

OrigaBox Speed Controller

OrigaTrod Rotating Disc Electrode

User's Guide



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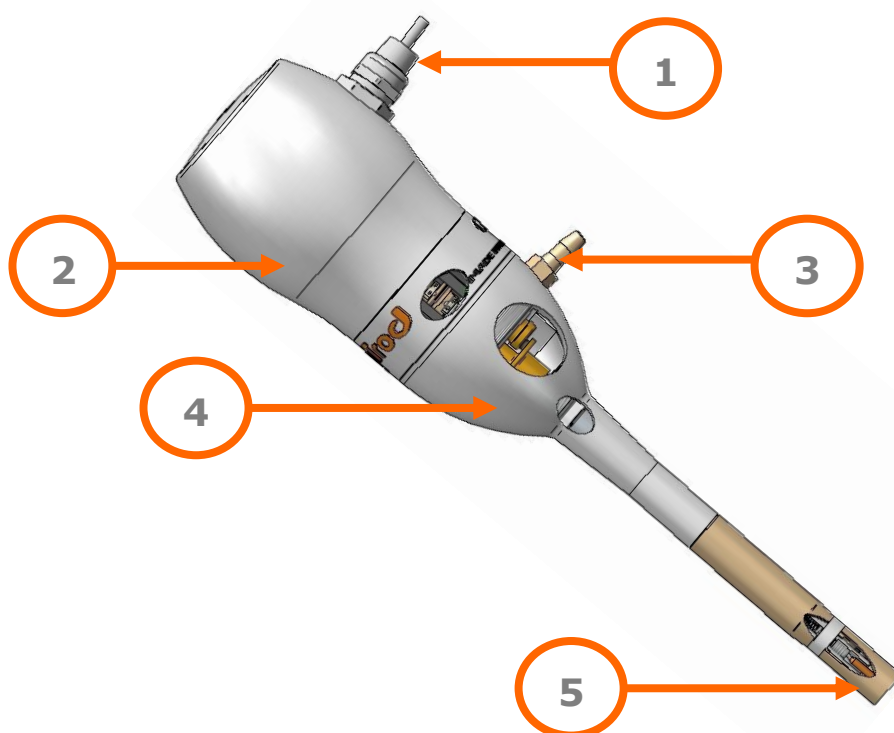
Description

OrigaTrode Rotating Disc Electrode (RDE)

The OrigaTrode Rotating Disc Electrode comprises the following:

- the electrode motor (2),
- the electrode body (4) with the electrode disc holder tip (5).

The motor part (2) is screwed onto the electrode body (4) and the tip (5) onto the electrode body.



The whole electrode comprises:

- BNC plug (1) for the electrical circuits ensuring the contact between disc and the voltage generator (potentiostat or polarographic analyzer),
- 6-pin male DIN plug (1) for connection to the OrigaBox Speed Controller,
- gas inlet (3) for a gas (nitrogen, helium) to protect the electrode bearings from corrosion and clogging agents.

The white parts are made in PET-P. The other parts (brown) are made in PEEK.

The OrigaTrod electrode has a ground joint (NS 14.5/23) which fits a great majority of measurement cells.

The electrical contact is ensured by brushes which rub a bush made of phosphorous bronze. The background noise due to this contact is negligible irrespective of the electrode rotation speed.

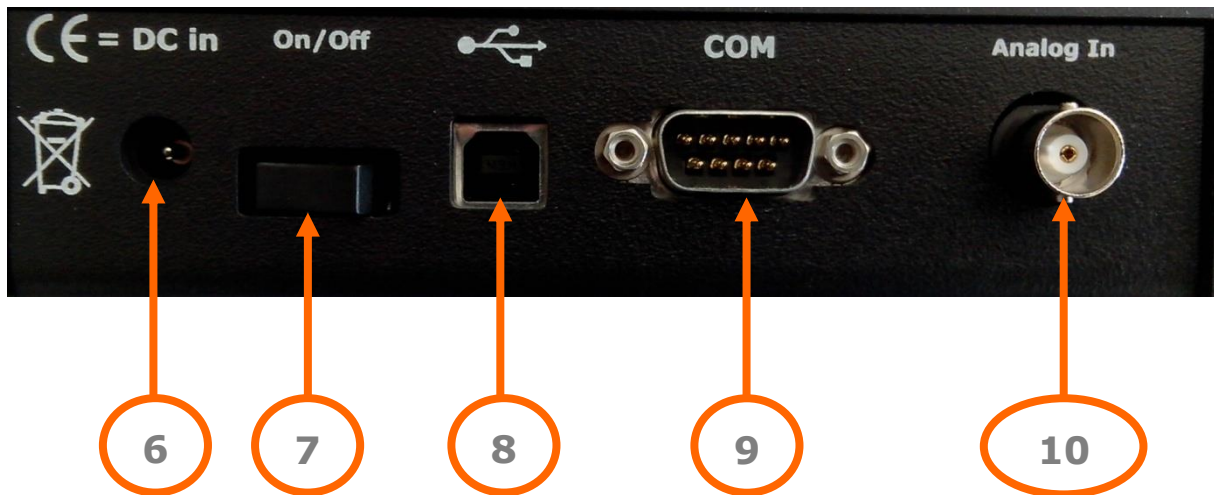
The gas inlet **(3)** is used for flushing the electrode bearings and contacts with an inert gas (nitrogen, helium, etc.). This operation prevents these vital parts from being damaged by any corroding or clogging agents.

