Meteorological Post Processing Documentation and Task Lists for 2012/2013

McMurdo Dry Valley Long Term Ecological Research (LTER)

This document compiles the steps taken to post-process raw meteorological data files and notes from station visits. Each numbered output value is identified by column header name, unit of measurement, and post-processing instruction. Station notes document datalogger time adjustments, sensor status, sensor and station maintenance, time of storage module changes, equipment and data problems, and other observations. Files are listed alphabetically by file name that begin with the station ID.

Contents:

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File description and task list for files:
  o1=omit from level 1
  ok= no changes to get to level 1
  rclow= reverse temperatures to mV and apply clow subroutine to mV values using Steinhart-Hart equation
  bad= normally would be included in level 1 but number is suspect or know to be incorrect
  flag= reasonable number but needs a note attached concerning its collection
  Lowe= see note for relative humidity below

Data Flags

Definition	Flags	Post-processing	Data Manager
Out of Range	R	None	Flag as R, except flag as "U" when IceT20cm exceeds 0 degrees and "V" when IceT1m exceeds 0 degrees
Negative values zeroed out	Z	Converted to zero	Flag as Z
Bad Value - Value below zeroing value	T	Value omitted	Flag as F
Bad Value - Value is equal to -6999 or known to be questionable	B	None	Flag as B
Bad Value - Raw temp value (-53C and 32.79C) which exceeds the bracketed limited for bisection	F	Value omitted	Flag as B
SwRadOut is greater than a % of SwRadIN	S	None	Flag as S
Wdir and WDirStD zeroed out because WSpd = 0	N	Converted to zero	Flag as N
Value missing	M	None	Flag as M

Relative humidity correction note: All of the relative humidity (RH) values were corrected for a systematic error in the measurement created by an instrument manufacturer error. All RH data with air temperatures below freezing were corrected using the vapor pressure over ice (rather than over water which was used initially). The error became quite large for very cold temperatures (the correction could grow to around 30%). The polynomials used for the correction is based on Lowe (1977).

=[RH3m]*(6.107799961 + [AirT3m] * (0.4436518521 + [AirT3m] * (0.01428945805 + [AirT3m] * (0.0002650648471 + [AirT3m] *(0.000003031240396 + [AirT3m] * (0.00000002034080948 + 0.00000000006136820929 * [AirT3m])))))) / (6.109177956 + [AirT3m] * (0.503469897 + [AirT3m] * (0.01886013408 + [AirT3m] * (0.0004176223716 + [AirT3m] * (0.00000582472028 + [AirT3m] * (0.00000004838803174 + 0.0000000001838826904 * [AirT3m]))))))

Beacon Valley Met Station (BENM)

Filename: BENM_201213_SM001.DAT
Author of this report: Hassan Basagic
File Period: 01/27/2012 12:30 to 11/28/2012 11:15
Sampling Frequency: wind every 4 sec.; others: every 30 sec.
Averaging and Output Interval: every 15 minutes
Program Name ben1011v1

1	array I.D.	o1
2	Day	ok
3	Time	ok
4	mean air temp. @ 3 meters (C)	rclow
5	corrected mean R.H. @ 3 meters (%)	lowe correction
6	mean solar flux going down (W/m2) –**PY28371**	bad
7	mean solar flux going up (W/m2) – **PY20562**	ok
8	mean horizontal wind speed (m/s)	ok
9	resultant mean wind speed (m/s)	o1
10	resultant mean wind direction (degrees from north)	ok
11	standard deviation of wind direction (degrees)	ok
12	maximum wind speed (m/s)	ok
13	minimum wind speed (m/s)	ok
14	mean P.A.R. (micromols/s/m2) – **Q23199**	bad
15	mean soil temperature @ 0 cm in soil (C)	rclow
16	mean soil temperature @ 5 cm in soil (C)	rclow
17	mean soil temperature @ 10 cm in soil (C)	rclow
18	sample of battery voltage	o1

Notes:
1) Station visit on Nov 28, 2012 at 1110, all input values look good. Adjusted clock back 10 minutes at 11:20.
2) Swapped SM4M for another SM4M at 12:28.

	Filename:	BENM_201213_SM002.DAT	
	Author of this report:	Hassan Basagic	
	File Period:	11/28/2012 11:15 to 12/27/12 10:45; **END OF SERVICE**	
	Sampling Frequency:	wind every 4 sec.; others: every 30 sec.	
	Averaging and Output Interval:	every 15 minutes	
	Program Name	ben1011v1	

1	array I.D.	o1
2	Day	ok
3	Time	ok
4	mean air temp. @ 3 meters (C)	rclow
5	corrected mean R.H. @ 3 meters (%)	lowe correction
6	mean solar flux going down (W/m2) –**PY28371**	bad
7	mean solar flux going up (W/m2) – **PY20562**	ok
8	mean horizontal wind speed (m/s)	ok
9	resultant mean wind speed (m/s)	o1
10	resultant mean wind direction (degrees from north)	ok
11	standard deviation of wind direction (degrees)	ok
12	maximum wind speed (m/s)	ok
13	minimum wind speed (m/s)	ok
14	mean P.A.R. (micromols/s/m2) – **Q23199**	bad
15	mean soil temperature @ 0 cm in soil (C)	rclow
16	mean soil temperature @ 5 cm in soil (C)	rclow
17	mean soil temperature @ 10 cm in soil (C)	rclow
18	sample of battery voltage	o1

Notes:

1) Station offline and removed from site on Dec 27, 2012 by Thomas Nylen. All input values look good. Power off at 10:50.
2) **Station removed from service.** Beacon met station, including tower and all sensors, were relocated to Lake Hoare as "New Hoare" met station.
3) Post-processing: No data missing.

