

BL-230 EE User Manual

The BL230EE (Echo Envelope) is similar to our original bl230 but also adds the ability to output the Echo Envelope full water column data. It starts with a Survey Grade 200 kHz and 30kHz echo sounder in one transducer. Its the best choice for shallow water bathymetric (hydrographic) surveys up to 200 meters deep. The 200 kHz is typically used for up to 100m of water depth and the more powerful 30 kHz is best from 100m – 200m of water depth. Dredgers also like using them to determine hard or soft bottom. By seeing how far the 30 kHz penetrates compared to the 200 kHz top layer return. This model has 3 specific USB outputs. The standard NMEA Dual Frequency output.

This specialized bl230EE unit does all of the above and then also provides a high and low frequency full water column echo envelope. This data when logged in the proprietary drivers included in Hydromagic and Hypack can create a high and low echogram side profile of the full water column and also illustrates the bottom penetration. This data is useful by anyone looking to see aquatic vegetation, algae blooms, fish habitats or submerged object in the water column. The visual image of bottom penetration is useful in bottom classification etc.

Included in the kit:

- 200/30 kHz Transducer
- Rugged Hard Case
- Boat Mounting Bracket
- 5x Survey poles
- 9000 mah Li-ion Battery with Charger
- Usb manual flash drive
- 3 USB data outputs



Switching the System On Simply plug in the power cable, turn on the battery and the transducer will start to ping, it must be in water to give a depth. Testing in a small bucket is fine but realize the depths will be incorrect from the shallowness and noise. The Dual Frequency unit may have trouble getting bottom track.

NMEA USB Output The Data output cable marked NMEA will provide the standard NMEA DBT format that is used for Bathymetric Survey. You would use this Cable when setting the Sound Velocity and Output Rate in the provided BL230 software. Remember always disconnect from the bl230 software before logging in Hydromagic or other software's.

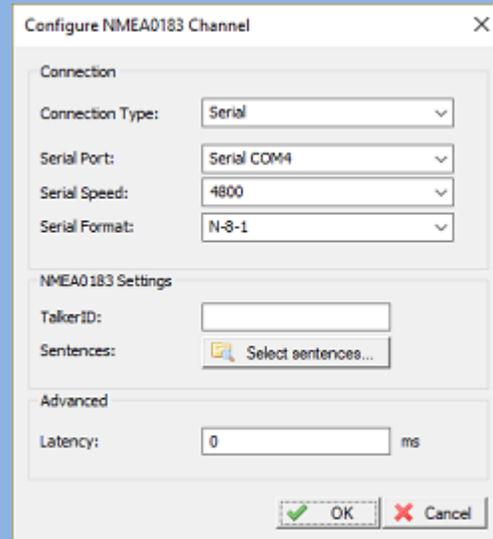
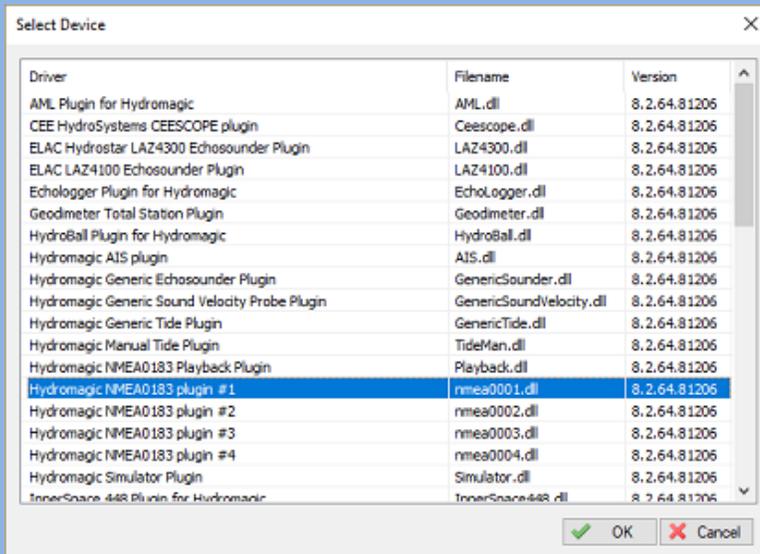
Hydromagic In Hydromagic Hardware you will setup the NMEA output using the NMEA 1083 #1 or #2 driver. Make sure you have the correct comport. Device Manager will tell you.

