



NORTEK QUICK GUIDE

Scour Monitor



Oct. 2017

Please check that all expected items are included in the shipment:

- The instrument
- External power/signal cable
- NORTEK equipment storage box/toolkit
- USB to serial converter
- AC/DC voltage transformer
- Power cable (European or American)
- Software on USB memory stick
- Final test check list
- Packing list

Install the Nortek software

The instrument's software is located on the attached memory stick.

Please check the web regularly for updates on both software and firmware.

This Quick Guide provides you with the basic information you need to get the Scour Monitor up and running as quickly as possible. If you are familiar with the Nortek instruments, this guide may be all you need. If you are new to our instruments and software we recommend that you check the web, where you will find some useful information: www.nortekgroup.com

Preparation

1. Make a Reception Control. The items included are listed in the column to the left and in the packing list.
2. Connect the battery.
3. Install the software located on the USB Memory stick. Once the installation is complete you can launch the **AquaPro Scour** application.
4. Run a Functional Test:
 - a) Set the Measurement Interval to 1 second in the Deployment Planning menu (see the next section). This allows you to retrieve data every second.
 - b) Start the instrument and check that all the beams produce signals. When the instrument pings in air, the signals will be nothing but noise.
 - c) Submerge the instrument in either a test tank or a bucket of water. Verify the following readings:
 - The signal strength observable in b) should rise noticeably
 - Battery voltage (New battery: > 13V DC)
 - The temperature
 - Tilt the instrument to verify the pitch and roll readings.

Configuration

- Select **Deployment Planning**.
- The activated dialog contains all parameters required to specify the operation of the instrument. Note that a description of each parameter can be found in the application help, accessible from the dialog box. The Deployment Planning frame on the right hand of the dialog displays performance parameters that are automatically updated as you change the settings. **Please pay special attention to the battery utilization and the memory requirements.**
- When finished, press **OK** to accept the changes. By using the Open/Save commands in the File menu (or the corresponding toolbar buttons) the deployment parameters can be saved to file at any given time and re-loaded when it is time to actually deploy the instrument.

Getting Started

- Establish communication with the instrument.
- Select Start Recorder Deployment.
- Specify the date and time to start data recording.
- In the Name field enter up to 6 characters of text to identify the data file stored in the recorder.
- In the File Comment box enter up to 180 characters of text which will be included in the data file for the purpose of documenting the data set.
- After pressing **OK** the Set Clock dialog box is displayed. We recommend setting the clock to PC time. The time reference is especially important in order to ensure proper synchronization between the instrument and other data sets collected independently.
- Press **Yes** to continue. A confirmation dialog will display the deployment parameters and allow you to verify that the set-up is what you intended.
- Press **Confirm** to send the configuration to the instrument. The configuration information from the deployment sequence is saved in a log file that has the same name as the deployment.

Stop Recorder Deployment

- Select **Stop Recorder Deployment**. When data acquisition has stopped a dialog will display the current Scour Monitor and PC clock time.

Data Retrieval

- Select Recorder Data Retrieval.
- The recorder overview dialog will show a list of all files currently stored in the recorder, including the time of the first measurement and the size for each file.
- Select a file in the list by clicking on the filename. Press **Retrieve** to specify the name and where to save the file.

Data Conversion

- To convert binary data files retrieved from the recorder to a readable ASCII format select **Data Conversion** from the Deployment menu or press the Data Conversion toolbar button.
- Add files to the **Files to convert** list by using the **Add file...** file selection dialog. To convert the files, select items in the list and press the blue arrow. Specify the location for the converted files in the Save in folder field. An optional pre- or postfix that will be added to the recorder filename may be specified. Select from the **View files** drop-down list to open the converted (ASCII) files in Notepad.

Tip! Check the retrieved data before deploying the instrument for the second time. If something is wrong with the instrument, the deployment or the configuration, this will be detected and the possibility of making the same mistake twice is avoided.