Lake Bonney Met Station (BOYM)

Filename:	BOYM_201112_SM002.dat, BOYM_201213_SM001.dat, BOYM_201213_T001.dat	
Author of this report:	Hassan Basagic	
File Period:	12/21/11 15:15 to 11/24/12 12:15	
Sampling Frequency:	sonic and prec. every 60 minutes, wind speed every 4 sec, other every 30 sec	
Averaging and Output Interval:	every 15 minutes	
Program Name	boy_201112_v1	

1	array I.D.	o1
2	Year	ok
3	Day	ok
4	Time	ok
5	mean air temp. @ 3 meters (C)	rclow
6	corrected mean R.H. @ 3 meters (%)	Lowe correction
7	mean air temp. @ 1 meters (C)	rclow
8	mean solar flux going down (W/m2) – **?????**	o1 until calibration is received
9	mean solar flux going up (W/m2) – **?????**	o1 until calibration is received
10	mean horizontal wind speed (m/s)	ok
11	resultant mean wind speed (m/s)	o1
12	resultant mean wind direction (degrees from north)	ok
13	standard deviation of wind direction (degrees)	ok
14	maximum wind speed (m/s)	ok
15	minimum wind speed (m/s)	ok
16	mean P.A.R. (micromols/s/m2) – **Q33906**	divide by 200, multiply by 292.51
17	mean soil temperature @ 0 cm in soil (C)	rclow
18	mean soil temperature @ 5 cm in soil (C)	rclow
19	mean soil temperature @ 10 cm in soil (C)	rclow
20	sample depth from sensor to surface (cm)	Measured depth * -100
21	mean up-facing pyrgeometer, rad. comp. (W/m2) - **30831F3**	divide by 250; multiply by 277.01
22	mean up-facing pyrgeometer hemisphere temp	Eppley
23	mean up-facing pyrgeometer thermopile (W/m2)	Eppley
24	mean up-facing pyrgeometer case temp	Eppley
25	mean down-facing pyrgeometer, rad. comp. (W/m2) -**32059F3**	divide by 250; multiply by 227.79
26	mean down-facing pyrgeometer hemisphere temp	Eppley
27	mean down-facing pyrgeometer thermopile (W/m2)	Eppley
28	mean down-facing pyrgeometer case temp	Eppley
29	sample precipitation (mm)	ok
30	sample of battery voltage	o1

Notes:
1) Station visit on 11/24/12 11:35 by Basagic and Nylen. Date and time correct. All input values look good except ultrasonic distance ranger, this was removed for repair. Ultra sonic data looks questionable after June 18, 2012. Wind monitor is aligned north.
2) Station maintenance on 11/24/2012: Swapped wind sensor at 1354. Marbles had been tossed on to the ground, presumably by wind. Recovered and replaced marbles. There was a bad wire on the battery charger, this was reconnected and voltage was increasing. Swapped storage module at 1202.
3) Post-processing: Missing worksheet from station visit on Jan 27, 2012, data not previously processed. Missing serial numbers for up and down pyranometers, and new quantum placed on 11/24/2012, this will need to be recorded next station visit and back processed, data is omitted from processing until these are received and flagged as "B". Missing data from 12/22/2012 13:00 to 12/25/2012 5:15. Check SM next visit.

Bonney Riegel Met Station (BRMM)

Filename:	BRMM_201112_SM001.dat	
Author of this report:	Hassan Basagic	
File Period:	12/22/2011 12:00 to 11/23/2012 16:45	
Sampling Frequency:	Wind every 4 secs, Sonic every 60 minutes, everything else 30 secs	
Averaging and Output Interval:	every 15 minutes	
Program Name	BRM1011v2	

1	array I.D.	o1
2	Year_RTM L	ok
3	Day	ok
4	Time	ok
5	AirT30c _AVG L	rclow
6	SwRadIn_AVG L	ok
7	WSpd1m_S_WVT L	ok
8	WSpd1m_U_WVT L	o1
9	WDir1m_DU_WVT L	ok
10	WDir1m_SDU_WVT L	ok
11	WSpdMax1m L	ok
12	WSpdMin1m L	ok
13	WSpd3m_S_WVT L	ok
14	WSpd3m_U_WVT L	o1
15	WDir3m_DU_WVT L	ok
16	WDir3m_SDU_WVT L	ok
17	WSpdMax3m L	ok
18	WSpdMin1m L	ok
19	SoilT20cm_AVG L	rclow
20	Depth L	Measured depth * -100
21	Battery L	o1

Notes:

1) Station visit on Nov 23, 2012 16:45 by Basagic and Nylen. CR10X clock back 8 min and 20 secs. Adjusted Nov 23, 2012 16:48. Input values look good. Wind monitor black boxes pointing north. Ultrasonic height is 117 cm.
2) Post-processing: No missing data, processed results look good. First line of data was old and deleted. Two dropped measurements on ultrasonic distance ranger. Over winter battery voltage dropped to 12.2 v.

Bonney Riegel Sensit Station (BRSM)

Filename:	BRSM_201213_01.dat	
Author of this report:	Hassan Basagic	
File Period:	12/22/2011 11:46 to 11/23/12 16:45	
Sampling Frequency:	60 secs	
Averaging and Output Interval:	every 15 minutes	
Program Name	BRS1011v1	
1	array I.D.	o1
2	Day	ok
3	Time	ok
4	PC20cm_TOT L	ok
5	PC100cm_TOT L	ok
6	sample of battery voltage	o1

Notes:
1) Station visit on Nov 23, 2012 16:45. Input values are bad, bad program, reverted back to old program.
2) All data is missing data. File discarded.

Bonney Riegel Theta Soil Station (BRTS)

Filename:	BRSS_201213_01.dat	
Author of this report:	Hassan Basagic	
File Period:	12/22/2011 12:15 to 11/23/12 17:30	
Sampling Frequency:	SoilTemp = 1 hr	
Averaging and Output Interval:	SoilTemp = 1 hr	
Program Name	BRTS_201112_V1.dld	

1	Array (102)	o1
2	Year	ok
3	Day	ok
4	Time	ok
5	SoilTemp_1	ok
6	SoilTemp_2	ok
7	SoilTemp_3	ok
8	SoilTemp_4	ok
9	ThetaProbe_1	ok
10	ThetaProbe_2	ok
11	ThetaProbe_3	ok
12	ThetaProbe_4	ok
13	Battery voltage	ok

Notes:
1) Station visit on 11/23/12 17:20 by Basagic and Nylen. CR10x time correct. Input values look good.
2) The new program combines two former arrays (102 temp and 112 theta).
3) No missing data, processed data looks good. First line of data is old and deleted.

