AWAC

NORTEK

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, which includes principles of operation, mounting guidelines, troubleshooting, service manual and simple system integration. You will also find a lot of useful information on the Nortek Support site.

Preparation

- Connect the battery/power cable.
- Install the software located on the USB memory stick. Once the installation is complete, launch the application related to your instrument.
- 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 also 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.
- When finished, press **Update** 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 deploy the instrument.

Start Recorder Deployment

- Establish communication with the instrument.
- Select **Start Recorder Deployment**, either from the pull-down menu or from the toolbar.
- Specify the date and time to start the data recording.
- In the Name field, enter up to six characters of text to identify the data file stored in the recorder.
- In the File Comment box, enter up to 180 characters of text that will be included in the data file for 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 to ensure proper synchronization between the instrument and other datasets collected independently. Time spent on setting the time properly before a deployment can save a lot of time in post processing and analysis.
- 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 instrument will verify that the deployment has started. The configuration information from the deployment sequence is saved in a log file that has the same name as the deployment..

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.

Stop Recorder Deployment
- Select **Stop Recorder Deployment**. When data acquisition has stopped a dialog will display the current instrument 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.

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

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 prefix or suffix 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.

On-line Data Collection
- 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 (needs a ProLog installed).

ProLog
The Nortek Processor and Logger (ProLog) is a micro-computer with a 4GB recorder located on a separate circuit board inside the AWAC. Its primary function is to reduce raw wave data to standard wave estimates for online applications. Reduction of wave data is valuable when considering low bandwidth communications (e.g. acoustic modems, satellite). To learn more about the ProLog option visit the website.

Mounting
Proper mounting of the instrument is crucial for successful collection of data. Please mount the instrument in accordance with the **Mounting Guidelines** in the Comprehensive Manual.

Basic principles
The AWAC 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. By combining the Doppler shifts from the three beams, the 3D velocity is calculated.

AST – Acoustic Surface Tracking
The vertically oriented transducer in the center of the AWAC is used to measure the distance to the sea surface directly by using the simple echo sounder principle. The center beam is used to transmit a very short pulse (relative to the Doppler measurements). The travel time from the AWAC to the surface and back allows us to estimate the distance to the surface for each ping.

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. These can be downloaded from our website; contact Nortek for a valid license key.

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.

Analog Input (default for most instruments)

The instrument can read two analog inputs at the same time. The input range is 0-5V, corresponding to 0-65535 counts in the data file.

Power

- DC Input: 9-18 VDC
- Battery DC-input, nominal voltage: 13.5-18 V
- 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, please take a look at the [System Integrator Manual](#).

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

Nortek online

At [our website](#) you will find technical support, user manuals, and the latest software and firmware. General information, technical notes, and user experience can also be found here.

Email: inquiry@nortekgroup.com for general inquiries or support@nortekgroup.com for technical support.

Underwater Connector				Termination	
Pin #	Wire Color	Purpose		Pins	
3	Black	RS232 Tx	Twisted Pair	2	
4	White	RS232 Rx		3	
5	Black	RS232 Gnd	Twisted Pair	5	
6	White/purple	Power Output			
7	Black	Analogue Ch. 2	Twisted Pair		∅ 5.5 mm ∅ 2.1 mm
8	White/orange	Analogue Ch. 1			
1	Black	Power Gnd	Twisted Pair		
2	White	Power +			
Screen terminated at pin 1 in underwater connector, unterminated at PC side.					
Ref: N2100-002A					

Underwater Connector				Termination	
Pin #	Wire Color	Purpose		Pins	
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		∅ 5.5 mm ∅ 2.1 mm
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					

Wiring of RS232 (upper) and RS422 (lower) cables.