



One Minute Frequency Automatic Weather Station Data

Version 1.0

This document describes the Bureau of Meteorology's one minute frequency automatic weather station observations products.

Please note: The Bureau's one-minute frequency observations are not made for aviation purposes, and are not authorised weather reports under the Civil Aviation Safety Regulations. Observations presented in this product are intended for real-time qualitative use and have only basic quality assurance measures applied. These data are not suitable for assessment of long-term climate trends of sea level, which requires additional calibration against reference height data.

Location

Files appear in users' .../omd/ directory.

Formats

- .txt.gz

File Name Convention

Observations from Bureau automatic weather stations are made in two formats ('OMD' and 'NVP'). These formats are quite distinct (see decode information below), thus are made available in separate files.

File names are:

IDY07049.yymmddhhmm.txt.gz
IDY07050.yymmddhhmm.txt.gz
IDY07049.txt.gz
IDY07050.txt.gz

Where:

- *yymmddhhmm* refers to the file issue time in UTC
- IDY07049 presents 'OMD' format observations
- IDY07050 presents 'NVP' format observations
- Files without timestamps present the latest file only

Issue Time

Files are issued every minute and include all messages received since the previous issue. Due to variations in communications networks, observations from some stations may not appear regularly in each file.

Station information

Data is available for all operational Bureau of Meteorology automatic weather stations made available via the Bureau's Latest Weather Observations pages (e.g.

<http://reg.bom.gov.au/nsw/observations/nswall.shtml?ref=hdr>).

Weather stations are identified by their Bureau of Meteorology station identifier. This value can be referenced against the Bureau's site list: <ftp://ftp.bom.gov.au/anon2/home/ncc/metadata/sitelists/stations.zip>.

The OMD format (IDY07049) also includes the site's aviation identifier.

General information

The observation format and file from any given weather station will remain consistent, i.e. that station will remain in whichever file its data appears.

The decode information below presents all possible values defined in the format. Please note that AWSs have varied instrumentation and may not report all parameters.

Decoding Information – IDY07049 (OMD)

Header

Bureau of Meteorology station identifier: *nnnnnn*

Message type: OMD

Aviation identifier: *aaa(a)* Note: this value can have three or four digits

Message received date (UTC): *yyyymmdd*

Message received time (UTC): *hhmmss*

OMD message

Please note: the lightning value (L) is reported for some stations but is not valid data. It should be ignored.

DATE Date of observation in local standard time

TIME Time of observation in local standard time

AT Air Temperature

WB Wet Bulb temperature

DP Dew Point temperature

RH Relative Humidity

WS Wind Speed

WD Wind Direction

RF Rainfall counter

L Lightning (not valid data)

QFE Station level barometric pressure

QNH Aviation-derived MSL pressure

QFF Meteorological-derived MSL pressure

CL Instantaneous cloud height readings

CL30 Cloud elements based on past 30 minutes of ceilometer data.

VI One minute Visibility data

VI10 Visibility elements based on past 10 minutes of visibility data.

WX1ME Weather Sensor 1 Present Weather METAR

WX1SY Weather Sensor 1 Present Weather SYNOP

TT Terrestrial Temperature sample (grass temperature)