Lake Brownworth Met Station (BRHM)

Filename: BRHM_201213_SM001.dat
Author of this report: Hassan Basagic
File Period: 1/26/2012 16:30 to 11/27/2012 14:30
Sampling Frequency: sonic every 60 minutes, wind speed every 4 sec, other every 30 sec
Averaging and Output Interval: every 15 minutes
Program Name   brhm_201112_v1

1	array I.D.	o1
2	year	ok
3	day	ok
4	time	ok
5	mean air temp. @ 3 meters (C)	rclow
6	corrected mean R.H. @ 3 meters (%)	lowe correction
7	mean solar flux coming down (W/m^2) – **PY40423**	ok
8	mean solar flux going up (W/m^2) – **PY27929**	ok
9	mean horizontal wind speed (m/s)	ok
10	resultant mean wind speed (m/s)	o1
11	resultant mean wind direction (degrees from north)	ok
12	standard deviation of wind direction (degrees)	ok
13	maximum wind speed (m/s)	ok
14	minimum wind speed (m/s)	ok
15	mean P.A.R. (micromols/s/m^2) - **Q32567**	multiply by 1.3960
16	mean soil temperature @ 0 cm in soil (C)	rclow
17	mean soil temperature @ 5 cm in soil (C)	rclow
18	mean soil temperature @ 10 cm in soil (C)	rclow
19	sample depth from sensor to surface (cm)	measured depth * -100
20	sample of battery voltage	o1

Notes:
1. Station visit on 11/27/12 at 13:20. Time adjusted + 22 min on 11/27/12 at 13:44. Checked input values and wind alignment, all values look good, except the ultrasonic ranger is still not working.
2. Station maintenance: swapped wind monitor at 14:30, station power off at 13:50 to swap datalogger. Swapped SM4M on 11/27/12 at 13:50 Station power on at 13:55. Reoriented radio antenna to right of Mount Newall. Not connecting with the radio.
3. Post processing: No missing data. Sonic did not operate, flagged as bad data. Battery needs replacement.

Canada Glacier (CAAM)

Filename: CAAM_201213_SM001.dat, CAAM_201213_T001.dat
Author of this report: Hassan Basagic
File Period: 01/4/2012 16:30 to 2/7/13 7:15
Sampling Frequency: wind speed every 4 sec; all other every 30 sec
Averaging and Output Interval: every 15 minutes
Program Name   CAAM_201112_v1

1	array I.D.	o1
2	Year	ok
3	Day	ok
4	Time	ok
5	mean air temp. @ 3m (C)	rclow
6	corrected mean relative humidity (%)	Lowe correction
7	Aspirated mean air temp @ 3m (C)	rclow
8	mean solar flux coming down (W/m^2) - **PY20565**	ok
9	mean solar flux going up (W/m^2) - **PY18395**	ok
10	mean horizontal wind speed (m/s)	ok
11	resultant mean wind speed (m/s)	o1
12	resultant mean wind direction (degrees from north)	ok
13	standard deviation of wind direction (degrees)	ok
14	maximum wind speed (m/s)	ok
15	minimum wind speed (m/s)	ok
16	mV_therm_average	o1
17	mV_tpile_AVG	o1
18	Ice surface temp (C)	ok
19	sample battery voltage	o1

Notes:
1. Nylen visited the station in late December 28, 2012 14:40 to swap storage module and lower the three station legs by 19.6, 21.6 and 22.0 cm.
2. Post processing notes: No missing data. A telemetry data file was added to processing.

Commonwealth Glacier Met Station (COHM)

Filename:	COHM_201213_SM001.dat, COHM_201213_T002.DAT	
Author of this report:	Hassan Basagic	
File Period:	01/03/2012 14:30 to 11/9/2012 13:30; 11/9/2012 13:45 to 3/5/2013 7:00	
Sampling Frequency:	sonic every 60 minutes, wind every 4 secs.; other every 30 secs.	
Averaging and Output Interval:	every 15 minutes	
Program Name:	cohm_201112_v1	

1	array I.D.	o1
2	Year	ok
3	Day	ok
4	Time	Ok
5	mean air temp. @ 3 meters (C)	rclow
6	mean R.H. @ 3 meters (%)	lowe correction
7	mean air temp. @ 1 meters (C)	rclow
8	mean solar flux coming down (W/m^2) - **33733F3**	divide by 100; multiply by 119.62
9	mean solar flux going up (W/m^2) – **31435F3**	divide by 100; multiply by 128.04
10	mean horizontal wind speed (m/s)	Ok
11	resultant mean wind speed (m/s)	o1
12	resultant mean wind direction (degrees from north)	ok
13	standard deviation of wind direction (degrees)	Ok
14	maximum wind speed (m/s)	Ok
15	minimum wind speed (m/s)	Ok
16	mean incoming IR pyrgeometer output (pins A-B) (W/m^2) - **32348F3**	divide by 250; multiply by 262.47
17	mean incoming IR hemisphere temp. (pins A-C) (mv)	eppley
18	mean incoming IR thermopile output (pins F-G)(W/m^2)	eppley
19	mean incoming IR case temp. (pins E-D)(mv)	eppley
20	mean outgoing IR pyrgeometer output (pins A-B)(W/m^2) – **29786F3**	divide by 250; multiply by 276.24
21	mean outgoing IR hemisphere temp. (pins F-G) (mv)	eppley
22	mean outgoing IR thermopile (pins A-C) (W/m2)	eppley
23	mean outgoing IR case temp. (pins E-D) (mv)	eppley
24	ice temperature @ 50cm (original depth, mV*0.01)	poly (n0=-105.05,n1=232.89,2=-494.81,n3=669.70, n4=-533.67,n5=247.01,n6=-61.29, n7=6.325
25	ice temperature @ 100cm (original depth, mV*0.01)	poly (n0=-106.23,n1=239.65,2=-512.50, n3=693.49 ,n4=-551.71,n5=254.79,n6=-63.07, n7=6.492
26	IRT thermistor (mV)	o1
27	IRT raw ice surface temp mV	o1
28	Surface Temperature (C)	Ok
29	sample depth from sensor to surface (m)	measured depth* -100
30	sample of battery voltage	ok

Notes:

1. Station visit on 11/9/2012 at 13:30 to 14:05. Datalogger time and date are correct. Input values look good except ice temps, which were not reinstalled after station relocation. Wind in alignment. Ultrasonic height is 70 cm from ice surface. Swapped SM4M storage module at 13:40.
2. Station maintenance on 11/9/2012: power off between 13:45 and 13:59 to add additional 100 amp hr battery. Voltage looks good.
3. Post processing: Many bad values for Ultrasonic ranger. Suggest transducer be replaced. Winter voltage minimum = 11.62v. Added new column to post processor for Air temperature at 1 meter.