The electrode active tip **(5)** is cylindrical and made of PEEK. The disc (generally a metal or a glassy carbon disc) is centred on the bottom face of the tip.

The disc diameter is 2 mm, 3 mm, 5 mm. Changing the type of the disc (i.e. the type of working electrode) is a fast and easy operation: unscrew the electrode tip and replace it with another one. A wide range of discs is available as shown at the end of this manual.

The OrigaBox Speed Controller

The OrigaBox Speed Controller is used as an intermediate between the OrigaTrod and the PC software (PC Control Panel), which manages it.



Rear Panel

DC in (6)

Jack diameter 2.1 mm. To be connected to an AC/DC switching adaptor, supplied with the instrument.

Input: 100-240V, 50/60Hz, 0.7A.

Output: 24V, 1.04A, 25W MAX.

WARNING: We decline any responsibility in the event of use of an adapter other than the one provided by OrigaLys ElectroChem.

Switch (7)

On->The OrigaBox is switched on

Off->The OrigaBox is stopped and switched off

USB 2.0 (8)

USB-B for connection to a PC.

COM (9)

RS232C. It is used to update the OrigaBox, to repair it or to control it from another software.

WARNING: We decline any responsibility in the event of use of a software other than the one provided by OrigaLys ElectroChem.

Analog In (10)

BNC plug. Speed consign signal analog input.

Front Panel



This panel does not have sockets.

Lateral Panel



Socket for OrigaTrode (11)

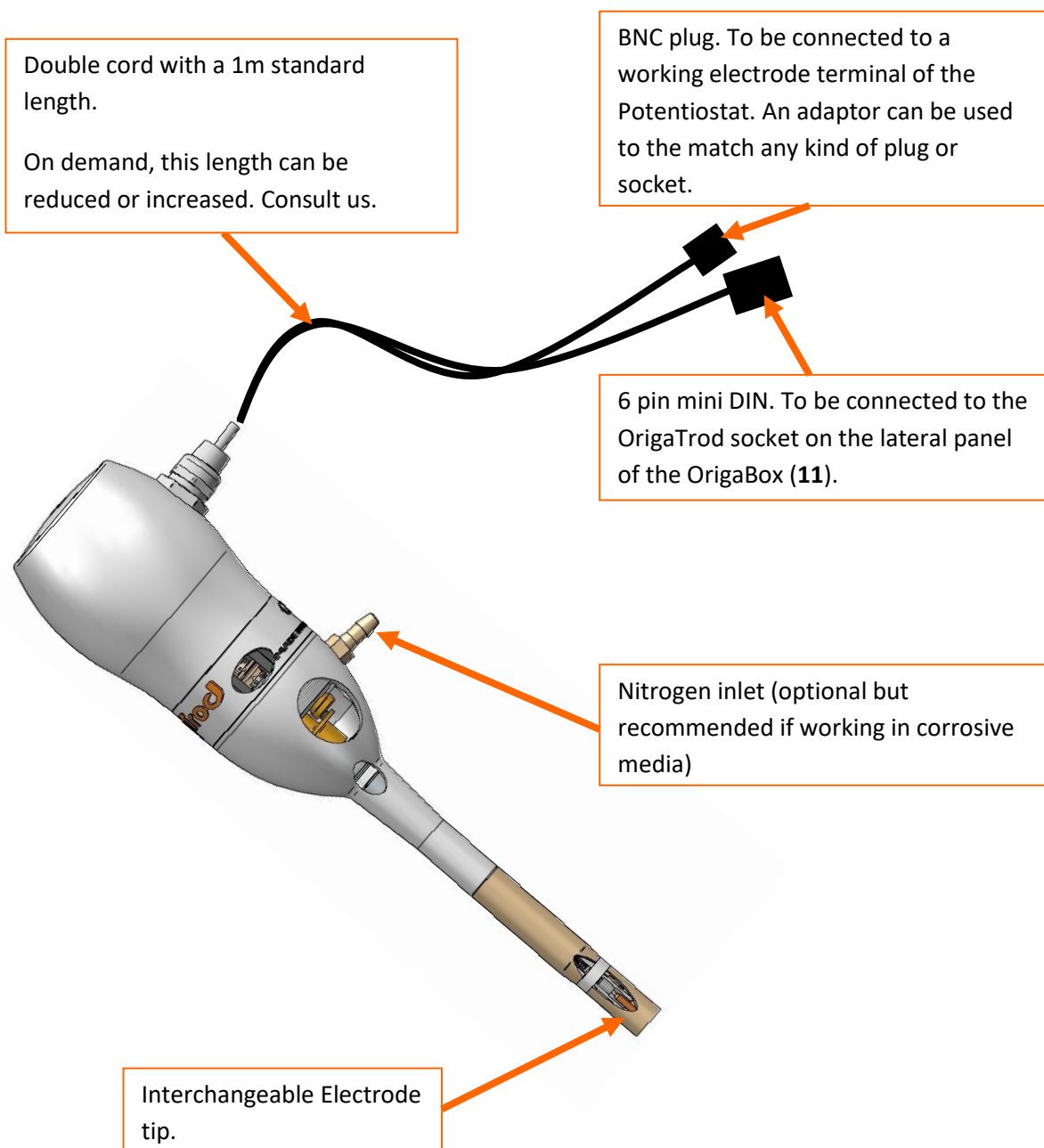
Motor servo-controlling. This 6-pin mini DIN is to be connected to the OrigaTrode Rotating Disc Electrode using the cable supplied with the instrument.

