

OMC-7006 Buoy

User manual



Version 2.03 May 2015

Document history

Date	Version	Comments
April 2013	V1.01	Original manual published
May 2013	V1.02	No Alarm Disc function added
April 2014	V2.01	Update manual to standard buoy 2014
March 2015	V2.02	Added EXO deployment instructions.
May 2015	V2.03	Added NEP 5000 connection details

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1. Introduction

This manual describes the commissioning and maintenance procedure of the OMC-7006 buoy. Basic configuration of the internal OMC-045-3 is included, for more advanced programming we kindly refer to the OMC-programmer manual.

We strongly recommend reading this complete manual before deployment of the buoy.

For specific sensor instructions always follow the recommendations in the manual of the sensor manufacturer.

2. General description

The OMC-7006 is a buoy meant for water quality measurement. The buoy can be delivered in several configurations, depending on the configuration some parts are optional.

The top light can be a programmable navigational signal light or an alarm warning light. The navigation signal lamp is an independent functional unit with a self supporting power supply: a solar cell on top and a battery inside. If your buoy is delivered with an alarm light, then the function is controlled and powered by the OMC-045-3 data logger. Standard functions are activation of the light when the canister is being removed or the buoy is moving to far from its location (which indicates the buoy came off its mooring). On the alarm light version the GPS antenna is also on top (other buoy versions might have it in the canister).

The canister contains the data logger OMC-045-3, the solar regulator and the optional backup battery pack. The backup battery pack will automatically take over when the power gets below approx 10.8 V. It will also work when the main battery pack completely fails (due to damage / vandalism etc.). This will allow the OMC-045-3 to send an alarm-text message and if required it can also activate the alarm light. The canister is the heart of the buoy, all parts (except the navigational signal light) are connected to this part with watertight connectors. In case an EXO sensor is used the interface is build in the canister as well.

The canister is placed inside the buoy itself which is the actual floating device. On the outside 3 solar panels are attached in a way always 1 or 2 panels will catch sunlight. Under most circumstances these should be sufficient to keep the main batteries charged.

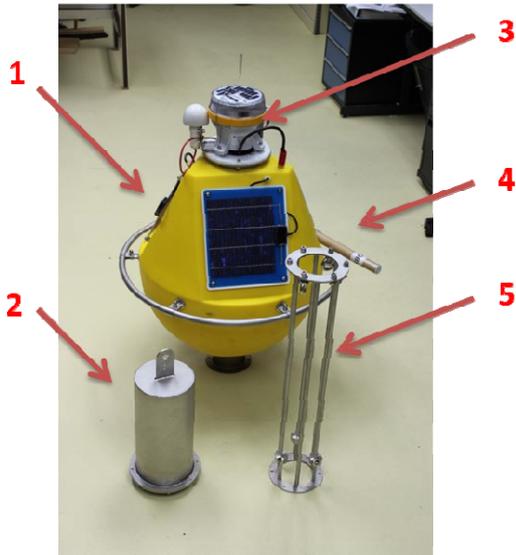
The deployment tube has room for a measurement probe and keeps it protected.

Underneath the deployment tube the battery compartment is attached. This has a double function: it also functions as a counterweight to keep the buoy upright.

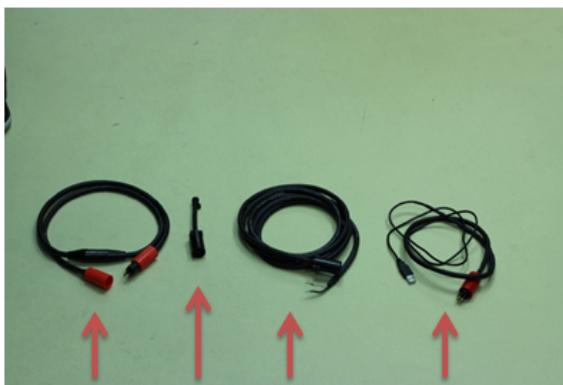
3. Assembly of OMC-7006.

The assembling instructions uses an EXO sensor as example. Assembly for other sensors is similar.

Identifying parts



- 1 - Buoy including:**
 - solar panels
 - protection ring
- 2 - Battery compartment**
- 3 - Canister including**
 - Datalogger
 - Flashlight
 - GPS antenna
- 4 - Antenna**
- 5 - Deployment tube**



1 **2*** **3*** **4***

- 1 - Battery cable**
- 2 - Dummy plug ***
- 3 - Battery charge cable***
- 4 - USB programming*
cable**

*** = Optional**

Assembling

- Disconnect the solar power connector and remove the 2 retaining clips.



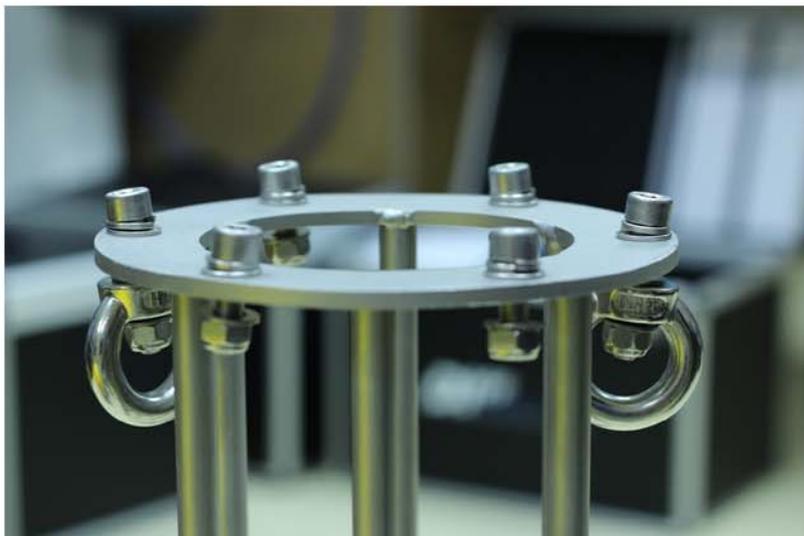
- Carefully lift the canister and remove it.



- Carefully put the buoy on a side to mount the deployment tube



- Note the 2 longer bolts must be placed opposite with the 2 mooring rings.



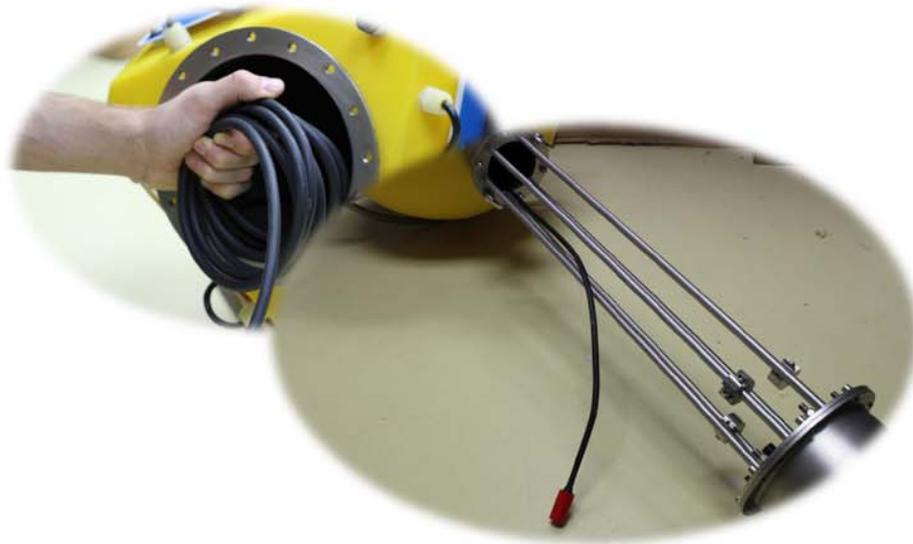
- Bolt the deployment tube to the buoy



- Bolt the battery compartment to deployment tube



- Fit the battery cable through the buoy



Do not connect it yet!

- Carefully slide the EXO sensor in from the top



- Connect the EXO sensor cable



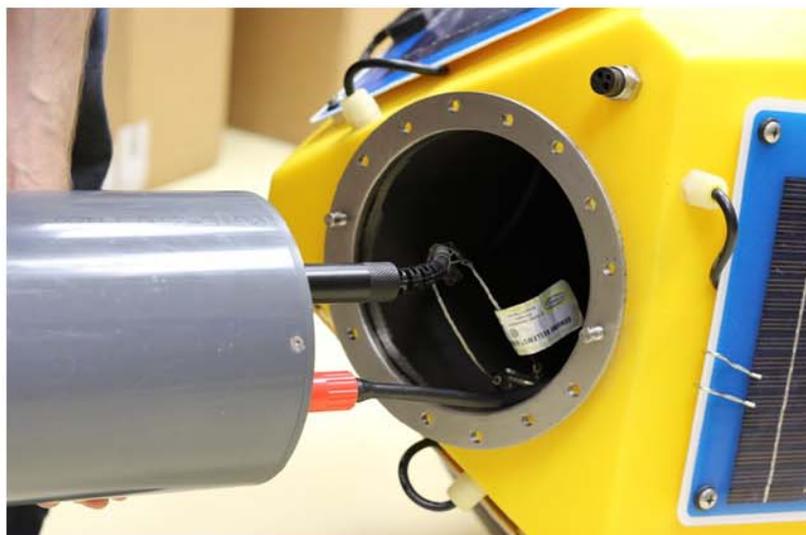
- ... and tighten cable strain relief



- Connect EXO and battery cable to the canister



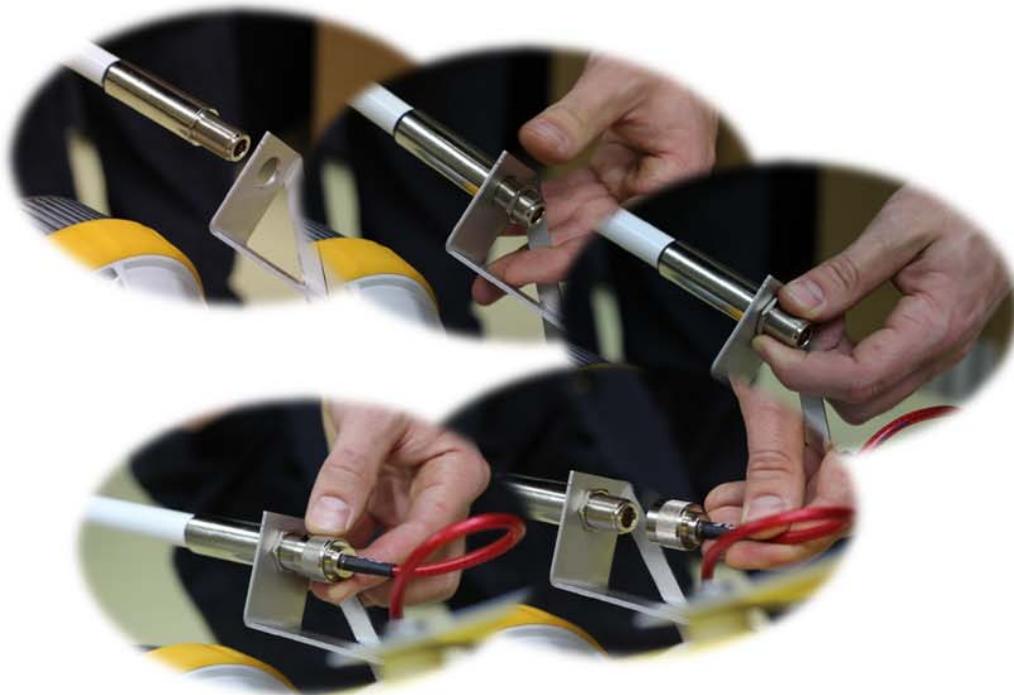
- Carefully slide the canister into the buoy



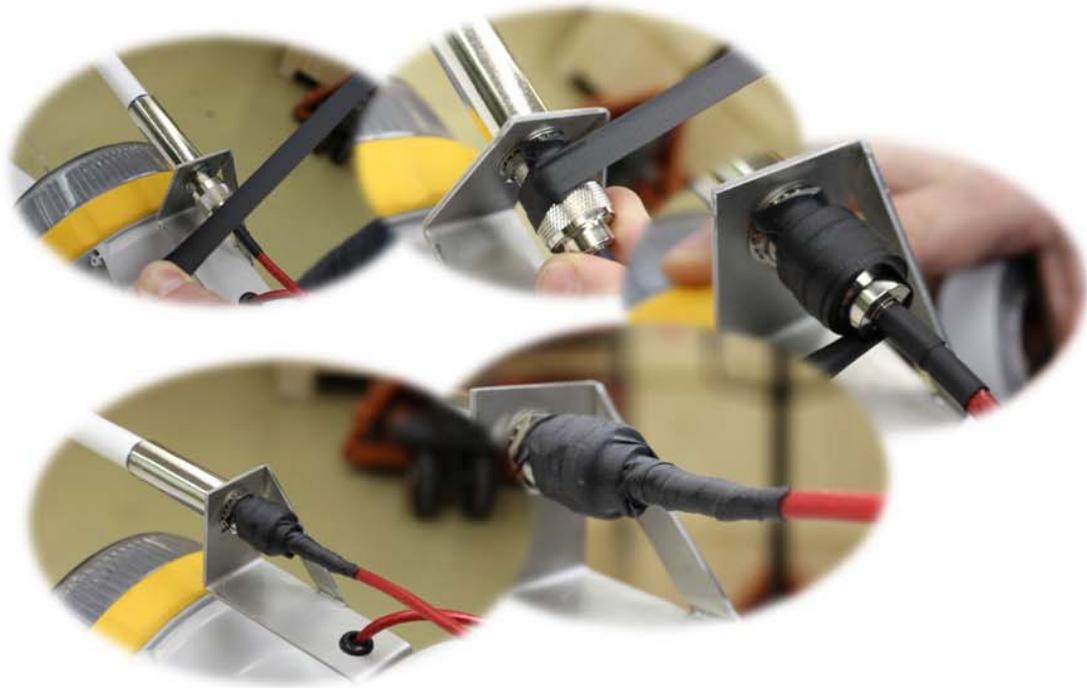
- Fit the 2 retaining clips to lock the canister



