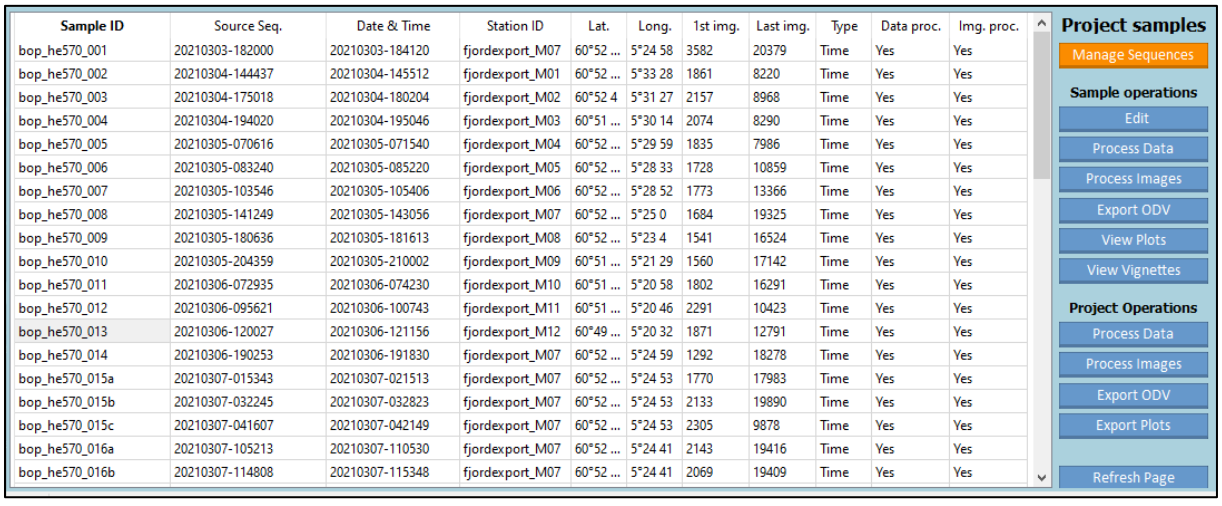
The automatic merging is very efficient to group many sequences into large ones. As there are infinite filtering options for merging, we recommend to 1) backup the data, 2) rename the raw folder to “raw_source”, 3) select the sequences to be merged and 4) move them into the raw folder.



5.6.2.8 Manage Sample

It allows displaying the *Sample management board* with the list of samples and the associated tools.

Many tools are available in right panel of the board. They are sorted in Per SAMPLE or per PROJECT operations to facilitate a global processing of the datasets.



The files issued from the Process Data and process Images tools are saved in the Ecodata folder of the project for later importation in EcoPART and EcoTAXA.

The files issued from the Export ODV and Export Plots are saved in the Results folder of the project. The ODV exports allows users to easily create text files to be imported in the Ocean Data View (ODV) free application (https://odv.awi.de).

5.6.2.9 Edit project metadata

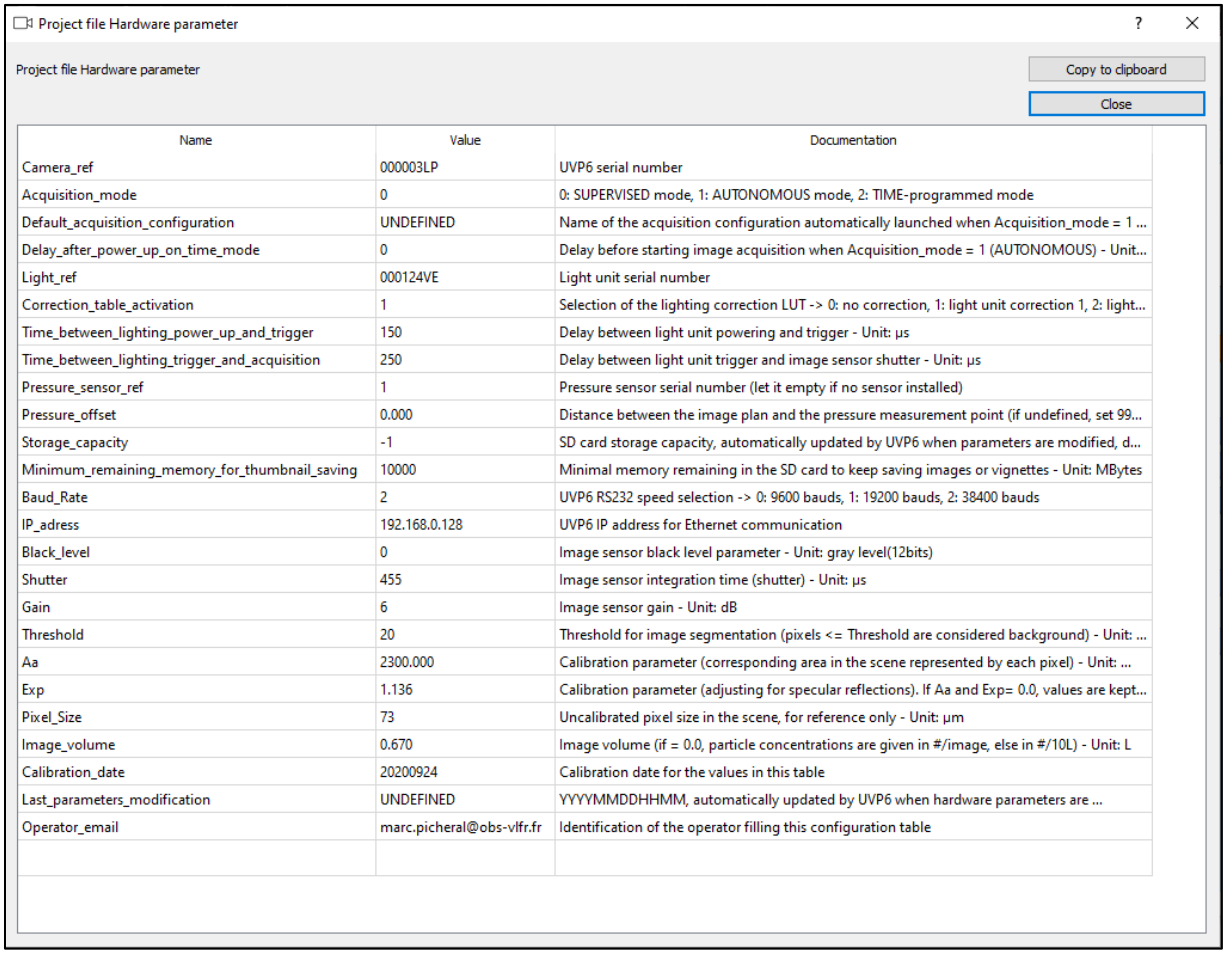
It gives access to the *project metadata window* and allows to fill or correct the missing information about the project.

5.6.2.10 View tools (Project)

The tools permit the visualisation of the instrument configuration, i.e., hardware, acquisition and time tables, from the project. It matches the files as they were stored in the instrument at the time of its latest connection.

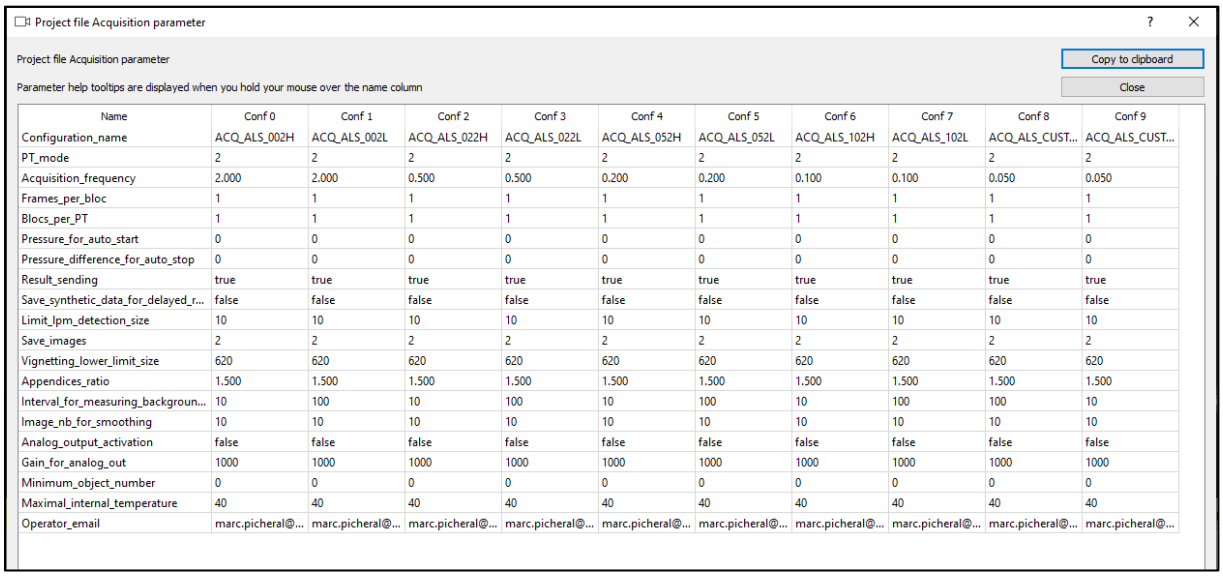
The tables contain the parameters names, its description and its values from the project.