Baud Rate: 4800 , 8 , none , 1 , none

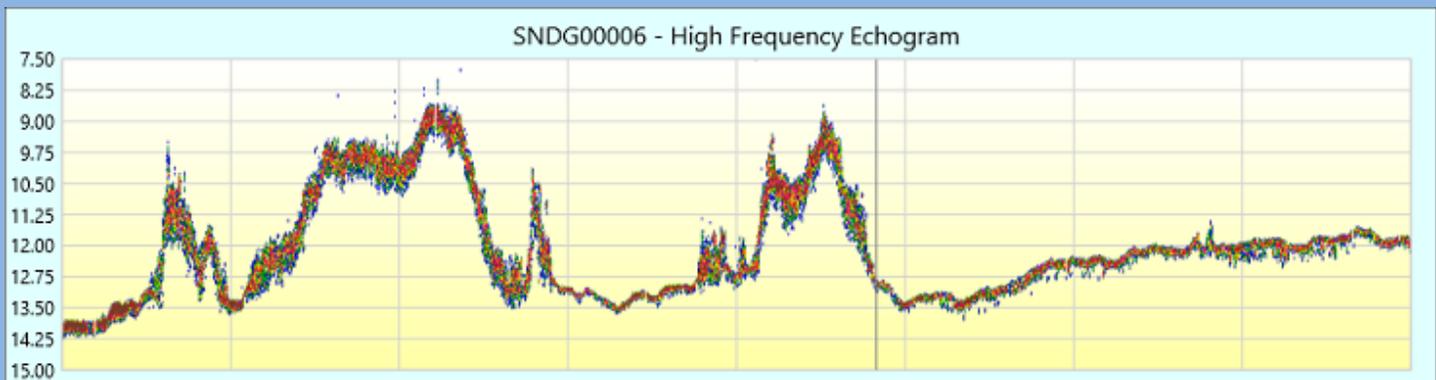
Example of NMEA output data format

\$SDXDR,D,0.80,M,XDHI,D,0.93,M,XDLO,C,19.01,C,WTHI*7C

\$SDXDR NMEA designation
 0.80,M, Hi Freq. depth in meters
 0.93,M, Low Freq. depth in meters

