

U20 QUICK START PROCEDURE

1. PREPARE U20 FOR DEPLOYMENT (OFFICE)
 - a. Start Hoboware, insert the U20 water level logger into coupler and wait for connection indication (30 seconds).
 - b. Click “STATUS” on toolbar and observe:
 - i. Abs. Pressure is near barometric pressure for the location.
 - ii. Temperature is near the actual temperature.
 - c. Click “LAUNCH” on toolbar and enter the following data:
 - i. Enter Launch Description.
 - ii. Select Abs. Pressure and Temperature (need temperature for temperature compensation of pressure). Logging battery voltage is not essential since one can check the battery voltage using the “STATUS” screen at “LAUNCH” or “READOUT” of logger.
 - iii. Select sampling rate using one to eight sets of sampling rates.
 - iv. Select launch time, and then click the “LAUNCH” button.
 - d. Repeat steps a, b, c for the U20 barometric logger (one per field).
2. INSTALL U20 LOGGERS AT TEST LOCATION (FIELD)
 - a. Set up a suspension for the water level logger in the well:
 - i. Measure the physical depth to the surface of the water from the suspension point. Cut a piece of stranded, stainless steel wire (Teflon coated) so that the U20 will hang about 15 feet below the water surface and attach the wire to the suspension point and to the U20 water level logger cap.
 1. Relaunch the U20, if desired and a PC is available, and lower the U20 into the well (~15 feet underwater) recording the deployment time and then measure the water depth from the desired reference point (top of pipe, ground level, or sea level) recording the measurement date/time. If the water depth measurement reference point is above the water level surface, record the water level as a negative number. If the water depth measurement reference point is below the water level surface, record the water level as a positive number.
 2. To maximize U20 accuracy, allow 20 minutes after the deployment time before measuring water depth to allow the U20 to reach temperature equilibrium with the well water. If the well is too small in diameter to measure the water depth after U20 deployment, measure the water depth before deployment, then deploy logger immediately and record deployment time.
 - b. Set up suspension for barometric logger in a well:
 - i. Cut a piece of stranded, stainless steel wire (Teflon coated) so that the barometric U20 will hang about 2 feet below the ground

- surface but always above the water surface and attach the wire to the suspension point and to the U20 barometric logger cap.
- ii. Relaunch the barometric U20, if desired and a PC is available, and lower the U20 into the well (above the water) recording the deployment time.
- c. Set up the suspension in a lake or stream:
- i. Build a stilling well to protect the logger during deployment from vibration, shock, and movement during deployment. Build a suspension such that the logger in the stilling well is always underwater, but not on the bottom to be buried by silt.
 1. Relaunch the U20 water level logger, if desired and a PC is available, and lower the U20 into the stilling well recording the deployment time and then measure the water depth of the lake or stream from the desired reference point recording the measurement date/time. If the water depth measurement reference point is above the water level surface, record the water level as a negative number. If the water depth measurement reference point is below the water level surface, record the water level as a positive number.
 2. To maximize U20 accuracy, allow 20 minutes after the deployment time before measuring water depth to allow the U20 to reach temperature equilibrium with the water.
 - d. Set up a suspension for the barometric logger in the stilling well:
 - i. Cut a piece of stranded, stainless steel wire (Teflon coated) so that the barometric U20 will hang always above the water surface and attach the wire to the suspension point and to the U20 barometric logger cap.
 - ii. Relaunch the barometric U20, if desired and a PC is available, and lower the U20 into the stilling well (above the water) recording the deployment time.

3. COLLECT AND PROCESS DATA

- a. READOUT U20 water level data
 - i. Measure the water depth using the original reference point with the correct sign. Record depth and date/time.
 - ii. Pull U20 out of the well and remove the U20 from its cap, leaving the suspension undisturbed.
 - iii. Insert the U20 into the coupler and “READOUT” the data using Hoboware, saving data in a test folder location.
- b. READOUT U20 barometric level data
 - i. Insert the U20 into the coupler and “READOUT” the data using Hoboware, saving data in a test folder location.
- c. Process the water level logger with the barometric logger to calculate water depth.

- i. In Hoboware, open the stored water depth data file and a “Plot Setup” screen will appear. Uncheck all boxes except “Abs. Pressure”, then select the “Barometric Compensation Assistant” and click the “PROCESS” button.
- ii. Select the water density box that best describes the water that you are measuring or enter the actual water density.
- iii. Check the “Use a Reference Water Level” box and enter the reference water level that you measured after U20 deployment and select the date and time from the pull-down menu that is closest to the recorded date/time for the measurement. If you measured the depth before deployment because of pipe size, then select a date/time after the deployment.
- iv. Check “Use Barometric Datafile” and click the “CHOOSE” button. Select and Open the U20 Barometric Datafile just saved from this location.
- v. Click the “Create New Series” button and a new “Plot Setup” screen will appear.
- vi. Select the “Water Level” box and click the “PLOT” button to obtain a plot of the logged water level data.
- vii. Compare the calculated depth at the end of the plot with the date/time of the measured depth taken just before extracting the water level logger to quantify measurement error. The error can be caused by manual measurement error, sensor drift, or change in suspension.

4. REDEPLOY WATER LEVEL AND BAROMETRIC LOGGERS

- a. Repeat Step 2 above, with a new LAUNCH and a new water depth measurement with date/time recorded for the water level logger and a new LAUNCH for the barometric logger. The existing suspension can be reused as long as the water level logger remained in the water and the barometric logger remained out of the water for the entire test interval. Redeployment zeros all drift errors and begins anew.