ST5 Soil Temperature sample at 5 cm

ST10 Soil Temperature sample at 10 cm

ST20 Soil Temperature sample at 20 cm

ST50 Soil Temperature sample at 50 cm

ST100 Soil Temperature sample at 100 cm

WT Water Temperature sample

WR2 Wind Run at 2 metres counter

SD Sunshine Duration counter

BV AWS Battery Voltage

TI AWS Internal Temperature

SWV AWS Software Version

Data groups

Ident.	Data _a	Data _b	Data _c	Data _d	Data _e	Units	Field length and format	Over-range value
DATE	Observation date (local time)	---	---	---	---	---	YYYYMMDD	---
TIME	Observation time (local time)	---	---	---	---	---	HHMM	---
AT	Instantaneous air temperature	One-minute minimum temperature	One-minute maximum temperature	---	---	-C	*##.#	99.9
WB	Instantaneous wet bulb temperature	One-minute minimum wet bulb temperature	One-minute maximum wet bulb temperature	---	---	-C	*##.#	99.9
DP	Instantaneous dew point temperature	One-minute minimum dew point temperature	One-minute maximum dew point temperature	---	---	-C	*##.#	99.9
RH	Instantaneous relative humidity	One-minute minimum relative humidity	One-minute maximum relative humidity	---	---	%	###	999
WS	One-minute average wind speed	One-minute minimum wind speed	One-minute maximum wind speed	---	---	knots	###	999
WD	One-minute average wind direction	One-minute minimum direction	One-minute maximum direction	---	---	degrees	###	999
RF	Cumulative rainfall since commencement of AWS	---	---	---	---	mm	*##.#	999.9
L	Lightning – not valid data							
QFE	Instantaneous	---	---	---	---	hPa	####.#	9999.9

	station level barometric pressure							
QNH	Instantaneous aviation criterion	---	---	---	---	hPa	####.#	9999.9
QFF	Instantaneous mean sea level barometric pressure	---	---	---	---	hPa	####.#	9999.9
CL	Instantaneous cloud height sample 1 (most recent)	Instantaneous cloud height sample 2	Instantaneous cloud height sample 3	Instantaneous cloud height sample 4	Instantaneous cloud height sample 5 (oldest)	ft	#####	99999
CL30	Cloud amount layer 1 (lowest); height of that layer	Cloud amount layer 2; height of that layer	Cloud amount layer 3 (highest); height of that layer	---	---	Oktas; 100s of ft	##; ###	99; 999
VI	One minute mean visibility	---	---	---	---	m	#####	99999
VI10	Ten minute mean visibility	---	---	---	---	m	####	9999
WX1ME	Present weather element 1	Present weather element 2	Present weather element 3	Recent weather element 1	---	Code	(see notes below)	
WX1SY	Present weather (SYNOP)	Past weather (SYNOP)	---	---	---	Code	(see notes below)	
TT	Instantaneous terrestrial temperature	---	---	---	---	-C	*##.#	99.9
ST5	Instantaneous soil temperature at 5cm	---	---	---	---	-C	*##.#	99.9
ST10	Instantaneous soil temperature at 10cm	---	---	---	---	-C	*##.#	99.9
ST20	Instantaneous soil temperature at 20cm	---	---	---	---	-C	*##.#	99.9
ST50	Instantaneous soil temperature at 50cm	---	---	---	---	-C	*##.#	99.9
ST100	Instantaneous soil temperature at 100cm	---	---	---	---	-C	*##.#	99.9
WT	Instantaneous water temperature	---	---	---	---	-C	*##.#	99.9
WR2	Cumulative 2m wind run since commencement of AWS	---	---	---	---	m	@#####.#	1E+09
SD	Cumulative sunshine duration since commencement of AWS	---	---	---	---	s	@#####	9999999
BV	Battery voltage	---	---	---	---	V	##.#	99.9
TI	Internal AWS temperature	---	---	---	---	-C	*##.#	99.9
SWV	Software version	---	---	---	---	---	Variable	---

where,

"#" is one digit i.e. 0 to 9

"@" is the over-range indication digit

"*" is the sign character, ie. + or – (optional for positive values)

Notes:

1. Some data fields may take positive or negative values. The sign character (ie. "-") is to be included only for negative values, otherwise it is to be omitted.
2. If the reading for a data field is unobtainable it is assigned its over-range value.
3. Leading zeros are to be transmitted, e.g. "007" would be transmitted not " 7" (two spaces preceding the "7") or just "7".
4. Some data fields contain an over-range indication digit. This digit will be "0" where the value is valid or "9" where the value is invalid. For the invalid data case, the remaining digits in the field will also be "9".

Cloud Height Group Notes

1. For the processed cloud variables in the CL30 group, within each field the cloud amount (cl_amtn) and layer height (cl_htn) are separated by a comma i.e. ", " (ASCII code 44 decimal).
2. If the Sky Condition Algorithm indicates there is less than three cloud groups then the lowest cloud group will be reported in the first cloud field, the next lowest cloud group will be reported in the second field and subsequent cloud fields will be reported as "00,000". For example, CL30:(01,010/00,000/00,000).