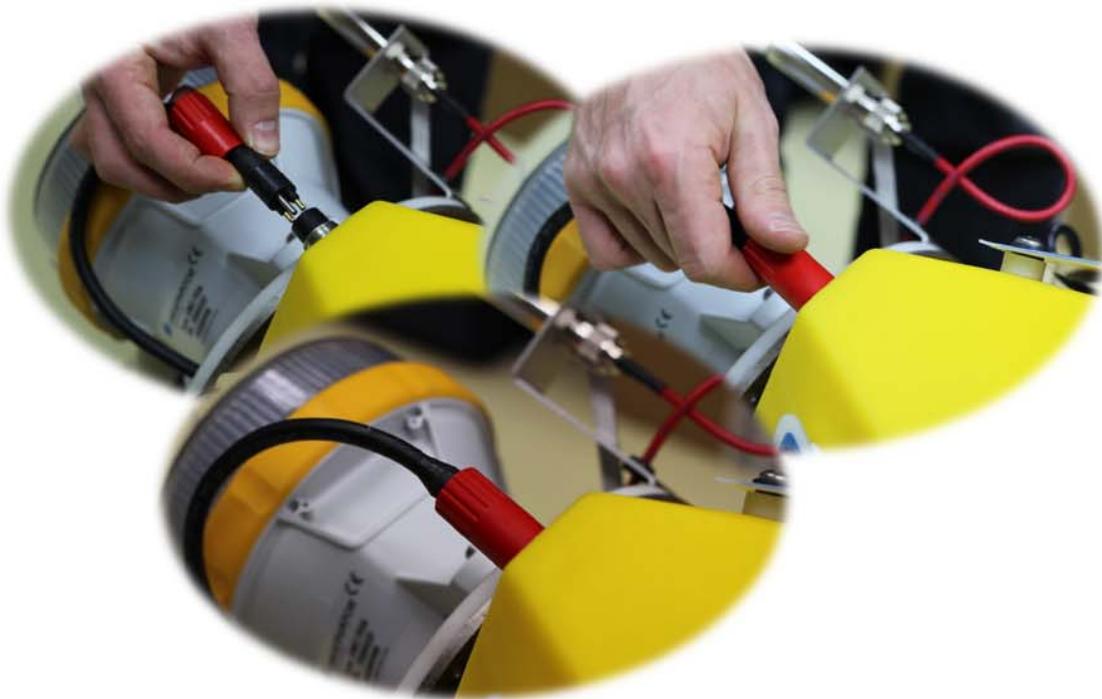
- Mount the antenna



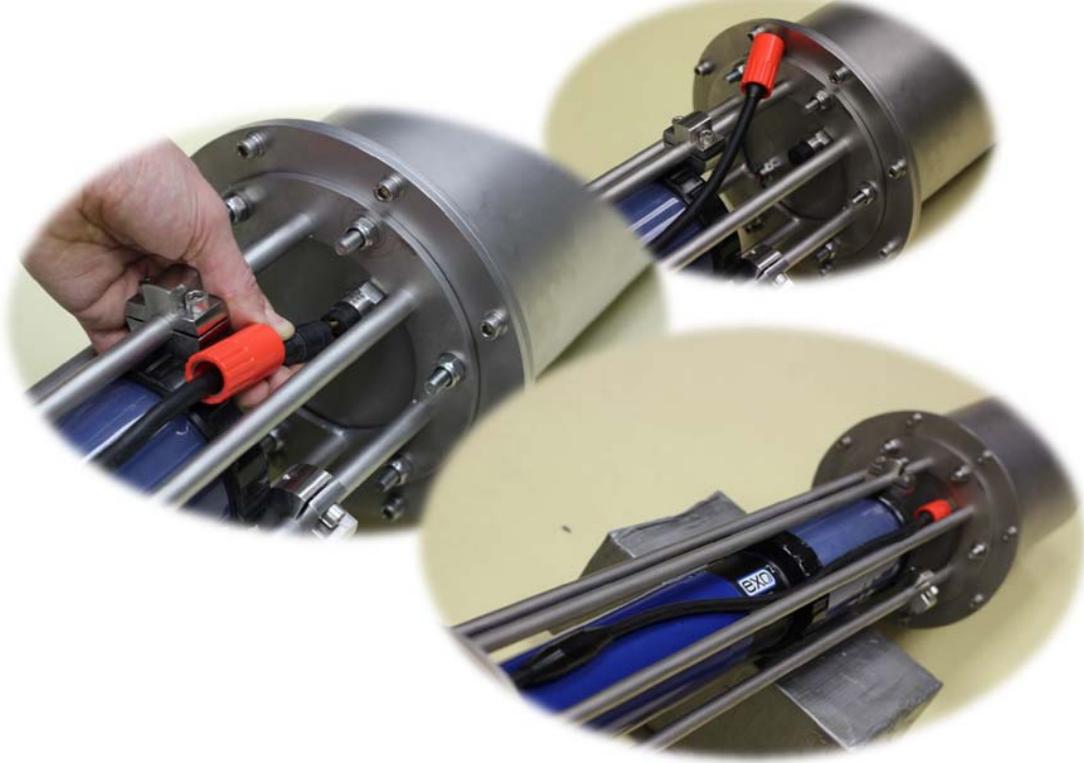
- And seal the connector with self-fusing tape!



- Connect the solar connector



- Finally connect the battery connector



Always follow the sensor specific instructions of your sensor manufacturer!

For example the EXO sensors must be protected with the water filled cup when not deployed!

Deployment with EXO:

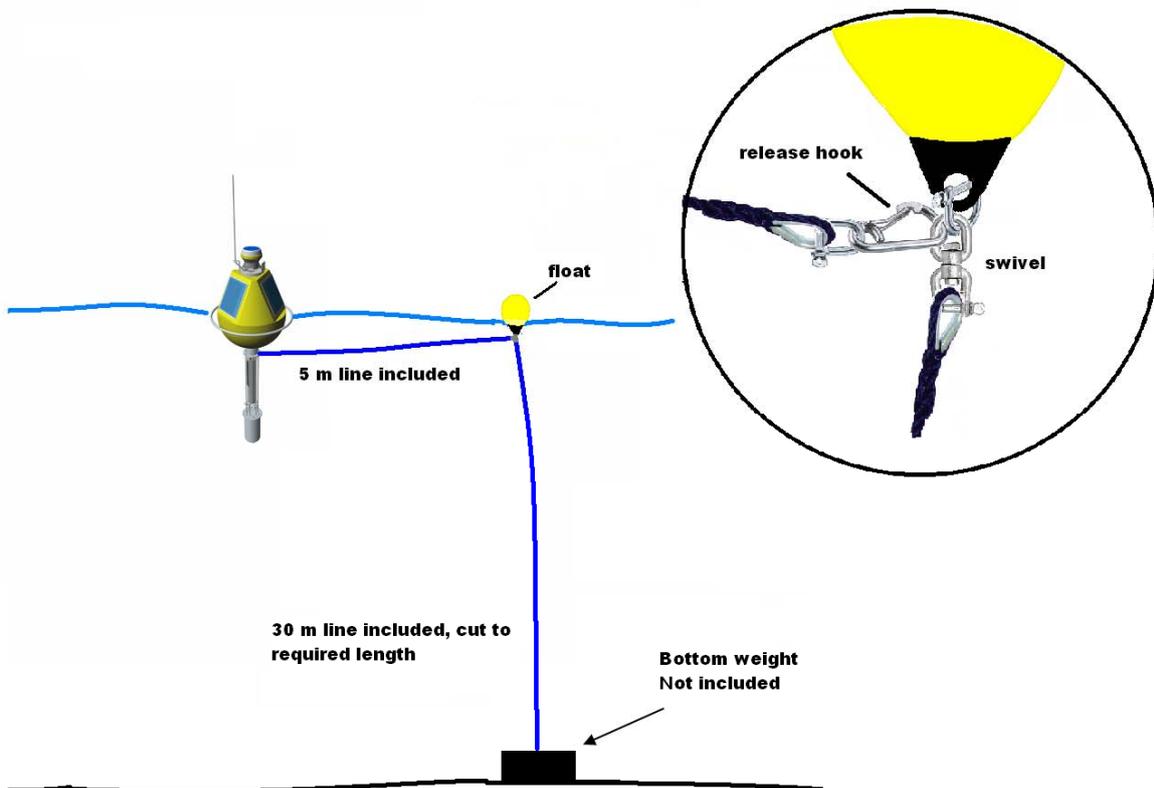


- **Remove protection cup on site and not already in your workshop!**
- **Keep sensors out of direct sunlight!**
- **Deploy a.s.a.p. after removal of cup, but definitely with 20 minutes!**

This means you will have to remove & reinstall the canister on site. It is not difficult, but we do recommend you practise this in your workshop before deployment.

4. Mooring

Advised mooring system (with Observator mooring set):



Bottom line should be max water-level + enough length to pull float on board (with a pick).

Buoy line (5 m) must be fastened on top (side) of the swivel, so the buoy can rotate freely around the mooring line without twisting it.

Bottom weight must be >20kg as an absolute minimum for situations with no current and waves. It is strongly advised to consult a local expert if the site has other conditions.



Do not use the ring underneath the battery compartment for mooring!

5. Deployment and retrieval of the buoy

The buoy can be fully configured before deployment. If required the monitoring can be delayed with either setting a deployment time via OMC-programmer or use of the STOP command text message. This will avoid useless measurement data during transport and deployment of the buoy.

Setting specific Deployment time:

In the overview window select 'Plan Deployment' and set the required date and time.

If the data is in the future the logger will not collect data until the set date and time.



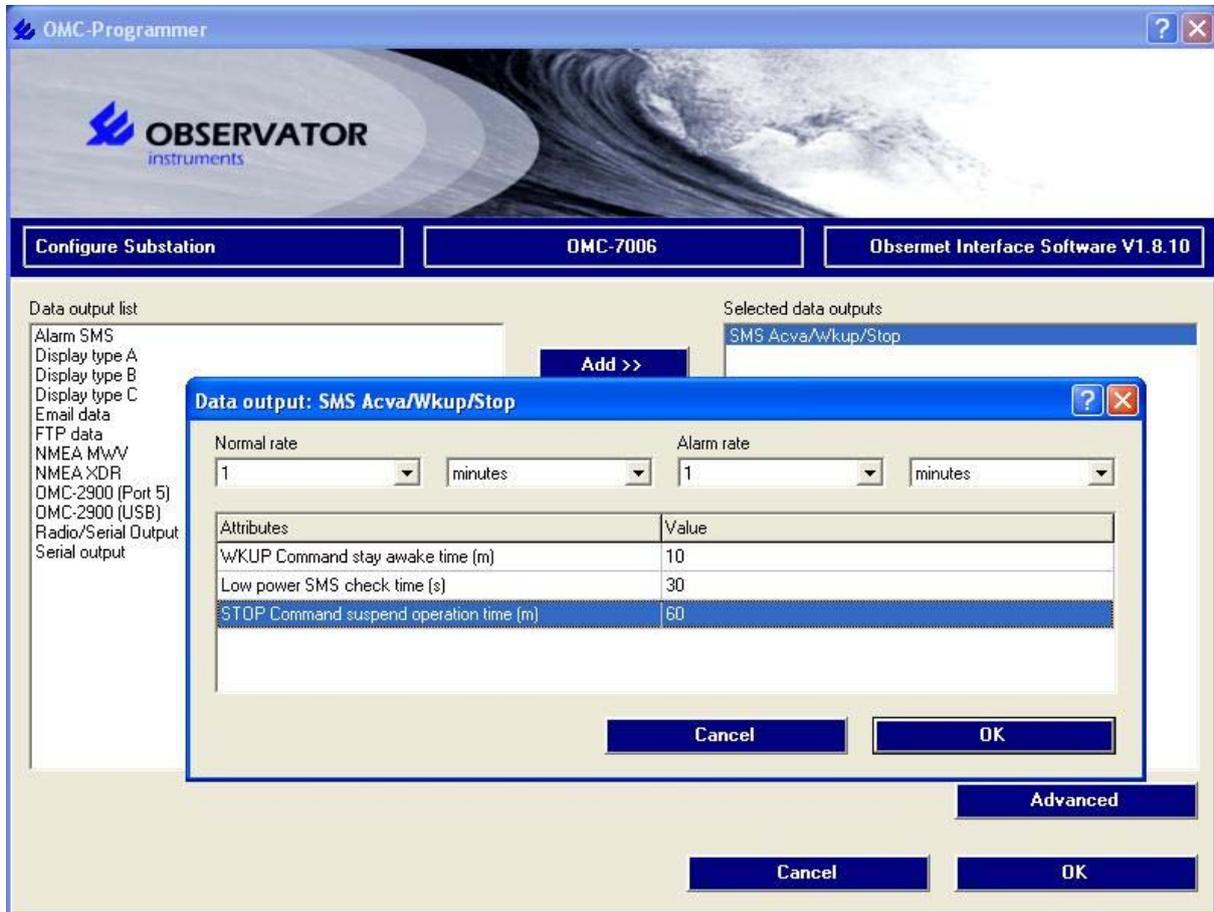
Deployment	Value
Deployment year	2014
Deployment month	1
Deployment day	1
Deployment hour	0
Deployment min	0

Do not forget to save the configuration to the logger.

Setting Stop command:

In Data Output menu add SMS Acva/Wkup/Stop.

Double Click to open the advanced menu and set the required minutes you want the logger to pause when a Stop command is send.



Don't forget to save the changes.

Now whenever you want the logger to pause collecting data simply send a SMS with 'Stop' to the logger. It will confirm by SMS when is has stopped.

Keep in mind that if the logger is in low power mode it will not receive the SMS until it is awake!

6. EXO probe mounting and deployment instructions.

The end cap of the EXO probe had been modified with an extra disc to fix the sensor in the deployment tube. The disc is supported by support clamps mounted on the deployment tube.