Setting up

Set up the OrigaTrod in a place where the heat produced can easily be evacuated. The room temperature should be between 5 and 40°C. Humidity conditions should be between 20 and 80 %.

Screw the electrode tip **(5)** on the electrode body **(4)**: the available tips are listed at the end of this manual.

Connect the OrigaTrod electrode, 6-pin plug to the "OrigaBox" 6-pin socket on the lateral panel of the OrigaBox **(11)**.



Fit the OrigaTrod on the measurement cell. The OrigaTrod electrode has a ground joint (NS 14.5/23) which enables the electrode to fit a great majority of measurement cells.

Connect the BNC plug of the OrigaTrod to the working electrode terminal of the potentiostat.

Connect the AC/DC switching adaptor to the OrigaBox "DC in" socket then connect the power adapter to a mains socket (90 Vac or 264 Vac / 47 or 63 Hz) using the mains cord supplied.

Switch on the OrigaBox **(7)**. Put the switch button on the ON position.

For safety reasons make sure that the power adapter is placed at a distance of at least 1 meter from a water supply.

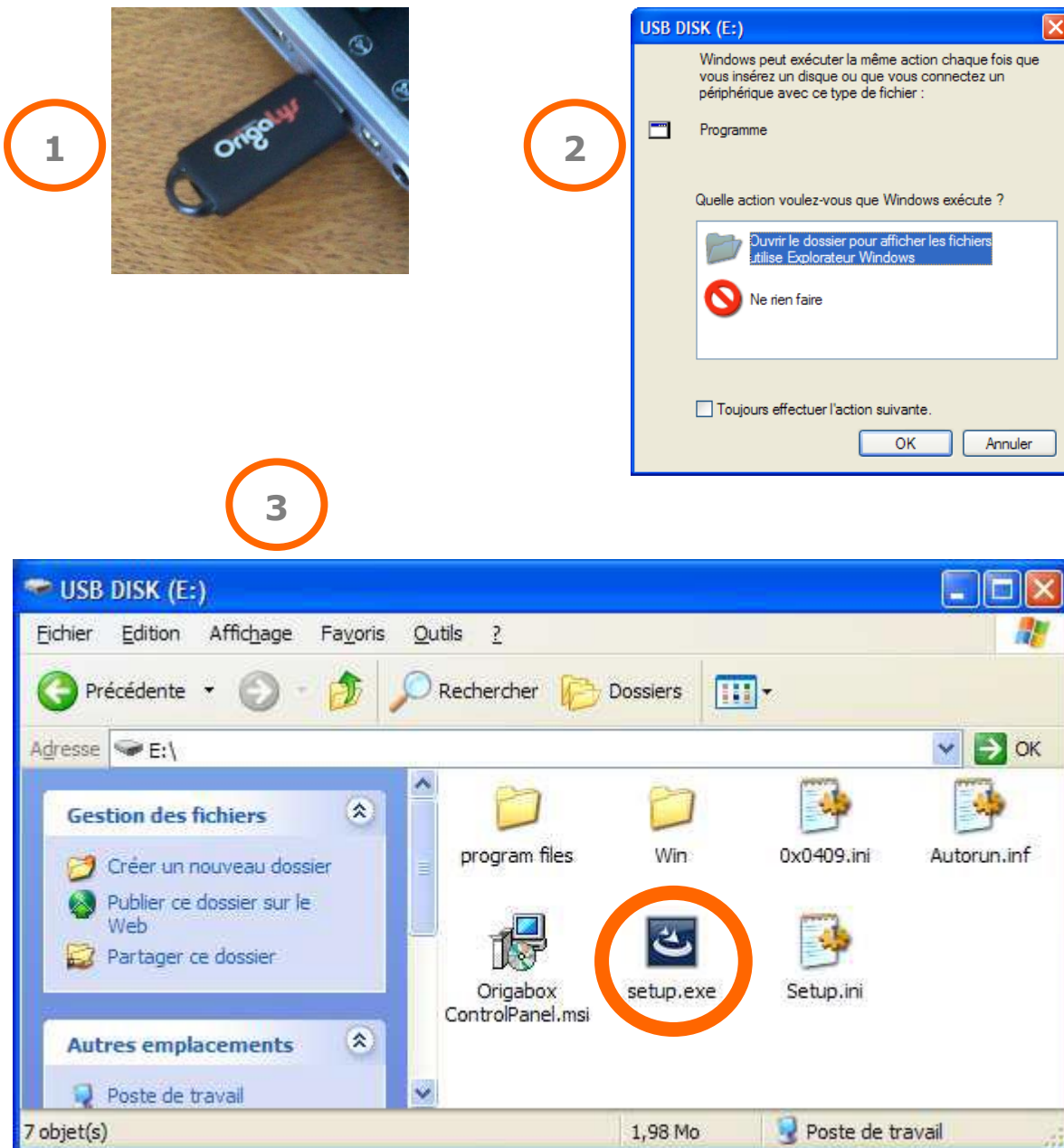
IMPORTANT

If the OrigaTrod electrode is used in a corrosive atmosphere, the electrode gas inlet **(3)** (see page 3 or 8) must be connected to an inert gas (i.e. nitrogen) bottle. If this is not done, the electrode bearings and contacts may quickly be damaged by corrosion and/or clogging agents.