5.6.2.11 Hardware table



Name	Value	Documentation
Camera_ref	000003LP	UVP6 serial number
Acquisition_mode	0	0: SUPERVISED mode, 1: AUTONOMOUS mode, 2: TIME-programmed mode
Default_acquisition_configuration	UNDEFINED	Name of the acquisition configuration automatically launched when Acquisition_mode = 1 ...
Delay_after_power_up_on_time_mode	0	Delay before starting image acquisition when Acquisition_mode = 1 (AUTONOMOUS) - Unit...
Light_ref	000124VE	Light unit serial number
Correction_table_activation	1	Selection of the lighting correction LUT -> 0: no correction, 1: light unit correction 1, 2: light...
Time_between_lighting_power_up_and_trigger	150	Delay between light unit powering and trigger - Unit: µs
Time_between_lighting_trigger_and_acquisition	250	Delay between light unit trigger and image sensor shutter - Unit: µs
Pressure_sensor_ref	1	Pressure sensor serial number (let it empty if no sensor installed)
Pressure_offset	0.000	Distance between the image plan and the pressure measurement point (if undefined, set 99...
Storage_capacity	-1	SD card storage capacity, automatically updated by UVP6 when parameters are modified, d...
Minimum_remaining_memory_for_thumbnail_saving	10000	Minimal memory remaining in the SD card to keep saving images or vignettes - Unit: MBytes
Baud_Rate	2	UVP6 RS232 speed selection -> 0: 9600 bauds, 1: 19200 bauds, 2: 38400 bauds
IP_adress	192.168.0.128	UVP6 IP address for Ethernet communication
Black_level	0	Image sensor black level parameter - Unit: gray level(12bits)
Shutter	455	Image sensor integration time (shutter) - Unit: µs
Gain	6	Image sensor gain - Unit: dB
Threshold	20	Threshold for image segmentation (pixels <= Threshold are considered background) - Unit: ...
Aa	2300.000	Calibration parameter (corresponding area in the scene represented by each pixel) - Unit: ...
Exp	1.136	Calibration parameter (adjusting for specular reflections). If Aa and Exp= 0.0, values are kept...
Pixel_Size	73	Uncalibrated pixel size in the scene, for reference only - Unit: µm
Image_volume	0.670	Image volume (if = 0.0, particle concentrations are given in #/image, else in #/10L) - Unit: L
Calibration_date	20200924	Calibration date for the values in this table
Last_parameters_modification	UNDEFINED	YYYYMMDDHHMM, automatically updated by UVP6 when hardware parameters are ...
Operator_email	marc.picheral@obs-vlfr.fr	Identification of the operator filling this configuration table

5.6.2.12 Acquisition tables



Project file Acquisition parameter

Project file Acquisition parameter

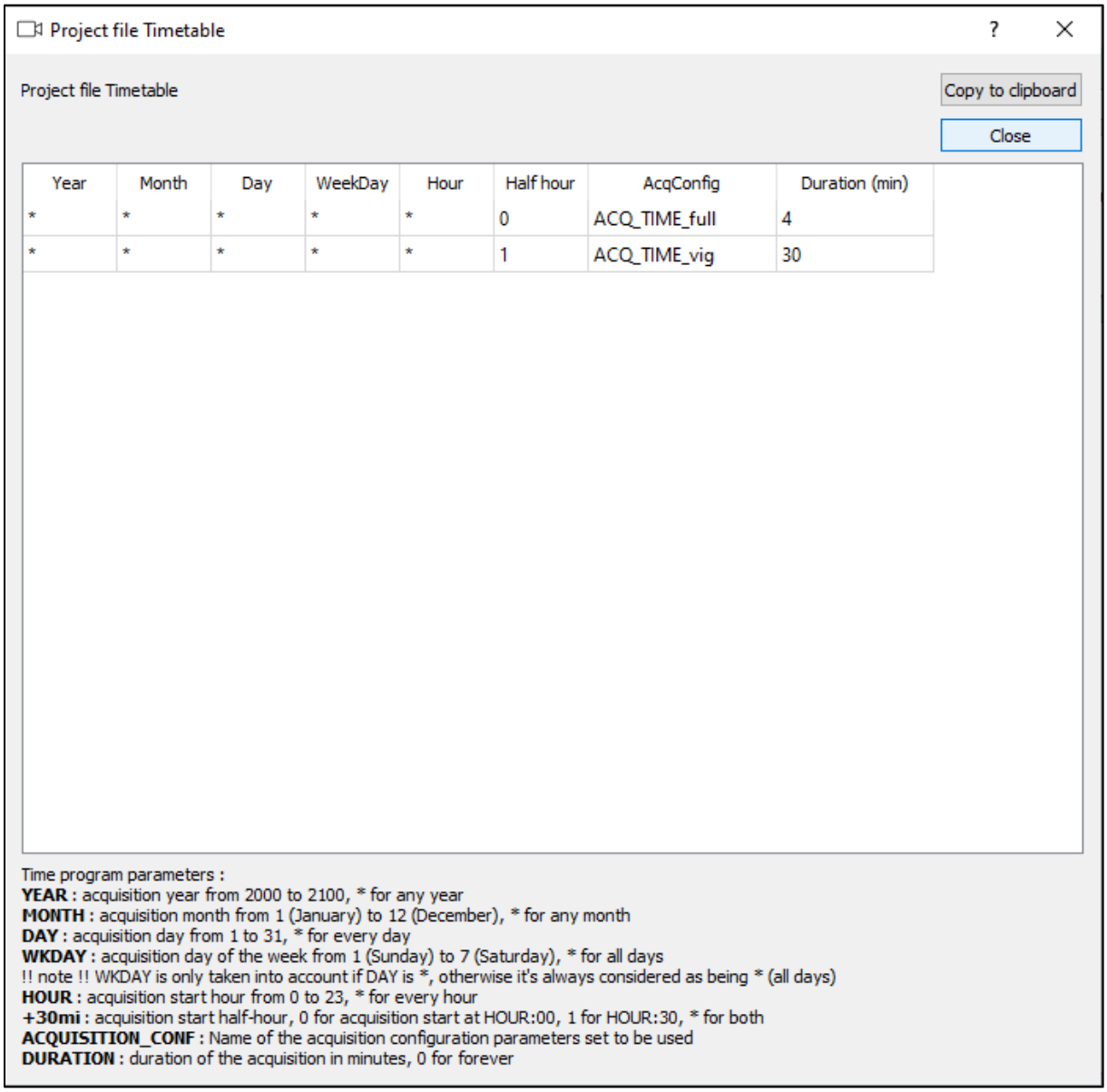
Copy to clipboard

Parameter help tooltips are displayed when you hold your mouse over the name column

Close

Name	Conf 0	Conf 1	Conf 2	Conf 3	Conf 4	Conf 5	Conf 6	Conf 7	Conf 8	Conf 9
Configuration_name	ACQ_ALS_002H	ACQ_ALS_002L	ACQ_ALS_022H	ACQ_ALS_022L	ACQ_ALS_052H	ACQ_ALS_052L	ACQ_ALS_102H	ACQ_ALS_102L	ACQ_ALS_CUST...	ACQ_ALS_CUST...
PT_mode	2	2	2	2	2	2	2	2	2	2
Acquisition_frequency	2.000	2.000	0.500	0.500	0.200	0.200	0.100	0.100	0.050	0.050
Frames_per_bloc	1	1	1	1	1	1	1	1	1	1
Blocs_per_PT	1	1	1	1	1	1	1	1	1	1
Pressure_for_auto_start	0	0	0	0	0	0	0	0	0	0
Pressure_difference_for_auto_stop	0	0	0	0	0	0	0	0	0	0
Result_sending	true	true	true	true	true	true	true	true	true	true
Save_synthetic_data_for_delayed_r...	false	false	false	false	false	false	false	false	false	false
Limit_lpm_detection_size	10	10	10	10	10	10	10	10	10	10
Save_images	2	2	2	2	2	2	2	2	2	2
Vignetting_lower_limit_size	620	620	620	620	620	620	620	620	620	620
Appendices_ratio	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500
Interval_for_measuring_backgroun...	10	100	10	100	10	100	10	100	100	10
Image_nb_for_smoothing	10	10	10	10	10	10	10	10	10	10
Analog_output_activation	false	false	false	false	false	false	false	false	false	false
Gain_for_analog_out	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Minimum_object_number	0	0	0	0	0	0	0	0	0	0
Maximal_internal_temperature	40	40	40	40	40	40	40	40	40	40
Operator_email	marc.picheral@...	marc.picheral@...	marc.picheral@...	marc.picheral@...	marc.picheral@...	marc.picheral@...	marc.picheral@...	marc.picheral@...	marc.picheral@...	marc.picheral@...