Deployment with EXO:

- **Remove protection cup on site and not already in your workshop!**
- **Keep sensors out of direct sunlight!**
- **Deploy a.s.a.p. after removal of cup, but definitely with 20 minutes!**

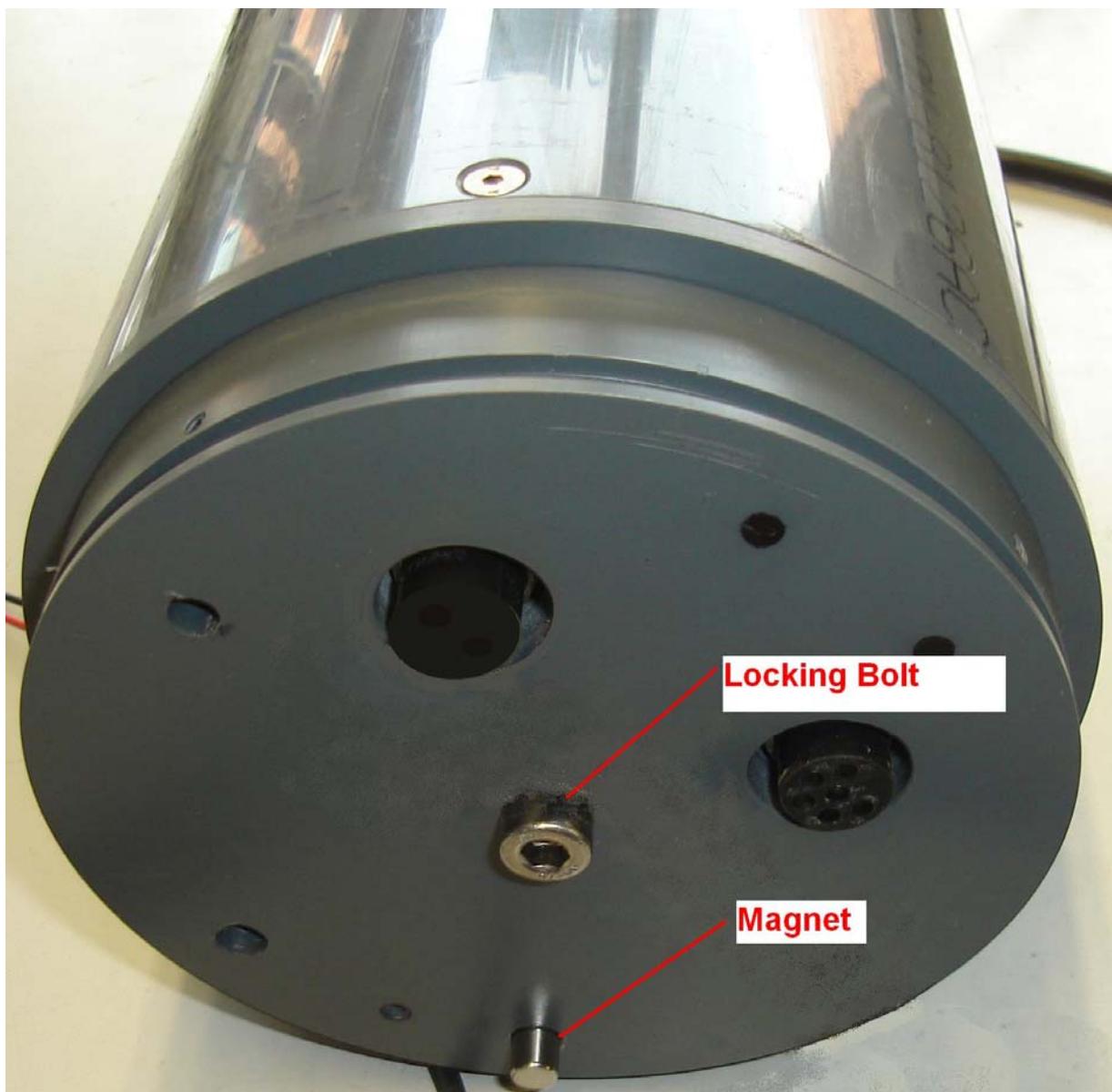
This means you will have to remove & reinstall the canister on site. It is not difficult, but we do recommend you practise this in your workshop before deployment

7. No Alarm Disc

Removal of the canister will activate the alarm (if set in the configuration).

The alarm is activated by an internal reed switch. To stop or prevent the alarm when you remove the canister a No Alarm Disc is included. This can be mounted on the bottom of the canister as in underneath picture. The magnet will deactivate the reed switch. It can be secured with the locking bolt.

The holes in the plate leave the connectors accessible and make sure the plate is correctly positioned.

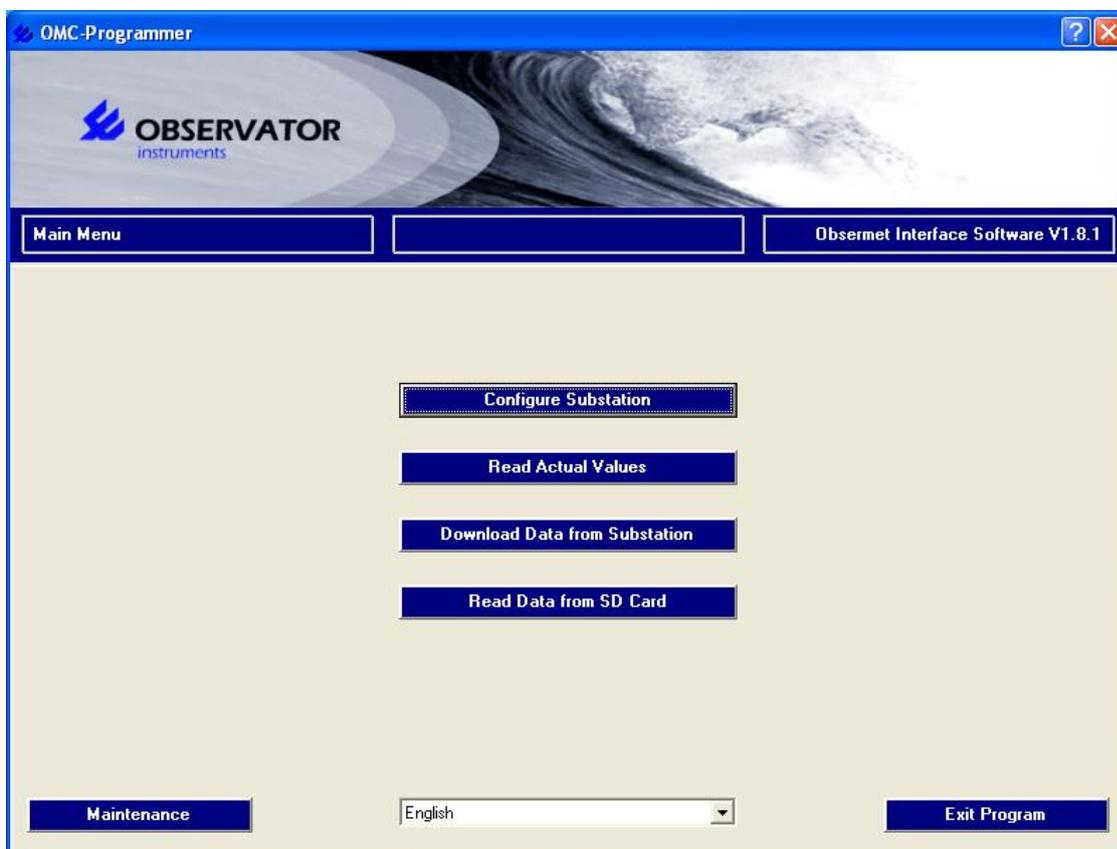


8. OMC-Programmer

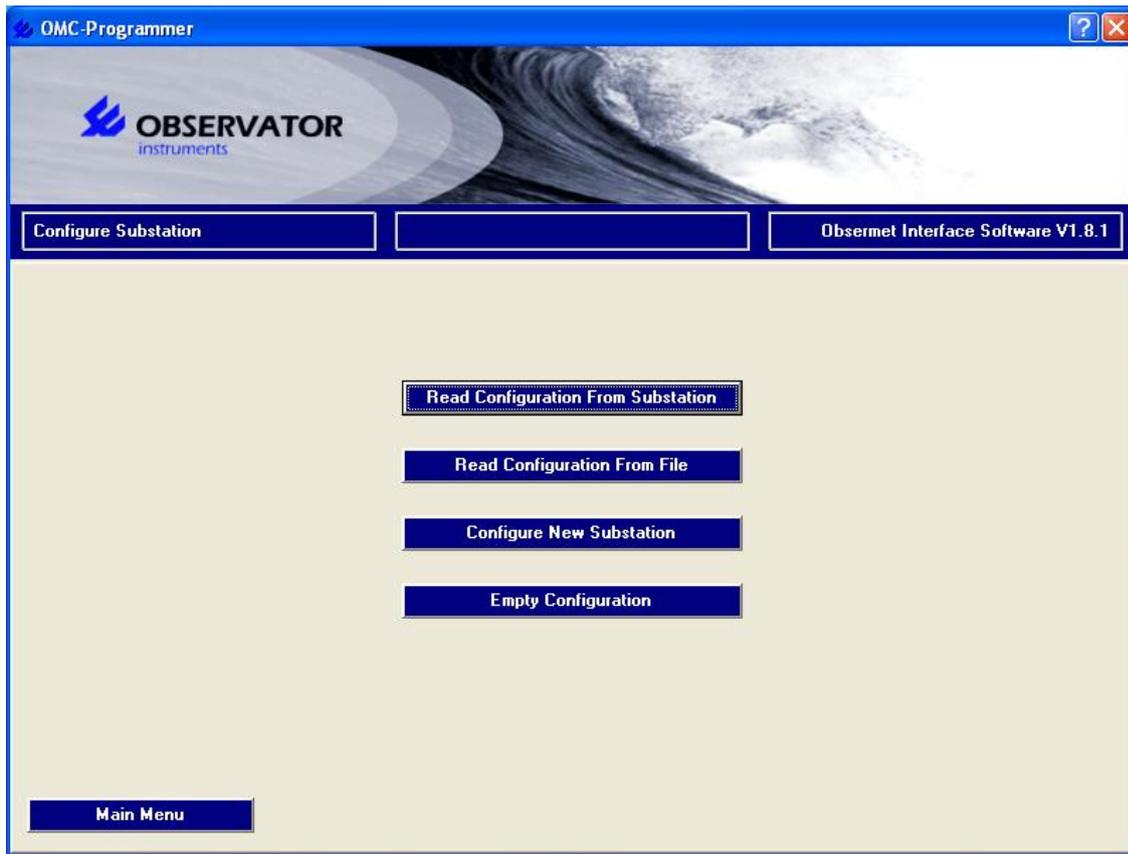
This chapter will explain the basic data logger settings using OMC-programmer. For more advanced information we refer to the OMC-programmer manual.

The Exo probe is integrated in OMC-programmer v1.8.1 and up. Check our website for the latest (Beta) version.

Connect the data logger to your laptop (see chapter 4) and start OMC-programmer



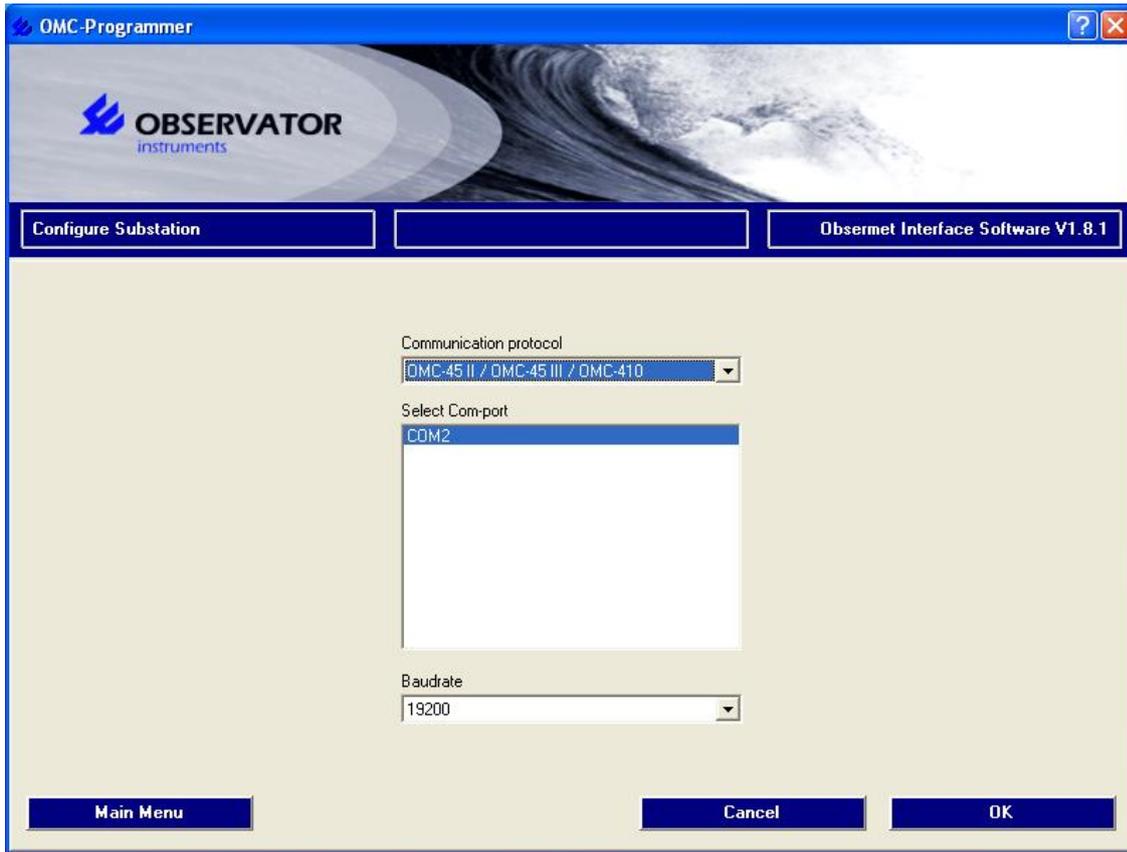
Choose 'Configure Substation'



Choose 'Read Configuration From Substation'



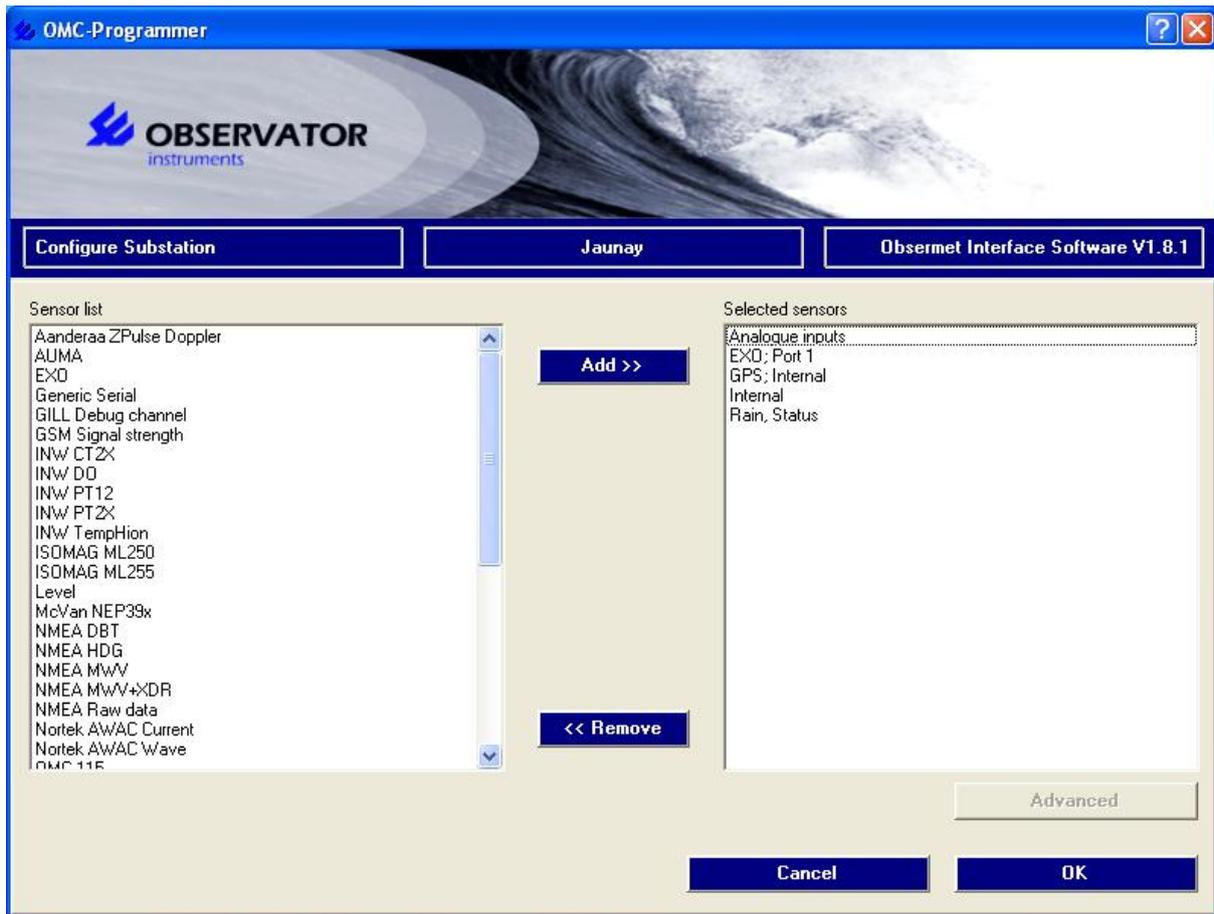
Choose 'Use Direct Communication'



Select Com port to which the Buoy is connected.