Present Weather Group Codes

00 No significant weather	27 Heavy, freezing fog
01 Mist	28 Freezing fog patches
02 Dust	30 Drizzle
03 Haze	31 Light drizzle
04 Light Hail	32 Drizzle
05 Hail	33 Heavy drizzle
06 Heavy Hail	34 Light freezing drizzle
07 Snow grains	35 Freezing drizzle
08 Ice crystals	36 Heavy freezing drizzle
20 Fog	37 Light drizzle and rain
21 Fog patches	38 Drizzle and rain
22 Slight fog	39 Heavy drizzle and rain
23 Moderate fog	40 Rain
24 Heavy fog	41 Light rain
25 Light, freezing fog	42 Rain
26 Freezing fog	43 Heavy Rain

44 Light freezing rain	66 Heavy showers of snow
45 Freezing rain	70 Showers (Rain & snow)
46 Heavy freezing rain	71 Light showers of rain & snow
47 Light rain and snow	72 Showers of rain & snow
48 Rain and snow	73 Heavy showers of rain & snow
49 Heavy rain and snow	74 Light showers of snow & rain
50 Snow	75 Showers of snow & rain
51 Light snow	76 Heavy showers of snow & rain
52 Snow	80 Showers (Ice pellets, hail, small hail)
53 Heavy snow	81 Light showers of ice pellets
54 Light snow and rain	82 Showers of ice pellets
55 Snow and rain	83 Heavy showers of ice pellets
56 Heavy snow and rain	84 Light showers of hail
57 Light ice pellets	85 Showers of hail
58 Snow pellets	86 Heavy showers of hail
59 Heavy ice pellets	87 Light showers of snow grains
60 Showers	88 Showers of snow grains
61 Light showers of rain	89 Heavy showers of snow grains
62 Showers of rain	97 Detected weather code not in table
63 Heavy showers of rain	98 No weather code detected
64 Light showers of snow	99 Unavailable or insufficient data (instrument)
65 Showers of snow	

The Message Status Group

The Message Status Group contains information which is specific to each individual message.

MSG:RNRNRNRN/CNCNCN/SSSSSS/CSCSCS

where,

MSG is the message status group identifier and is fixed.

: is a separator character which is fixed.

RNRNRNRN is the message sequence number which may take a value between 0000 and 9999 inclusive. Between successive messages RNRNRNRN is incremented by one and after 9999 it “rolls over” to 0000.

Note: Always use four digits, e.g. 0000, 0001, 0010.

/ is a separator character which is fixed.

CNCNCN is the number of characters in the message excluding the <eoln> markers. If the number of characters is greater than 999 then CNCNCN is equal to the three least significant digits of the total.

Note: Always use three digits, e.g. 000, 003, 023.

/ is a separator character which is fixed.

SSSSSS is the system status error counter. It is the total number of system errors, software or hardware; e.g. sensor failures, resets initiated by a watch-dog timer, divided by zero errors, etc. If the number of errors is greater than 999 then SSSSSS is equal 999.

Note: Always use three digits, e.g. 000, 001, 099.

/ is a separator character which is fixed.

CSCSCS is the check-sum code which is derived from the sum of the ASCII codes of the all characters in the message excluding CSCSCS itself and any <eoln> markers.

CSCSCS is equal to the three least significant digits of the ASCII sum e.g. if ASCII sum = 12345 then CSCSCS = 345.

Note: Always use three digits, e.g. 000, 002, 023.

Decoding Information – IDY07050 (NVP)

- The following symbols are used to define the characters used within the data formats
 - # numeric (0-9)
 - @ alphanumeric (a-z, 0-9)
 - ± sign
- Where sign is indicated in the format, only the minus sign (-) is reported. Positive signs are not reported.
- “Legitimate Values” indicates the maximum range of possible values for that reporting format, and do not define valid/invalid data ranges for specific parameters.
- Leading zeroes are not reported unless indicated.

Message Header

The following groups are always included in the message header:

Tag	Description	Format	Units	Legitimate Values
NVP	NVP message type	#	-	1 to 9
STN	Station Number	#####	-	001000 to 999999
UTC	Time and Date (UTC)	##### YYYYMMDDHHMMSS	-	YYYY: 1800 to 2100 MM: 01 to 12 DD: 01 to 31 HH: 00 to 23 MM: 00 to 59 SS: 00 to 59

Note: Leading zeroes are included in STN variable.