5.6.2.13 Time table



Project file Timetable

Project file Timetable

Copy to clipboard

Close

Year	Month	Day	WeekDay	Hour	Half hour	AcqConfig	Duration (min)
*	*	*	*	*	0	ACQ_TIME_full	4
*	*	*	*	*	1	ACQ_TIME_vig	30

Time program parameters :
YEAR : acquisition year from 2000 to 2100, * for any year
MONTH : acquisition month from 1 (January) to 12 (December), * for any month
DAY : acquisition day from 1 to 31, * for every day
WKDAY : acquisition day of the week from 1 (Sunday) to 7 (Saturday), * for all days
!! note !! WKDAY is only taken into account if DAY is *, otherwise it's always considered as being * (all days)
HOUR : acquisition start hour from 0 to 23, * for every hour
+30mi : acquisition start half-hour, 0 for acquisition start at HOUR:00, 1 for HOUR:30, * for both
ACQUISITION_CONF : Name of the acquisition configuration parameters set to be used
DURATION : duration of the acquisition in minutes, 0 for forever

5.6.3 Sensor control drop-down menu

5.6.3.1 Connect to sensor

This is the tool to connect the application to a sensor. This connection stops the acquisition when the sensor is recording data at the same time. A successful connection allows to visualize the sensor status in the UVP6 dashboard.

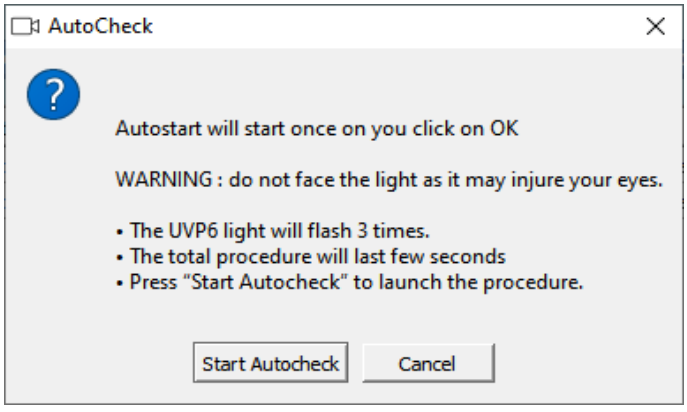
When starting, the application automatically tries to set a connection.

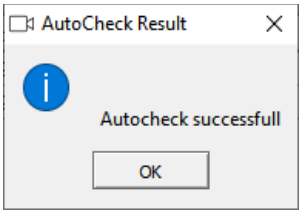
5.6.3.2 Reboot and disconnect

The tool allows to reset the sensor in a perfect state immediately after stopping UVPapp or shutting OFF the sensor power.

5.6.3.3 Autocheck

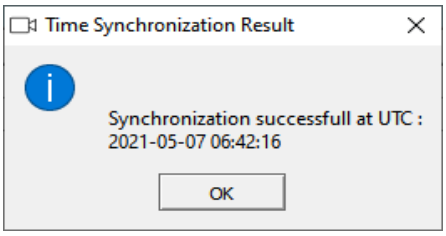
The autocheck tool will start a good health test sequence. It will check all components of the sensor and store a short sequence on its memory. The autocheck can be run as often as necessary prior to instrument deployment.





5.6.3.4 Time tools

The time tools make it possible to check the sensor time and to synchronize it to the computer time in UTC.



It is essential to synchronize the sensor time with the computer time prior to any deployment, mainly when the UVP6 is not equipped with a pressure sensor for depth interfacing with other sensors during vertical profiles. The UVPapp application will manage to set the sensor in UTC no matter the current time of the piloting computer.

It is important that the computer time is automatically synchronized using the Internet time.

5.6.3.5 View tools (Sensor)

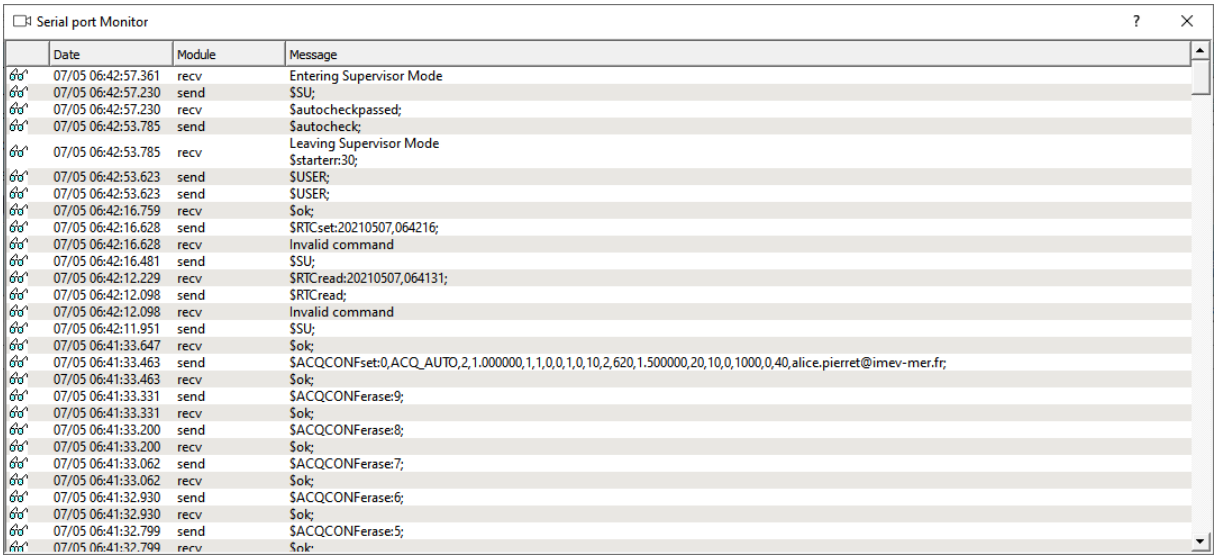
The tools permit the visualization of the instrument hardware, acquisition and time parameters tables of the connected sensor.

5.6.3.6 Program sensor

The programming tools can be run only if a sensor is connected. The programming tools allow you to modify only the relevant settings of the UVP6. See the relevant usage chapters above.

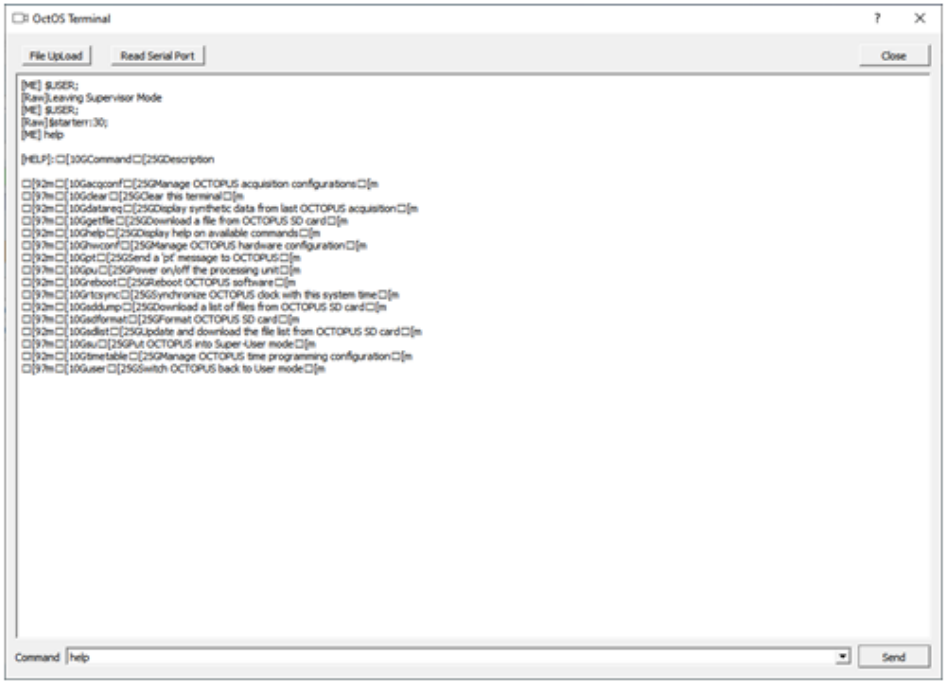
5.6.3.7 Monitor serial port

It opens the *serial port window* which will display all received and sent messages between the UVP6 and the computer. It is usually used for troubleshooting.



5.6.3.8 Open OctOs terminal

The *OctOs terminal* allows to communicate to the UVP6 sensor using a specific terminal and low-level commands.



