Tarfala Research Station automatic weather station, 2011

Peter Jansson

November 11, 2014

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1 Instrumentation

The TRS met station consisted of the following instruments during 2011:

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Serial number</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pt100</td>
<td></td>
<td>in Stevenson screen</td>
</tr>
<tr>
<td>Pt100</td>
<td></td>
<td>in Young screen</td>
</tr>
<tr>
<td>Young Wind Monitor</td>
<td></td>
<td>at 3 m</td>
</tr>
<tr>
<td>LiCor Li-200SB pyranometer</td>
<td></td>
<td>at 2 m</td>
</tr>
<tr>
<td>Tipping bucket precipitation</td>
<td></td>
<td>at 2 m</td>
</tr>
<tr>
<td>Vent HygroClip T/Rh</td>
<td></td>
<td>at 2 m</td>
</tr>
<tr>
<td>CR10X-2M data logger</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2 Notes on the station data

- Wind sensor failed in November 2010 repaired in January 2011

3 Data coverage

- Wind data missing from
  2011-01-01 01:00:00 to 2011-01-24 16:00:00

- Daily data missing from
  2011-01-02 00:00:00 to 2011-01-25 00:00:00

4 Notes on data storage

Example of hourly data:
101,2011,185,1300,11.739,11.953,10.367,50.191,2.1697,277.48,0.03989,481.55,0,0,0,5.1842,1249,12.448,13.08,11.221,51.105,11.32,1254,9.6371,1201,890.03
<table>
<thead>
<tr>
<th>Column</th>
<th>Example data</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01:</td>
<td>101</td>
<td>ID</td>
</tr>
<tr>
<td>02:</td>
<td>2011</td>
<td>Year</td>
</tr>
<tr>
<td>03:</td>
<td>191</td>
<td>Day of Year</td>
</tr>
<tr>
<td>04:</td>
<td>1600</td>
<td>hour-minute (hhmm)</td>
</tr>
<tr>
<td>05:</td>
<td>11.739</td>
<td>2 Pt100 T in Stevenson screen)</td>
</tr>
<tr>
<td>06:</td>
<td>11.953</td>
<td>3 Pt100 in new Young screen</td>
</tr>
<tr>
<td>07:</td>
<td>10.367</td>
<td>4 Ventilated T</td>
</tr>
<tr>
<td>08:</td>
<td>50.191</td>
<td>5 Ventilated T</td>
</tr>
<tr>
<td>09:</td>
<td>2.1697</td>
<td>6 Mean horizontal wind speed</td>
</tr>
<tr>
<td>10:</td>
<td>277.48</td>
<td>7 resultant mean wind direction</td>
</tr>
<tr>
<td>11:</td>
<td>0.03989</td>
<td>8 Standard deviation of wind direction</td>
</tr>
<tr>
<td>12:</td>
<td>481.55</td>
<td>9 Global radiation</td>
</tr>
<tr>
<td>13:</td>
<td>0</td>
<td>10 Precipitation</td>
</tr>
<tr>
<td>14:</td>
<td>0</td>
<td>11 Not used</td>
</tr>
<tr>
<td>15:</td>
<td>0</td>
<td>12 Not used</td>
</tr>
<tr>
<td>16:</td>
<td>5.1842</td>
<td>13 hourly max wind speed</td>
</tr>
<tr>
<td>17:</td>
<td>1249</td>
<td>14 time for max wind speed</td>
</tr>
<tr>
<td>18:</td>
<td>12.448</td>
<td>15 Sample T Stevenson</td>
</tr>
<tr>
<td>19:</td>
<td>13.08</td>
<td>16 Sample T Young</td>
</tr>
<tr>
<td>20:</td>
<td>11.221</td>
<td>17 Sample ventilated T</td>
</tr>
<tr>
<td>21:</td>
<td>51.105</td>
<td>18 Sample ventilated Rh</td>
</tr>
<tr>
<td>22:</td>
<td>11.32</td>
<td>19 Max T</td>
</tr>
<tr>
<td>23:</td>
<td>1254</td>
<td>20 time for max T</td>
</tr>
<tr>
<td>24:</td>
<td>9.6371</td>
<td>21 Min T</td>
</tr>
<tr>
<td>25:</td>
<td>1201</td>
<td>22 time for min T</td>
</tr>
<tr>
<td>26:</td>
<td>890.03</td>
<td>23 Barometric pressure</td>
</tr>
</tbody>
</table>