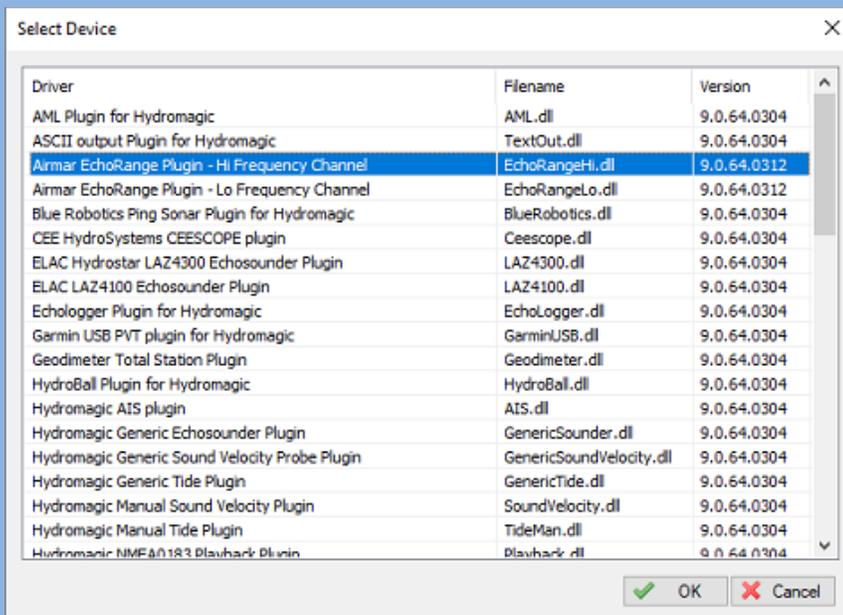
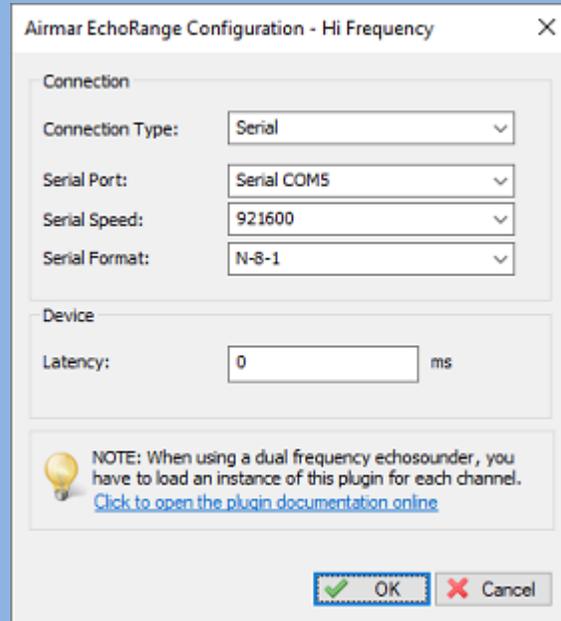
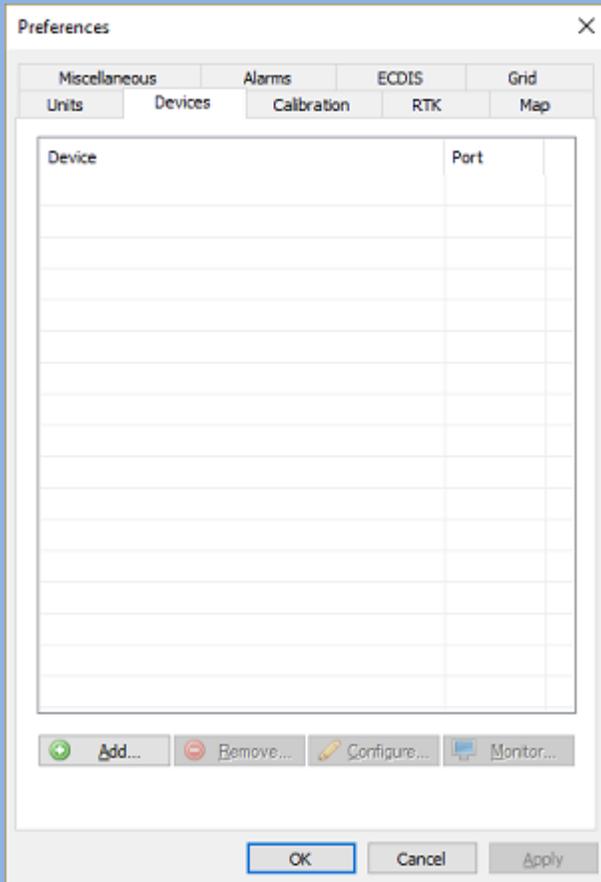


In Hydromagic the data can be viewed in real time as well. In the Hydromagic Survey software, select "Echogram (Hi)" or "Echogram (Lo)" after loading the plugin to show the incoming echogram data.



Echo Envelope High Output The Data cable labeled High will be used in the driver called "AIRMAR Echogram Hi" Make sure you have the correct comport. Device Manager will tell you.