You're now in the 'main' screen



This is the Sensors page, here you can add & remove sensors you wish to monitor and / or log.

- Analogue inputs: The voltage input is used to monitor main the battery pack (independent from the backup battery pack)
- EXO : the connected Probe
- GPS: the internal gps if you require to log / monitor the buoys location
- Internal: internal data logger sensors like: battery power, internal humidity etc.
- Rain, Status: The status input is used for the canister removal alarm

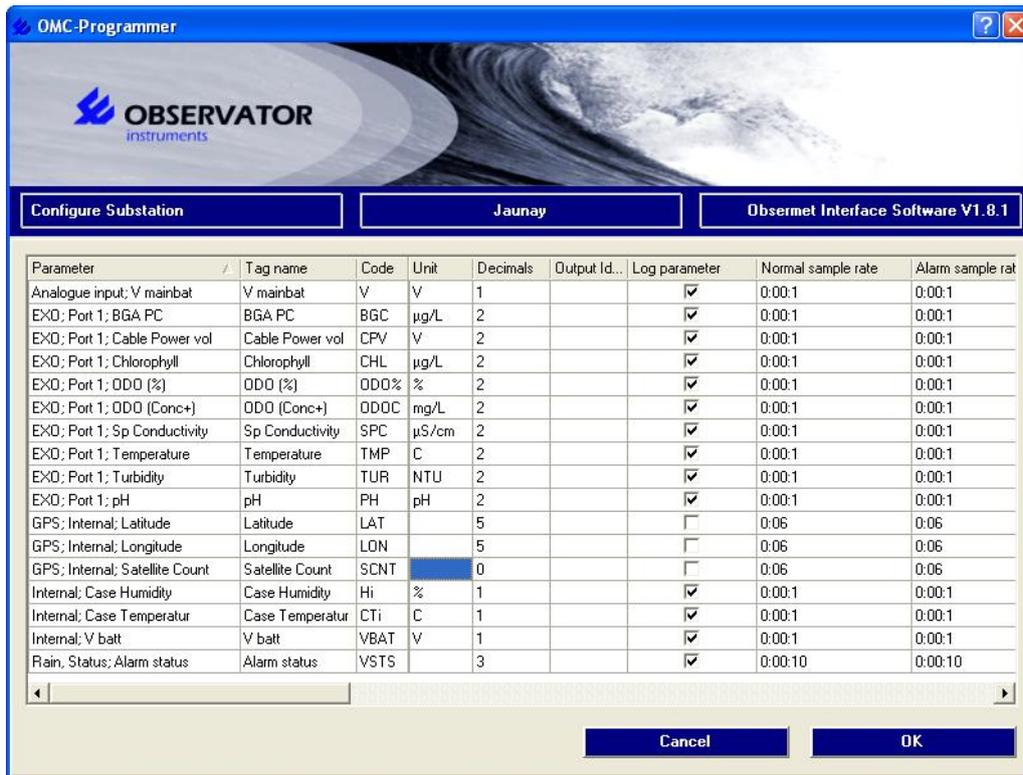


Double click on GPS for advanced settings, Small log is enabled to log the GPS data independent from other measurements.



The next page is the parameter list. You can select here which parameters should be monitored / logged of the sensor you selected in the 'Sensors' page. The commonly used parameters for each sensor will be added by default when a sensor is selected. You can add and remove parameters.

The next step is the Input (Tag list).



In this page you select if a parameter must be logged and you can set the alarm levels & warnings.

Double click on a parameter to open an extra menu where the settings can be changed.



Tag name: name of parameter

Code: used in OMC-data online

Unit: measuring Unit

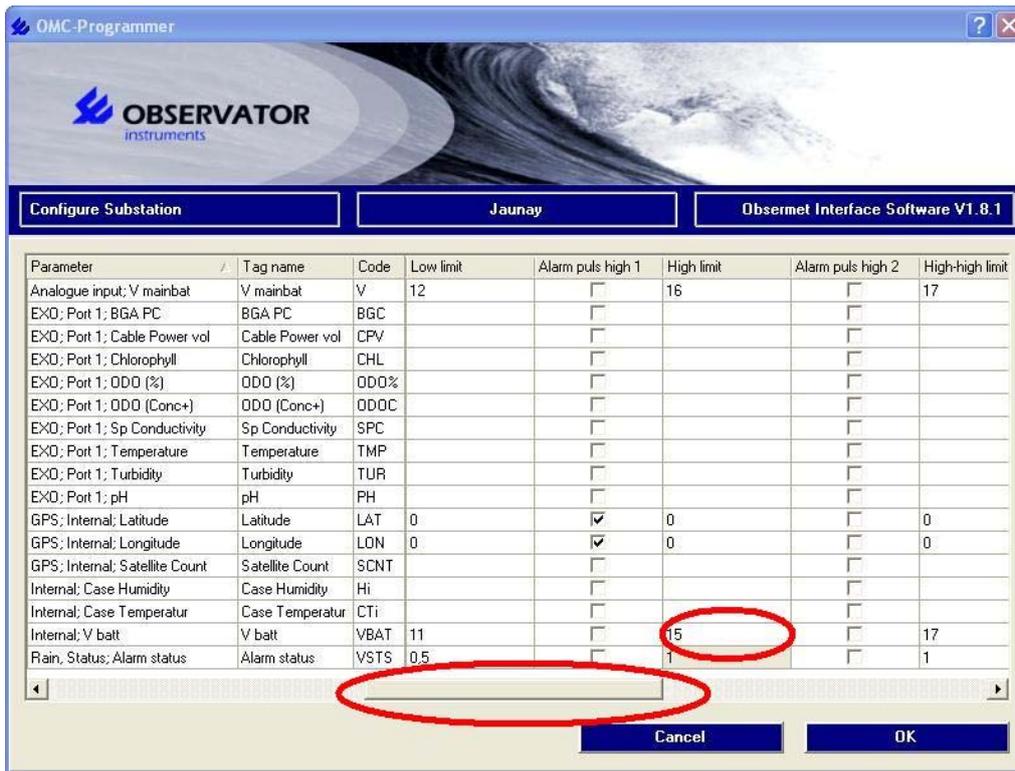
Output identifier: only used for direct (serial) output

Sample rate: equal to output rate of sensor or (in low power!) equal to store to SD rate

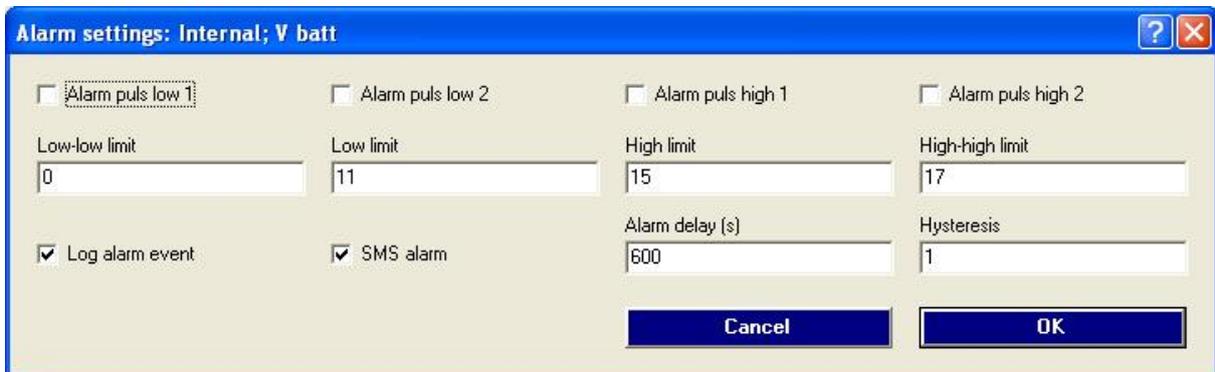
Alarm sample rate: must be =< sample rate. Rate used if an alarm is triggered.

Log parameter: Tag if you want this parameter logged.

Click 'OK' to store changes



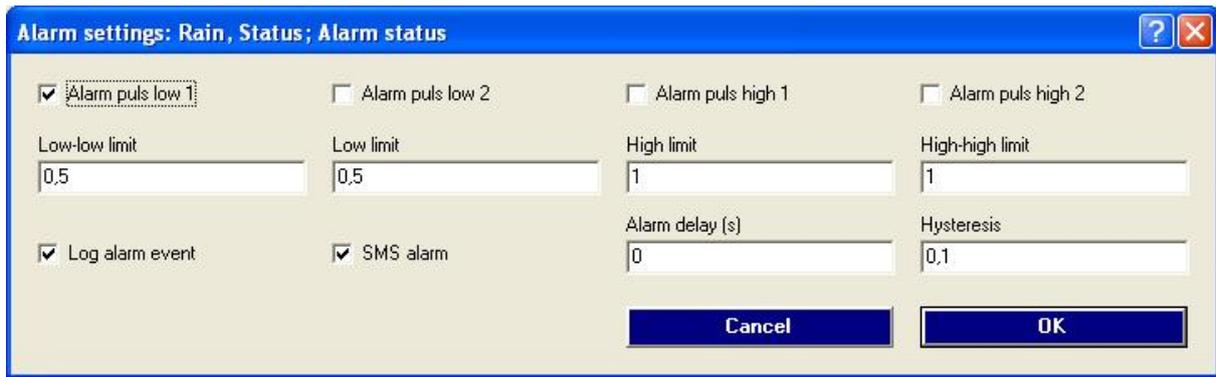
To change an alarm setting slide the bar to the right until the alarm settings are visible and click on an alarm setting.



A new menu will popup. Here you can select the following:

- Set the limits, delay & hysteresis of the alarm event
- Log the alarm event
- Send a SMS when the alarm event occurs
- Select if the Alarm light should be switched on or not (Alarm pulse 1)

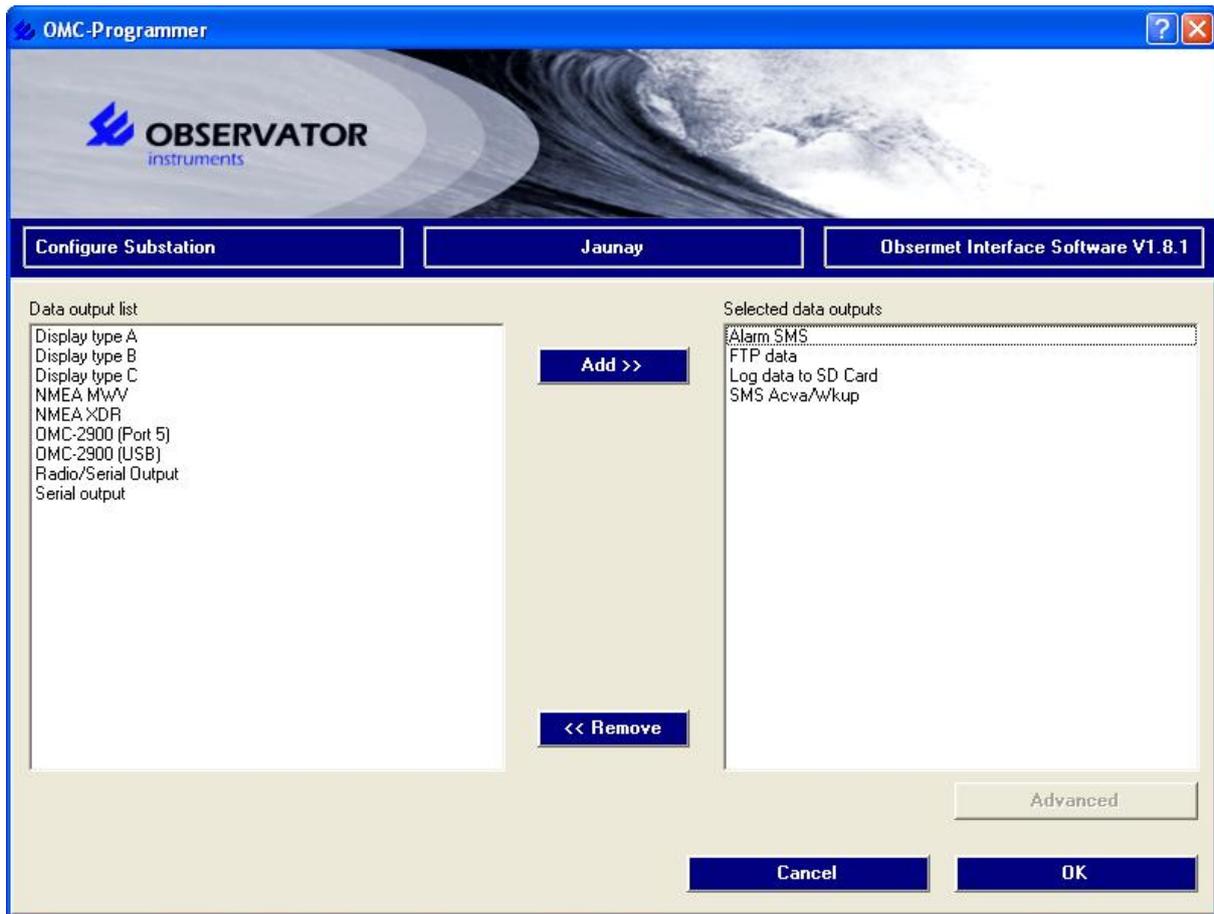
Underneath for example the settings for the canister removal alarm:



Setting	Value
Alarm puls low 1	0,5
Alarm puls low 2	0,5
Alarm puls high 1	1
Alarm puls high 2	1
Log alarm event	checked
SMS alarm	checked
Alarm delay (s)	0
Hysteresis	0,1

