



NORTEK QUICK GUIDE

2D Horizontal Profiler



Nov. 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 instrument 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, you should check out the Nortek Comprehensive Manual (available on the web), which includes principles of operation, mounting guidelines, troubleshooting, service manual and simple system integration. You will also find much useful information in the FAQ site at the Nortek web: www.nortekgroup.com

Preparation

- Connect the battery/power cable.
- Install the software located on the USB memory stick. Once the installation is complete, launch the program called AWAC.
- Run a Functional Test, described in the **Service Manual** chapter in the Comprehensive Manual.
- Set the Pressure Offset: **On-line > Set Pressure Offset**.
- If there are magnetic materials in proximity to the instrument when mounted, a calibration of the compass is necessary: **On-line > Compass Calibration**.
- Erase the recorder in advance of every deployment.

Deployment Planning

- Select **Deployment Planning**.
- The activated dialog contains all parameters required to specify the operation of the instrument. The Deployment Planning frame on the right-hand side of the dialog displays performance parameters that are automatically updated as you change the settings. Use the Standard configuration to plan your deployment unless you have a very good reason to move to Advanced. The latter increases the flexibility but so does the risk of making mistakes. Note that the Use **Advanced Settings** box (in the Standard tab) must be checked for the advanced settings to be effective. A description of each parameter can be found in the application help, accessible from the dialog box.
- 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 deploy the instrument.

On-line Data Collection

The most common data collection module for horizontal profilers is on-line data collection. To start it:

- Establish communication with the instrument and run through the Deployment Planning.
- 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.
- The output can either be in ASCII, in fixed NMEA format, or binary format. Note: To output NMEA, use the Activate Serial Output option in the Deployment planning (need a ProLog installed)

Stop Recorder Deployment

- Select **Stop Recorder Deployment**. When data acquisition has stopped a dialog will display the current AWAC 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 disk location of the file.
- For systems with a ProLog recorder, you may save time by swapping out the SD card and inserting it into a memory card reader connected to a PC, as opposed to downloading data.

Data Conversion

- To convert binary data files retrieved from the recorder to a readable ASCII format, select **Data Conversion**.
- Add files to the Files to convert list by using the **Add file...** file selection dialog. Select the file to convert 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 e.g. Notepad.

Mounting

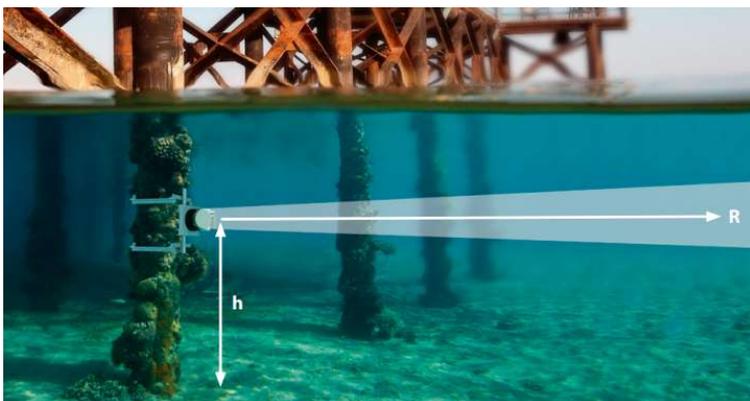
Proper mounting of the instrument is crucial for successful collection of data. The system is normally mounted horizontally on a channel or pier wall and profiles the 2D current along a horizontal segment.

- When mounting the instrument near large obstructions (bridges, piers, walls, etc.), ensure that the acoustic beams do not "see" any obstructions.
- Keep the instrument away from magnetic materials to the greatest extent possible. If magnetic materials are nearby, the best recommendation is to use XY coordinates, as the instrument then does not use the compass readings.
- Both acoustic transducers must be submerged during data collection. Operating with the transducers out of water will not cause damage, but your data will be meaningless.

The echoes from the bottom will generally be more likely to contaminate the data than the echoes from the surface. There are several reasons for this:

- The surface is smoother than the bottom. Grazing reflections from the surface produce little backscatter, but even a smooth bottom can have irregularities and rocks that reflect sound.
- The bottom does not move so echoes from the bottom bias velocities toward zero. In contrast, the surface moves at approximately the same speed as the water just below it.

It is recommended to mount the instrument midway between the surface and the bottom. If impossible, the better option is to mount the instrument closer to the surface. Check out more details in the **Mounting Guideline**.



R = Range
h = distance from bottom

Basic principles

The instrument measures current speed and direction by transmitting sound waves that are reflected by particles drifting with the currents in the water. The Doppler shift of the return signal is proportional to the velocity component along the beams.

Data analysis

The software supplied has been designed to provide you with the ability to set the instrument up for deployment, upgrade the firmware, download acquired data and do a quality assurance of them. The data can be converted to ASCII format that may be imported into various post processing programs. In addition, Nortek has developed a series of real time and post processing software packages that simplify your analysis work. SeaState can be used for online presentation of current data.

AOS

In areas with little infrastructure or no power supply, the 2D profiler can be integrated with the Nortek Autonomous Online System (AOS). This shore-mounted interface unit collects data from the 2D profiler, transfers the data to a server over Iridium satellites, and displays the data on a hosted website.

Cables

Our instruments are mostly shipped with RS232 communication. RS422 is used for cables longer than 50 m. The wiring is shown in the tables to the right.

Communication baud rate: 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

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

On-line Interface Box

For cables longer than 50 m the online cable can be connected to shore to an Interface Box which supplies 48 VDC power and RS422 communication. In the instrument, a DC-DC converter is used to reduce the supply voltage to 15 V. Online cable systems are conceptually quite simple, but in real life, they are both a technical and practical challenge. We have taken many years of experience and designed what we believe to be a very good solution. More information about the Interface Box can be found on our website.

System Integrator Manual

For more information on how to control a Nortek product with a non-PC controller, a **System Integrator Manual** is available on the website.

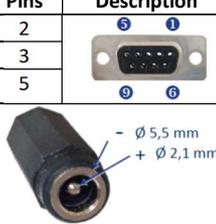
Troubleshooting

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**. The FAQ site may also be helpful.

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	RS232 Tx	Twisted	
4	white	RS232 Rx	Pair	
5	black	RS232 Gnd	Twisted	
6	white/purple	Power Output	Pair	
7	black	Analogue Ch. 2	Twisted	
8	white/orange	Analogue Ch. 1	Pair	
1	black	Power Gnd	Twisted	
2	white	Power +	Pair	
Screen terminated at pin 1 in underwater connector, unterminated at PC side.				
Ref: N2100-002A				

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

Underwater Connector			Termination: UTS6JC147P		
Pin. No	Wire Color	Purpose	Pins	Wire color	
1	black	Power Gnd	Twisted	1	Black
2	Red/white	Power+	Pair	2	Red
3	Black	RS422 Tx+	Twisted	5	Blue
4	White	RS422 Tx-	Pair	6	Orange
5					
6					
7	Black	RS422 Rx-	Twisted	3	Green
8	Orange	RS422 Rx+	Pair	4	White
Screen	Bare	Ground			Stift
Ref: N2100-105					

Wiring of RS232 (upper), the RS422 (middle), and the ONLINE cable to Interface box (bottom).