Message Footer

The following groups are always included in the message footer:

Tag	Description	Format	Units	Legitimate Values
VER	NVP format version	##.#	n/a	0.0 to 99.9
BV	Battery voltage	##.#	volts	0 to 99.9
ET	Enclosure temperature	±##.#	°C	-99.9 to 99.9
SSS	One minute system status summary	@@@@@	-	0..0 to F..F ^[Note 1] (hexadecimal)
MN	Message number	#####	-	0 to 9999
EC	Error counter	#####	-	0 to 9999

Note: Leading zeroes are included in the SSS variable

Message Body**Air Temperature**

Tag	Description	Format	Units	Legitimate Values
T	Air temperature, average, one minute	±##.#	°C	-99.9 to 99.9
TN	Air temperature, minimum, one minute	±##.#	°C	-99.9 to 99.9
TX	Air temperature, maximum, one minute	±##.#	°C	-99.9 to 99.9
TS	Air temperature, standard deviation, one minute	±##.#	°C	-99.9 to 99.9
TQ	Air temperature, number of valid samples, one minute	##	n/a	0 to 60

Wet Bulb Temperature

Tag	Description	Format	Units	Legitimate Values
W	Wet bulb temperature, average, one minute	±##.#	°C	-99.9 to 99.9
WN	Wet bulb temperature, minimum, one minute	±##.#	°C	-99.9 to 99.9
WX	Wet bulb temperature, maximum, one minute	±##.#	°C	-99.9 to 99.9
WS	Wet bulb temperature, standard deviation, one minute	±##.#	°C	-99.9 to 99.9
W#V	Wet bulb temperature, number of valid samples, one minute	##	n/a	0 to 60
W#F	Wet bulb temperature, data validation flags, one minute	@...@	n/a	@: a to z (alpha)
W#L	Wet bulb temperature, average, one minute, low sample	±##.#	°C	-99.9 to 99.9
WN#L	Wet bulb temperature, minimum, one minute, low sample	±##.#	°C	-99.9 to 99.9
WX#L	Wet bulb temperature, maximum, one minute, low sample	±##.#	°C	-99.9 to 99.9
WS#L	Wet bulb temperature, standard deviation, one minute, low sample	±##.#	°C	-99.9 to 99.9

Atmospheric Pressure

Tag	Description	Format	Units	Legitimate Values
QFE	Station level atmospheric pressure, instantaneous, one minute	####.#	hPa	0.0 to 9999.9
QFES	Station level atmospheric pressure, standard deviation, one minute	####.#	hPa	0.0 to 9999.9
QFEQ	Atmospheric pressure, number of valid samples, one minute	##	n/a	0 to 60

Relative Humidity

Tag	Description	Format	Units	Legitimate Values
H	Relative humidity, average, one minute	±###	%	-2 to 110
HN	Relative humidity, minimum, one minute	±###	%	-2 to 110
HX	Relative humidity, maximum, one minute	±###	%	-2 to 110
HS	Relative humidity, standard deviation, one minute	±###	%	-2 to 110

Tag	Description	Format	Units	Legitimate Values
HQ	Relative humidity, number of valid samples, one minute	##	n/a	0 to 60

Wind Direction

Tag	Description	Format	Units	Legitimate Values
D	Wind direction, average, one minute	###	°	0 to 360
DS	Wind direction, standard deviation, one minute	###	°	0 to 360
DQ	Wind direction, number of valid samples, one minute	##	n/a	0 to 60

Wind Speed (standard)

Tag	Description	Format	Units	Legitimate Values
S	Wind speed, average, one minute	###.#	knots	0.0 to 999.9
SN	Wind speed, minimum, one minute	###.#	knots	0.0 to 999.9
SX	Wind speed, maximum, one minute	###.#	knots	0.0 to 999.9
SS	Wind speed, standard deviation, one minute	###.#	knots	0.0 to 999.9
SQ	Wind speed, number of valid samples, one minute	##	n/a	0 to 60