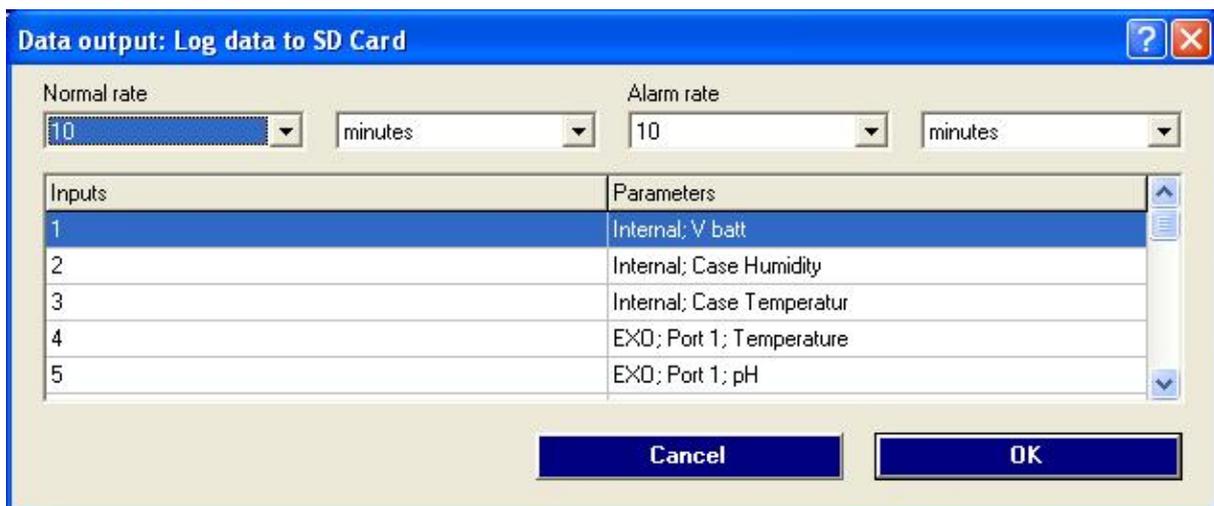
The alarm is detected on the status input. When the canister is in place the value is 1, when the canister is removed the status value is 0. This < 0.5 so this will trigger the alarm. Alarm pulse low 1 is tagged, so the alarm light will be activated. The event will be logged and a SMS will be send.

The data output page allows you to set the desired log interval and output options.



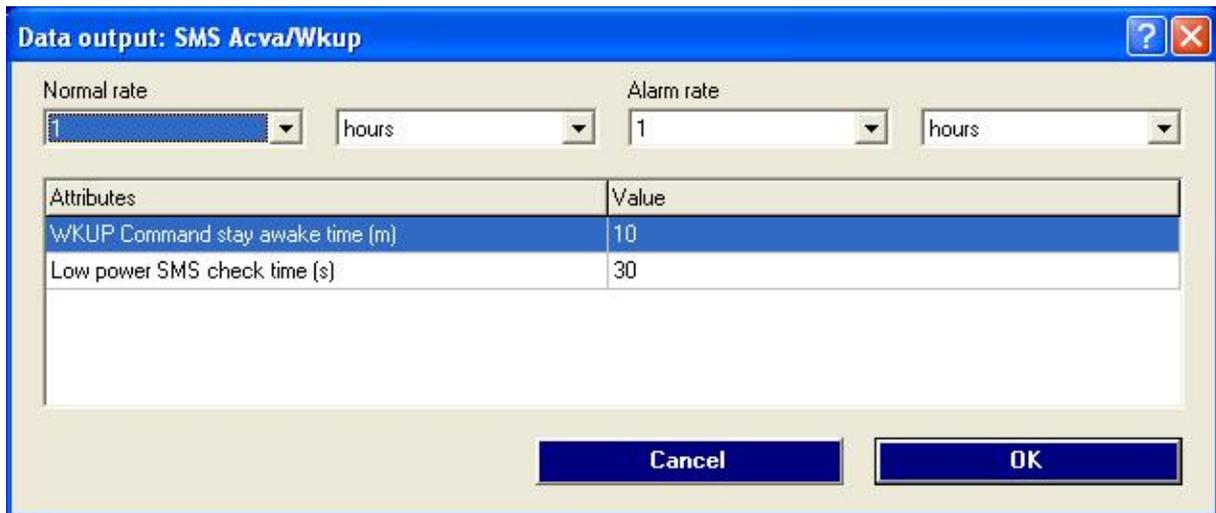
The intervals are related: the output rate should be equal or a multiple of the log interval. OMC-programmer will warn you if there is a conflict with the interval times.

The log interval is set by the Log data to SD card interval:



A very useful option the SMS Acva/Wkup option.

This will allow you to request data via SMS and also wakeup the logger if you would like to configure it remotely via a GSM data modem.



The last actual values can be requested by sending a SMS to the logger with the command: ACVA

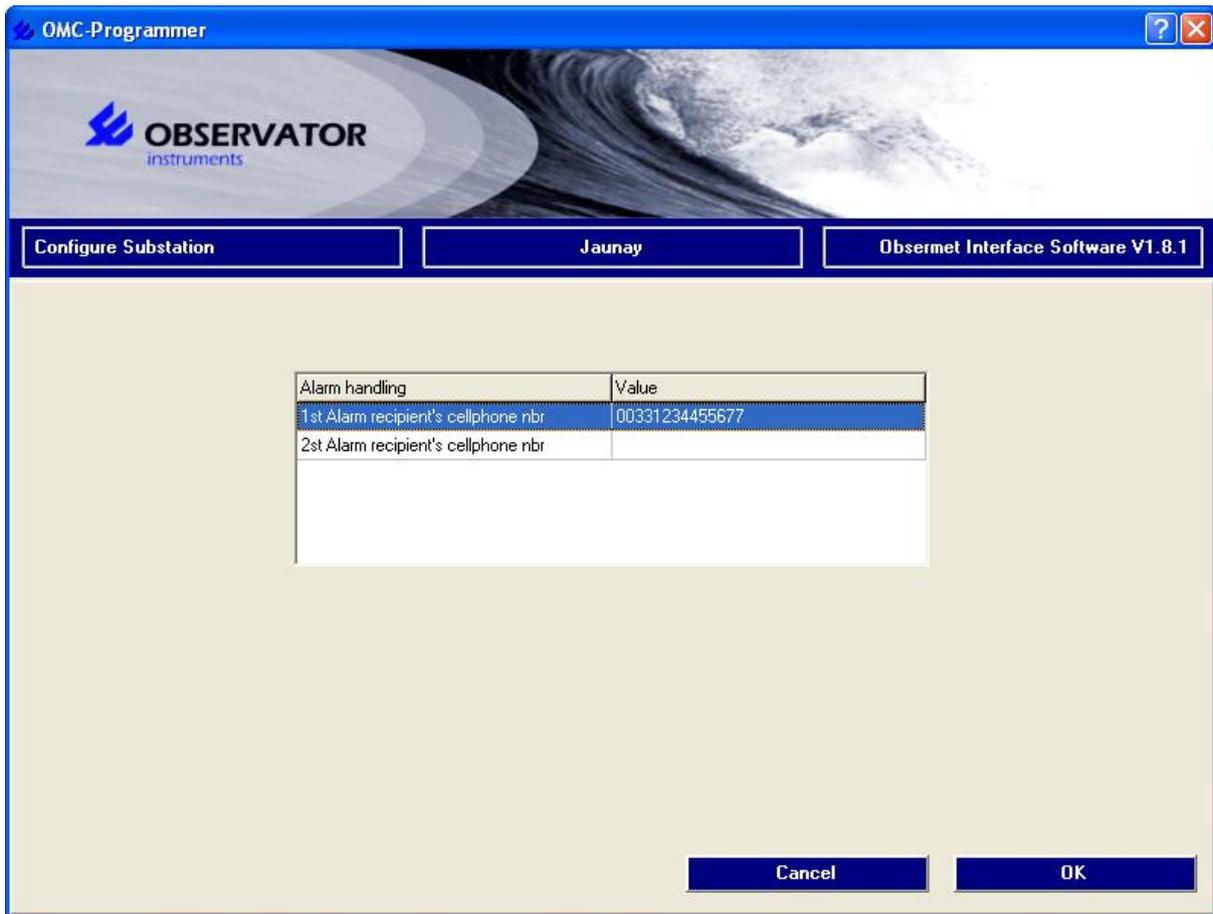
Waking up can be done with the text: WKUP

The logger will send you a SMS when it is awake.

In the modem menu you can set the GPRS settings (APN, username & password). Those should be provided by your GPRS provider. Also you FTP or Email settings are in this menu.



In the alarm handling menu the SMS alarm recipient number(s) can be set (max 2).



All changes done in OMC-programmer are done in OMC-programmer alone. You should save them to file and or upload them to your OMC-045-3 data logger via the Save configuration button.

More detailed information can be found in the OMC-programmer 2010 manual.

9. Maintenance

Regular maintenance will extend the life of your buoy.

We recommend the following at least once a year*:

*Local circumstances can either extend or reduce this interval

External:

- Clean the buoy including all metal parts. All steel parts are 316, but exposure to salt water can cause corrosion.
- Check buoy for any damages and leakage.
- Check the anodes, replace if less than 50% remains.
- Replace the mooring lines.
- Check all shackles, replace if in doubt.
- Clean the solar panels
- Check antenna connection, replace tape if in doubt.

Canister:

Normally it is not required to open the canister, programming can be done via the external connector.

If you do need to open the canister see chapter 11.

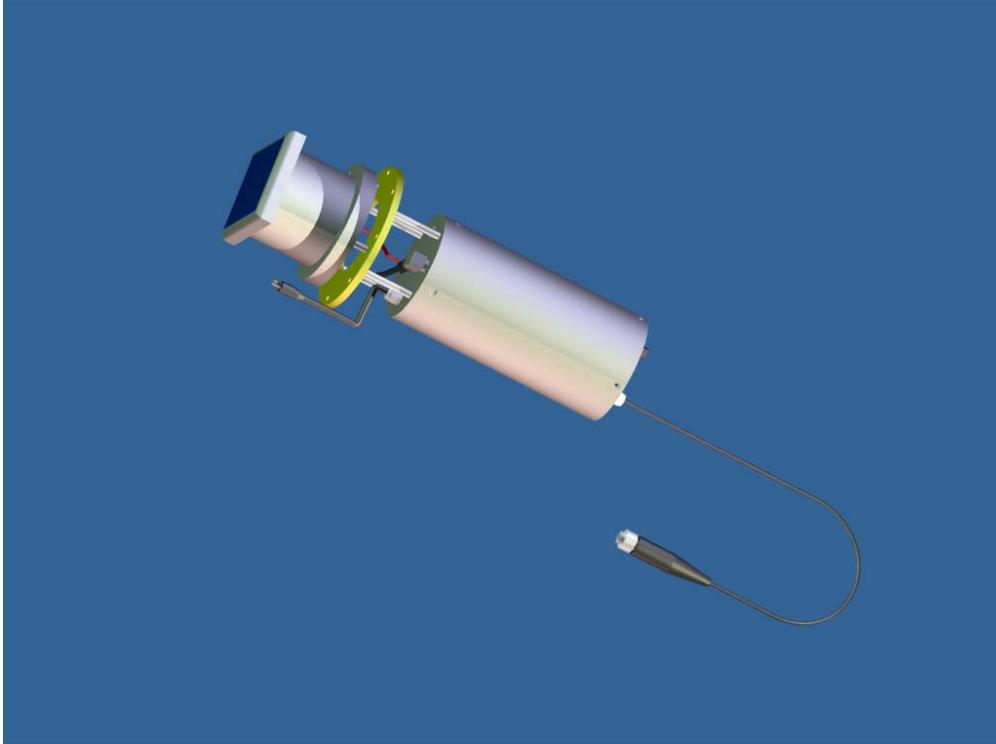
Work on the canister must be performed in a clean workshop!

Batteries:

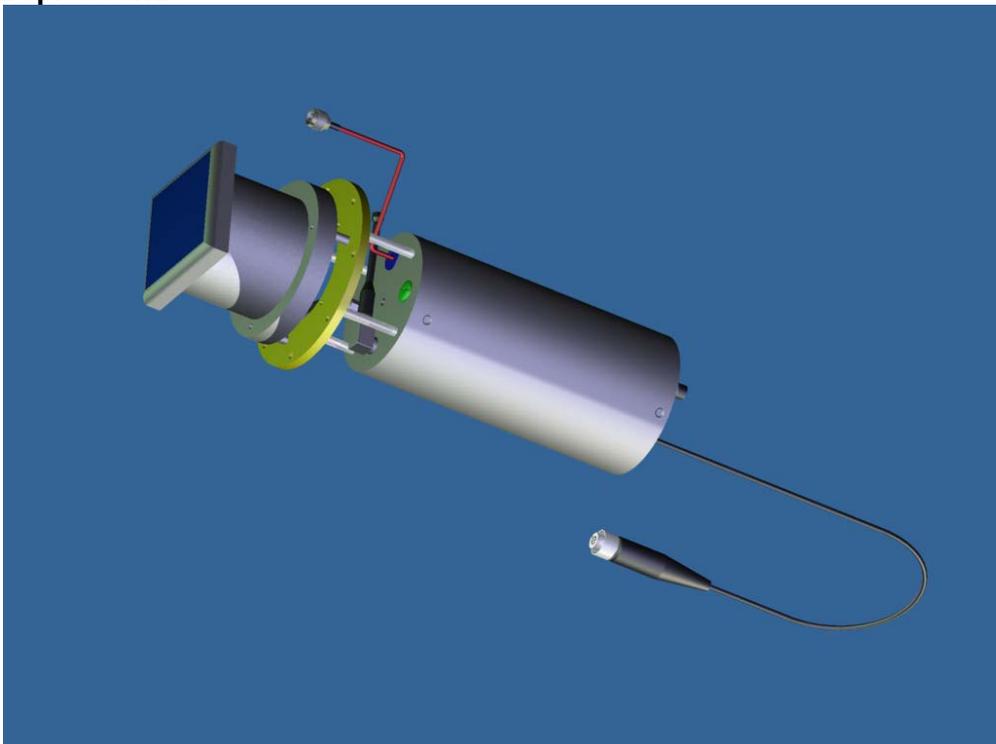
- Check condition of batteries.
- For unattended installations we recommend to replace the batteries once a year.

10. Opening the canister

Before starting this procedure it is recommended that the GPRS antenna is disconnected and removed from the canister.