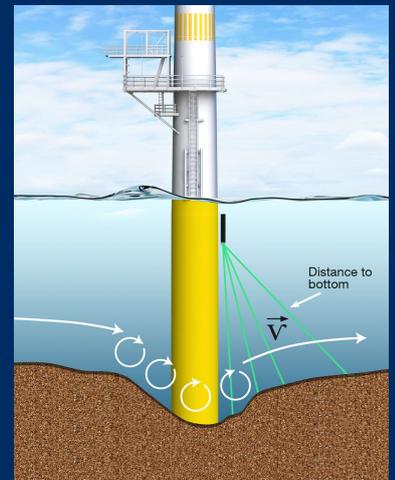
On-line Data Collection

- An on-line data collection module is included for test purposes and to provide data collection from the Scour Monitor in real time. The program will also store data to binary files on the computer hard disk for post processing and analysis.
- Select **Start Data Collection** from the On-line menu or press the toolbar button to start data acquisition. The real time display shows velocity data and sensor data as it is collected.
- To capture the data that comes in over the serial port to disk select **Disk Recording...** from the On-line menu and define the name of a file (without extension). Once this disk file is defined, the Start Disk Recording and Stop Disk Recording menu items and toolbar buttons will be enabled. Once data recording to disk has started, the status box on the display screen will show the name of the disk file and its size.
- It is possible to get ASCII data out in real-time by using the Disk Recording functionality.
- For users wanting to collect on-line data using a controller; check out the System Integrators Guide for information about the data structure.

Basic Principles

The Nortek Scour Monitor is designed to provide a profile of the seabed close to the base of a mounting structure. It operates as a four beam echo sounder; it measures the distance to the seabed along four downward looking narrow acoustic beams with angles 10, 20, 30 and 45 degrees from the vertical. It comes in two different versions; one that is used for 0.1 to 10 meters distance to the bottom (2 MHz) and one that is used for 7 to 30 meters distance (1 MHz). The intensity of the acoustic return signal along the four beams is measured. The bottom reflection provides a strong peak in signal amplitude, which is used to determine the exact distance

The basic mechanism causing scour is the formation of vortices, a result of pile-up of water at the upstream side and subsequent acceleration of the flow around the obstruction, as illustrated in the figure below.



Changes in the seabed level are measured in real-time and relayed back from the field, even during storm periods, thus providing invaluable information for modelers of these changes as they occur. The data are corrected for tilt and beam angles to provide true bottom elevation as a function of time.

Cables

The Scour Monitor comes standard with an 8-conductor connector and cable, using RS422 communication. The table to the right lists the pin assignments for the RS422 cable, and the figure shows the inline 8-pin connector.

Communication baud rate: 9600 standard, 300-115200 (user setting). Recorder download baud rate: 600/1200 kBaud.

Ensure that the connectors and dummy plugs are lubricated with dielectric silicone. We recommend 3M silicone spray. Note that the silicone grease included in the shipment should be used on the O-rings only.

Power and Communication

DC Input: 9-16 VDC
 Battery DC-input: Nominal voltage: 13.5-18V
 Absolute maximum DC input voltage: 18.6 V

System Integrator Manual

For more information about the options above and how to control a Nortek product with a non-PC controller, a System Integrator Manual is available at the web.

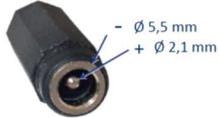
Troubleshooting

As most problems are caused by simple mistakes, please initially check if

- you have forgotten to power the system
- the connector has fallen out of the computer
- you are using the wrong serial port

When all obvious mistakes are ruled out, please turn to our **Troubleshooting Guide** available at the web.

If the problem is still present contact Nortek support at support@nortekgroup.com

Underwater Connector			Termination		
Pin. No	Wire Color	Purpose		Pins	Description
3	black	RS422 Tx +	Twisted Pair	7	
4	white	RS422 Tx -		2	
7	black	RS422 RX -	Twisted Pair	8	
8	white/orange	RS422 RX+		3	
5	black	Sync. Out	Twisted Pair		
6	white/purple	Sync. In			
1	black	Power Gnd	Twisted Pair		
2	white	Power +			
Screen terminated at pin 1 in underwater connector, unterminated at PC side.					
Ref: N2100-108 rev-					

The wiring of the RS422 cable is shown in the table above. The Pin No. in the table corresponds to the 8-pin connector in the figure below.