Explorers Cove Met Station (EXEM)

Filename:	EXEM_201112_SM001.dat;	
Author of this report:	Hassan Basagic	
File Period:	11/17/2011 17:45 to 11/22/2012 9:00	
Sampling Frequency:	prec every 60 minutes, wind every 4 secs.; others: every 30 secs.	
Averaging and Output Interval:	every 15 minutes	
Program Name:	EXE201112v1.dld	

1	array I.D.	o1
2	year	ok
3	day	ok
4	time	ok
5	mean air temp. @ 3 meters (C)	rclow
6	mean RH @ 3 meters	lowe correction
7	mean solar flux coming up (W/m^2) - **PY23275**	ok
8	mean solar flux going down (W/m^2) - **PY45668**	ok
9	mean horizontal wind speed (m/s)	ok
10	resultant mean wind speed (m/s)	o1
11	resultant mean wind direction (degrees from north)	ok
12	standard deviation of wind direction (degrees)	ok
13	maximum wind speed (m/s)	ok
14	minimum wind speed (m/s)	ok
15	mean P.A.R. (mmols/s/m^2): **Q33906**	divide by 200, multiply by 289.95
16	mean soil temperature @ 0 cm (C)	rclow
17	mean soil temperature @ 5 cm (C)	rclow
18	mean soil temperature @ 10 cm (C)	rclow
19	sample precipitation (mm)	ok
20	sample battery voltage	ok

Notes:
1. Station visit on 11/22/12 9:10 to 9:50. Datalogger time and date are correct. Input values look good and wind is in alignment.
2. Station maintenance on 11/22/12: power off 9:12 to 9:30 to add additional 100 amp hr battery. Removed sensit from station.
3. Post processing: Deleted first line of data that is from another station. Winter battery minimum was 12.3v (before addition battery). Precipitation makes a big drop on 12/28/11 – assumed maintenance but no report. Unable to use telemetry data to complete season as there was missing data at the end of 2012.

Explorers Cove Sensit Station (EXSM)

Filename: EXSM_201213_SM001.dat
Author of this report: Hassan Basgaic
File Period: 12/28/2011 11:46 to 11/22/12 9:16; **END OF SERVICE**
Sampling Frequency: 60 secs between 00-01, 15-16, 30-31 and 45-46 during each hour
Averaging and Output Interval: every 15 minutes
Program Name   exs1011v1.dld

1	array I.D.	o1
2	Year	ok
3	Day	ok
4	Time	ok
5	Particle Count	ok
6	Kinetic Energy	ok
7	sample of battery voltage	o1

1. Station visit on 11/22/12. Sensit removed from station and will no longer be available. CR10X ahead by 10 minutes.
2. Post-processing: No missing data. PC count does not appear to be operating, while KE appears to have a background value of 7. All data is questionable.

F6 Met Station (F6MM)

Filename:	F6MM_201213_SM01.dat	
Author of this report:	Hassan Basagic	
File Period:	12/29/2011 10:00 to 11/23/12 9:45	
Sampling Frequency:	sonic every 60 min, wind every 4 sec; others: every 30 sec	
Averaging and Output Interval:	every 15 min	
Program Name:	FSM1112v2.dld	

1	array I.D.	o1
2	Year	ok
3	Day	ok
4	Time	ok
5	AirT@1m	rclow
6	AirT@30cm – average	rclow
7	AirT@30cm – sample	o1
8	SwRadIn. @ 82 cm (W/m^2) – PY25307	ok
9	mean horizontal wind speed (m/s) @ 1m	ok
10	resultant mean wind speed (m/s) @ 1m	o1
11	resultant mean wind direction (degrees from north) @ 1m	ok
12	standard deviation of wind direction (degrees) @ 1m	ok
13	maximum wind speed (m/s) @ 1m	ok
14	minimum wind speed (m/s) @ 1m	ok
15	mean horizontal wind speed (m/s) @ 3m	ok
16	resultant mean wind speed (m/s) @ 3m	o1
17	resultant mean wind direction (degrees from north) @ 3m	ok
18	standard deviation of wind direction (degrees) @ 3m	ok
19	maximum wind speed (m/s) @ 3m	ok
20	minimum wind speed (m/s) @ 3m	ok
21	mean soil temperature @ 20 cm in soil	rclow
22	Sonic Ranger Depth (cm)	Measured depth * -100
23	sample of battery voltage	o1

Notes:
1. Station visited on 11/23/2012 between 9:38 and 10:20. Adjusted CR10X back 6 minutes on 11/23/2012 at 9:38. Input values look good. Wind sensors are properly aligned. Ultra sonic height = 81 cm. Sensit height = 29; 100 cm. Swapped SM at 9:50.
2. Post processing notes: Voltage winter low = 12.0v. Ultra sonic transducer starting fail. Needs replacement.