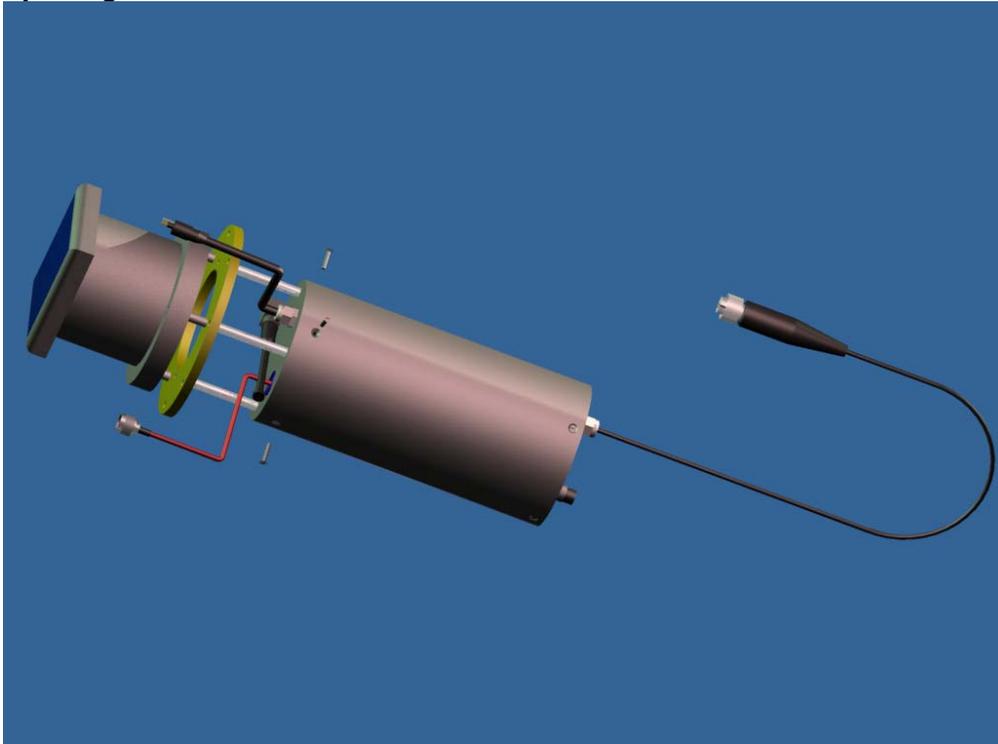


Depressurize

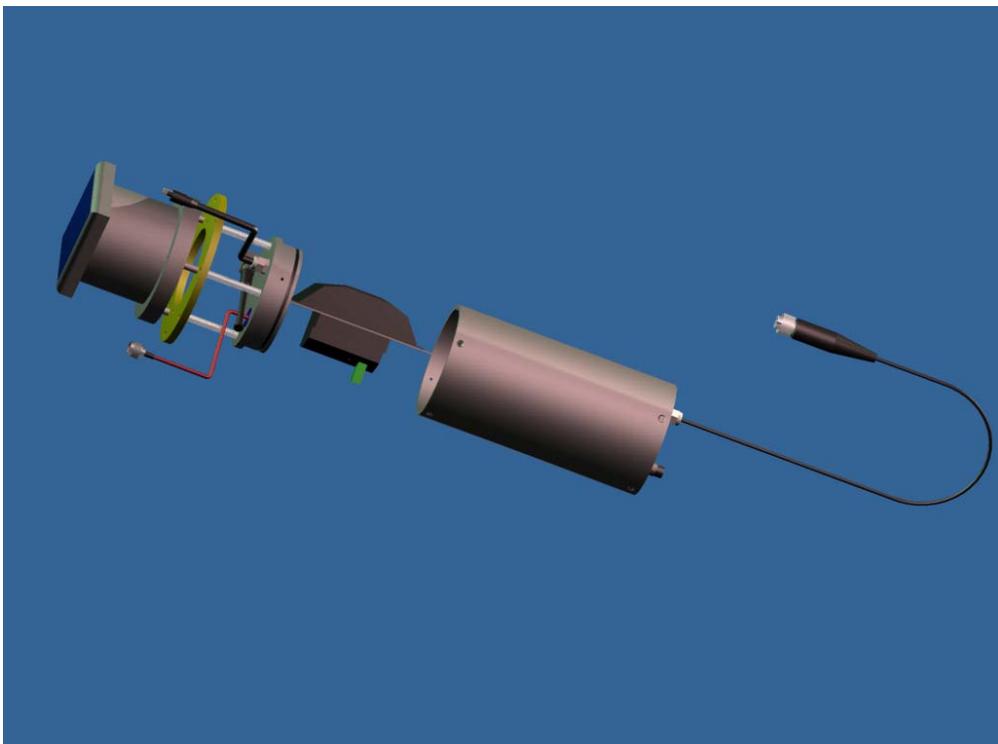


Unscrew the Air-plug (indicated in green) with the screwdriver supplied in the small maintenance-kit.

Opening



Remove the four screws on the sides.

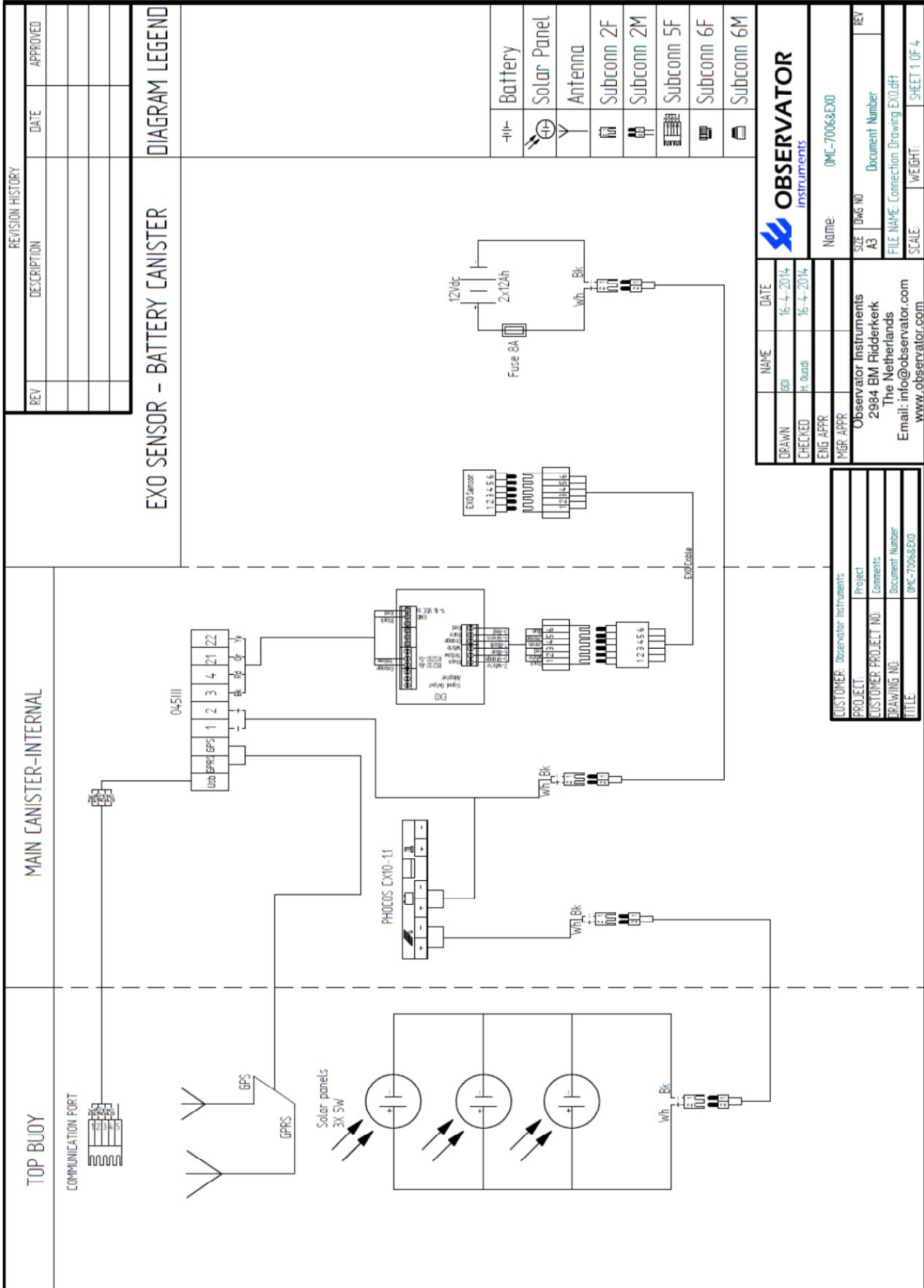


Pull out the top lid.

- If it seems difficult to remove the top lid, try to pump in pressed air via the Air-plug.
- To re-assemble the canister, put a little lubricant on the side of the lid and sealing-ring.

Follow the instructions counter wise

11. Canister Circuit diagram EXO

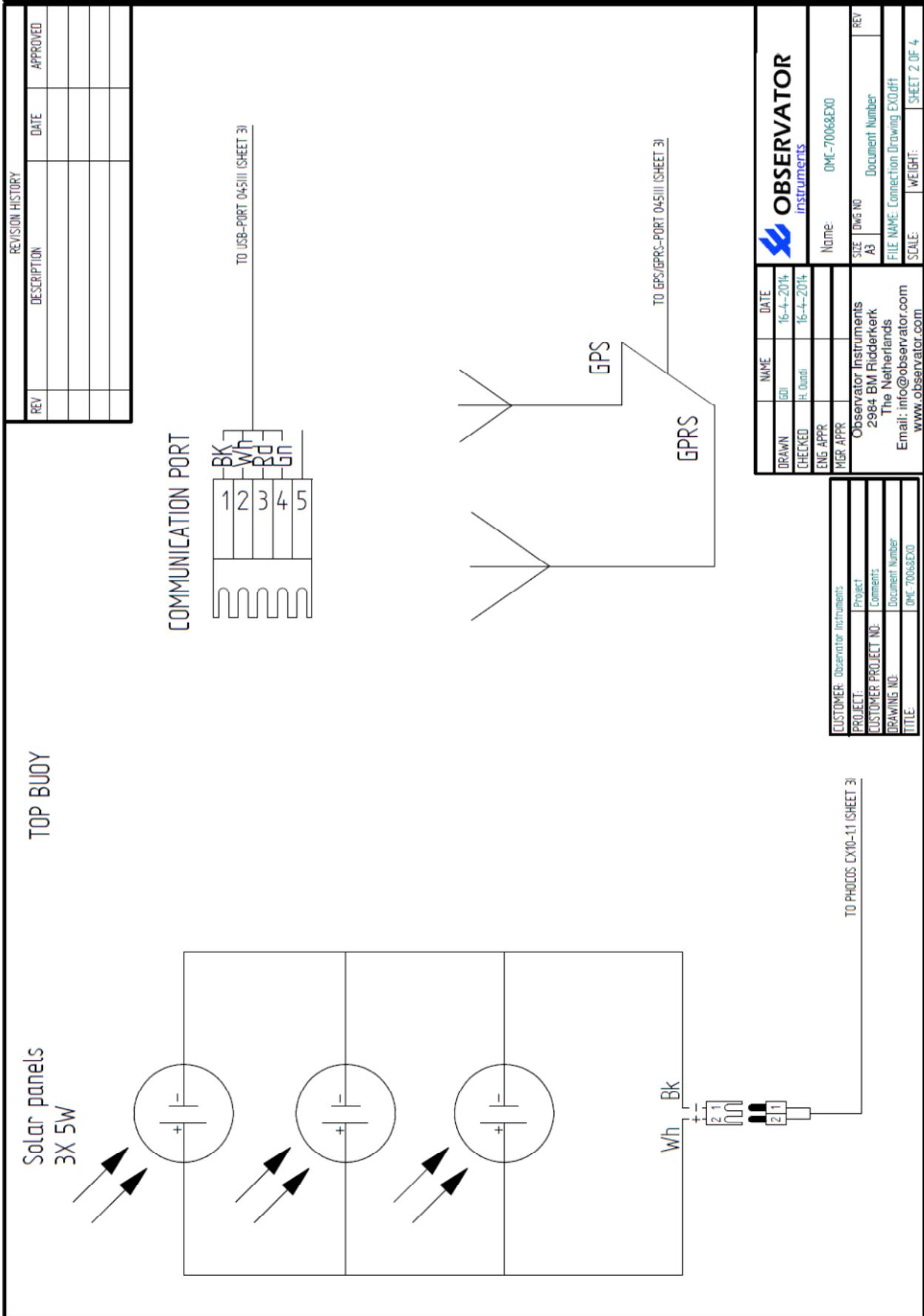


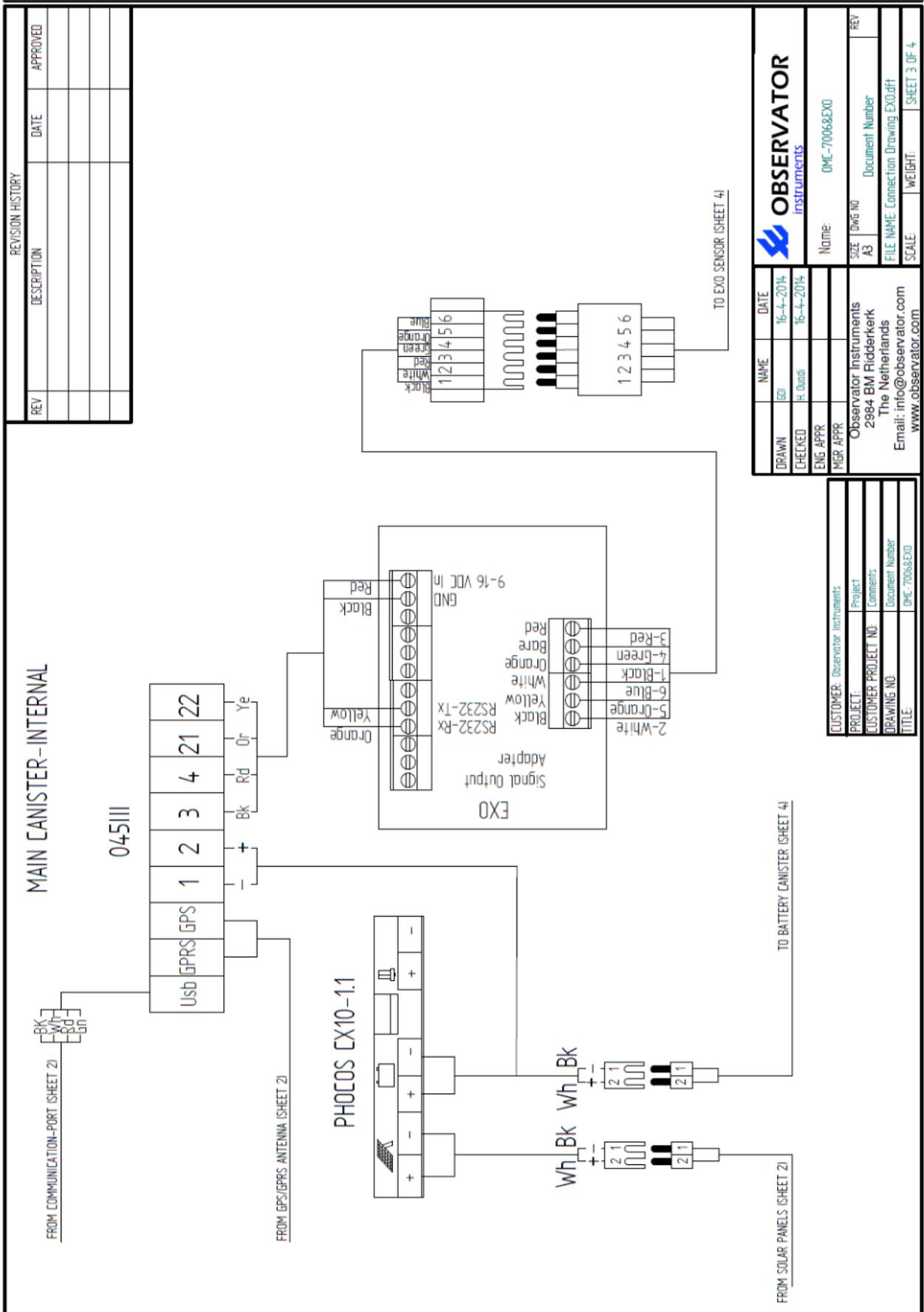
REVISION HISTORY		
REV	DESCRIPTION	DATE

DIAGRAM LEGEND	
	Battery
	Solar Panel
	Antenna
	Subconn 2F
	Subconn 2M
	Subconn 5F
	Subconn 6F
	Subconn 6M