Example of daily data summaries:
124,2011,185,2400,9.3552,9.633,8.3079,59.848,13.559,1712,4.4415,338,5.1842,1249,1.7253,157.41,166.86,0,13.966,0,0,889.77

<table>
<thead>
<tr>
<th>Column</th>
<th>Example data</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01:</td>
<td>124</td>
<td>ID</td>
</tr>
<tr>
<td>02:</td>
<td>2011</td>
<td>Year</td>
</tr>
<tr>
<td>03:</td>
<td>185</td>
<td>Day of Year</td>
</tr>
<tr>
<td>04:</td>
<td>2400</td>
<td>hour-minute (hhmm)</td>
</tr>
<tr>
<td>05:</td>
<td>9.3552</td>
<td>2 Daily average T in Stevenson screen)</td>
</tr>
<tr>
<td>06:</td>
<td>9.633</td>
<td>3 Daily T from T/Rh in Young screen</td>
</tr>
<tr>
<td>07:</td>
<td>8.3079</td>
<td>4 Daily T from ventilated T/Rh</td>
</tr>
<tr>
<td>08:</td>
<td>59.848</td>
<td>5 daily average Rh from ventilated T/Rh</td>
</tr>
<tr>
<td>09:</td>
<td>13.559</td>
<td>6 Daily maximum temperature in Young screen</td>
</tr>
<tr>
<td>10:</td>
<td>1712</td>
<td>7 hhmm for maximum daily temperature</td>
</tr>
<tr>
<td>11:</td>
<td>4.4415</td>
<td>8 Daily minimum temperature in Young screen</td>
</tr>
<tr>
<td>12:</td>
<td>338</td>
<td>9 hhmm for minimum daily temperature</td>
</tr>
<tr>
<td>13:</td>
<td>5.1842</td>
<td>10 Maximum wind speed</td>
</tr>
<tr>
<td>14:</td>
<td>1249</td>
<td>11 hhmm for maximum wind speed</td>
</tr>
<tr>
<td>15:</td>
<td>1.7253</td>
<td>12 Average wind speed</td>
</tr>
<tr>
<td>16:</td>
<td>157.41</td>
<td>13 Average wind direction</td>
</tr>
<tr>
<td>17:</td>
<td>166.86</td>
<td>14 Incoming radiation</td>
</tr>
<tr>
<td>18:</td>
<td>0</td>
<td>15 Totalized precipitation</td>
</tr>
<tr>
<td>19:</td>
<td>13.966</td>
<td>16 Battery voltage</td>
</tr>
<tr>
<td>20:</td>
<td>0</td>
<td>17 Not used</td>
</tr>
<tr>
<td>21:</td>
<td>889.77</td>
<td>18 Not used</td>
</tr>
</tbody>
</table>

Example of 'Synoptic' output:
103,2011,185,1300,13.08
5 Data files and content

<table>
<thead>
<tr>
<th>Column</th>
<th>Example data</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01:</td>
<td>103</td>
<td>ID</td>
</tr>
<tr>
<td>02:</td>
<td>2011</td>
<td>Year</td>
</tr>
<tr>
<td>03:</td>
<td>185</td>
<td>Day of Year</td>
</tr>
<tr>
<td>04:</td>
<td>1300</td>
<td>hour-minute (hhmm)</td>
</tr>
<tr>
<td>05:</td>
<td>13.08</td>
<td>Pt100 in Young screen</td>
</tr>
</tbody>
</table>