This terminal is dedicated for experts who will act under Hydroptic supervision, mainly for **specific troubleshooting.**

The File Upload tool permits you to manually change any setting of the instrument without any control. **It must not be utilized by users.**

5.6.3.9 LiveCamera

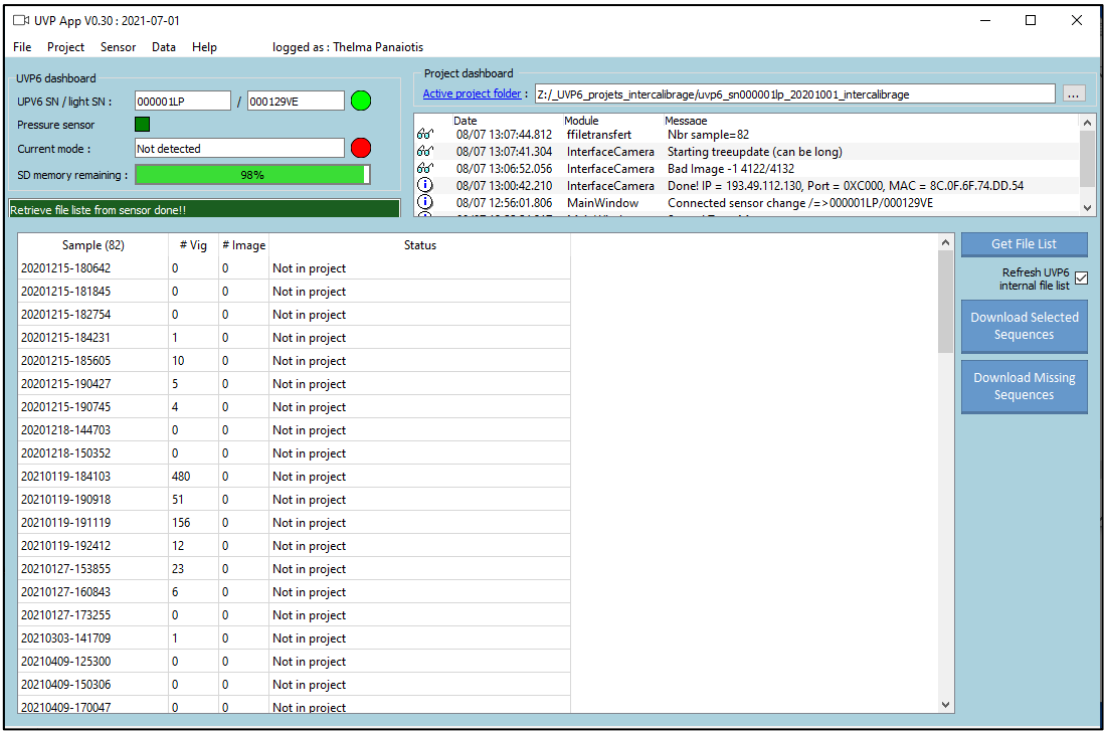
The livecamera tool allows the use of the UVP6 sensor as a remote camera. **See the relevant usage chapters above.**

5.6.4 Data drop-down menu

The Data tools can be run only if a sensor is connected.

5.6.4.1 Download data

It opens the *download data board* to download the data from the sensor to the project on the computer via the Ethernet connexion.



The first step is to use the *Get File List button* to ask the sensor to inventory the data stored in its mass storage SD card. This inventory may take a very long time depending on the quantity of data as the SD card can be either 400 GB or 1TB (in option).

The *Refresh UVP6 internal file list* must be enabled to make an up-to-date inventory (longer).

After getting the files list, the user has the possibility to download the data sequence by sequence or let the application download all missing sequences (i.e., sequences that are not yet recovered in the project).

It is very important to consider that downloading 400GB via the 100MB Ethernet link may take 48hours. The instrument will have to stay connected and powered preferably using an AC adapter for long downloads.

The data will be downloaded in the RAW folder of the project. Each sequence sub folder is named according to the UTC date and time of the first image of the sequence. It will contain a data.txt file with all raw particle counting and sensor metadata plus a ZIP archive of all raw image/vignette files.

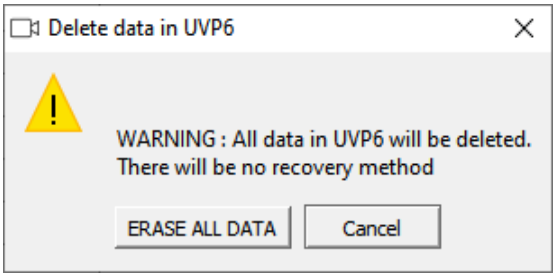
In case you experience difficulties downloading data due to the Ethernet connection, please go to the PC configuration related chapter.

The #vig field indicates the number of recorded vignettes from the original images.

The #image filed indicates the number of recorded images in case this option is selected for the acquisition.

5.6.4.2 Delete data

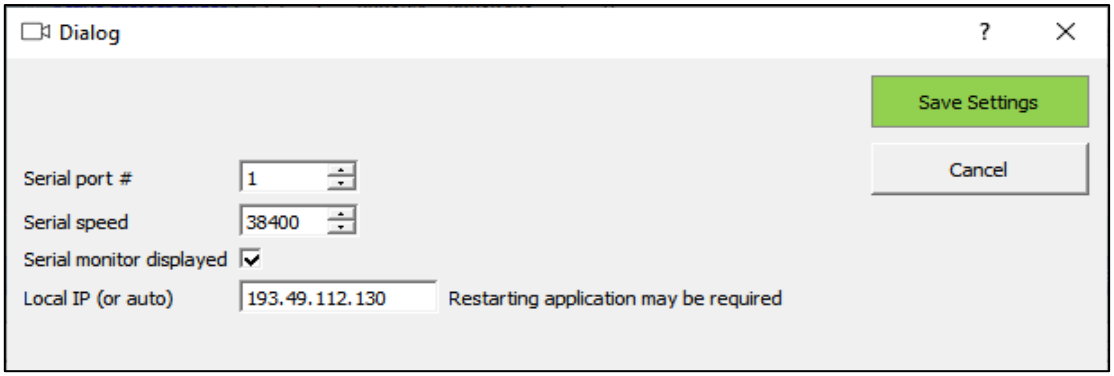
It is impossible to select the data to delete in the instrument. The tool will reformat the entire mass storage, erasing all previous data.



In case very important data has been erased by mistake, you can ask Hydroptic to recover them by sending the instrument back. This operation can only be tested if no data has been recorded since the formatting of the SD card.

5.6.5 Help and application settings

The Help menu opens the *application settings window*.

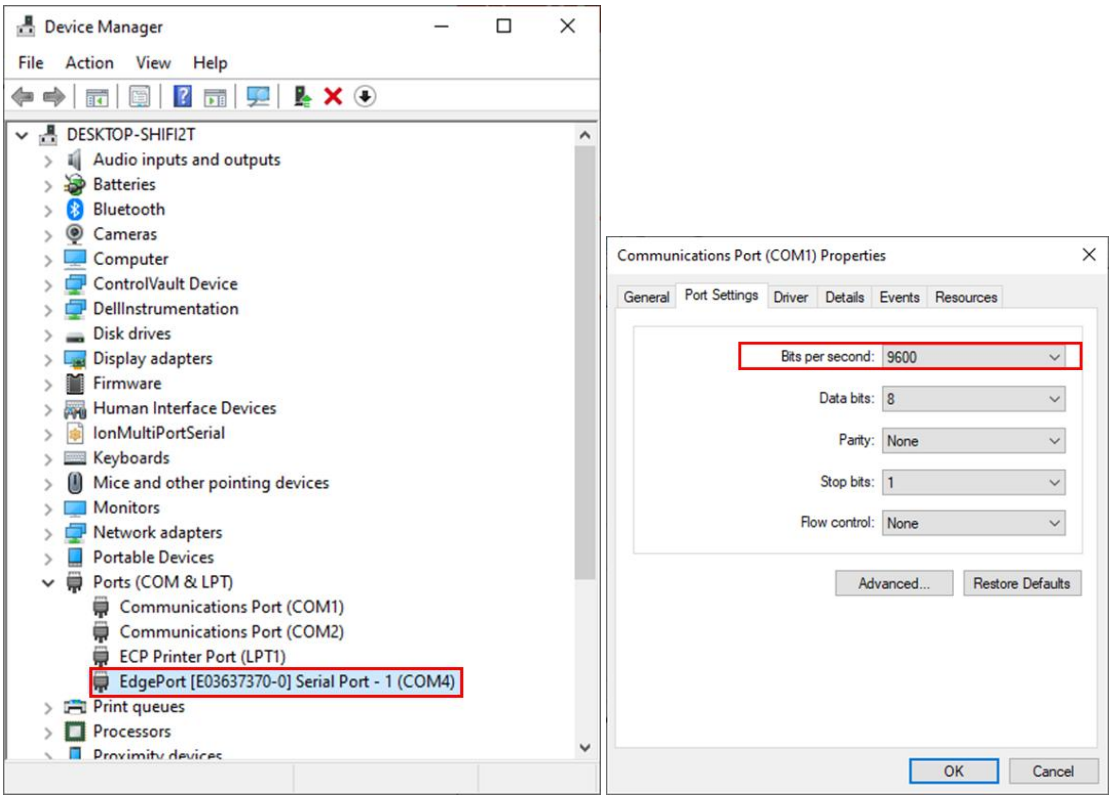


5.6.5.1 Serial port

Ensure that the COM port is properly defined. Connect your UVP6 to the specified COM port, and make sure that no other terminal application is using it

If you encounter any issues, adjust the latency timer of FTDI cable serial port by following these steps:

In Windows, navigate to Device Manager and open the properties of the Serial Port as illustrated below. Within the Port Parameter Tab, click on the Advanced button. Finally, reduce the RS232 latency as needed



5.6.5.2 Serial speed

The serial speed must be set to 38400. In case of communication over a longer data cable, it may be necessary to lower this serial speed. Contact Hydroptic to get the specific procedure for changing the serial speed in the sensor prior changing it in UVPapp.