2 Metre Wind Speed

Tag	Description	Format	Units	Legitimate Values
S2	Wind speed, 2 metre, average, one minute	###.#	knots	0.0 to 999.9
S2#V	Wind speed, 2 metre, number of valid samples, one minute	##	n/a	0 to 60
S2#F	Wind speed, 2 metre, data validation flags, one minute	@...@	n/a	@: a to z (alpha)
S2#L	Wind speed, 2 metre, average, one minute, low sample	###.#	knots	0.0 to 999.9

Rainfall Count

Tag	Description	Format	Units	Legitimate Values
R	Rainfall, count, instantaneous, one minute	###.#	mm	0 to 999.9
R#V	Rainfall, count, number of valid samples, one minute	##	n/a	0 to 60
R#F	Rainfall, count, data validation flags, one minute	@...@	n/a	@: a to z (alpha)

Present Weather

Refer to table below for weather codes

Tag	Description	Format	Units	Legitimate Values
WX1S	Present weather, SYNOP, one minute	@...@	(code)	00 to 99 [Note 1]
WX1SH	Past weather, SYNOP, one minute	@...@	(code)	00 to 99 [note 1]

Tag	Description	Format	Units	Legitimate Values
WX1M1	Present weather, METAR, one minute, first field	@...@	(code)	@: a to z (alpha)
WX1M2	Present weather, METAR, one minute, second field	@...@	(code)	@: a to z (alpha)
WX1M3	Present weather, METAR, one minute, third field	@...@	(code)	@: a to z (alpha)
WX1MH	Recent weather, METAR, one minute	@...@	(code)	@: a to z (alpha)
WX1#V	Present weather, number of valid samples, one minute	##	n/a	0 to 60
WX1#F	Present weather, data validation flags, one minute	@...@	n/a	@: a to z (alpha)

Note: Leading zeroes are included in WX1S and WX1SH variables.

Thunderstorm

Tag	Description	Format	Units	Legitimate Values
WX2VN	Flash count, one minute, vicinity, north	##	(count)	0 to 99 [Note 1]
WX2VNE	Flash count, one minute, vicinity, north east	##	(count)	0 to 99
WX2VE	Flash count, one minute, vicinity, east	##	(count)	0 to 99
WX2VSE	Flash count, one minute, vicinity, south East	##	(count)	0 to 99
WX2VS	Flash count, one minute, vicinity, south	##	(count)	0 to 99
WX2VSW	Flash count, one minute, vicinity, south west	##	(count)	0 to 99
WX2VW	Flash count, one minute, vicinity, west	##	(count)	0 to 99
WX2VNW	Flash count, one minute, vicinity, north west	##	(count)	0 to 99
WX2DN	Flash count, one minute, distant, north	##	(count)	0 to 99
WX2DNE	Flash count, one minute, distant, north east	##	(count)	0 to 99
WX2DE	Flash count, one minute, distant, east	##	(count)	0 to 99
WX2DSE	Flash count, one minute, distant, south East	##	(count)	0 to 99
WX2DS	Flash count, one minute, distant, south	##	(count)	0 to 99
WX2DSW	Flash count, one minute, distant, south west	##	(count)	0 to 99
WX2DW	Flash count, one minute, distant, west	##	(count)	0 to 99
WX2DNW	Flash count, one minute, distant, north west	##	(count)	0 to 99
WX2OH	Flash count, one minute, overhead	##	(count)	0 to 99
WX2CC	Flash count, one minute, cloud to cloud	##	(count)	0 to 99
WX2#V	Flash count, number of valid samples, one minute	##	n/a	0 to 60
WX2#F	Flash count, data validation flags, one minute	@...@	n/a	@: a to z (alpha)

Note: Leading zeroes are included in all Flash Count variables (except WX2#V and WX2#F).