TRSmet2011.csv Raw data file

TRS_met_2011_Baro metric_pressure.csv
2011-01-01 01:00:00,859.9

TRS_met_2011_Precipitation.csv
Date-time, Precipitation
2011-01-01 01:00:00,0.00

TRS_met_2011_Radiation.csv
Date-time, Global radiation
2011-01-01 01:00:00,-4.54

TRS_met_2011_Relative_humidity.csv
Date-time, Vented Rh, ssample ventilated Rh
2011-01-01 01:00:00,86.3,87.3

TRS_met_2011_Temperature.csv
Date-time, hourly average T (Stevenson), hourly average T (Young), hourly average vented T/Rh, sample T (Stevenson), Sample T (Young), sample T vent, max T vent, time for max T vent, min T vent, time for min T vent
2011-01-01 01:00:00,-9.67,-9.05,-10.48,-9.89,-8.46,-11.00,-9.91,24,-11.30,54

TRS_met_2011_Wind.csv
Date-time, Mean horizontal wind speed, resultant mean wind direction, hourly max wind speed, time of max wind spd
2011-01-01 01:00:00,NaN,NaN,NaN,NaN,0

TRS_met_2011_Daily_data.csv
Data columns follows description above except last two columns (not used)
2011-01-02 00:00:00,-6.89,-6.32,-7.45,71.9,-4.93,1656,-10.70,128,NaN,NaN,NaN,-4.3,0.0,13.99

TRS_met_2011_Synop_data.csv
Date-time, sample temperature
2011-01-01 01:00:00,-8.46

The data collected during 2011 is summarized the figure 1 and Table 1.
### Tarfala Research Station meteorological data for 2011