OBSERVATOR instruments	
NAME	OMC-7006&EXO
DATE	16-4-2014
DRAWN	H. Oudt
CHECKED	H. Oudt
ENG. APPR.	
MGR. APPR.	
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Document Number	
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WEIGHT	
SHEET	1 OF 4

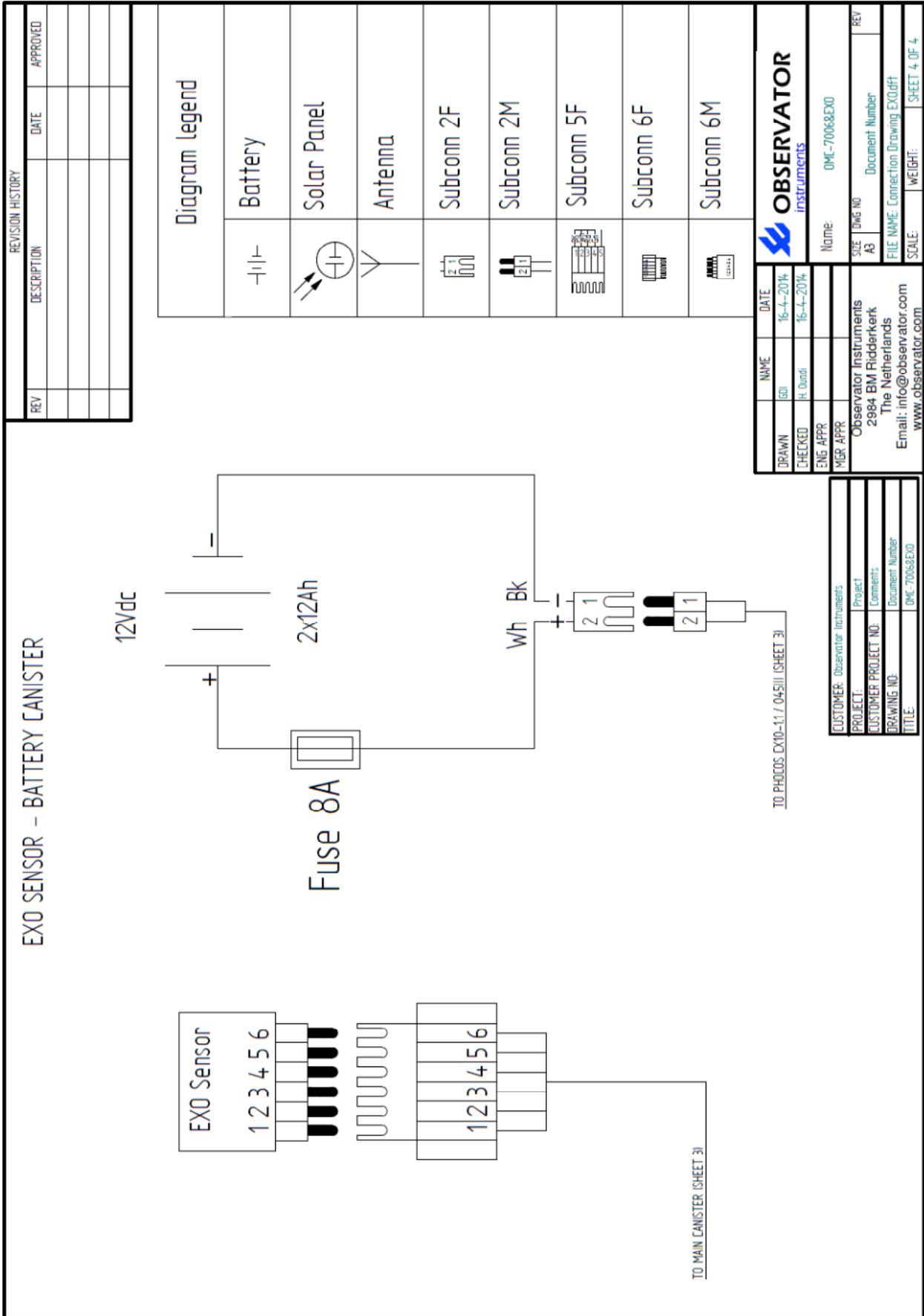
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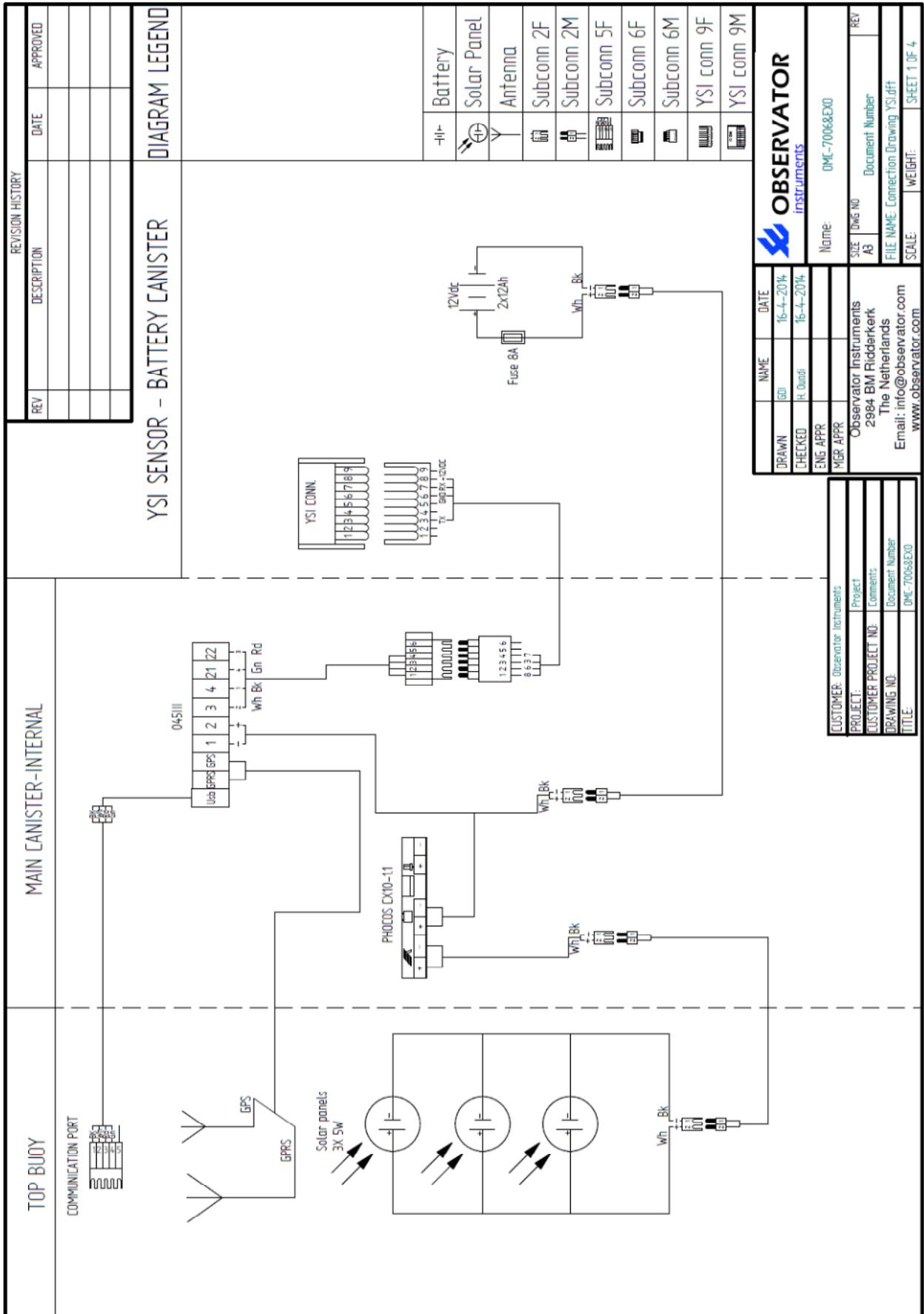


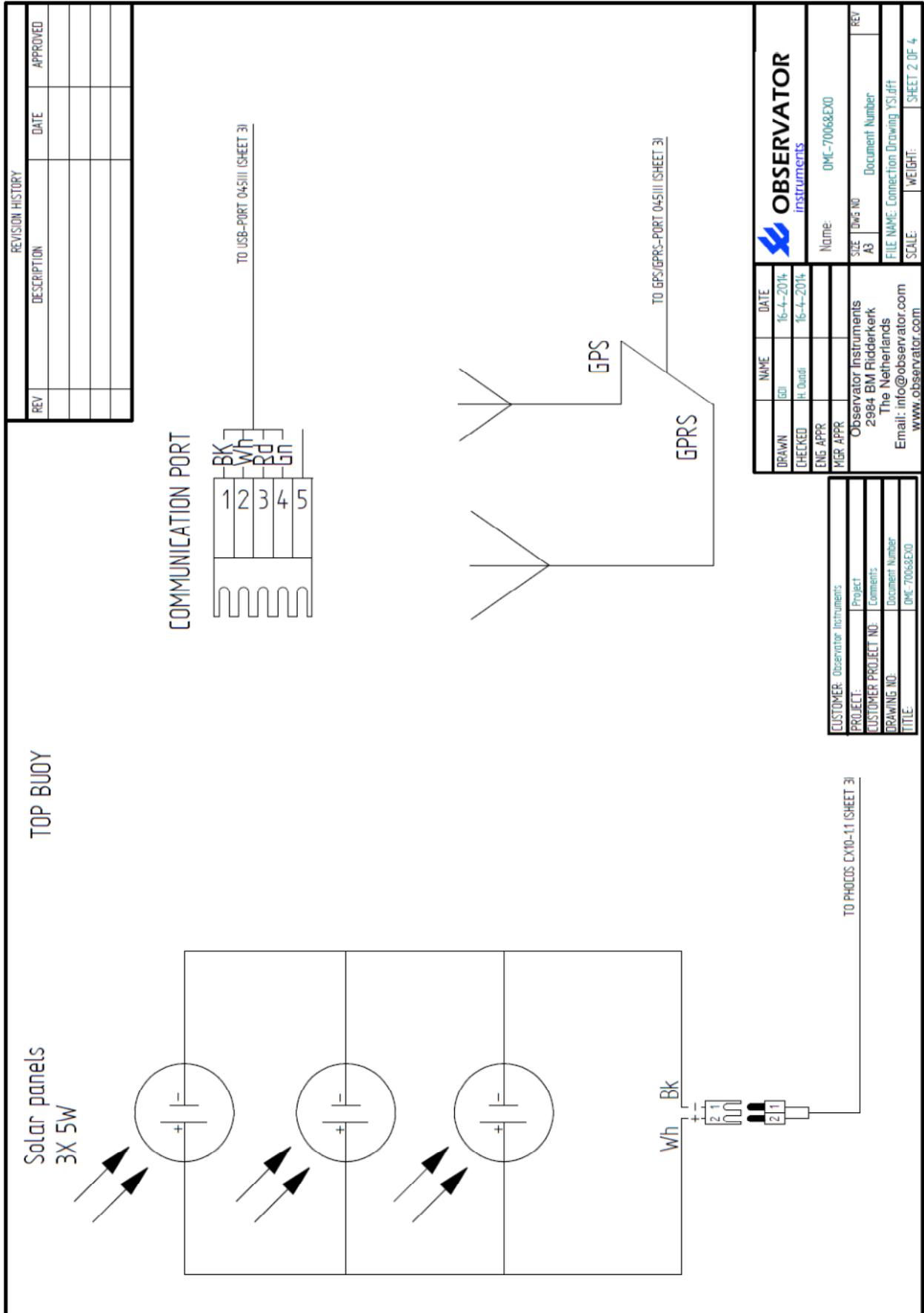
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OBSERVATOR Instruments		Document Number	2984 BM Ridderkerk
The Netherlands		FILE NAME	Connection Drawing EXO.dft
E-mail: info@observator.com		SCALE	WEIGHT:
www.observator.com		SHEET 3 OF 4	

CUSTOMER:	Observator Instruments
PROJECT:	
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DRAWING NO.:	
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12. Canister Circuit diagram YSI 6600

