

## Variables & Terms

Terms	Definitions	Units (English)	Units (Metric)
#_Stations	The number of stations across the width of the river/canal at which measurements were taken. Includes both left and right edge of water (LEW and REW).		
Automatic_Quality_Control_Test_(BeamCheck)	Before data collection, probe is placed in moving water for a 30 second quality control test. Warnings are issued if any underwater obstacles are detected.		
Averaging_Interval	The time in which the FlowTracker records and averages the current velocity data measured at each station. User specified. Default set to 40 seconds.		
Boundary_Condition_(Bnd)	Boundary quality control measurement; 0=Best, 1=Good, 2=Fair, 3=Poor.		
CPU_Firmware_Version	The version of Firmware. (e.g. version 3.9).		
Discharge_Equation	The FlowTracker supports three equations for calculating discharge: Mid Section, Mean Section, and the Japanese equation. FlowTracker defaults to Mid Section discharge equation. For further explanation of how the mid section method works, see section 5.2.1 "Mid Section Discharge Equation" in FlowTracker Technical Manual.		
Discharge_Uncertainty_(ISO)	Discharge uncertainty using the ISO method, which is based on the international standard. It provides users with the results of a published, standard technique; however, in some cases this calculation may not provide a reliable indicator of data quality. The overall uncertainty percentage is the sum of the uncertainty calculations of these several different parameters: Accuracy (the accuracy of the FlowTracker calibration), Depth, Velocity, Width, Method, and # Stations.		
Discharge_Uncertainty_(Statistical)	Discharge uncertainty using the Statistical (Stats) method. This is a method developed by researchers at the U.S. Geological Survey; this is the default calculation as it provides the most reliable indicator of measurement quality. The contributors to the overall uncertainty are based on several different parameters: Accuracy, Depth (this term includes both uncertainty in the depth measurement and the effect of changes in depth between stations), Velocity (this term includes both uncertainty in the velocity measurement and the effect of changes in velocity between stations), and Width.		
File_Name	User specified file name. Contains up to eight characters. Will include the file name and an abbreviation of the site name. (e.g. file name "20150731.20S" for the flowtracker measurement on July 31, 2015 at the 200 South site).		
Mean_Bnd	The mean boundary quality control measurement: 0=Best, 1=Good, 2=Fair, 3=Poor.		
Mean_Depth	The mean depth of the river/canal (Total area / Total width).	ft	m
Mean_SNR	The mean signal to noise ratio. Ideally, the SNR should be above 10 dB, but the FlowTracker can operate reliably with SNR as low as 3-4 dB.	dB	dB
Mean_Temp	The mean canal/river water temperature.	°F	°C
Mean_Velocity	The mean velocity (Total discharge/Total area) of entire canal/river.	ft/s	m/s
Mean_Verr	The mean standard error of velocity in the x-direction.	ft/s	m/s
Mounting_Correction	A user specified correction percentage to account for the flow disturbance from the FlowTracker probe, mount, and rod. For example, inputting a positive correction value mean that measured velocity data is increased by the specified percentage. Default set to No correction (0.0%).		
Noise_level_check	One of the BeamChecks as part of the Automatic Quality Control Test.		
Operator(s)	Initials of individual(s) operating the flowtracker.		
Peak_location_check	One of the BeamChecks as part of the Automatic Quality Control Test.		
Peak_shape_check	One of the BeamChecks as part of the Automatic Quality Control Test.		
Sensor_Type	Type of flowtracker used for measurements. (e.g. Flowtracker Handheld ADV).		
Serial_#	The flowtracker serial number.		
Site_Name	The name of the specific site of flowtracker measurement. (e.g. site name of "NWF200S" for the Northwest Field Canal at 200 South).		
SNR_check	One of the BeamChecks as part of the Automatic Quality Control Test.		
Software_Ver	Version of FlowTracker software. (e.g. version 2.30).		
Start_Date_and_Time	The date (YYYY/MM/DD) and time (24 hr) of when flowtracker measurements began at the specific site.		
Start_Edge	The edge of the river or canal where the first station and measurements began. (LEW) is the left edge of water when facing downstream. (REW) is the right edge of water when facing downstream.		
Total_Area	The total cross sectional area of the canal/river. The sum of areas from each station (width*depth).	ft^2	m^2
Total_Discharge	The total discharge (flow) of the measured canal/river. Total Discharge is the main final outcome of the measurement process (Total Area*Mean Velocity).	cfs	cms
Total_Width	The total width of the canal/river. The sum of every station width.	ft	m
Unit_System	The unit system that Flowtracker measurements were recorded in. Either English or Metric.	English (ft)	Metric (m)