F6 Sensit Met Station (F6SM)

Filename: F6SM_201213_SM02.dat
Author of this report: Hassan Basagic
File Period: 12/29/2011 10:00 to 11/23/2012 9:45
Sampling Frequency: 60 seconds
Averaging and Output Interval: every 15 min
Program Name: F6S1112V1.dld

1	array I.D.	o1
2	Year	Ok
3	Day	Ok
4	Time	Ok
5	PC_1	Ok
6	PC_2	Ok
7	sample of battery voltage	Ok

Notes:
1. Station visited on 11/23/2012 between 9:38 and 10:20. Adjusted CR10X ahead 30 seconds on 11/23/2012 at 9:47. Input values look good.
2. Post processing notes: No missing lines of data. Sensit at 30 cm did not record any events and does not seem to be operating properly. There are several events that were recorded at 100 cm. Suggest check wiring, program, or sensor replacement. Flagged all data for Sensit 30 cm as 'Bad'.

F6 Theta Soil Station (F6TS)

Filename: F6ST_201213_SM01.dat
Author of this report: Hassan Basagic
File Period: 1/27/2011 14:00 to 12/29/2011 9:00
Sampling Frequency: SoilTemp = 1 hr, Theta = 24 hrs
Averaging and Output Interval: SoilTemp = 1 hr, Theta = 24 hrs
Program Name   F6TS_201112_v1.dld

1	Array (113)	ok
2	Year	ok
3	Day	ok
4	Time	ok
5	SoilT1	rclow
6	SoilT2	rclow
7	SoilT3	rclow
8	SoilT4	rclow
9	Theta_1	ok
10	Theta_2	ok
11	Theta_3	ok
12	Theta_4	ok
13	Voltage	ok

Notes:
1) Station visited on 11/23/2012 between 9:38 and 10:20. Adjusted CR10X back 2 min and 30 seconds on 11/23/2012 at 10:02. Input values look good. Swapped SM at 9:58.
2) Post processing notes: Built new post processor for station as two tables (soil temps and theta) were combined in last program. No missing data. Winter battery low of 11.9v.

Mt. Fleming Met Station (FLMM)

Filename:	FLMM_201213_SM001.DAT	
Author of this report:	Hassan Basagic	
File Period:	01/26/2012 14:30 to 12/26/2012 12:45	
Sampling Frequency:	wind every 4 sec; others: every 30 sec	
Averaging and Output Interval:	every 15 min	
Program Name:	flmm_201112_v1.dld	

1	array I.D.	o1
2	Year	ok
3	Day	ok
4	Time	ok
5	AirT2m (C)	ok
6	RH1.3m (%)	Lowe correction
7	wspd_U_WVT (m/s)	ok
8	wspd_U_WVT (m/s)	o1
9	WDir DU (degrees)	ok
10	WDir Std Dev	ok
11	WSpd Max (m/s)	ok
12	WSpd Max (m/s)	ok
13	Pressure (mbar)	ok
14	Voltage	o1

Notes:
1. Station visit on 12/26/2012 at 12:37 by Nylen. Clock adjusted back 4 min and 4 sec. Input values looked good. Replaced the SM4M at 1245. Loaded new program, FLMM_201213v1. Plugged in radio. Pointed antenna to Mt. Loke.
2. Post-processing: No missing data. Winter battery power looks good.

Lake Fryxell Met Station (FRLM)

Filename   FRLM_201213_01.dat, FRLM_201213_T02.dat
Author of this report: Hassan Basagic
File Period: 11/16/2011 11:00 to 2/13/13 6:00
Sampling Frequency: sonic every 60 min, wind every 4 sec; others: every 30 sec
Averaging and Output Interval: every 15 min
Program Name: FRL201112v2

1	array I.D.	o1
2	Year	Ok
3	Day	Ok
4	Time	Ok
5	mean air temp. @ 3 meters (C)	rclow
6	mean RH @ 3 meters	lowe correction
7	mean solar flux coming down (W/m^2) - **PY41099**	ok
8	mean solar flux going up (W/m^2) - **PY23276**	ok
9	mean horizontal wind speed (m/s)	ok
10	resultant mean wind speed (m/s)	o1
11	resultant mean wind direction (degrees from north)	ok
12	standard deviation of wind direction (degrees)	ok
13	maximum wind speed (m/s)	ok
14	minimum wind speed (m/s)	ok
15	mean P.A.R. (micromols/s/m^2) - **Q99253**	divide by 200, multiply by 248.59
16	mean soil temperature @ 0 cm in soil (C)	rclow
17	mean soil temperature @ 5 cm in soil (C)	rclow
18	mean soil temperature @ 10 cm in soil (C)	rclow
19	sample depth from sensor to surface (m)	measurement * -100
20	sample of battery voltage	o1

Notes:
1. Station visited on 11/23/2012 at 11:38. Telemetry is operational. CR10X time matches GPS time. Inputs look good. Wind sensor is in alignment.
2. Swapped SM4M at 11:48.
3. Post processing notes: RH seems high after post processing with many values falling out of range. Voltage remained about 12v through last winter. The transducer on the ultrasonic distance ranger is beginning to fail, values above 100 and below 52 were rejected and flagged as bad.

Friis Hills Met Station (FRSM)

Filename: FRSM_201213_SM001.dat
Author of this report: Hassan Basagic
File Period: 12/14/2011 11:30 to 11/20/2012 9:45
Sampling Frequency: wind every 4 sec; others: every 30 sec
Averaging and Output Interval: every 15 min
Program Name: FRSM_201112_v1

1	array I.D.	o1
2	Year	ok
3	Day	ok
4	Time	ok
5	Mean air temp. @ 2.5 m (C)	ok
6	Mean RH @ 2.5m (%)	ok
7	NetRad (W m^{-2})	ok
8	NetRad (W m^{-2}) Correction	ok
9	mean horizontal wind speed (m/s)	ok
10	WSpd_U_WVT L	o1
11	resultant mean wind direction (degrees from north)	ok
12	standard deviation of wind direction (degrees)	ok
13	Wind Speed Max (m/s)	ok
14	Wind Speed Min (m/s)	ok
15	Pressure (mbar)	ok

Notes:
1. Station visit on 11/20/2012 9:20 to 10:00. Datalogger time and date are correct. Input values look good except for wind speed. Wind sensor is in alignment.
2. Station maintenance: Replaced wind, but was not working. Swapped SM4M at 9:51.
3. Post-processing: No missing lines of data. Wind speed worked for a short period and then stopped, only operated intermittently. Recommend replacement of datalogger and panel. Add voltage to program.