<table>
<thead>
<tr>
<th>Date (in 2011)</th>
<th>Precipitation (mm/hr)</th>
<th>Air temperature (°C)</th>
<th>Wind Speed (m/s)</th>
<th>Wind direction (°)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Jan.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Feb.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Mar.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Apr.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 May</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Jun.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Jul.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Aug.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Sep.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Oct.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Nov.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Dec.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 1:** Summary of meteorological data from Tarfala Research Station automatic weather station 2011.
Table 1: Monthly averages of meteorological parameters from the Tarfala Research Station automatic weather station 2011.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Average air temperature (Stevenson) (°C)</td>
<td>-10.6</td>
<td>-12.3</td>
<td>-8.4</td>
<td>-2.2</td>
<td>-0.1</td>
<td>6.3</td>
<td>9.5</td>
<td>7.1</td>
<td>4.1</td>
<td>0.2</td>
<td>-1.2</td>
<td>-8.1</td>
</tr>
<tr>
<td>n</td>
<td>743</td>
<td>671</td>
<td>767</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>767</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>767</td>
</tr>
<tr>
<td>Average air temperature (Young) (°C)</td>
<td>-9.9</td>
<td>-11.7</td>
<td>-7.9</td>
<td>-1.8</td>
<td>0.2</td>
<td>6.8</td>
<td>9.9</td>
<td>7.5</td>
<td>4.6</td>
<td>0.8</td>
<td>-0.5</td>
<td>-7.5</td>
</tr>
<tr>
<td>n</td>
<td>743</td>
<td>671</td>
<td>767</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>767</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>767</td>
</tr>
<tr>
<td>Average air temperature (°C)</td>
<td>-11.1</td>
<td>-12.8</td>
<td>-8.9</td>
<td>-3.2</td>
<td>-1.3</td>
<td>5.4</td>
<td>8.6</td>
<td>6.3</td>
<td>3.3</td>
<td>-0.4</td>
<td>-1.7</td>
<td>-8.5</td>
</tr>
<tr>
<td>n</td>
<td>743</td>
<td>671</td>
<td>767</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>767</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>767</td>
</tr>
<tr>
<td>Positive degree sum (°C)</td>
<td>0</td>
<td>18</td>
<td>10</td>
<td>224</td>
<td>449</td>
<td>4097</td>
<td>6367</td>
<td>4804</td>
<td>2572</td>
<td>934</td>
<td>770</td>
<td>0</td>
</tr>
<tr>
<td>n</td>
<td>0</td>
<td>17</td>
<td>9</td>
<td>112</td>
<td>300</td>
<td>697</td>
<td>743</td>
<td>767</td>
<td>657</td>
<td>351</td>
<td>321</td>
<td>2</td>
</tr>
<tr>
<td>Average relative humidity (%)</td>
<td>78.4</td>
<td>74.8</td>
<td>75.9</td>
<td>72.4</td>
<td>84.2</td>
<td>77.0</td>
<td>80.7</td>
<td>86.8</td>
<td>92.0</td>
<td>80.4</td>
<td>78.1</td>
<td>83.7</td>
</tr>
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<td>743</td>
<td>671</td>
<td>767</td>
<td>743</td>
<td>743</td>
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<td>767</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>767</td>
</tr>
<tr>
<td>Average incoming global radiation (W m⁻²)</td>
<td>-3.4</td>
<td>8.9</td>
<td>48.5</td>
<td>99.1</td>
<td>127.9</td>
<td>132.0</td>
<td>108.7</td>
<td>63.9</td>
<td>27.8</td>
<td>15.8</td>
<td>-1.5</td>
<td>-4.4</td>
</tr>
<tr>
<td>n</td>
<td>743</td>
<td>671</td>
<td>767</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>767</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>767</td>
</tr>
<tr>
<td>Global incoming energy sum (W m⁻²)</td>
<td>346</td>
<td>8025</td>
<td>38941</td>
<td>74735</td>
<td>95442</td>
<td>98101</td>
<td>80997</td>
<td>49925</td>
<td>22157</td>
<td>14108</td>
<td>1451</td>
<td>0</td>
</tr>
<tr>
<td>n</td>
<td>58</td>
<td>190</td>
<td>360</td>
<td>469</td>
<td>595</td>
<td>696</td>
<td>635</td>
<td>507</td>
<td>369</td>
<td>280</td>
<td>121</td>
<td>1</td>
</tr>
<tr>
<td>Totalized precipitation (mm)</td>
<td>0.32</td>
<td>6.56</td>
<td>2.88</td>
<td>14.56</td>
<td>101.76</td>
<td>205.12</td>
<td>132.16</td>
<td>62.08</td>
<td>225.92</td>
<td>57.92</td>
<td>75.36</td>
<td>0.00</td>
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<td>743</td>
<td>671</td>
<td>767</td>
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<td>743</td>
<td>767</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>767</td>
</tr>
<tr>
<td>Average wind speed (m s⁻¹)</td>
<td>2.7</td>
<td>5.1</td>
<td>4.4</td>
<td>2.7</td>
<td>3.1</td>
<td>2.5</td>
<td>2.2</td>
<td>3.2</td>
<td>4.2</td>
<td>4.9</td>
<td>3.6</td>
<td></td>
</tr>
<tr>
<td>n</td>
<td>-</td>
<td>671</td>
<td>767</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>767</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>767</td>
</tr>
<tr>
<td>Average barometric pressure (hPa)</td>
<td>869.3</td>
<td>874.4</td>
<td>869.4</td>
<td>876.6</td>
<td>881.4</td>
<td>883.0</td>
<td>884.7</td>
<td>883.8</td>
<td>876.9</td>
<td>872.7</td>
<td>875.4</td>
<td>857.2</td>
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<td>n</td>
<td>743</td>
<td>671</td>
<td>767</td>
<td>743</td>
<td>743</td>
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<td>743</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>767</td>
</tr>
</tbody>
</table>
Logger program

5.1 Program for 2011 (same as for 2010)

;[CH10X]
*Table 1 Program
01: 10.0000 Execution Interval (seconds)