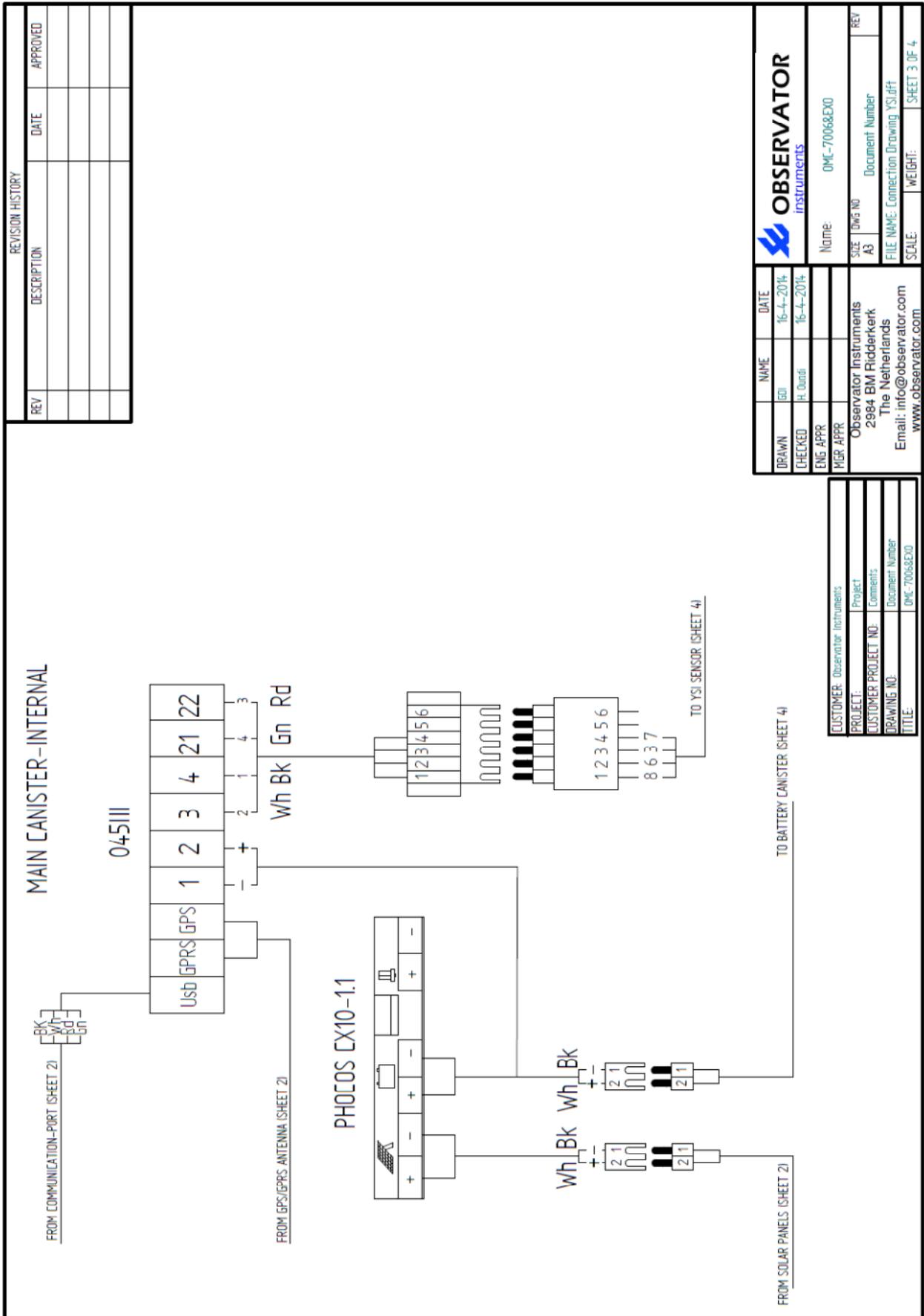




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CHECKED	16-4-2014
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MGR. APPR.	
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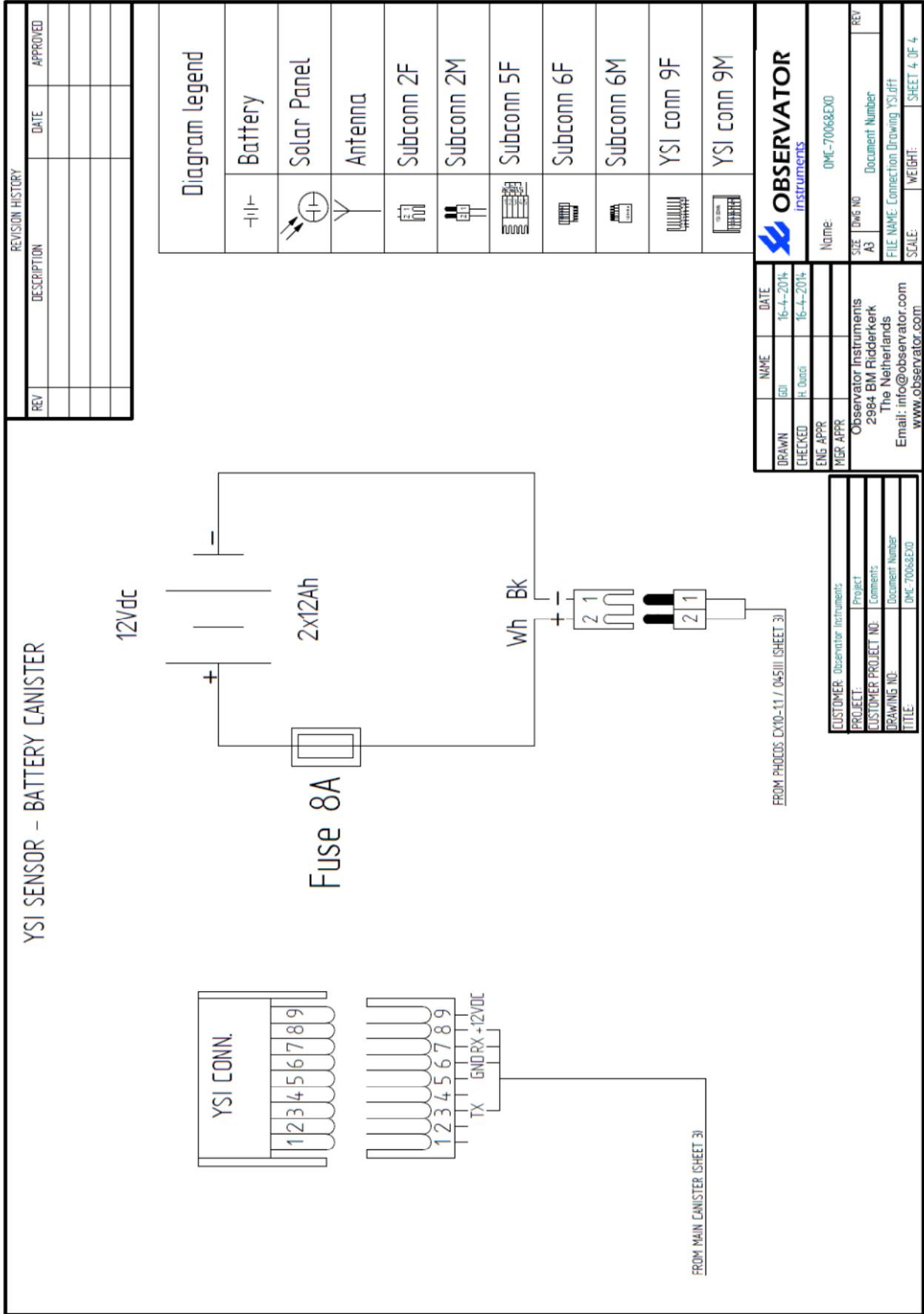
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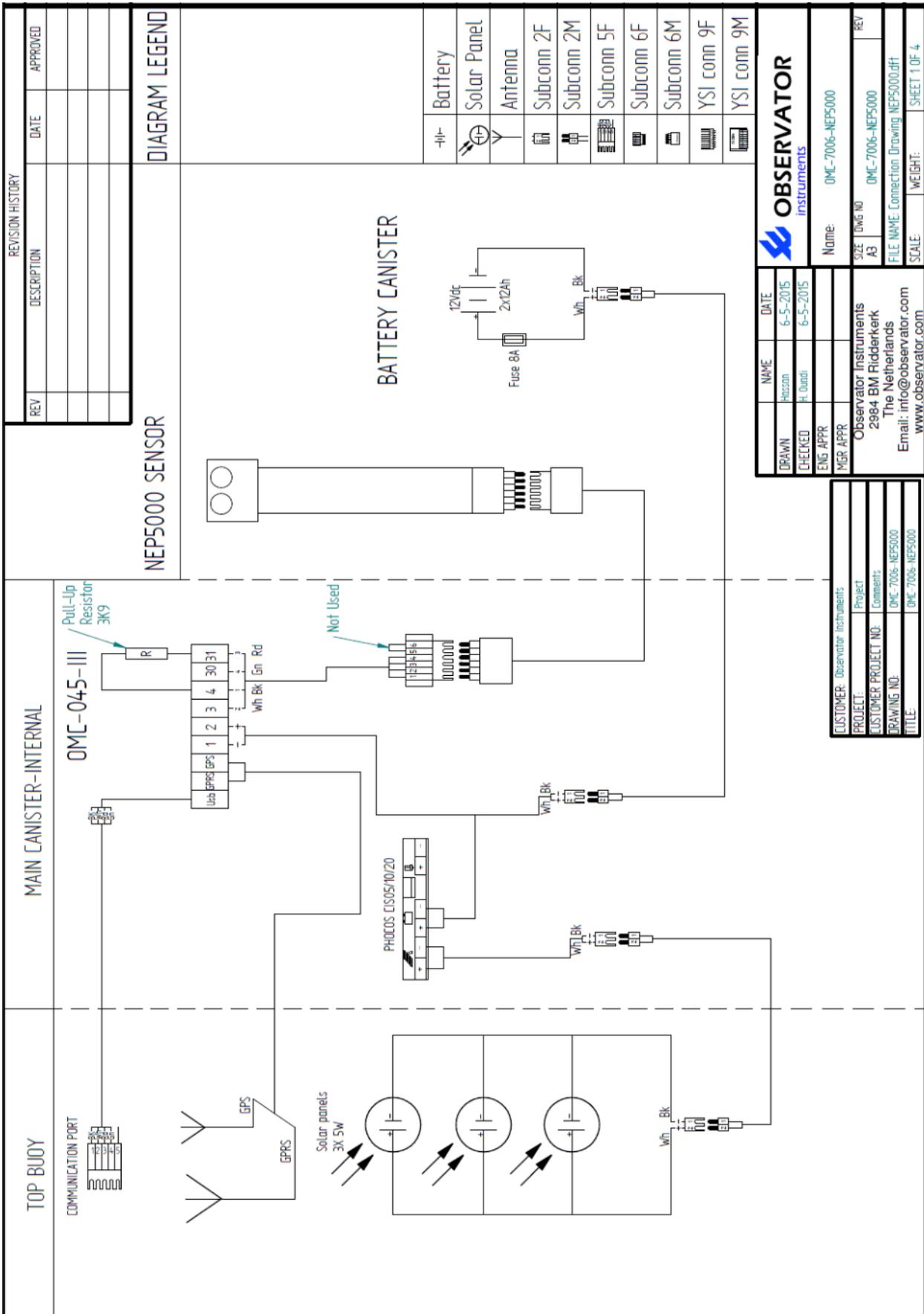
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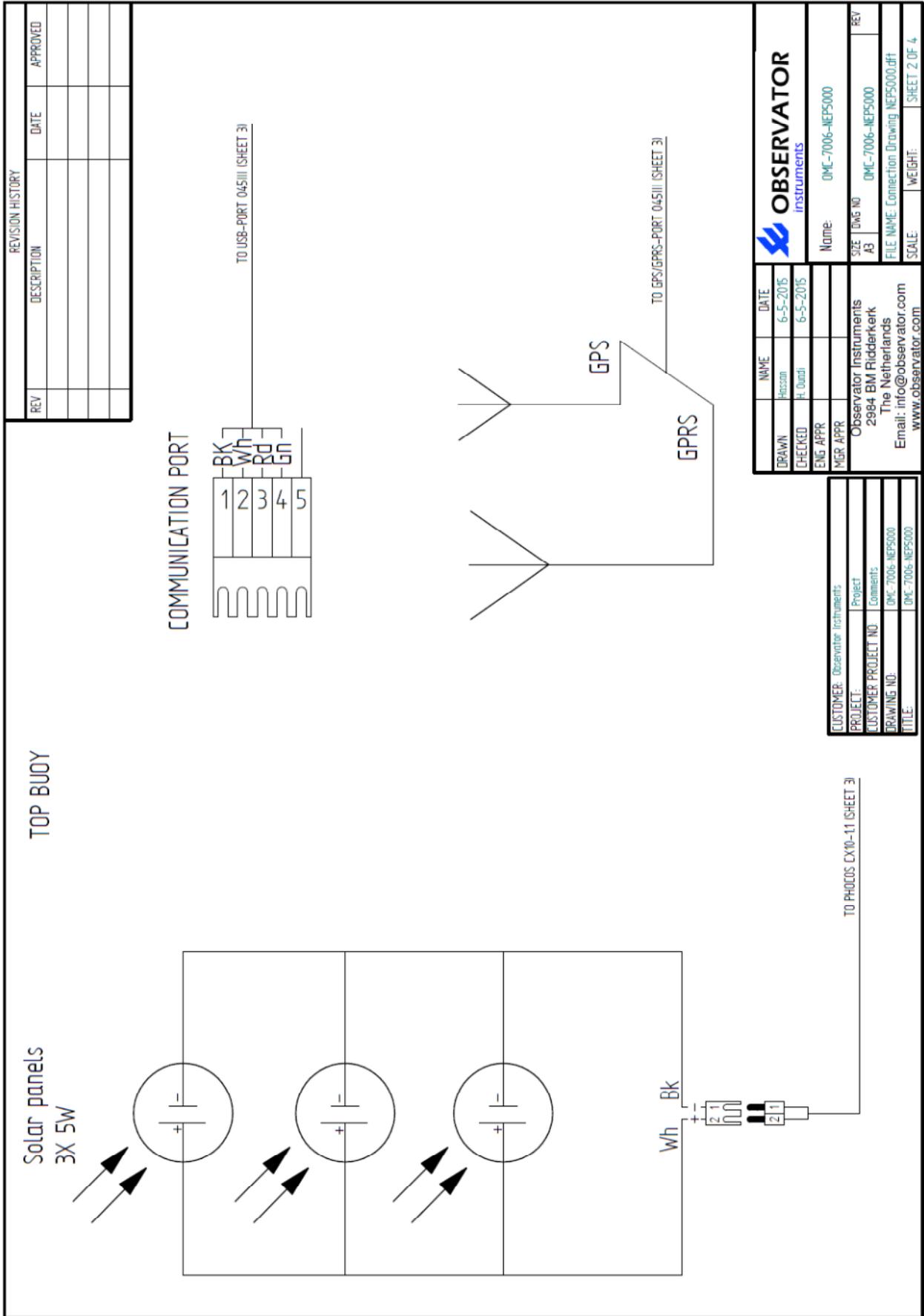
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The Netherlands		Document Number	
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www.observator.com		SCALE	WEIGHT: SHEET 3 OF 4

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CUSTOMER PROJECT NO:
DRAWING NO: OMC-7006&EX0
TITLE:



13. Canister Circuit Diagram NEP 5000





REVISION HISTORY			
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OBSERVATOR instruments		NAME	DATE
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CHECKED	H. van den Broek	6-5-2015	
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MGR APPR			
Observer Instruments 2994 BM Ridderkerk The Netherlands Email: info@observator.com www.observator.com		Name:	OMC-7006-NEFS000
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CUSTOMER:	Observer Instruments
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