Horizontal Visibility

Tag	Description	Format	Units	Legitimate Values
VI	Visibility, horizontal, average, one minute	#####	m	0 to 99999
VI#V	Visibility, horizontal, number of valid samples, one minute	##	n/a	0 to 60
VI#F	Visibility, horizontal, data validation flags, one minute	@...@	n/a	@: a to z (alpha)

Cloud Height

Tag	Description	Format	Units	Legitimate Values
CLH1	Cloud base height, one minute, sample 1	#####	feet	00000 to 99999
CLH2	Cloud base height, one minute, sample 2	#####	feet	00000 to 99999
CLH3	Cloud base height, one minute, sample 3	#####	feet	00000 to 99999
CLH4	Cloud base height, one minute, sample 4	#####	feet	00000 to 99999
CLH5	Cloud base height, one minute, sample 5 [Note 1]	#####	feet	00000 to 99999
CLH#V	Cloud base height, number of valid samples, one minute	##	n/a	0 to 60
CLH#F	Cloud base height, data validation flags, one minute	@...@	n/a	@: a to z (alpha)

Note: Leading zeroes are included in all cloud height variables except CLH#V and CLH#F.

Terrestrial Temperature

Tag	Description	Format	Units	Legitimate Values
TT	Terrestrial temperature, average, one minute	±##.#	°C	-99.9 to 99.9
TT#V	Terrestrial temperature, number of valid samples, one minute	##	n/a	0 to 60
TT#F	Terrestrial temperature, data validation flags, one minute	@...@	n/a	@: a to z (alpha)
TT#L	Terrestrial temperature, low sample, one minute	±##.#	°C	-99.9 to 99.9

Soil Temperatures

Tag	Description	Format	Units	Legitimate Values
ST5	Soil temperature, average, one minute, 5 cm	±##.#	°C	-99.9 to 99.9
ST5#V	Soil temperature, number of valid samples, one minute, 5cm	##	n/a	0 to 60
ST5#F	Soil temperature, data validation flags, one minute, 5cm	@...@	n/a	@: a to z (alpha)
ST5#L	Soil temperature, average, one minute, 5cm, low sample	±##.#	°C	-99.9 to 99.9
ST10	Soil temperature, average, one minute, 10 cm	±##.#	°C	-99.9 to 99.9
ST10#V	Soil temperature, number of valid samples, one minute, 10cm	##	n/a	0 to 60

Tag	Description	Format	Units	Legitimate Values
ST10#F	Soil temperature, data validation flags, one minute, 10cm	@...@	n/a	@: a to z (alpha)
ST10#L	Soil temperature, average, one minute, 10cm, low sample	±##.#	°C	-99.9 to 99.9
ST20	Soil temperature, average, one minute, 20 cm	±##.#	°C	-99.9 to 99.9
ST20#V	Soil temperature, number of valid samples, one minute, 20cm	##	n/a	0 to 60
ST20#F	Soil temperature, data validation flags, one minute, 20cm	@...@	n/a	@: a to z (alpha)
ST20#L	Soil temperature, average, one minute, 20cm, low sample	±##.#	°C	-99.9 to 99.9
ST50	Soil temperature, average, one minute, 50 cm	±##.#	°C	-99.9 to 99.9
ST50#V	Soil temperature, number of valid samples, one minute, 50cm	##	n/a	0 to 60
ST50#F	Soil temperature, data validation flags, one minute, 50cm	@...@	n/a	@: a to z (alpha)
ST50#L	Soil temperature, average, one minute, 50cm, low sample	±##.#	°C	-99.9 to 99.9
ST100	Soil temperature, average, one minute, 100 cm	±##.#	°C	-99.9 to 99.9
ST100#V	Soil temperature, number of valid samples, one minute, 100cm	##	n/a	0 to 60
ST100#F	Soil temperature, data validation flags, one minute, 100cm	@...@	n/a	@: a to z (alpha)
ST100#L	Soil temperature, average, one minute, 100cm, low sample	±##.#	°C	-99.9 to 99.9

Water Level

Tag	Description	Format	Units	Legitimate Values
WLA	Water level, average, one minute, primary	±##.###	m	-99.999 to 99.999
WLN	Water level, minimum, one minute, primary	±##.###	m	-99.999 to 99.999
WLX	Water level, maximum, one minute, primary	±##.###	m	-99.999 to 99.999
WLS	Water level, standard deviation, one minute, primary	±#.###	m	-99.999 to 99.999
WLQ	Water level, number of valid samples, one minute, primary	##	n/a	0 to 60
WLA_2	Water level, average, one minute, secondary	±##.###	m	-99.999 to 99.999
WLN_2	Water level, minimum, one minute, secondary	±##.###	m	-99.999 to 99.999
WLX_2	Water level, maximum, one minute, secondary	±##.###	m	-99.999 to 99.999
WLS_2	Water level, standard deviation, one minute, secondary	±##.###	m	-99.999 to 99.999
WLQ_2	Water level, number of valid samples, one minute, secondary	##	n/a	0 to 60
WLA_3	Water level, average, one minute, tertiary	±##.###	m	-99.999 to 99.999
WLN_3	Water level, minimum, one minute, tertiary	±##.###	m	-99.999 to 99.999
WLX_3	Water level, maximum, one minute, tertiary	±##.###	m	-99.999 to 99.999

