Data Format: DisdrometerOTTParsivel Stats

Header: InstrumentModel (SN: SerialNumber) Time (YYJJJHH): StatsFileBeginTime[2-digit-Year;3-digit-DayOfYear;2-digit-Hour] UTC

Data Field 1: Begin time of the accumulation/averaging period in UTC

MM = minute
SS = second
mmm = millisecond

Data Field 2: End time of the accumulation/averaging period in UTC

MM = minute
SS = second
mmm = millisecond

Data Field 3-34: Partical distribution (count) binned by ClassNumber

ClassNumber according to volume-equivalent diameter:

ClassNumber	ClassAverage(mm)	ClassSpread(mm)
1	0.062	0.125
2	0.187	0.125
3	0.312	0.125
4	0.437	0.125
5	0.562	0.125
6	0.687	0.125
7	0.812	0.125
8	0.937	0.125
9	1.062	0.125
10	1.187	0.125
11	1.375	0.250
12	1.625	0.250
13	1.875	0.250
14	2.125	0.250
15	2.375	0.250
16	2.750	0.500
17	3.250	0.500
18	3.750	0.500
19	4.250	0.500
20	4.750	0.500
21	5.500	1.000
22	6.500	1.000
23	7.500	1.000
24	8.500	1.000
25	9.500	1.000
26	11.000	2.000
27	13.000	2.000
28	15.000	2.000
29	17.000	2.000
30	19.000	2.000
31	21.500	3.000
32	24.500	3.000

Note: Class 1 and Class 2 are limits and are not evaluated at the current time in measurements using the Parsivel since they are outside the measurement range of the device.

Data Field 35-37: Data acquisition software quality control

Blackout = number of data samples excluded during PC clock synchronization
Good = number of samples that passed the quality control checks, as performed by the data acquisition software
Bad = number of samples that failed the quality control checks, as performed by the data acquisition software

Data Field 38-42: Precipitation statistics

NumParticle = total number of detected particles
Rate(mm/h) = rain rate; units: millimeter per hour
Amount(mm) = interval rain accumulation ; units: millimeter
AmountSum(mm) = event rain accumulation; units: millimeter
Z(dB) = radar refelctivity factor; units: decibel

Data Field 43-48: Laser status

NumError = number of sample instances that were reported as dirty, very dirty, or damaged
Dirty = laser protective glass is dirty, but measurements are still possible
VeryDirty = laser protective glass is dirty, partially covered; no further usable measurements are possible
Damaged = laser damaged
SignalAvg = average signal amplitude of the laser strip; unitless
SignalStdDev = standard deviation of the signal amplitude of the laser strip; unitless

Data Field 49-54: Sensor status

TempAvg(C) = average sensor temperature; units: Celsius
TempStdDev(C) = standard deviation of the sensor temperature; units: Celsius
VoltAvg(V) = sensor power supply voltage; units: Volts
VoltStdDev(V) = standard deviation of the sensor power supply voltage; units: Volts
HeatCurrentAvg(A) = average heating system current; units: Amps
HeatCurrentStdDev(A) = standard deviation of the heating system current; units: Amps

Data Field 55-58: Precipitation partitioning

NumRain = number of particles detected as rain
NumNoRain = number of particles detected not as rain
NumAmbig = number of particles detected as ambiguous
Type = precipitation type (1=rain; 2=mixed; 3=snow)

Note: NumRain, NumNoRain, and NumAmbig counts are determined based on size-velocity masking described in:

Yuter, S. E., D. E. Kingsmill, L. B. Nance, and M. Loffler-Mang, 2006: Observations of precipitation size and fall speed characteristics within coexisting rain and wet snow. J. Appl. Meteor.,45, 1450-1464.

Precipitation type is determined by RainFraction thresholds, where

RainFraction = NumRain / (NumRain + NumNoRain), and

Type = 1 (rain) for RainFraction > 0.95
Type = 3 (snow) for RainFraction < 0.05
Type = 2 (mixed) for RainFraction >= 0.05 and RainFraction <= 0.95

Erroneous particle-size-velocity measurements (and thereby derived precipitation types) can occur at higher wind speeds (as low as ~ 6 m/s), as documented in:

Neiman, P.J., D.J. Gottas, A.B. White, W.R. Schneider, and D. Bright, 2018: A Real-Time Online Data Product that Automatically Detects Easterly Gap Flow Events and Precipitation Type in the Columbia River Gorge. J. Atmos. Oceanic Technol., 35, 2037-2052.

Less conservative RainFraction thresholds for precipitation typing were also explored in Neiman et al.