5.6.5.3 Serial monitor displayed

Allows to display all incoming and sent messages between the UVP6 and the computer.

5.6.5.4 Local IP (PC configuration)

The Ethernet link is utilised in association with the serial link to download the data from the UVP6 and to use the LIVECAMERA mode. It is thus essential to properly set it for these purposes. The serial link can be sufficient to monitor the instrument status using the UVPapp dashboard (see above).

For UVP6 LP, any IP address can be utilised as the instrument and PC use the MAC address to set the communication

For UVP6 HF, the IP address of the Ethernet card of the computer must be 193.49.112.XXX where 0<XXX<256 and XXX != 100. The local IP (or auto) value should be set to this IP address and “auto” avoided as the application would check all the IP addresses of the PC and select one which could be wrong in case of the presence of more than one address (WIFI).

Setting the IP Address on the computer

- Click on Start, then type "settings" and select "Settings > Network & internet."

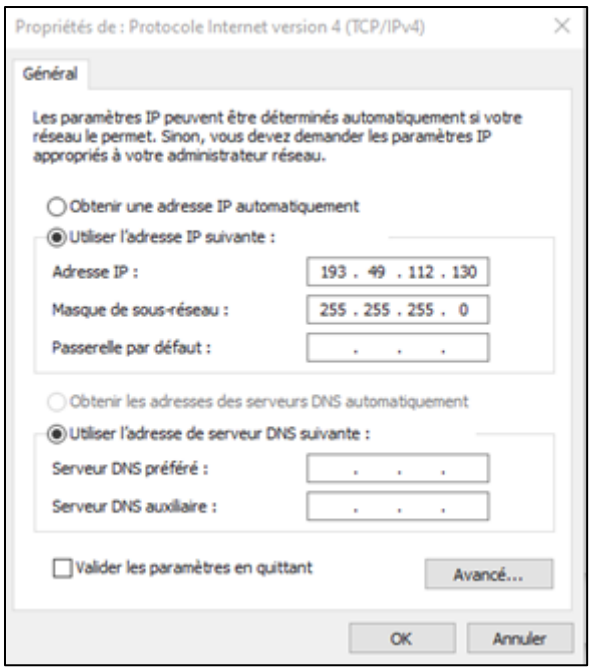
- Choose "Ethernet" on the left and click on the "Modify adapter options" button.

- Select the specific Ethernet connection you are using.

- Click on "Properties."

- Double-click on "Internet Protocol Version 4 (IPv4)."

- Opt for the manual IP configuration and enter the provided IP address as shown below.



6 MAINTENANCE

6.1 In case of flooding suspicion

If you suspect that the UVP6 main pressure case or the light units have flooded, use EXTREME CAUTION around the instrument. **The best course of action is to take preventive measures to avoid accidents.**

An indication for flooding is that the instrument stops operating or that there is a short-circuit condition in the instrument. An instrument flooded with salt water will short all of the connector pins together. An electric continuity test between random pins on any of the bulkheads may confirm this suspicion.

In case you suspect any flooding, place the instrument in a safe location and contact HYDROPTIC for further instructions.

Never stay in front of the end caps or the glass porthole !

CONTINUE AT YOUR ON RISK!

You should try to depressurize the main pressure case slowly backing off one of the two connectors of the connector end cap. When all the pressure has been released the instrument can be stored and safely shipped to Hydroptic for repairs.

6.2 Inter calibration

The UVP6 is an imaging sensor. It is thus carefully adjusted and calibrated at Plateforme d'Imagerie Quantitative de Villefranche sur mer (PIQv) before delivery. Just like any other sensor, we recommend a regular check and intercalibration to ensure the data consistency. The PIQv, responsible for the initial tuning and intercalibration of the instrument, continues to provide routine intercalibration for all sensors by performing optical tests. **Furthermore, the PIQv consistently inter calibrates its own**

instruments between each cruise. This process ensures the accuracy and reliability of the UVP6's imaging capabilities.

Contact the PIQv (piqv@imev-mer.fr) to request an inter-calibration service.

6.3 Connector maintenance

The UVP6 connectors must be dried each time they are disconnected. They must be greased on a regular basis using the provided Molykote 44 transparent and soft grease.

The connectors are provided with dummies. They must never be left without protection.

Handle electrical terminations carefully, as they are not designed to withstand strain. Disconnect the cables from the components by pulling on the connector heads and not the cables. Do not twist the connector while pulling, as this will damage the connector pins.

Do not use petroleum-based lubricants on Subconn® connectors.

6.4 75Wh Battery (optional for LP instruments)

It is recommended to limit the discharge of the Li-Ion batteries in order to enhance their lifespan. **We thus recommend using only 50% of the provided battery before charging.**

The battery charger is plugged directly to the battery for charging. A relief valve secures the charging without requesting to open the battery.

The Y cable provided with the battery permits to power the UVP6 on the battery. **It's important to note that this cable doesn't support powering the UVP6 using the power from the data cable**. If you want to use the AC power of the data/Octopus cable, connect the data cable directly to the UVP6 without utilising the Y cable.

6.5 Battery voltage measurements

While checking voltages with a voltmeter, use extreme care to avoid shorting the probe leads. A shorted power supply or battery can output many amperes of current, potentially harming the user, starting fires, or damaging equipment.

Insert the positive probe first, followed by the negative one. When removing the probes, take out the negative probe first, and then the positive probe. This sequence ensures safe and proper handling during the insertion and removal of the probes.

PIN (MCBH2F, battery bulkhead)	Signal
1	0 vdc
2	Vcc (21.6 volts nominal)

6.6 Battery charge

Use the provided charger to charge the battery. **The charger should be disconnected from the AC power when connecting or disconnecting the battery.**

The charger LED indicates the status of the charge :

- Red : rapid charge
- Yellow : intermediate charge

- Green : charge finishing

The charge will be automatically stopped after 4 hours and the LED will stay green.

6.7 Instrument storage and transport

The camera and light protections should always be kept in place during storage and transport.

The marine connectors must be kept in good condition by rinsing them with freshwater after each profile, by drying them and by applying some provided Molykote 44 grease on them when needed. Dummy plugs should always be plugged in to avoid dust to be aggregated on the grease.

7 SPECIFICATIONS

7.1 UVP6-LP

- Operational depth: 0 to 6000 metres
- Weight in air: 3.2 Kg
- Weight in water: 1.5 Kg
- Materials: titanium, glass and POM
- Input voltage: 8-28 Vdc (0.1Watt@0.1Hz – 0.35Watt@0.5Hz – 1Watt@1.3Hz)
- Interface: RS232, Ethernet, analog output, I/O
- Lighting: 635nm, 50-400µS flashs
- Resolution: 5Mpixels / 0.73µM
- Field of view: 180 x 151mm x 23mm (0.6 L)
- Max image frequency: 1.3Hz
- Real time processing of images
- Memory: > 400Go (1 TB option)
- Pressure sensor (option) : 0.1%FS accuracy

7.2 UVP6-HF

- Operational depth: 0 to 6000 metres
- Weight in air: 3.2 Kg
- Weight in water: 1.5 Kg
- Materials: titanium, glass, POM and Aluminium (arm)
- Input voltage: 10-28 Vdc (6 W / 0.02 W, acquisition / standby)
- Interface: RS232, Ethernet, analog output, I/O
- Lighting: 635nm, 50-100µS flashs
- Resolution: 5Mpixels / 0.73µM
- Field of view: 180 x 151mm x 23mm (0.6 L)
- Max image frequency: 25Hz
- Real time processing of images
- Memory: > 400Go (1 TB option)
- Pressure sensor: 0.1%FS accuracy

7.3 Standard battery (HYDRPTIC)

- Operational depth: 0 to 6000 metres
- Weight in air: 1.4 Kg
- Weight in water: 0.6 Kg
- Materials: titanium
- Power: 75 Wh
- Voltage: 21.6 Vdc

8 ANNEXE

8.1 Regulations

8.1.1 HS code

8.1.1.1 International

901580

8.1.1.2 French

9015.80.20.00

8.1.1.3 US ECCN

8A992

8.1.1.4 Battery

The UVP6 sensor unit itself does not incorporate a battery. Nevertheless, the additional battery housing contains a 6 x 3.3A / 3.6V Li-ion battery with a 75Wh capacity, weighing 0.27 Kg. This optional battery housing is designed for convenient transportation, including carriage on planes (in cabin only). Prior to travel, it is advisable to consult with your company or relevant authorities to ensure adherence to airline regulations and safety standards.

