

Hakatte Nanbo(the weather volume)DIY observation system

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Background

A well organized observation is indispensable for investigation of weather phenomena. For instance, it is well known that observations by the Automated Meteorological Data Acquisition System and the HIMAWARI satellite accomplished a great insight to large area weather phenomena. However, rather insufficient and little amount observations are done for the small-scale weather phenomena in current state, even though a great amount of concern comes to be paid to these phenomena in recent years.

The small space range should take many observing points to the difficulty which observes the weather of a small scale. Furthermore, it is in high resolution and the necessity of measuring at intervals of fine time. It is difficult to prepare for an observing point more nearly actually the place desired in - usual observation. This becomes remarkable for placing an observing point in the small space range especially. instruments with sufficient data inclusion equipment and sufficient accuracy which realizes high resolution and a fine sampling is needed, and equipment becomes large-scale. This announcement reports the observation system which was developed also as efforts to mitigate such difficulties and which specialized in the locality weather survey.

Results

The equipments developed this time are a datalogger and a thermo-hygrometer. In order to solve the difficulty which hangs around the local weather survey that are stated for the preceding clause, it developed by attaching importance to the following points.

1. high observation accuracy
2. high resolution
3. miniaturization
4. high mobility

A radiation shield influences accuracy most by observation of temperature humidity about observation accuracy first. Even if it compared with the commercial radiation shield the radiation shield of the thermo-hygrometer developed this time, it showed to have high observation accuracy. Moreover, this radiation shield was quite small and, thereby, led also to the miniaturization of the instrument itself.

Moreover, a datalogger is the important equipments used as the important point of observation. An AD conversion is equipped with 12-bit resolution, and enabled it to carry out the AD conversion of the six sensors at a stretch in consideration of high resolution being required for locality observation about datalogger. 128 K bytes of EEPROM of non-volatility was adopted as the data record memory inside datalogger, and continuation record for one week was enabled by the sampling of a 1-minute interval. Since there is a function to take an average in this datalogger, use of averaging the sampling for a minimum of 1 second, and recording as a sampling in every minute is also possible.

The datalogger operates with DC power supply of 9V, and fully operates for one week by six single 3 commercial dry cells. Furthermore, the datalogger's size is 95x58x18mm, the weight of the datalogger about 50g, that marks the outstanding mobility. In order to perform communication with the datalogger, the software in the wonderswan which is the small game machine of marketing besides the software in PC is developed, and carrying out PC makes observation on the inconvenient outdoors easy. Moreover, if this the datalogger is a general-purpose measuring instrument which measures voltage and it is the sensor which a voltage output characteristic understands, it is also possible to connect sensors other than a temperature hygrometer.

If it is with such a thermo-hygrometer and the datalogger, it will be possible to realize high density multi-point observation with comparatively easy equipment, and I will think that it is useful to construction of the flexible observation network set by the needs of a researcher.