; Check battery voltage
; and stop execution if lower than 9.7V
1: Batt Voltage (P10)
1: 10 Loc [ Battery ]
2: If (X<>F) (P99)
1: 10 X Loc [ Battery ]
2: 4 <
3: 9.7 F
4: 0 Go to end of Program Table

;-------------------------------------------
; AIR TEMPERATURE  
; Measure R/RO for old net cage Rt100
3: 3W Half Bridge (P7)
1: 1 Reps
2: 33 25 mV 50 Hz Rejection Range
3: 1 SE Channel
4: 2 Excite all reps w/Exchan 2
5: 2100 μV Excitation
6: 22 Loc [ R_R0_T_1 ]
7: 95.969 Mult
8: 0 Offset

; Measure R/RO for Young screen Rt100
4: 3W Half Bridge (P7)
1: 1 Reps
2: 33 25 mV 50 Hz Rejection Range
3: 3 SE Channel
4: 2 Excite all reps w/Exchan 2
5: 2100 μV Excitation
6: 23 Loc [ R_R0_T_2 ]
7: 100.2 Mult
8: 0 Offset

; Calculate T for both Rt100
5: Temperature RTD (P16)
1: 2 Reps
2: 22 R/RO Loc [ R_R0_T_1 ]
3: 1 Loc [ T_1 ]
4: 1 Mult
5: 0 Offset

;-------------------------------------------
; VENTILATED T & RH
; Measure temperature from ventilated
; HygroClip sensor
6: Volt (Diff) (P2)
1: 1 Reps
2: 35 2500 mV 50 Hz Rejection Range
3: 3 DIFF Channel
4: 3 Loc [ T_vent ]
5: .1 Mult
6: -40 Offset

; Measure humidity from ventilated
; HygroClip sensor
7: Volt (Diff) (P2)
1: 1 Reps
2: 35 2500 mV 50 Hz Rejection Range
3: 4 DIFF Channel
4: 4 Loc [ rH_vent ]
5: .1 Mult
6: 0.0 Offset

;-------------------------------------------
; WIND
; Measure wind speed on Young Wind Monitor
8: Pulse (P3)
1: 1 Reps
2: 1 Pulse Channel 1
3: 21 Low Level AC, Output Hz
4: 5 Loc [ Wind_spd ]
5: .998 Mult
6: 0 Offset

; Measure wind direction on Young Wind Monitor
9: Excite-Delay (SE) (P4)
1: 1 Reps
2: 5 2500 mV Slow Range
3: 9 SE Channel
4: 1 Excite all reps w/Exchan 1
5: 2 Delay (0.01 sec units)
6: 2500 mV Excitation
7: 6 Loc [ Wind_dir ]
8: .142 Mult
9: -135 Offset

; Make corrections to wind direction
10: If (X<>F) (P89)
   1: 6 X Loc [ Wind_dir ]
   2: 4 <
   3: 0 F
   4: 30 Then Do

11: Z=X+F (P34)
   1: 6 X Loc [ Wind_dir ]
   2: 360 F
   3: 6 Z Loc [ Wind_dir ]

12: End (P95)

;-------------------------------------------
; G L O B A L R A D I A T I O N
; Measure Li200s Pyranometer
13: Volt (SE) (P1)
   1: 1 Reps
   2: 33 25 mV 50 Hz Rejection Range
   3: 10 SE Channel
   4: 7 Loc [ Li200s ]
   5: 116.5 Mult
   6: 0 Offset

;-------------------------------------------
; P R E C I P I T A T I O N
; Measure tipping bucket rain gauge
14: Pulse (P3)
   1: 1 Reps
   2: 2 Pulse Channel 2
   3: 2 Switch Closure, All Counts
   4: 8 Loc [ Precip ]
   5: .16 Mult
   6: 0 Offset

;-------------------------------------------
; I N T E R N A L T E M P E R A T U R E
15: Internal Temperature (P17)
   1: 9 Loc [ T_int ]