The UN number for such a battery is 3481, classified as "Lithium Ion Batteries contained in equipment." This UN number is part of the classification system used for the transportation of hazardous materials, providing specific information about the nature of the contents for regulatory and safety purposes.

8.2 Data downloaded files

The data file are named according to the date and time (UTC) of the first image of sequence. Their headers contain two metadata lines, one for the instrument hardware configuration and one for the acquisition settings utilized for the sequence.

***HW_CONF**,000003LP,0,UNDEFINED,0,000124VE,1,150,250,1,0.000,393819,10000,2,192.168.0.128,0,455,6,20,2342.000,1.136,73,0.670,20200924,202010130814,marc.picheral@obs-vlfr.fr,40.3,50.8,64,80.6,102,128,161,203,256,323,406,512,645,813,1020,1290,1630,2050;*

***ACQ_CONF**,ACQ_ALS_022H,2,0.500,1,1,0,0,1,0,10,2,620,1.5,10,10,0,1000,0,40,marc.picheral@obs-vlfr.fr,0,393788;*

The header lines are followed by the Large Particulate Matter (LPM) lines and Black lines at regular intervals.

BLACK line (light OFF) :

*20210428-143248,94.65,16.06,**0**:1,5056,30.9,11.6;2,145,31.4,10.5;3,2,28.3,7.2; (black line with light flag to **0**)*

LPM line (light ON) :

*20210428_3250,94.18,16.00,**1**:1,5809,30.5,11.2;2,369,36.0,16.7;3,87,40.6,21.1;4,46,52.4,29.1;5,11,54.8,31.4;6,11,58.4,37.5;7,5,49.5,31.9;8,5,72.2,44.9;9,2,85.0,45.3;10,3,87.1,53.1;11,1,57.7,20.5;12,2,80.2,51.5;25,1,79.7,45.9; (data line with linght flag to **1**)*

The first one indicates the image time, depth (when available, otherwise ‘nan’), internal temperature a flag indicating the status of the light (ON/OFF) for the image.

The second section (after the ':') contains the data per pixel size (1), the number of objects for that size (5056 or 5809), the mean grey of these objects (30.9 or 30.5) and the stddev of the mean grey (11.6 or 11.2).... and then the same data for the 2, 3 and.... pixel sizes.

There might be some "OVER_EXPOSED" lines when the sensor is saturated either by sun light (on deck or in water) or by images of too turbid waters.

OVEREXPOSED line (light ON) :

20210428-134956-1,-0.05,21.38,1:OVER_EXPOSED,22.2%;

8.3 RS232 commands for SUPERVISED mode of operation

In order to avoid any subsequent problem with the UVP6, we present only the "USER" command and responses. The "SUPER USER" commands are reserved for Hydroptic. The "USER" mode is switched by default every time the instrument is powered ON or reboot. We thus present here the typical sequence of commands for :

- Pre deployment checks
- Acquisition commands
- Other commands

It is not possible to bypass the UVPapp application (or the OctOs guru terminal) to download images and raw data from the UVP6 as it requires a specific Ethernet procedure combining the serial connexion and the Ethernet connexion in UDP mode.

8.3.1 General procedure in SUPERVISED mode

Please refer to the more detailed manual available on demand. The procedure indicated below must be considered as a summary.

It is important to consider the booting time of the instruments which impacts the responding time:

- The UVP6LP boots in few ms => immediate response to messages
- The UVP6HF boots in 14 seconds => it may respond after 14seconds

Procedure:

- The sensor is powered ON
- Acquisition starts with a START command, including the name of the setting table
- The sensor returns HW and ACQ data lines (TAXO line if activated)
- The sensor returns DATA lines
    - On demand by "PT" commands if PILOTED
    - At its own frequency if CONTINUOUS
- The acquisition is stopped
    - By powering OFF (file safe system)
    - By sending a STOP command (preferable)
- The sensor is turned OFF (if necessary)

8.3.2 Pre-deployments

Here we present the typical succession of commands that can be utilised to check that the instrument is ready for the deployment.

Action	Sent message	Response from UVP6	Comment
Power ON		HW_conf line	
		ACQ_conf line	
		(Taxo_conf line)	Depending on version and configuration
Checking UVP6 hardware configuration (optional)	$HWCONFread;	HW_conf line	
Checking UVP6 acquisition configurations(optional)	$ACQCONFread:0;	$ACQCONFread:0,**ACQ_ALR1500_0**,2,0.100,1,1,0,0,1,0,10,2,620,1.5,50,10,0,1000,0,60,alice.pierret@imev-mer.fr,1,2,0,NO_RE,393675;	To be resent to check slots 0 to 9, provides the name of the configurations
Checking UVP6 acquisition configurations (optional)	$confcheck:**ACQ_XX**;	$ACQ_CONF,**ACQ_XX**,2,0.100,1,1,0,0,1,0,10,2,620,1.5,50,10,0,1000,0,60,alice.pierret@imev-mer.fr,NO_RE,1,2,0,0;	Checks the known configuration ACQ_XX
Checking UVP6 taxonomic configurations (optional, depends on UVP6 firmware)	$taxocheck:**TAXO_XX**;	$TAXO_CONF,**TAXO_XX**,MODEL_14,65535,12,100000,100001,100002,100003,100004,100005,100006,100007,100008,100009,100010,100011,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0;	Checks the known configuration TAXO_XX
Instrument Autocheck	$autocheck;	$autocheckpassed;	The UVP6 checks all peripherals and flashes three times (to check lights)

8.3.3 Acquisition commands

The pre-deployment checks indicated that the “ACQ_ALR1500_0” table is present in slot 0 of the instrument memory. It can thus be utilised in that sequence.

Note that the start command includes the date and time and will thus set the instrument date and time.

Action	Sent message	Response from UVP6	Comment
Start acquisition using table ACQ_ALR1500_0	$start:**ACQ_ALR1500_0**,20220223,040051;	ACQ_CONF, **ACQ_ALR1500_0**,2,0.100,1,1,0,0,1,0,10,2,620,1.5,50,10,0,1000,0,60,alice.pierret@imev-mer.fr, 1,2,0,TAXO_0,393675;	Starts acquisition using the specified table Set the UVP6 real time clock (optional)
		TAXO_CONF,TAXO_0,MODEL_14,65535,12,100000,100001,100002,100003,100004,100005,100006,100007,100008,100009,100010,100011,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0;	Depending on version and configuration
		BLACK_DATA,1554.02,20220223,040051,1,23.69,48,0,4,0,2,0,1,0,1,1,1,2,0,0,1,0,0,2;	First Black data line The lines are repeated at the specified rate (according to the selected acquisition table)
		TAXO_DATA,1,8,1299,43,8,17085,49,8,12379,50;	Depending on version and configuration Taxo line related to the next LPM Data line The lines are repeated at the specified rate (according to the selected acquisition table)
		LPM_DATA,1554.09,20220223,040052,1,23.69,33,0,4,2,1,0,1,1,0,1,1,2,0,0,1,0,0,2,23,0,17,21,20,0,21,19,0,29,30,35,0,0,43,0,0,50;	The lines are repeated at the specified rate (according to the selected acquisition table)
		.....	Black lines are repeated at the specified rate (according to the selected acquisition table)
Stop acquisition	$stop;		Optional if power OFF
Power OFF the UVP6			Optional if a new sequence is started immediately

8.3.4 Other useful commands in USER mode

PILOT Commands	descriptions	UVP6 responses
$USER;	Switch to user mode. Default mode after power on	== Leaving Supervisor Mode ==
$pt:12.5;	Triggered a bloc of frames in PT_mode=0. PP.PPP is the pressure from the platform.	BLACK_DATA,12.50,20240129,111358,1,24.75,0,4469,252,36,10,1,0,0,0,0,0,0,0,0,0,0,0,0; Or LPM_DATA,12.50,20240129,111406,1,24.81,0,9483,1358,512,244,243,167,68,31,21,8,4,3,1,1,1,0,5,0,27,25,26,26,26,26,26,27,27,27,28,27,30,29,36,0,98;
$autocheck;	Starts the autocheck of the instrument	$autocheckpassed;

8.3.5 HWconf metadata frame (UVP6 size classes)

The HWconf frames are sent by the instrument after being powered (delay : 1 second for UVP6LP, 14 second for UVP6HF).