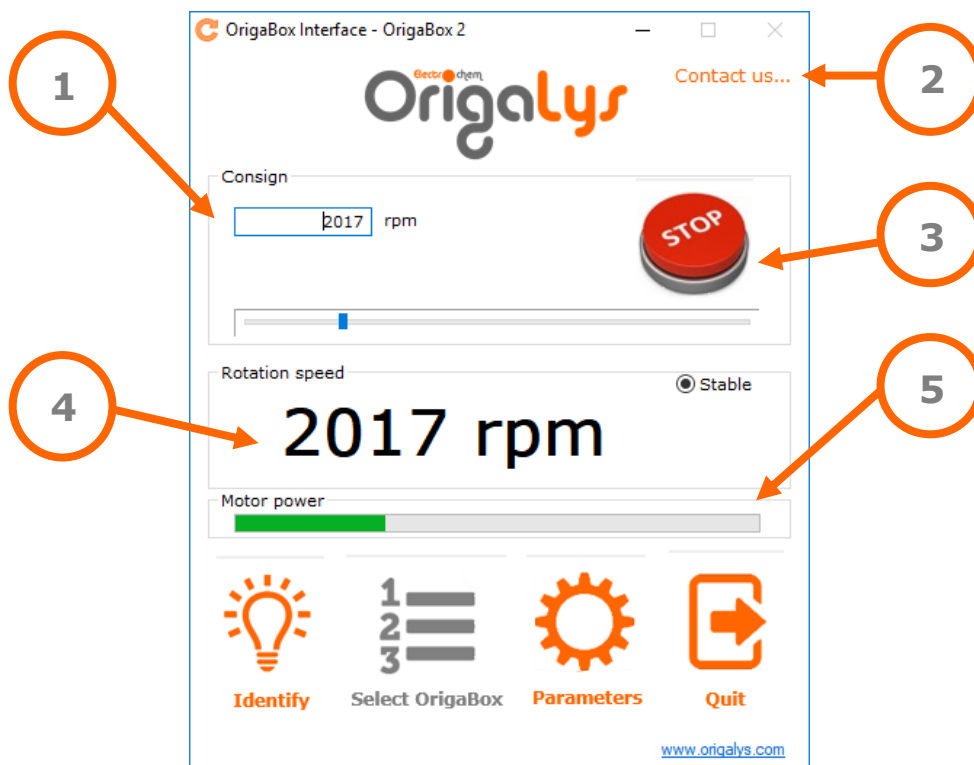
Use

PC Control Panel

The PC software can control the OrigaBox via USB. This software must be installed using the installation program located on a USB key. Once this key inserted, open the corresponding folder and run "setup.exe".



Then, open Control Panel. It's ready to use.



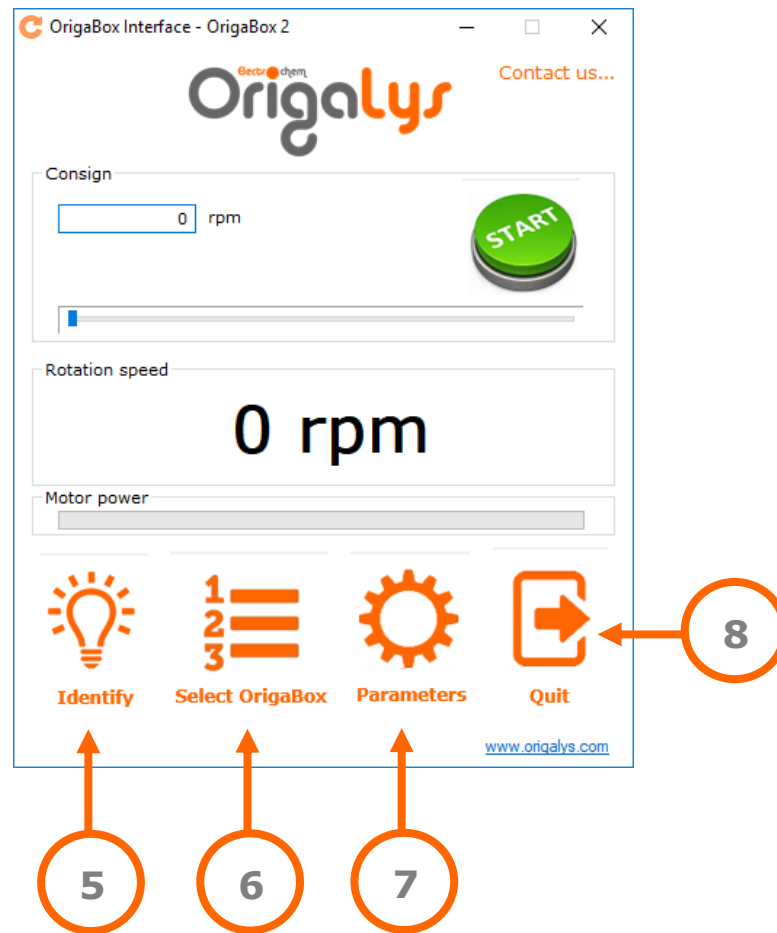
This is the main screen of the software. There, you can set the speed of the OrigaTrod **(1)**, from 100 to 10,000 rpm.