Station Data Variables			
Variable	Definitions	Units (English)	Units (Metric)
St	Station number. Note: Stations may include more than one measurement.		
Clock	Measurement time from FlowTracker clock.		
Loc	User input station location from the start edge (typically from the LEW).	ft	m
Method	Used to determine mean velocity. Method type can be user specified at each station #. Default set to 0.6 method (measurement location of 0.6 * depth from the surface. Adjust wading rod depth to actual water depth. The 0.6 velocity is the mean velocity). For a more accurate velocity measurement, the 0.2/0.8 method can be used (measurement location of 0.2*depth & 0.8*depth). For 0.2 measurement, adjust wading rod depth to 2*actual depth. For 0.8 measurement, adjust wading rod depth to 0.8*actual depth. These two velocities are averaged to obtain the mean velocity. The 0.2/0.8 method should be used when water depths exceed 2ft [English] or 0.5m [metric] for more accurate mean velocity values. If greater accuracy is desired, the 0.2/0.6/0.8 method can be used (See Table 2-1 in User Manual for further detail on 0.2/0.6/0.8 method and other methods).		
Depth	Water depth at each station (User input actual water depth into flowtracker & also adjust wading rod to depth, depending on method).	ft	m
IceD	Ice depth, water surface to bottom of ice or slush.	ft	m
%Dep	Measurement depth location, as fraction of the effective depth. Depth of where the velocity levels were read. Effective depth is water depth minus ice depth. This value is referenced from the surface down (e.g., 0.6 indicates 0.6*depth down from the surface).		
MeasD	Measurement depth location, in depth units. This value is referenced from the bottom (e.g., 0.40 m up from the bottom). MeasD = [Depth * (1-%Dep)].	ft	m
Npts	Number of samples recorded per station measurement over the averaging interval; one sample collected per second. Default of 40 Npts.		
Spike	Spikes in FlowTracker velocity data are removed using a spike filter. Some spikes are common and no cause for concern. Too many spikes indicate a problem in the measurement environment (e.g. interference from underwater obstacles or highly aerated water). Typically < 5% of total samples. Should be < 10% of total samples.		
Vel	Station Mean velocity in the x-direction.	ft/s	m/s
SNR	SNR is the most important quality control parameter. It measures the strength of the acoustic reflection from particles in the water. Without sufficient SNR, the FlowTracker cannot measure velocity. Ideally > 10 dB. Minimum ≥ 4 dB	dB	dB
Angle	Angle is the direction of the measured velocity relative to the FlowTracker X-axis. Used for discharge measurements only. A good site should have small velocity angles. Large angles may be unavoidable at some sites. Ideally < 20°.		
Verr	Standard error of velocity in the x-direction of each station's recorded velocity.	ft/s	m/s
Bnd	Boundary quality control measurement; 0=Best, 1=Good, 2=Fair, 3=Poor.		
Temp	Station Water temperature.	°F	°C
CorrFact	Correction factor used to scale measured velocity. Typically value of 1.00.		
MeanV	Mean station velocity.	ft/s	m/s
Area	Station area.	ft <sup>2</sup>	m <sup>2</sup>
Flow	Station discharge (Velocity*Area).	ft <sup>3</sup> /s	m <sup>3</sup> /s
%Q	%Q is the percentage of the total discharge in a single measurement station. Typical criteria: Ideally < 5%, Maximum < 10%. If end summary states certain stations containing %Q > 10.0, user should return to station location and reduce the Q% by taking velocity measurements slightly left and right of specific station location.	%	%