The last 18 parameters are the lower value of the size classes. These values may be different according to the sensor firmware.

They will always correspond to standard data classes in EcoPART (https://EcoTAXA.obs-vlfr.fr/part/).

HW_CONF,000002LP,0,UNDEFINED,0,000002VE,2,150,250,169559,20.000,393819,2000,2,192.168.0.128,0,356,6,23,1130.000,1.310,73,0.630,20190207,201907241218,marc.picheral@obs-vlfr.fr,40.3,50.8,64,80.6,102,128,161,203,256,323,406,512,645,813,1020,1290,1630,2050;

HW_CONF
Camera_ref
Acquisition_mode
Default_acquisition_configuration
Delay_after_power_up_on_time_mode
Light_ref
Correction_table_activation
Time_between_lighting_power_up_and_trigger
Time_between_lighting_trigger_and_acquisition
Pressure_sensor_ref
Pressure offset
Storage_capacity
Minimum_remaining_memory_for_thumbnail_saving
Baud_Rate
IP_adress
Black_level
Shutter
Gain
Threshold
Aa
Exp

Pixel_Size
Image_volume
Calibration_date
Last_parameters_modification
Operator_email
40.3
50.8
64
80.6
102
128
161
203
256
323
406
512
645
813
1020
1290
1630
2050

8.3.6 ACQconf metadata frame

The ACQconf frames are sent when the acquisition of a sequence starts even if a delay is then applied (CTD or AUTO modes)

ACQ_CONF,ACQ_CSCS_002L,3,2.000,1,1,10,30,1,1,10,1,50,1.0,10,10,0,1000,0,40,marc.picheral@obs-vlfr.fr,0,381774;

rame

Configuration_name
PT_mode
Acquisition_frequency
Frames_per_bloc
Blocs_per_PT
Pressure_for_auto_start
Pressure_difference_for_auto_stop
Result_sending
Save_synthetic_data_for_delayed_request
Limit_lpm_detection_size
Save_images
Vignetting_lower_limit_size
Appendices_ratio
Interval_for_mesuring_background_noise
Image_nb_for_smoothing
Analog_output_activation
Gain_for_analog_out
Minimum_object_number
Maximal_internal_temperature
Operator_email
0
SD card remaining memory (Mbytes)

8.3.7 Data frames

8.3.7.1 Particle frames

The data frame is sent after the acquisition and process of a bloc (batch) of images. The numbers are per bloc of images. The concentrations will be calculated using the indicated number of images and the image volume from the HWconf frame.

LPM_DATA,27.31,20200110,120542,2,14.25,2051,800,123,50,10,1,0,0,0,0,0,0,0,1,0,0,0,0,
25,30,27,50,26,100,0,0,0,0,0,0,0,201,0,0,0,0;

	Unit	Min	Max
LPM_DATA	characters	na	na
Depth	mH2O		
Date	YYYYMMDD		
Time	HHMMSS		
Number of analyzed images	images	1	2^8
Internal temperature	°C		
Cumulated number of objects for class 1	integer	0	2^{16}
Cumulated number of objects for class 2	integer	0	2^{16}
Cumulated number of objects for class 3	integer	0	2^{16}
Cumulated number of objects for class 4	integer	0	2^8
Cumulated number of objects for class 5	integer	0	2^8
Cumulated number of objects for class 6	integer	0	2^8
Cumulated number of objects for class 7	integer	0	2^8
Cumulated number of objects for class 8	integer	0	
Cumulated number of objects for class 9	integer	0	
Cumulated number of objects for class 10	integer	0	
Cumulated number of objects for class 11	integer	0	
Cumulated number of objects for class 12	integer	0	
Cumulated number of objects for class 13	integer	0	
Cumulated number of objects for class 14	integer	0	
Cumulated number of objects for class 15	integer	0	
Cumulated number of objects for class 16	integer	0	
Cumulated number of objects for class 17	integer	0	
Cumulated number of objects for class 18	integer	0	
Mean grey level of objects from class 1	integer	0	255
Mean grey level of objects from class 2	integer	0	255
Mean grey level of objects from class 3	integer	0	255

Mean grey level of objects from class 4	integer	0	255
Mean grey level of objects from class 5	integer	0	255
Mean grey level of objects from class 6	integer	0	255
Mean grey level of objects from class 7	integer	0	255
Mean grey level of objects from class 8	integer	0	255
Mean grey level of objects from class 9	integer	0	255
Mean grey level of objects from class 10	integer	0	255
Mean grey level of objects from class 11	integer	0	255
Mean grey level of objects from class 12	integer	0	255
Mean grey level of objects from class 13	integer	0	255
Mean grey level of objects from class 14	integer	0	255
Mean grey level of objects from class 15	integer	0	255
Mean grey level of objects from class 16	integer	0	255
Mean grey level of objects from class 17	integer	0	255
Mean grey level of objects from class 18	integer	0	255

In case the sensor is over exposed (at the surface) by sunlight, it will replace the LPM frame by an over exposed frame in which all values for the 18 classes of abundances and grey levels are set to 0.

LPM_DATA,0.25,20200110,120112,0,14.25,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0;

8.3.7.2 Black frames

A black frame is sent at preset intervals between particle frames. It contains the number of objects from the images acquired without activating the light.

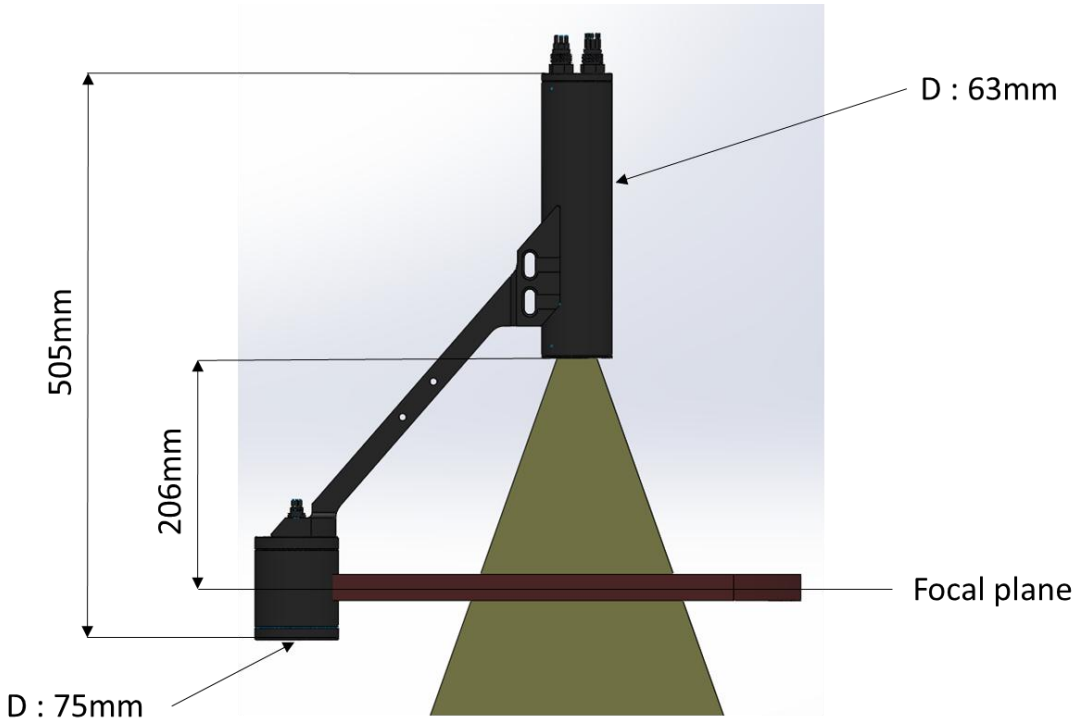
BLACK_DATA,1.23,20200110,120132,2,14.25,1275,251,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0;

	Unit	***Min***	***Max***
BLACK_DATA	***characters***	***na***	***na***
Depth	***mH2O***		
Date	***YYYYMMDD***		
Time	***HHMMSS***		
Number of analyzed images	***images***	***1***	***255***
Internal temperature	***°C***		
Cumulated number of objects for class 1	***integer***	***0***	

Cumulated number of objects for class 2	***integer***	***0***	
Cumulated number of objects for class 3	***integer***	***0***	
Cumulated number of objects for class 4	***integer***	***0***	
Cumulated number of objects for class 5	***integer***	***0***	
Cumulated number of objects for class 6	***integer***	***0***	
Cumulated number of objects for class 7	***integer***	***0***	
Cumulated number of objects for class 8	***integer***	***0***	
Cumulated number of objects for class 9	***integer***	***0***	
Cumulated number of objects for class 10	***integer***	***0***	
Cumulated number of objects for class 11	***integer***	***0***	
Cumulated number of objects for class 12	***integer***	***0***	
Cumulated number of objects for class 13	***integer***	***0***	
Cumulated number of objects for class 14	***integer***	***0***	
Cumulated number of objects for class 15	***integer***	***0***	
Cumulated number of objects for class 16	***integer***	***0***	
Cumulated number of objects for class 17	***integer***	***0***	
Cumulated number of objects for class 18	***integer***	***0***	