;-------------------------------------------
; B A R O M E T R I C P R E S S U R E
16: If time is (P92)
   1: 59 Minutes (Seconds --) into a
   2: 60 Interval (same units as above)
   3: 48 Set Port 8 High

17: If time is (P92)
   1: 0 Minutes (Seconds --) into a
   2: 60 Interval (same units as above)
   3: 30 Then Do

   18: Volt (SE) (P1)
      1: 1 Reps
      2: 15 2500 mV Fast Range
      3: 11 SE Channel
      4: 11 Loc [ P_mb ]
      5: 0.2 Mult
      6: 600 Offset

   19: Do (P86)
      1: 58 Set Port 8 Low

20: End (P95)

;-------------------------------------------
; H O U R L Y O U T P U T
21: If time is (P92)
   1: 0 Minutes (Seconds --) into a
   2: 60 Interval (same units as above)
   3: 10 Set Output Flag High (Flag 0)

22: Set Active Storage Area (P80)
   1: 1 Final Storage Area 1
2: 101 Array ID

23: Real Time (P77)
   1: 1220 Year, Day, Hour/Minute (midnight = 2400)

24: Resolution (P78)
   1: 1 High Resolution
   ; Store average unvent and vent T and Rh
25: Average (P71)
   1: 4 Reps
   2: 1 Loc [ T_1 ]

26: Resolution (P78)
   1: 1 High Resolution
   ; Store wind speed, dir and std dev
27: Wind Vector (P69)
   1: 1 Reps
   2: 1 Samples per Sub-Interval
   3: 0 S, theta(), sigma(theta()) with polar sensor
   4: 5 Wind Speed/East Loc [ Wind_spd ]
   5: 6 Wind Direction/North Loc [ Wind_dir ]

28: Resolution (P78)
   1: 1 High Resolution
   ; Store average global rad
29: Average (P71)
   1: 1 Reps
   2: 7 Loc [ Li200S ]
   ; Store hourly precipitation
30: Totalize (P72)
   1: 1 Reps
   2: 8 Loc [ Precip ]
   ; no data
31: Average (P71)
   1: 2 Reps
   2: 12 Loc [ _________ ]

32: Resolution (P78)
   1: 1 High Resolution
   ; Store maximum wind speed during last hour
33: Maximum (P73)
   1: 1 Reps
   2: 10 Value with Hr-Min
   3: 5 Loc [ Wind_spd ]

34: Resolution (P78)
   1: 1 High Resolution
   ; Store transient unvent and vent T and Rh
35: Sample (P70)
   1: 4 Reps
   2: 1 Loc [ T_1 ]

36: Resolution (P78)
   1: 1 High Resolution
   ; Store max vent T
37: Maximum (P73)
   1: 1 Reps
   2: 10 Value with Hr-Min
   3: 3 Loc [ T_vent ]

38: Resolution (P78)
   1: 1 High Resolution
   ; Store min vent T
39: Minimum (P74)
   1: 1 Reps
   2: 10 Value with Hr-Min
   3: 3 Loc [ T_vent ]

40: Resolution (P78)
   1: 1 High Resolution

41: Sample (P70)
   1: 1 Reps
   2: 11 Loc [ P_mb ]

//-- Daily output

42: If time is (P92)
1: 0 Minutes (Seconds --) into a
2: 1440 Interval (same units as above)
3: 10 Set Output Flag High (Flag 0)

43: Set Active Storage Area (P80)
1: 1 Final Storage Area 1
2: 124 Array ID

44: Real Time (P77)
1: 1220 Year,Day,Hour/Minute (midnight = 2400)

45: Resolution (P78)
1: 1 High Resolution

; Store daily average unvent and vent T & Rh
46: Average (P71)
1: 4 Reps
2: 1 Loc [ T_1 ]