Miers Valley Met Station (MISM)

Filename:	MISM_201213_SM001.dat; MISM_201213_T002.dat	
Author of this report:	Hassan Basagic	
File Period:	01/28/2012 11:00 to 11/28/2012 13:15; 11/28/2012 13:45 to 3/1/13 9:00	
Sampling Frequency:	wind every 4 secs.; ultrasonic every 1 hr; others every 30 secs.	
Averaging and Output Interval:	every 15 minutes	
Program Name	MISM_201112_v1.dld	

1	array I.D.	o1
2	year	ok
3	day	ok
4	time	ok
5	mean air temp. @ 3 meters (C)	rclow
6	mean R.H. @ 3 meters (%)	lowe correction
7	mean solar flux coming down (W/m^2) – **PY28370**	ok
8	mean solar flux going up (W/m^2) – **PY18656**	ok
9	mean horizontal wind speed (m/s)	ok
10	resultant mean wind speed (m/s)	o1
11	resultant mean wind direction (degrees from north)	ok
12	standard deviation of wind direction (degrees)	ok
13	maximum wind speed (m/s)	ok
14	minimum wind speed (m/s)	ok
15	mean P.A.R. (micromols/s/m^2) - Q9916	divide by 200, multiply by 306.60
16	mean soil temperature @ 0 cm in soil (C)	rclow
17	mean soil temperature @ 10 cm in soil (C)	rclow
18	pressure (mbars)	ok
19	distance to surface (m)	ok
20	sample of battery voltage	o1

Notes:
1. Station visit on 11/28/2012 at 9:20. Datalogger date and time are correct. Input values and wind alignment looks good. No ultrasonic at site, but station is still programed for measurement.
2. GPS: 78.10115, 163.78778
3. Station maintenance on 11/28/2012: power off to add additional 100 amp hr battery and new style regulator. Swapped Omni antenna for Yagi antenna. Swapped SM at 13:45.
4. Post-processing: Processed with telemetry data. Delete first line of data. One line missing data from station visit 11/28/2012 at 13:30, multiple repetitive lines of data were deleted between 1/3/13 and 1/9/13, no missing data during this period.

Howard Glacier Met Station (HODM)

Filename:	HODM_201112_SM005.dat; HODM_201213_SM001.dat	
Author of this report:	Hassan Basagic	
File Period:	12/30/2011 14:15 to 1/20/2012 16:15; 01/20/2012 16:45 to 11/19/2012 13:15	
Sampling Frequency:	sonic every 60 min, wind every 4 sec; others: every 30 sec	
Averaging and Output Interval:	every 15 minutes	
Program Name:	Hod1011v1.dld	

1	array I.D.	o1
2	Year	ok
3	Day	Ok
4	Time	ok
5	mean air temp. @ 3 meters (C)	rclow
6	mean R.H. @ 3 meters (%)	lowe correction
7	mean solar flux coming down (W/m^2) - **30884F3**	divide by 100; multiply by 120.77
8	mean solar flux going up (W/m^2) - **32057F3**	divide by 100; multiply by 114.29
9	mean horizontal wind speed (m/s)	ok
10	resultant mean wind speed (m/s)	o1
11	resultant mean wind direction (degrees from north)	ok
12	standard deviation of wind direction (degrees)	ok
13	maximum wind speed (m/s)	ok
14	minimum wind speed (m/s)	ok
15	ice temperature @ 50cm (original depth, mV*0.01)	o1
16	ice temperature @ 100cm (original depth, mV*0.01)	o1
17	mean air temp @ 1 meter m (C)	rclow
18	mean rh @ 1 meter (%)	lowe correction
19	sample depth from sensor to surface (cm)	measured depth * -100
20	sample of battery voltage	o1

Notes:
1. Station visited station on 11/19/2012 13:15. Datalogger time and data are correct. Input values and wind alignment look good. Ice temp at 20 cm no longer at station.
2. No station maintenance. Swapped SM4M at 1339.
3. Post-processing: Missing data due to move of station. The last file from the previous season was unprocessed; therefore it is processed with this season's data. Ice temp at 20cm no longer at station, flagged as missing. Winter 2012 battery low 12v.

Lake Hoare Met Station (HOEM)

Filename:	HOEM_201213_SM001.dat, HOEM_201213_T001.DAT	
Author of this report:	Hassan Basagic	
File Period:	02/12/2012 19:30 to 02/13/2012 01:30	
Sampling Frequency:	sonic every 60 min, wind every 4 sec; prec every 1 minute, others, every 30 sec	
Averaging and Output Interval:	every 15 minutes	
Program Name:	HOEM_201112_V3	

1	array I.D.	o1
2	Year	ok
3	Day	ok
4	Time	ok
5	mean air temp. @ 3 meters (C)	rclow
6	mean RH @ 3 meters	Lowe correction
7	mean air temp @ 1 meter (C)	rclow
8	mean solar flux coming down (W/m^2) – **PY20561**	ok
9	mean solar flux going up (W/m^2) – **PY20523**	ok
10	mean horizontal wind speed (m/s)	ok
11	resultant mean wind speed (m/s)	o1
12	resultant mean wind direction (degrees from north)	ok
13	standard deviation of wind direction (degrees)	ok
14	maximum wind speed (m/s)	ok
15	minimum wind speed (m/s)	ok
16	mean P.A.R. (mmols/s/m2) **Q17248**	divide by 200, multiply by 317.70
17	mean soil temperature @ 0 cm	rclow
18	mean soil temperature @ 5 cm	rclow
19	mean soil temperature @ 10 cm	rclow
20	sample station barometric pressure (mbar)	ok
21	mean temperature difference 1&3 m (C)	multiply -1
22	distance to surface (m)	measurement * -100
23	Prec Accum Real-Time, Not Real-Time – Total	o1
24	Prec Accum. Not Real-Time – Total	o1
25	Prec Accum. Total Non Real-Time	o1
26	Prec Bucket Real-Time – Average	o1
27	Prec Sample Bucket Non Real-Time	Measurement – Previous Measurement
28	Prec Status	o1
29	sample of battery voltage	ol

Notes:

1. Station visit on Nov 8 2012, time of arrival 20:15. There was a station power failure over the winter on Feb 13, 2012 to Sep 24, 2012, with intermittent data collected until another long-term power failure from Oct 4, 2012 to Oct 19, 2012. Battery voltage was 13v during initial power failure. Possible wiring issue.
2. All inputs look good. Swapped SM at 20:22.
3. Data processed with telemetry download on Feb 12, 2013.