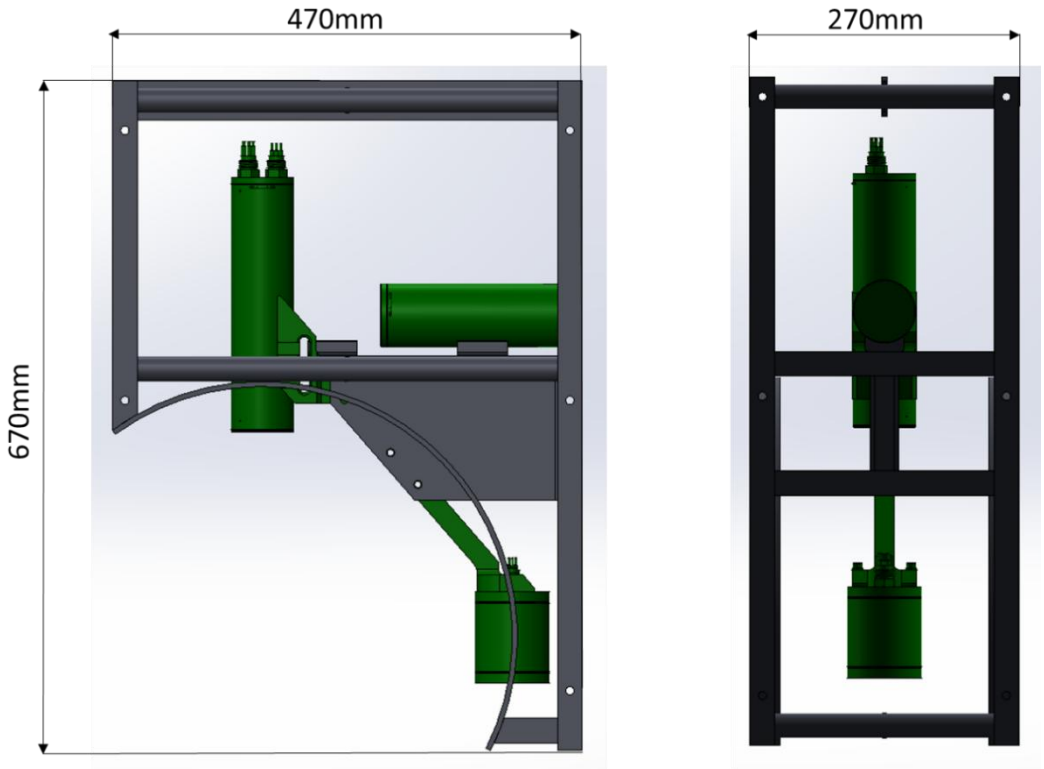
8.4 Instrument dimensions

8.4.1 UVP6 Dimensions

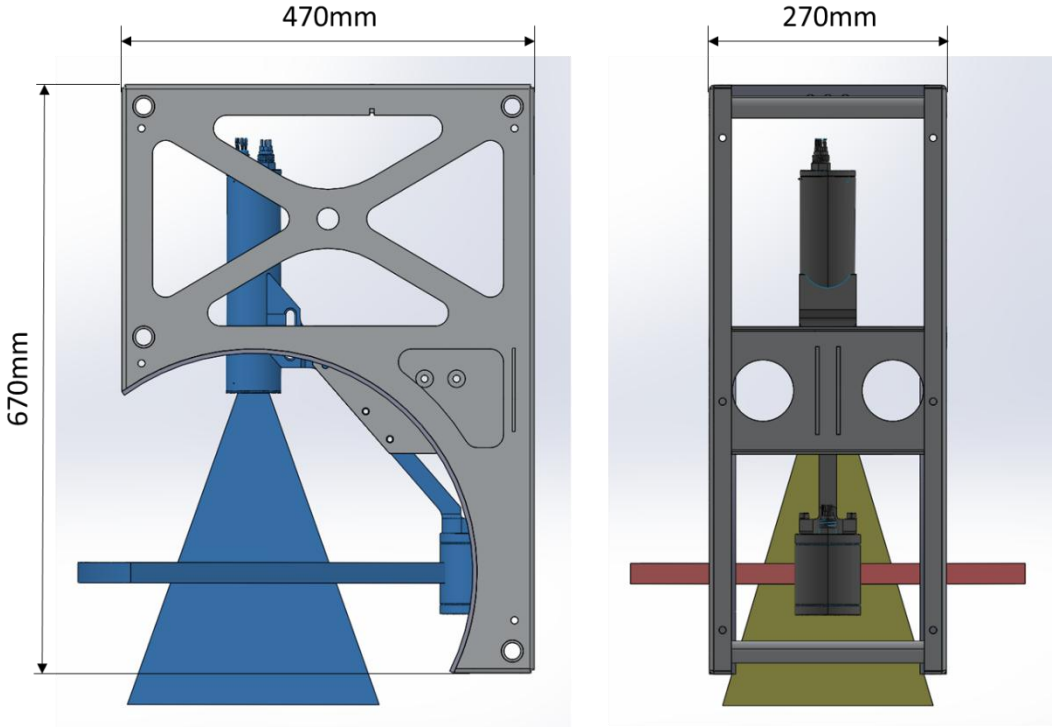


8.4.2 UVP6 protective Frames

8.4.2.1 First design



8.4.2.2 Actual design



8.5 Connector pin configuration on the UVP6 camera

8.5.1 DATA, ANALOGUE and POWER (MCBH8M)

PIN (MCBH8M, bulkhead)	**Signal**
1	0 volt
2	Vin vdc (10 - 28)
3	UVP6 **Tx** (RS232)
4	UVP6 **Rx** (RS232)
5	Ethernet (or ANALOGUE gnd)*
6	Ethernet
7	Ethernet (or ANALOGUE +) *
8	Ethernet

*The analogue output is always activated on UVP6HF instruments. It has to be activated on UVP6LP instrument (on request before delivery)

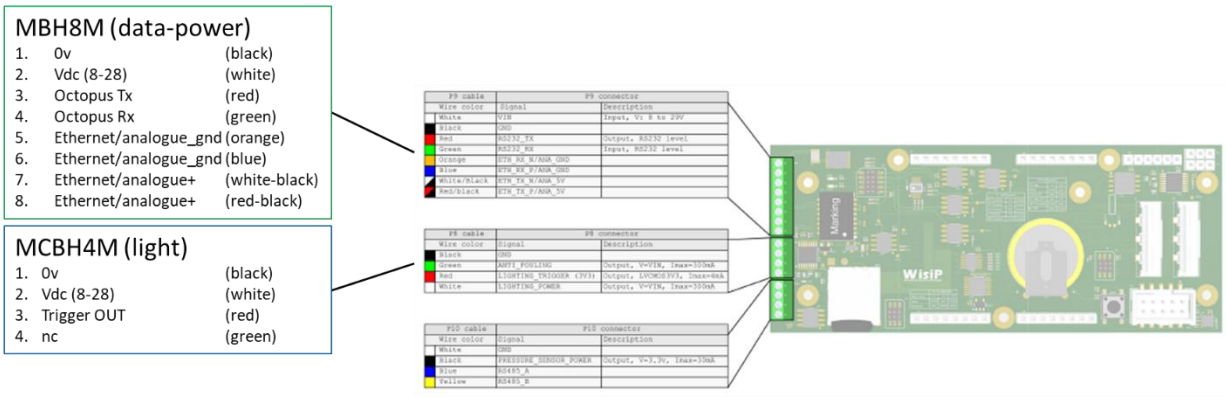
8.5.2 LIGHT and I/O (MCBH4M)

PIN (MCBH4M, bulkhead)	**Signal**
1	0 volt
2	Vout vdc (10-28)

3	Trigger out
4	I/O*

* The I/O permits to pilot any device such as a wiper or a closing operculum (ask Hydroptic about this function)

8.5.3 Internal camera cabling



Pin numbers on mother board does not correspond to connector pin numbers

8.6 Battery for long deployments

The Develogic company is providing battery systems which can be utilised for long deployments : http://www.develogic.de/products/power-supply-systems/refillable-battery-container/

8.7 Instrument delivery contents (from Hydroptic)

8.7.1 Shipping cardbox:

- UVP6LP with light cable, dummy and optics covers

8.7.2 PELICASE

- UVP6HF with light cables and optics covers
- Octopus cable for serial, ethernet and power inlet
- Serial to Usb converter
- Ethernet Switch
- Grease pot
- USB key

Optional

- Battery
- Battery charger
- Y cable for battery
- Analog cable
- CTD mounting kit


SubCorp