By clicking on "Contact us" **(2)**, all the contact details are available as below.



You can also stop the speed of the OrigaTrod at any time by pressing the STOP button **(3)**.

If the OrigaTrod contains an optical digital encoder, you can see on the screen the real speed of the OrigaTrod in order to check it and to better control it **(4)**. At any time, you can check the motor power **(5)**. Thus, you can make sure if everything is ok. See Maintenance page in case.



In the down part of the main screen, four functions are available if they are not in Grey.

Finally, the default parameters can be modified if you are not using the OrigaTrod and the OrigaBox in a standard way. To proceed, click on Parameters **(7)** or click on Quit **(8)** to close the software PC Control Panel.

Parameters of the PC Control Panel

The parameters are divided in 4 tabs: COM plug, Analog In, Motor and OrigaBox. A daughter window is available at any time by clicking on « Help » (4).

- COM plug

OrigaBox - Parameters

COM plug | Analog In | Motor | OrigaBox

COM in/out
 TTL RS232 serial port 115200 8 N 1

TTL start/stop input Enabled

Input selection: Input 1 (pin no. 2)

Selected input active level: High Low

TTL output

Output 1 (pin no. 3): High Low

Output 2 (pin no. 4): High Low

Buttons: OK, Annuler, Aide

Help: COM plug

1 At Power-up, the "COM" socket of the OrigaBox is initialized as a serial RS232C COM port. Its communication format is defaulted to 115200-bauds, 8-data bits, No parity check and 1-stop bit. This format is necessary for the IAP (In-Application Programming) purpose. This function allows the update of the OrigaBox embedded software.

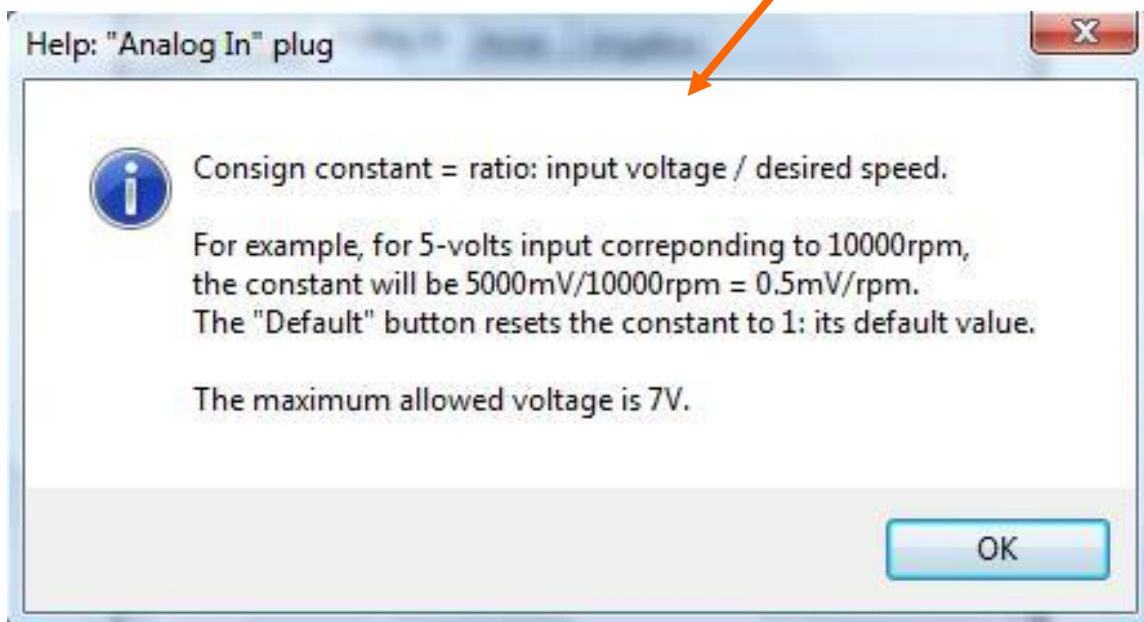
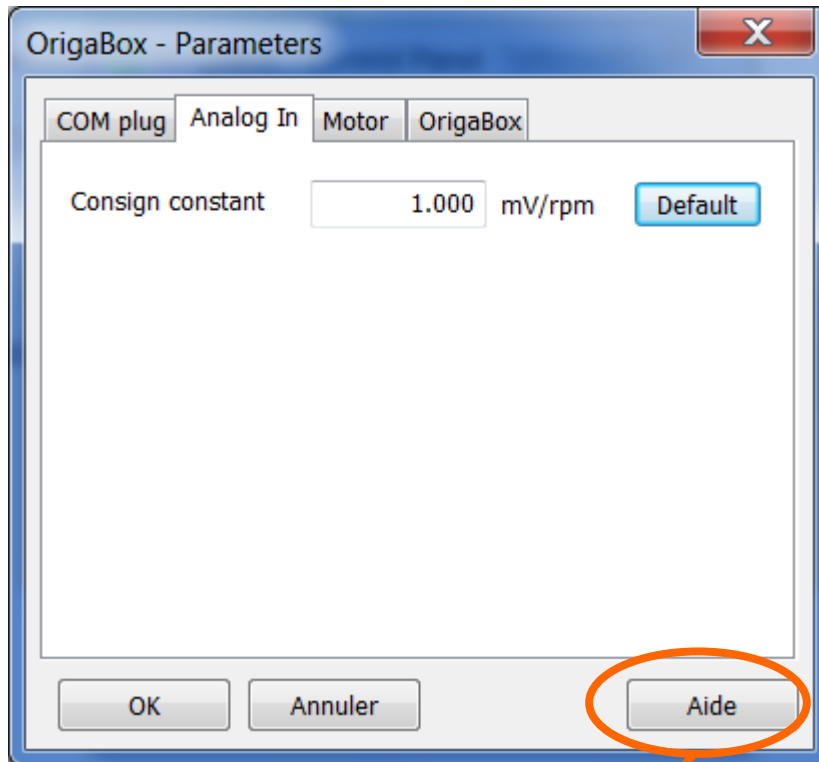
Then, the user will be able to change the baudrate, or, to use the "COM" socket as logical "TTL" I/Os. In the "TTL" configuration, two inputs and two outputs are available.

