

SonTek RiverSurveyor Quick Sheet

✓	DISCHARGE MEASUREMENT PROCEDURE	
	4. Setup ADCP and other equipment	
	a. Attach ADCP to mount or tethered boat	
	b. Attach safety line to ADCP	
	c. Turn on computer before connecting ADCP or data radios	
	d. Turn off all automated field computer tasks/power saver settings	
	e. Connect ADCP\GPS\field computer\data radios	
	f. Verify communication with all devices	
	g. Check and set ADCP clock time to appropriate time	
	h. Measure water temperature, record, and compare to ADCP measured temperature	
	5. Configure ADCP	
	a. Locate appropriate measurement section / collect trial transect, if needed	
	b. Select measurement site with uniform flow, no rapid dropoffs	
	c. Minimize unmeasured area	
	d. Determine maximum profiling depth	
	e. Configure ADCP using automated software tools, if possible	
	f. Measure salinity and if not zero, enter salinity in ADCP software	
	g. Measure ADCP depth and record in software and notes (beware of pitch and roll)	
	h. Fill out all field sheet with configuration and other information	
	6. Prepare for discharge measurement	
	a. Perform ADCP diagnostic tests and log results	
	b. Perform and document compass calibration procedure (total error < 1° preferred)	
	c. Record moving-bed test (stationary or loop)	
	<u>Stationary moving bed test</u> Duration of test = 600 seconds $V_{mb} = \text{Dist Upstream} / \text{Duration}$ Moving bed if: Anchored or tethered $V_{mb}/V_w > 0.01$ Not Anchored Boat $V_{mb}/V_w > 0.02$ GPS Referenced $V_{mb}/V_w > 0.01$ V_w is the mean water velocity	<u>Stationary moving bed test</u> Duration of test = 600 seconds $V_{mb} = \text{Dist Upstream} / \text{Duration}$ Moving bed if: Anchored or tethered $V_{mb}/V_w > 0.01$ Not Anchored Boat $V_{mb}/V_w > 0.02$ GPS Referenced $V_{mb}/V_w > 0.01$ V_w is the mean water velocity
	d. Use GPS or other appropriate technique, if a moving bed is present	
	e. Establish start/stop points	
	i. Need minimum of two depth cells with "good" velocity on each edge	
	ii. May use buoys, pilings, poles, or other reference (avoid ferrous objects)	
	4. Make discharge measurement	
	a. Position boat at starting edge-of-water (two 'good' depth cells)	
	i. Begin recording data	
	ii. Measure and record distance to shore	
	b. Hold position for minimum of 10 ensembles	
	c. Drive boat across the river	
	i. Boat speed should be less than or equal to the water speed	
	ii. Be a smooth operator	
	d. Approach ending shore slowly	
	i. Hold position for minimum of 10 ensembles	
	ii. Stop recording	
	iii. Measure and record distance to shore	
	iv. Collect four or more transects	
	v. All transects must be within 5% of the mean discharge, except for unsteady flow conditions; if not, another set of transects should be measured and all transects collected averaged for the final discharge	
	e. Evaluate data in field, looking for potential problems in the data	
	f. Make temporary backups before leaving the site	

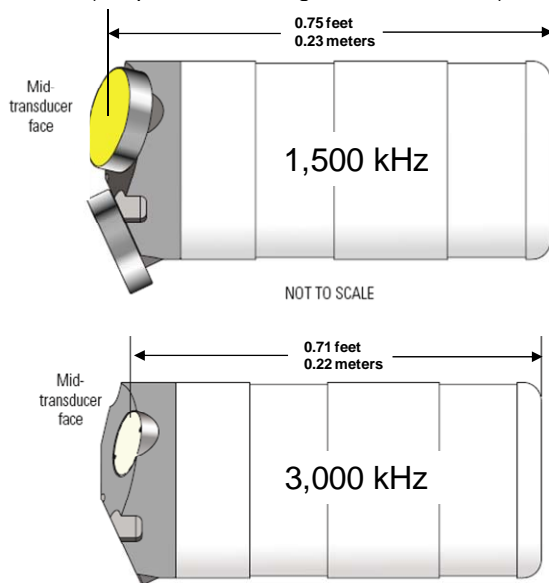
Recommendations and Limitations

ADP Frequency (kHz)	Profiling Range [min. – max.] (ft)	Cell Size [min. – max.] (ft)	Blanking Distance [minimum] (ft)	Max. Bottom Tracking Depth (ft)
500	10 - 394	3.3 – 39.4	3.3	443
1,000	3.9 - 131	0.82 – 16.4	2.3	131
1,500	3.0 - 82	0.82 – 13.1	1.3	98
3,000	2.0 - 20	0.49 – 6.6	0.66	33

ADP Frequency (kHz)	Ping Rate (Hz)	Cell Size (ft)	Single Ping Std. Dev. (ft/s)	1-Second Std. Dev. (ft/s)	5-Second Std. Dev. (ft/s)
500	4.5	1.64	3.08	1.44	0.66
500	4.5	3.28	1.54	0.72	0.33
1,000	12	0.82	3.08	0.88	0.39
1,000	12	1.64	1.54	0.46	0.20
1,500	9	0.82	2.07	0.69	0.30
1,500	9	1.64	1.02	0.33	0.16
3,000	20	0.49	1.71	0.39	0.16
3,000	20	0.82	1.02	0.23	0.10

Draft Measurement

(adapted from Oberg and others, 2005)



Helpful Shortcuts

- F5 Start Pinging
- F6 Stop Transect
- F7 Start Recording
- Alt-F7 Stop Recording
- Ctrl-B Reference - Bottom Track
- Ctrl-G Reference - GPS
- Ctrl-E English Units
- Ctrl-M Metric/SI Units
- Ctrl-S Communications Dialog
- Ctrl-U User Setup
- Ctrl-H Hardware Dialog
- Ctrl-Y Q Summary
- Ctrl-D Q Calculation Dialog
- Ctrl-T Q Report
- + (keypad) Scale Sticks Up
- (keypad) Scale Sticks Down

Stand-Alone ADP Connector Wiring

(adapted from Sontek, 2001)

IL-8-MP Pin No.	MIL-16-MP Pin No.	RS232	RS422
1	1	Vpower	Vpower
2	10	Data out	Tx+
3	11	Data in	Tx-
4	4 & 9	Drain	Drain
5	5	Not used	Not used
6	6	Not used	Rx+
7	14	Not Used	Rx-
8	16	Ground	Ground

Baud Rates

GPS Baud Rate: The minimum acceptable GPS baud rate depends on the number of NMEA 0183 data types being output but the following are good general guidelines.

GPS Update Rate	Baud Rate
1 Hz	4800 or higher
5 Hz	19.2k or higher
10 Hz	38.4k or higher