Taylor Glacier Met Station (TARM)

Filename:	TARM_201213_SM001.dat, TARM_201213_T002-003.dat	
Author of this report:	Hassan Basagic	
File Period:	01/21/2012 11:00 to 11/20/12 12 12:30; 11/20/12 12:45 to 3/4/13 17:45	
Sampling Frequency:	depth every 60 minutes, wind every 4 secs.; others: every 30 secs.	
Averaging and Output Interval:	every 15 minutes	
Program Name	TARM_201112_V1	

1	array I.D.	o1
2	Year	o1
3	Day	ok
4	Time	ok
5	mean air temp. @ 3 meters (C)	rclow
6	mean R.H. @ 3 meters (%)	lowe correction
7	mean air temp @ 1m (C)	rclow
8	mean RH at 1m (%)	lowe correction
9	mean solar flux coming down (W/m^2) –**32057F3**	divide by 100; multiply by 113.38
10	mean solar flux going up (W/m^2) – **29762F3**	divide by 100; multiply by 125.79
11	mean horizontal wind speed (m/s)	ok
12	resultant mean wind speed (m/s)	o1
13	resultant mean wind direction (degrees from north)	ok
14	standard deviation of wind direction (degrees)	ok
15	maximum wind speed (m/s)	ok
16	minimum wind speed (m/s)	ok
17	ice temp	ok
18	surface temperature internal thermister output (mV)	o1
19	surface temperature (mV)	o1
20	surface temperature (C)	ok
21	sample depth from sensor to surface (cm)	multiple by -100
22	sample of battery voltage	ok

Notes:
1. Station visit on 11/20/12 at 12:30. Datalogger time and date correct. All input values and wind alignment look good. Ultrasonic distance = 78 cm to ice surface.
2. Station maintenance on 11/20/12: Power off station to added an additional 100 amp hr battery, now running on two. Lower station legs by 16.5 cm. Replaced lost screw on downward facing pyranometer. Swapped SM at 12:59.
3. Post processing: One missing line of data during station visit 12:45. Winter battery min = 11.95.

Lake Vanda Met Station (VAAM)

Filename:	VAAM_201213_SM001.dat; VAAM_201213_T001-2.dat	
Author of this report:	Hassan Basagic	
File Period:	1/6/2012 11:45 to 11/27/2012 10:30; 11/27/2012 10:45 to 3/6/13 8:00	
Sampling Frequency:	wind every 4 secs.; ultrasonic every 1 hr; others every 30 secs.	
Averaging and Output Interval:	every 15 minutes	
Program Name	vaam_201112_v1	

1	array I.D.	o1
2	day	ok
3	time	ok
4	mean air temp. @ 3 meters (C)	rclow
5	mean R.H. @ 3 meters (%)	lowe correction
6	mean solar flux coming down (W/m^2) - **PY40424**	ok
7	mean solar flux going up (W/m^2) - **PY33485**	ok
8	mean horizontal wind speed (m/s)	ok
9	resultant mean wind speed (m/s)	o1
10	resultant mean wind direction (degrees from north)	ok
11	standard deviation of wind direction (degrees)	ok
12	maximum wind speed (m/s)	ok
13	minimum wind speed (m/s)	ok
14	mean P.A.R. (micromols/s/m^2) - **Q30806, newQ29773**	divide by 200, multiply by 221.34
15	mean soil temperature @ 0 cm in soil (C)	rclow
16	mean soil temperature @ 5 cm in soil (C)	rclow
17	mean soil temperature @ 10 cm in soil (C)	rclow
18	distance to surface (m)	measured depth * -100
19	sample of battery voltage	ok

Notes:
1. Station visit on 11/27/2012 9:28. Large portions of lake ice rafted onto shore and came within 15 feet of station. CR10X date and time correct, input values and wind alignment look good. Ultrasonic height is 61.0 cm.
2. Station maintenance on 11/27/2012: Station power off between 9:35 and 9:48 to replace battery (100 amp hr). Station power off again between 10:02 and 10:12 for CR10x datalogger swap. Swapped wind monitor at 10:03, swapped quantum PAR at 10:30 (old #Q30806, new #Q29773). Swapped SM at 10:38.
3. Post processing: Processed with two telemetry files. No missing data. Ultrasonic had several bad values which were flagged as bad. RH had bad several bad values, check connection. Winter 2012 battery voltage low = 11.8v

Lake Vida Met Station (VIAM)

Filename:	VIAM_201213_SM001.dat	
Author of this report:	Hassan Basagic	
File Period:	01/07/2012 13:00 to 11/27/2012 16:15	
Sampling Frequency:	wind every 4 secs.; ultrasonic every 1 hr; others every 30 secs.	
Averaging and Output Interval:	every 15 minutes	
Program Name	via1011v1	

1	array I.D.	o1
2	year	ok
3	day	ok
4	time	ok
5	mean air temp. @ 3 meters (C)	Rclow
6	mean R.H. @ 3 meters (%)	Lowe correction
7	mean solar flux coming down (W/m^2) – **PY23271**	ok
8	mean solar flux going up (W/m^2) – **PY20565**	ok
9	mean horizontal wind speed (m/s)	ok
10	resultant mean wind speed (m/s)	o1
11	resultant mean wind direction (degrees from north)	ok
12	standard deviation of wind direction (degrees)	ok
13	maximum wind speed (m/s)	ok
14	minimum wind speed (m/s)	ok
15	mean P.A.R. (micromols/s/m^2) - **Q30800**	divide by 200, multiply by 222.23
16	mean soil temperature @ 0 cm in soil (C)	Rclow
17	mean soil temperature @ 5 cm in soil (C)	Rclow
18	mean soil temperature @ 10 cm in soil (C)	Rclow
19	distance to surface (m)	Measured depth * -100
20	sample of battery voltage	o1