2 TTL start/stop input: when the "Enabled" box is checked, one of the logical inputs is used to trigger the "Analog In" consign input. The rotation is enabled when the logical level on the selected input meets the "Selected input active level". The rotation is stopped otherwise. The logical level is "Low" for an input potential ranging from -25 to +0.6-Volts, and, "High" for +2.4 to +25-Volts.

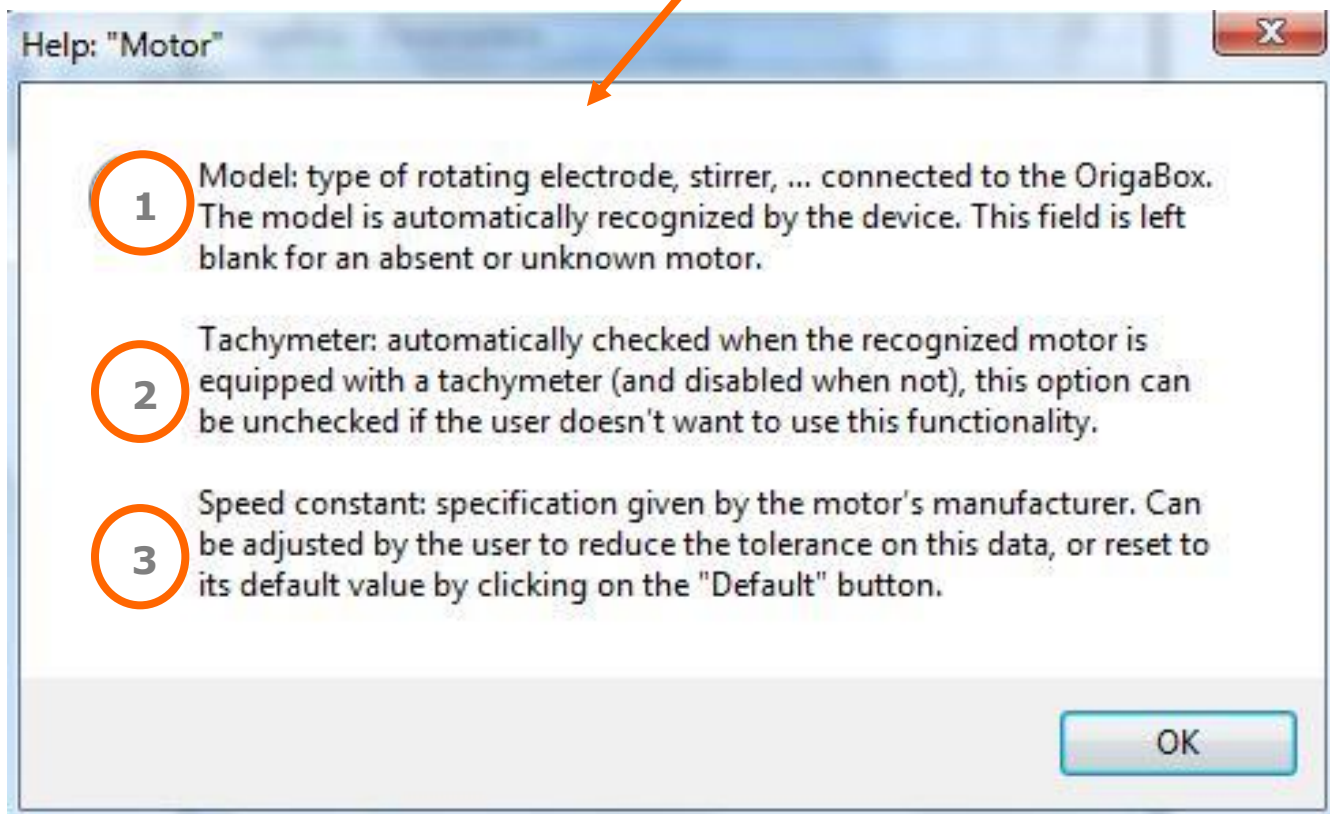
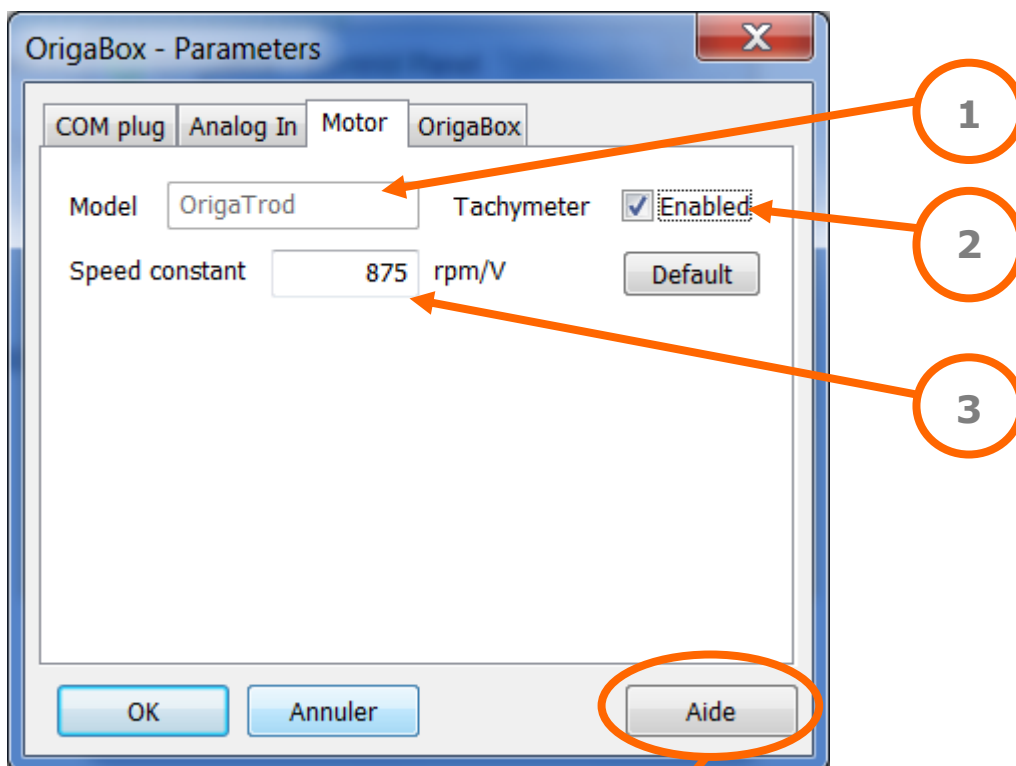
3 TTL outputs: the selected level is written on the outputs after the user has clicked on the "OK" button. The output potential is nominally ±5.4-Volts on a 3000-Ohms load.