47: Resolution (P78)
1: 1 High Resolution

; Store daily max unvent T
48: Maximum (P73)
1: 1 Reps
2: 10 Value with Hr-Min
3: 2 Loc [ T_2 ]

49: Resolution (P78)
1: 1 High Resolution

; Store daily min unvent T
50: Minimum (P74)
1: 1 Reps
2: 10 Value with Hr-Min
3: 2 Loc [ T_2 ]

51: Resolution (P78)
1: 1 High Resolution

; Store daily max wind speed
52: Maximum (P73)
1: 1 Reps
2: 10 Value with Hr-Min
3: 5 Loc [ Wind_spd ]

53: Resolution (P78)
1: 1 High Resolution

; Store average wind vector
54: Wind Vector (P69)
1: 1 Reps
2: 1 Samples per Sub-Interval
3: 1 S, theta(1) with polar sensor
4: 5 Wind Speed/East Loc [ Wind_spd ]
5: 6 Wind Direction/North Loc [ Wind_dir ]

55: Resolution (P78)
1: 1 High Resolution

; Store daily avg global radiation
56: Average (P71)
1: 1 Reps
2: 7 Loc [ Li200S ]

; Store daily precipitation
57: Totalize (P72)
1: 1 Reps
2: 8 Loc [ Precip ]

; Store sample of battery voltage
58: Sample (P70)
1: 1 Reps
2: 10 Loc [ Battery ]

; no data
59: Average (P71)
1: 2 Reps
2: 12 Loc [ ________ ]

60: Resolution (P78)
1: 1 High Resolution

61: Average (P71)
1: 1 Reps
2: 11 Loc [ P_mb ]
SYNOPTIC OUTPUT
transient T data is stored every 3 hrs
according to synoptic standards.

62: If time is (P92)
1: 60 Minutes (Seconds --) into a
2: 180 Interval (same units as above)
3: 10 Set Output Flag High (Flag 0)

63: Set Active Storage Area (P80)
1: 1 Final Storage Area 1
2: 103 Array ID

64: Real Time (P77)
1: 1220 Year,Day,Hour/Minute (midnight = 2400)

65: Resolution (P78)
1: 1 High Resolution

66: Sample (P70)
1: 1 Reps
2: 2 Loc [ T_2 ]

Table 2 Program
01: 0.0000 Execution Interval (seconds)

Table 3 Subroutines

End Program

1 [ T_1 ] RW-- 3 1 Start ------ ---
2 [ T_2 ] RW-- 6 1 ------ ------ ----
3 [ T_vent ] RW-- 5 1 ------ ------ ----
4 [ rH_vent ] RW-- 3 1 ------ ------ ----
5 [ Wind_spd ] RW-- 4 1 ------ ------ ----
6 [ Wind_dir ] RW-- 4 2 ------ ------ ----
7 [ Li200S ] RW-- 2 1 ------ ------ ----
8 [ Precip ] RW-- 2 1 ------ ------ ----
9 [ T_int ] --W-- 0 1 ------ ------ ----
10 [ Battery ] RW-- 2 1 ------ ------ ----
11 [ P_ab ] RW-- 2 1 ------ ------ ----
12 [ _________ ] R-- 2 0 ------ ------ ----
13 [ _________ ] R-- 2 0 ------ ------ ----
14 [ _________ ] ---- 0 0 ------ ------ ----
15 [ _________ ] ---- 0 0 ------ ------ ----
16 [ _________ ] ---- 0 0 ------ ------ ----
17 [ _________ ] ---- 0 0 ------ ------ ----
18 [ _________ ] ---- 0 0 ------ ------ ----
19 [ _________ ] ---- 0 0 ------ ------ ----
20 [ _________ ] ---- 0 0 ------ ------ ----
21 [ _________ ] ---- 0 0 ------ ------ ----
22 [ R_R0_T_1 ] RW-- 1 1 ------ ------ ----
23 [ R_R0_T_2 ] RW-- 1 1 ------ ------ ----