Notes:
1. Station visit on 11/27/2012 at 15:30 to 16:50. Time adjusted back 8 minutes on 11/27/2012 at 15:34. All inputs and wind alignment look good. Sonic sensor depth = 57.5 cm.
2. Maintenance: on 11/27/2012 added antenna and radio. Loaded new program and received a keypad error (E22 111). Error 22 is a compile error (missing END statement) and line 111 is for setting port 7 Low. The program has an End statement following it, not sure why there is an error.
3. Post Processing: Two hour data gap between last file and present file due to station move on 1/7/2012. Overwinter power low was 12.1v

Filename:		VIAM_201213_SM002.dat	
Author of this report:		Hassan Basagic	
File Period:		11/27/2012 16:45 to 12/28/2012 10:15	
Sampling Frequency:		wind every 4 secs.; ultrasonic every 1 hr; others every 30 secs.	
Averaging and Output Interval:		every 15 minutes	
Program Name		via1011v1	

1	array I.D.	o1
2	year	ok
3	day	ok
4	time	ok
5	mean air temp. @ 3 meters (C)	Rclow
6	mean R.H. @ 3 meters (%)	Lowe correction
7	mean solar flux coming down (W/m^2) – **PY23271**	ok
8	mean solar flux going up (W/m^2) – **PY20565**	ok
9	mean horizontal wind speed (m/s)	ok
10	resultant mean wind speed (m/s)	o1
11	resultant mean wind direction (degrees from north)	ok
12	standard deviation of wind direction (degrees)	ok
13	maximum wind speed (m/s)	ok
14	minimum wind speed (m/s)	ok
15	mean P.A.R. (micromols/s/m^2) - **Q30800**	divide by 200, multiply by 222.23
16	mean soil temperature @ 0 cm in soil (C)	Rclow
17	mean soil temperature @ 5 cm in soil (C)	Rclow
18	mean soil temperature @ 10 cm in soil (C)	Rclow
19	distance to surface (m)	Measured depth * -100
20	sample of battery voltage	o1

Notes:

1. Station visit by Nylen on 12/28/2012 at 10:10. Loaded new program. Swapped SM.
2. Radio not connecting.

Appendix

Array ID and date of established date

Array ID	ID	Name	Date of Station Establishment
1	HOEM	Lake Hoare	Dec 1, 1993 by Peter Doran
2	FRLM	Lake Fryxell	Jan 6, 1994 by Peter Doran
3	BOYM	Lake Bonney	November 24, 1993 by Peter Doran
4	COHM	Commonwealth Glacier	November 22, 1993 by Peter Doran
5	HODM	Howard Glacier	November 20, 1993 by Peter Doran
6	TARM	Taylor Glacier	November 21, 1994 by Peter Doran
7	VAAM	Lake Vanda	November 24, 1994 by Peter Doran
8	BRHM	Lake Brownworth	November 13, 1996 by Peter Doran and DJ Osborne
9	EXEM	Explorer's Cove	Nov 21, 1997 by Peter Doran, DJ Osborne and K. Sauter
10	CAAM	Canada Glacier (without Eddy Sensors)	Nov 20, 1995 by Karen Lewis; reinstalled Jan 13, 1998
11	VIAM	Lake Vida	November 24, 1995 by Peter Doran
12	????	RETIRED Hoare Submerged	???
13	????	RETIRED Fryxell Submerged	???
14	????	RETIRED Bonney East Submerged	???
15	????	RETIRED Canada Gl. (w/ Eddy Sensors)	???
16	????	RETIRED Bonney West Submerged	???
17	F6MM	F6 Snow Fence, Met, and Sensit	Changed to F6 Met and F6 Sensit by Hassan Basagic
18	BENM	RETIRED Beacon Valley	Jan 27, 2000 by Susan Kaspari, Thomas Nylen and Adrian Green. Retired in Dec 2012
19	LHPM	RETIRED Lake Hoare Precipitatio	January 26, 2002 by Thomas Nylen (also Upper Howard)
19	UHDM	RETIRED Upper Howard Met	Temporary station Retired in 2004.
19	BLDM	RETIRED Blood Falls	Temporary station 11/14/2004
20	BRMM	Bonney Snow Fence	Changed to Bonney Riegel Met and Sensit by Hassan Basagic
21	FRSM	Friis	Installed by Cuffey et al., ????
22	FLMM	Mt. Fleming	Installed 10/16/06 by Univ of Wisc AWS
25	GADM	RETIRED Garwood Valley	Installed by Peter Doran; Removed from service in 2011-12
25	MISM	Miers Valley	Installed by Nylen 2011-12
26	GAFM	Garwood Valley Ice Cliff	December 2010 by Thomas Nylen
27	HTDR	Lake Hoare TDR Station	08-09 Season by Hassan Basagic
92	EXSM	RETIRED Explorers Cove Sensity	Installed by Hassan Basagic; Retired Nov 2012
95	F6SM	F6 Snowfence Sensit	Installed by Hassan Basagic
96		Lake Fryxell Sensit	Installed by Hassan Basagic, Data combined with Fryxell station data
97		RETIRED Lake Hoare Sensit	Installed by Hassan Basagic, Retired 12/2010
98		RETIRED Lake Bonney Sensit	Installed by Hassan Basagic in 2005/06, Retired 12/2010
99	BRSM	Bonney Reigel Sensit	Installed by Hassan Basagic
102	BRSS	Bonney Reigel Soil Station	
103	F6SS	F6 Soil station	
104	LHS3	LH Soil station 2	
105	LHS4	LH Soil station 4	
112	BRTS	Bonney Reigel Theta Station	
113	F6TS	F6 Soil station	
114	LHS1	Lake Hoare Soil station 1 Theta	1/28/2003
115	LHS2	Lake Hoare Soil station 3 Soil	1/28/2003
119	HJHM	RETIRED Hjorth Hill Met	Installed by Peter Doran; Removed from service