Button: OK

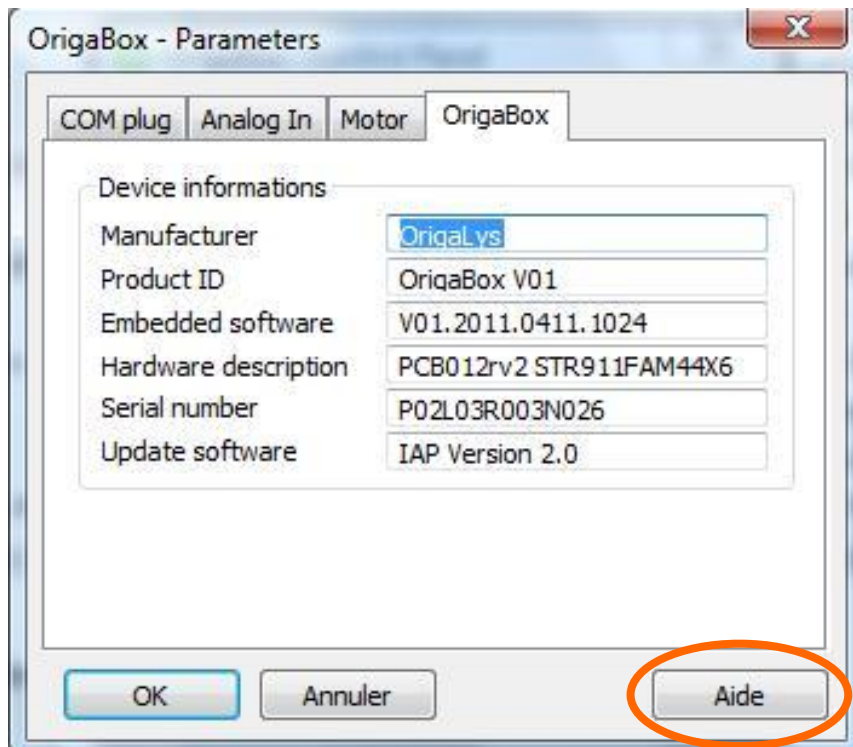
- Analog In



- Motor



- OrigaBox



This is an important part for maintenance. If something goes wrong with the OrigaBox or the OrigaTrod, please call the hotline of OrigaLys or send us an email (contact@origalys.com) and give us these informations.

Troubleshooting

The OrigaTrod motor does not start

Check the power circuit on the OrigaBox (mains socket, mains cable, power adapter ...).

Check the connection between the OrigaBox Speed Controller and the OrigaTrod Rotating Disc Electrode.

The measurement signal shows background noise and interferences

Check the connections between the potentiostat and the OrigaTrod Rotating Disc Electrode.