Tag	Description	Format	Units	Legitimate Values
WLS_3	Water level, standard deviation, one minute, tertiary	±##.###	m	-99.999 to 99.999
WLQ_3	Water level, number of valid samples, one minute, tertiary	##	n/a	0 to 60
WLA3	Water level, average, three minute	±##.###	m	-99.999 to 99.999
WLS3	Water level, standard deviation, three minute	±##.###	m	-99.999 to 99.999
WLQ3	Water level, number of valid samples, three minute	##	n/a	0 to 60

Surface Water Temperature

Tag	Description	Format	Units	Legitimate Values
WT	Surface water temperature, average, one minute	±##.#	°C	-99.9 to 99.9
WTS	Surface water temperature, standard deviation, one minute	±##.#	°C	-99.9 to 99.9
WTQ	Surface water temperature, number of valid samples, one minute	##	n/a	0 to 60

Tube Temperatures (Aquatrak Sensor)

Tag	Description	Format	Units	Legitimate Values
TAT1	Tube temperature, top, average, one minute	±##.#	°C	-99.9 to 99.9
TAT1Q	Tube temperature, top, number of valid samples, one minute	##	n/a	0 to 60
TAT2	Tube temperature, bottom, average, one minute	±##.#	°C	-99.9 to 99.9
TAT2Q	Tube temperature, bottom, number of valid samples, one minute	##	n/a	0 to 60

Present weather codes

Code	Description
BR	Mist
DU	Dust
HZ	Haze
-GR	Light Hail
GR	Hail
+GR	Heavy Hail
SG	Snow grains
IC	Ice crystals
BCFG	Fog patches
-FG	Slight fog
FG	Moderate fog

Code	Description
+FG	Heavy fog
-FZFG	Light, freezing fog
FZFG	Freezing fog
+FZFG	Heavy, freezing fog
FZBCFG	Freezing fog patches
-DZ	Light drizzle
DZ	Drizzle
+DZ	Heavy drizzle
-FZDZ	Light freezing drizzle
FZDZ	Freezing drizzle
+FZDZ	Heavy freezing drizzle
-DZRA	Light drizzle and rain
DZRA	Drizzle and rain
+DZRA	Heavy drizzle and rain
-RA	Light rain
RA	Rain
+RA	Heavy Rain
-FZRA	Light freezing rain
FZRA	Freezing rain
+FZRA	Heavy freezing rain
-RASN	Light rain and snow
RASN	Rain and snow
+RASN	Heavy rain and snow
-SN	Light snow
SN	Snow
+SN	Heavy snow
-SNRA	Light snow and rain
SNRA	Snow and rain
+SNRA	Heavy snow and rain
-PL	Light ice pellets

Code	Description
PL	Snow pellets
+PL	Heavy ice pellets
-SHRA	Light showers of rain
SHRA	Showers of rain
+SHRA	Heavy showers of rain
-SHSN	Light showers of snow
SHSN	Showers of snow
+SHSN	Heavy showers of snow
-SHRASN	Light showers of rain & snow
SHRASN	Showers of rain & snow
+SHRASN	Heavy showers of rain & snow
-SHSNRA	Light showers of snow & rain
SHSNRA	Showers of snow & rain
+SHSNRA	Heavy showers of snow & rain
-SHPL	Light showers of ice pellets
SHPL	Showers of ice pellets
+SHPL	Heavy showers of ice pellets
-SHGR	Light showers of hail
SHGR	Showers of hail
+SHGR	Heavy showers of hail
-SHSG	Light showers of snow grains
SHSG	Showers of snow grains
+SHSG	Heavy showers of snow grains