Baud Rate: 921600 , 8 , none , 1 , none

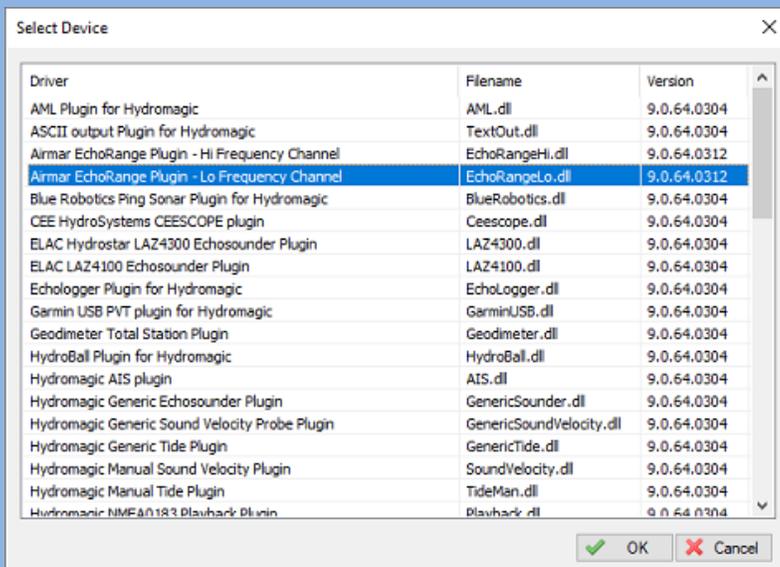
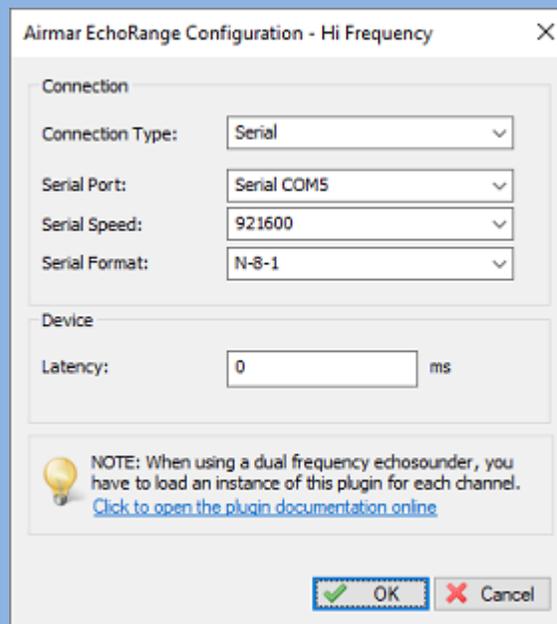
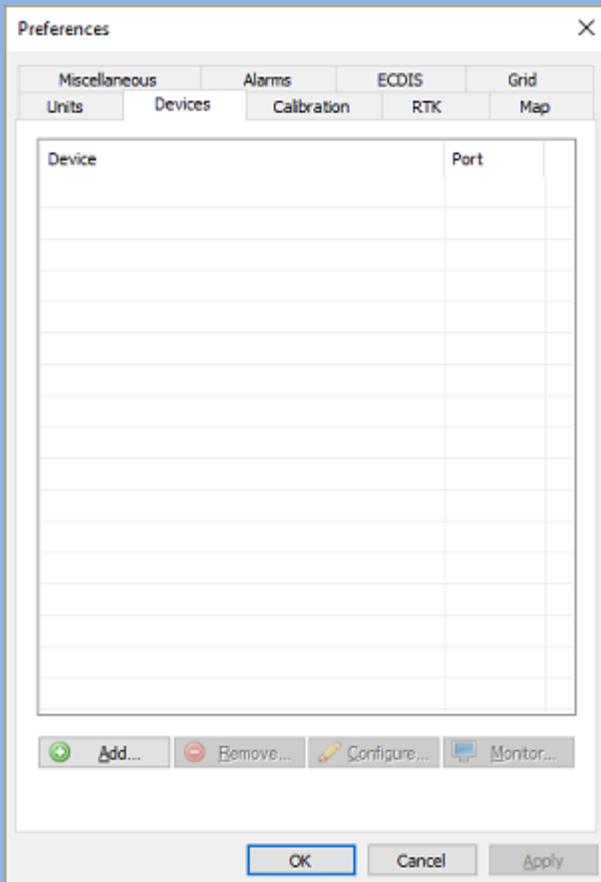


Echo Envelope Low Output The Data cable labeled Low will be used in the driver called "AIRMAR Echogram Low" Make sure you have the correct comport. Device Manager will tell you.

Baud Rate: 921600 , 8 , none , 1 , none

Export Echogram Images

<https://www.eye4software.com/hydromagic/documentation/manual/post-processing/export-echograms/>



Bar Checking Bar checking is calibrating the system for the sound velocity of the water you will survey in. There are normally three methods of doing this but we have found that in shallow water (100m or less) using the third option, Thermometer and a Sound Velocity Table is plenty accurate.