Shield the measurement cell in order to eliminate the interferences due to electrochemical sources. Do not hesitate to place the measurement system in a Faraday cage.

The speed control is incorrect

Check that the motor power is ok and thus that the resistive torque is not too important.

Check on the parameters of the PC software Control Panel. See if the parameters are the default ones. In order to be sure, click on the default button.

Your problem is not listed here

In this case, please contact the hotline of OrigaLys. See below the details:

Mail: contact@origalys.com

Phone: +33 (0)9 54 17 56 03

Fax: +33 (0)9 59 17 56 03

Maintenance

OrigaTrode

If the OrigaTrode electrode is to be used in samples containing corroding agents, an inert gas (Nitrogen, Helium) flow must be applied through the electrode bearings and contacts. Connect the tubing of the inert gas bottle to the gas inlet **(3)** (see chapter "Description"). This operation prevents the electrode bearings and contacts from being quickly damaged by corrosion and/or clogging.

OrigaBox

The OrigaBox requires a minimum of maintenance. The exterior surface of the instrument should be cleaned with a soft and dry cloth. The use of any solvent is forbidden as it can alter the marking. Any operation that requires to open the OrigaBox casing should only be performed by an OrigaLys ElectroChem service representative: contact our OrigaLys ElectroChem representative or:

ORIGINALYS ELECTROCHEM SAS

Les Verchères 2, 1^{er} étage

62A avenue de l'Europe

69140 Rillieux la Pape

France

Phone: +33 (0)9 54 17 56 03

Fax: +33 (0)9 59 17 56 03

E-mail: contact@origalys.com

Always use the original packaging of the OrigaBox during transportation.

Specifications

OrigaTrode

Speed range:	100 to 10000 rpm
Accuracy:	better than 0,1%. Eccentricity less than ± 0.1 mm
Motor:	6-pin female DIN connector for speed control and reading
Electrode body:	Gas inlet (\varnothing 2 mm) 14.5/23 ground joint
Tip:	Active diameter: 2,3 or 5 mm Material: PEEK
General specifications:	Total length (with tip): 240 mm Max diameter: 56 mm Weight: 0.325 kg

CE marking

The OrigaTrode Rotating Disc Electrode complies with the same electromagnetic compatibility directive (2004/108/EC) as the OrigaBox: see the OrigaBox specifications following next.

OrigaBox

Connection: 6-pin female DIN connector for OrigaTrod

Analog speed consign voltage: 7 Vdc maxi and 20KOhm
input resistance

SUB D9 (RS232C COM port / logical I/O)

USB-B (USB 2.0)

Weight: 0.23 kg

Dimensions (W x D x H): 14.2 x 12 x 4 cm

Power supply: Power adaptor 90/264Vac, 47/63Hz, 30VA

Environmental conditions:

Ambient temperature:

- working range: 5 to 40°C

- storage: -20 to 60°C

- transport: -40 to 60°C

Relative humidity:

20 to 80 % with temperature between 5 and 31 °C. Above 31°C, the interval amplitude decreases linearly from 20 - 80% at 31°C to 20 - 50% at 40°C.

Level of pollution: 2

Transitory overvoltage: class II

International Standards



The OrigaBox complies with the following regulations:

EMC (2004/108/EC)

- EN 61326-1, 2006
- EN 61000-3-2, 2000 + A2, 2005, class A
- EN 61000-3-3, 1995 + A1, 2001,
- EN 55011, 1998 + A1, 1999 + A2, 2003, class B
- EN 61000-4-2, 1995 + A1, 1998 + A2, 2001, level 2 with contact discharges and level 2 with air discharges,
- EN 61000-4-3, 2006, level 2
- EN 61000-4-4, 2004, level 2 on AC power line
- EN 61000-4-5, 1995 + A1, 2001, level 2
- EN 61000-4-6, 1996 + A1, 2001, level 2
- EN 61000-4-11, 2004

Packing list

The standard packaging is the OrigaTrode Kit, which contains:



Quantity	Description	Reference
1	OrigaTrode – Rotating Disc Electrode (RDE) for OrigaBox – with optical digital encoder – 100 to 10000 rpm	X10.OGL.007
1	OrigaBox – Rotating Disc Electrode (RDE) Speed Controller	X10.OGL.009
1	Origaccess – USB Key for PC Software	X12.OGL.026
1	Origaccess – USB2 2m Cord	X12.OGL.023
1	Origaccess – AC/DC Power Supply	X12.OGL.019
1	Origaccess – EURO, US or UK Power Cord 2m	X12.OGL.024
1	OrigaDoc – UK/US, FR, ES Getting Started with OrigaBox Control Panel	X12.OGL.030
1	The case	-

Connectivity

The OrigaTrod can be connected to the following OrigaLys' products:

- OrigaStat: OGS080, OGS100 and OGS200
The OrigaTrod works alone (without the OrigaBox), because the OrigaStat contains a built-in RDE Speed Controller. It is controlled by the software of the OrigaStat, called OrigaMaster.
- LandStat: all the version available
The OrigaTrod works alone (without the OrigaBox), because the LandStat contains a built-in RDE Speed Controller. It is controlled by the software of the LandStat, called OrigaMaster.
- OrigaFlex: OGF500, OGF01A, OGF05A and OGF10A