RTD file is a text file, contents one measurement File name is “{dd}\_{HH}\_{mm}\_{ss}\_{index}\_{channel}.rtd” where dd, HH, mm, ss – day, hours, minutes, seconds of a measurement, index – index number of a measurement, channel – number of a measurement channel.

STA-file is a text file, contents all the measurements made during one scanning cycle. File name is “{dd1}\_{HH1}\_{mm1}\_{ss1}\_-\_{dd2}\_{HH2}\_{mm2}\_{ss2}.sta”, where dd1, HH1, mm1, ss1 is a measurement start time; dd2, HH2, mm2, ss2 – is a measurement end time.

One measurement – is a string in a following format:

[Time]|[Index]|[Channel]|[Window Size]|[Aver Time]|[Local Azimuth]|[Local Zenith]|[Global Azimuth]|[Global Zenith]|[Points Count]|[Radial Speed 0]|[Width 0]|[SNR 0]|[Beta 0]|[ Radial Speed 1]|[Width 1]|[SNR 1]|[Beta 1]|…

[Time] – UTC in ‘yyyy-MM-dd HH:mm:ss’ format

[Index] – index number of measurement

[Channel] – data channel number

[Window Size] – window size, m

[Aver Time] – accumulation time, ms

[Local Azimuth] – azimuth angle in lidar coordinates, °

[Local Zenith] – elevation angle in lidar coordinates, °

[Global Azimuth] – azimuth angle in global coordinates, °

[Global Zenith] – elevation angle in global coordinates, °

[Points Count] – number of points in a measurement

[Radial Speed X] – radial speed in a point X, m/s

[Width X] – specter width in a point X, м/с

[SNR X] – SNR in a point X, dB

[Beta X] – reflectivity coefficient in a point X

| – is a separator between data (a tab symbol)

Example:

2017-03-01 13:40:01|1|0|40|1000|-178.4|45.0|151.2|45.0|344|-2.5|4|7.37227869|0.00096628|-2.5|2.5|7.43064069|0.00130476|…

WINDCONFIG.INI – text file, contents parameters of scanning (Table 4). File name is“{dd}\_{HH}\_{mm}\_{ss}\_WindConfig.ini”, where dd, HH, mm, ss – is scanning start time.

Таблица 4 – Scanning parameters description

|  |  |
| --- | --- |
| Parameter | Description |
| TYPE | Measurement type:  0 – with constant elevation angle (PPI)  1 – with constant azimuth angle (RHI)  2 – with constant elevation and azimuth angles (LOS)  3 – scanning in points with constant elevation angles and equally distributed azimuth angles (DBS) |
| PARAM1 | PPI: initial azimuth angle, °  RHI: azimuth angle, °  LOS: azimuth angle, °  DBS: number of points by azimuth angle |
| PARAM2 | PPI: elevation angle, °  RHI: initial elevation angle, °  LOS: elevation angle, °  DBS: elevation angle, ° |
| PARAM3 | PPI: sector size, °  RHI: sector size, °  LOS: number of measurements in a point  DBS: number of measurements in one point |
| PARAM4 | PPI: scanning speed °/s  RHI: scanning speed °/s  LOS: not used  DBS: not used |
| AVERTIME | Accumulation time |

Example:

[PARAMS]

TYPE=0; PPI mode

PARAM1=-180; azimuth angle 180°

PARAM2=30; elevation angle 30°

PARAM3=360; sector size 360°

PARAM4=1; scanning speed 1°/s

AVERTIME=1000; accumulation time 1000 ms

PFW – is a text file which contents wind profile data. Wind profile data is generated in following cases

1. After PPI (TYPE = 0) scanning is completed and abs(PARAM3) > 240°
2. After DBS (TYPE = 3) scanning is completed and PARAM1 > 3

File consists of strings of the following format:

[Height]|[HorizontalSpeed]|[VerticalSpeed]|[Direction]|[Eval]

[Height] – measurement height, м

[HorizontalSpeed] – horizontal component of wind speed, m/s

[VerticalSpeed] – vertical component of wind speed, m/s

[Direction] – wind direction, °

[Eval] – relative measurement error %.

0% – means perfect measurement. 100% – means the worst measurment.

File example:

38|17.4|0.0|50.8|2.5

75|17.4|0.0|50.1|2.7

113|17.4|0.0|50.0|2.6

150|17.4|0.1|49.9|2.7

188|17.5|0.1|49.1|2.5

226|17.1|-0.2|50.7|1.5

263|17.2|0.1|49.3|2.5

301|17.4|0.0|48.4|2.8

338|17.4|0.0|48.3|2.8

376|17.6|0.0|47.9|2.6

ALM-file is an XML-file with the following elements:

|  |  |  |  |
| --- | --- | --- | --- |
| Element | Element description | Attribute | Attribute description |
| RemoteConnect | Lidar connection status | Value | 0 – no connection  1 – connected |
| LidarState | Lidar status | Value | 0 – state is unknown  1 – ready for operation  2 – preparation for scanning  3 – scanning  4 – scanning is stopping  5 – scanning is stopped  6 – scanning is completed  7 – an error occurred during scanning |
| State | Status element | Name | Name of state:  Connect State – state of devices connection  Start State – state of scanning starting  Inclinometer State – state of inclinometer  Compass State – state of compass  Gps State – state of GPS receiver  Scaner State – state of a scanner  Detector 0 State – state of lidar detector  Processor State –state of a secondary data processing module  Profile Processor State – state of a tertiary data processing module |
| Value | State value:  1 – yes  0 – no |
| Error | Error element | Source | Error source |
| Message | Error message |

Examples:

<?xml version="1.0" encoding="utf-8"?>

<Alarm>

<RemoteConnect Value="1" />

<LidarState Value="1" />

<State Name="Scaner State" Value="1" />

<State Name="Processor State" Value="1" />

<State Name="Profile Processor State" Value="1" />

<State Name="Detector 0 State" Value="1" />

<State Name="Inclinometer State" Value="1" />

<State Name="Compass State" Value="1" />

<State Name="Gps State" Value="1" />

</Alarm>

<?xml version="1.0" encoding="utf-8"?>

<Alarm>

<RemoteConnect Value="1" />

<LidarState Value="7" />

<State Name="Scaner State" Value="1" />

<State Name="Processor State" Value="1" />

<State Name="Profile Processor State" Value="0" />

<State Name="Detector 0 State" Value="1" />

<State Name="Inclinometer State" Value="1" />

<State Name="Compass State" Value="1" />

<State Name="Gps State" Value="1" />

<Error Source="WindProfilerCyclogram" Message="Device error &quot;ProfileProcessor&quot;: Profile processor CosProfilesProcessor init error" />

</Alarm>