1. A digital bar check (example Odom Digibar Pro).
2. Building a bar check consisting of a flat, large base at a fixed distance from the transducer.
3. For shallow water print out the sound velocity tables on the flash drive included to set your BathyLogger to the desired setting. To do this you would get a water temperature from mid water column and refer to proper sound velocity table for fresh or salt water. Please call if you have further questions. Using the sea bed distance for calibration is not acceptable; this should only be used for rough check.

Note: Certain Jobs will spec a SVP is used.

Battery Charging Charge the battery fully before each use and on long, remote surveys bring a spare **IMPORTANT:** The battery must be in "on" position during charging. After its full you can turn it off until you are ready to survey. Never leave batteries on charge for more than 8 hours.

Maintenance Avoid scratching the bottom of the transducer and also don't use chemical cleaners. Always rinse Boat mount kit , transducer and cable after use especially when used in salt water environment. Avoid getting the USB and Charge ends wet.

BathyLogger Software Load our BathyLogger 230 setup software onto your PC. You can adjust the sound velocity here as well as the output rate. Depending on the type of survey or software used you can choose between 1 sounding /sec up to 10 soundings /sec. In Hypack or hydromagic most guys would go max 10/sec, but if your logging in a data collector 2hz is most common. The lower windows shows your output data string. Note the output rate is below the setting arrows next to "Transmissions per Second" Survey TIP: Adjust the Sound Velocity in the sonar with this software or in Hydromagic but never in both locations.

Hydromagic Echogram links

<https://www.eye4software.com/hydromagic/documentation/manual/post-processing/export-echograms/>

<https://www.eye4software.com/hydromagic/documentation/manual/configuration/software/echogram-settings/>

Read This Section

Mounting and Surveying Tips

- Mount the pole kit straight and adjust once personnel are seated. This will ensure you are getting the depth below the boat.
- The bottom of the transducer should be just lower than the boat draft. If it is just a few inches under returning soundings could be reflected off the hull.
- position the transducer to move streamlined through the water not sideways.
- A motion sensor is not needed unless you are offshore in swells.
- Try and mount over the side to avoid aeration from the motor.
- When using a RTK GPS you may take a rod height offset and enter that into the data collector. Most GPS field software today will apply this depth below transducer to the rod offset and you will log bottom elevation in real time. Most Land Surveyors compare this to doing a continuous topo on a quad
- Others may just measure the draft from the transducer bottom to the water surface. This will depend on the GPS you are using and the software you are collecting data in.

Single beam echo sounder Survey FYI

Typically survey boat speed is 1 m/s and you would work in a back and forth pattern across the shortest distance. (similar to the lines on a football field), line spacing will be determined by how large the area is and how much detail you need. I usually survey some additional lines in the perpendicular direction from the original lines. This ties the lines together and creates a more accurate finished product. Ping rate or soundings /second is also a factor you can adjust that with our Bathylgger software.

As the surveyor you control the amount of points you log. In the Hydrographic community using Hypack or Hydromagic we are used to collecting a lot of points. The Land Surveyors are not typically used to this and space soundings out quite a bit. River crossings may not require a lot of points, but pre and post dredging and bridge scouring surveys it would be beneficial to have dense data to create an accurate map of the bottom.

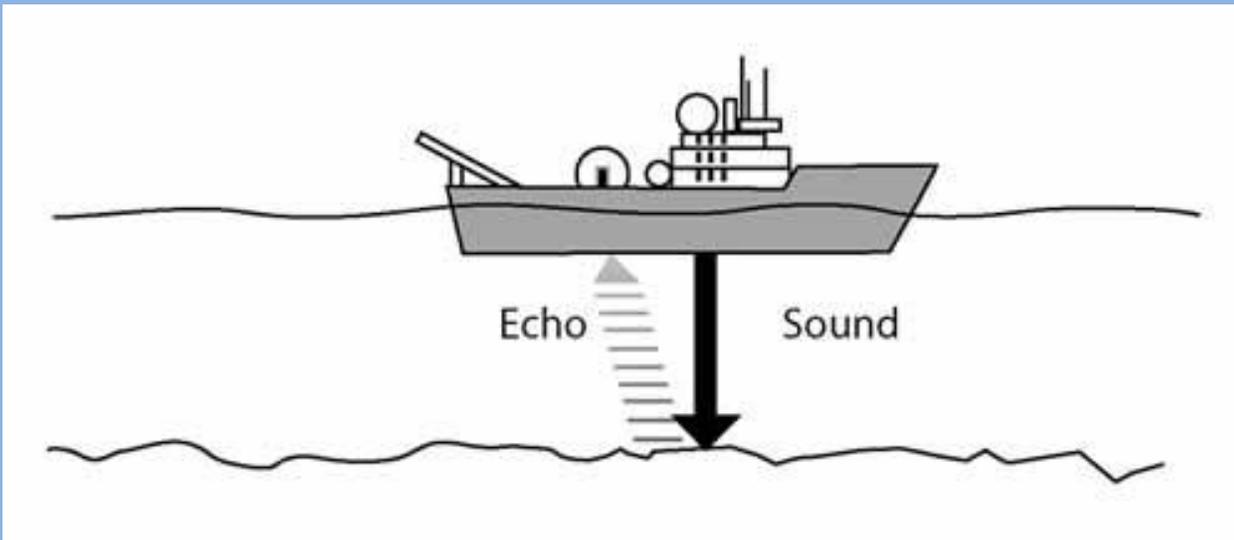
When you get around 1.3 feet (.39m) of water depth you may experience what's called double or triple returns. The sounding will appear deeper. All 200Khz transducers will do this, just keep that in mind. Shorelines should be done with a rod.

Vegetation can give echo sounders problems. If its thick enough it will give false readings or zero depth readings. Despite popular belief, a dual beam is not the answer as you will also get bottom penetration readings and not actual seabed with a low 30Khz transducer. Options are use a rod in these areas or wait until after winter while the vegetation is dead.

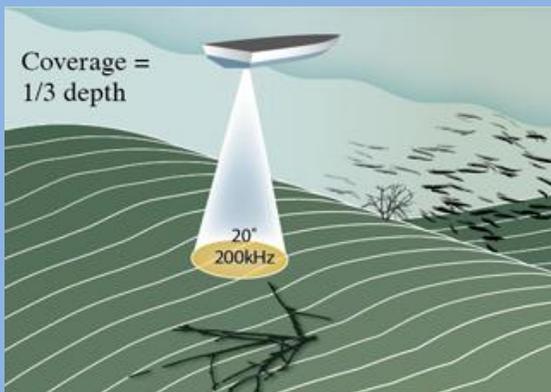
The sonar cone is 9 degrees and would look like an upside down ice cream cone. If the transducer is close to a seawall, piling, dock etc. it will take the first and nearest return which may not be the seafloor.

Sonar FYI

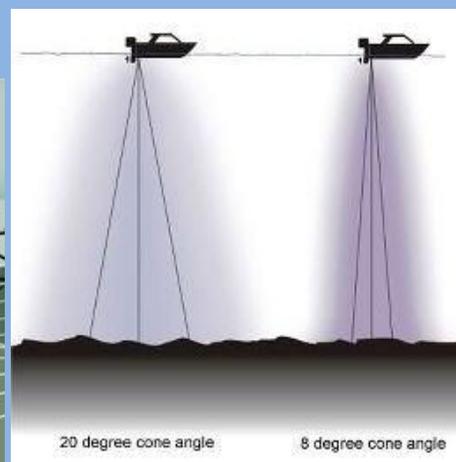
Echo Sounding Sonar uses the time interval between a series of soundings and echos for several purposes like range finding (survey), fish finding or imaging. The bathy logger is a single beam, single frequency 200 kHz echo sounder made for conducting survey grade bathymetric (Hydrographic) surveys. Over 90% of bathymetric surveys in the world are still done with single beam echo sounders. Survey Echo sounders have a narrower beam (cone) and can not see fish in the water column. We just want to track the bottom and interpret the returns for accuracy unlike a fish finder. In pic two you can see the difference of the beam angle.



The sonar cone is similar to an upside down ice cream cone. An echo sounder will take the first return it gets within this cone, so slight movement of the cone won't affect getting the first return directly below the boat. Typically surveys are conducted as slow as possible 2-4 mph and working the survey back and forth similar to the lines on a football field. Also going in the perpendicular direction will form a grid and really tie the survey in nicely.



Example Sonar Cone



Example of beam width