

Brief guide to SAMOS

SAMOS stands for Semi-Automatic Meteorological Observing System. It records, codes and sends weather data, which it receives from automated sensors. The data are displayed on a PC screen so that changes or additions can be made to it. SAMOS can make observations every ten minutes if required, and can be fully automated at stations with no observers. Although the system can automatically make observations when you are not available, it can not do them as comprehensively as you.

Below is a list of the elements that can be recorded by SAMOS and the equipment used. Not all stations will record the complete list of elements. SAMOS only records present weather when your station is unmanned.

Equipment	Elements recorded
Platinum resistance thermometers	Temperatures: dry bulb, wet bulb, maximum, minimum, soil, grass minimum, concrete minimum
Humidity sensor	Relative humidity
Wind system	Wind direction and speed, gusts
Vibrating cylinder pressure transducer	Station- and sea-level pressure, 3-hour tendency and amount
Tipping bucket rain-gauge (<i>0.2 mm tip</i>)	Hourly/6-hourly/12-hourly rainfall totals
Laser ceilometer	Cloud-base height and amounts
Present weather instrument and precipitation detector	Present weather
Pyranometer	Solar radiation
Sunshine sensor	Sunshine
Snow depth sensor	Snow depth
Visiometer	Visibility

SAMOS calculates dew-point temperature from the dry- and wet-bulb temperatures.

The system is run using Windows NT, so getting around the SAMOS screen is similar to other Windows packages.

The latest automatic data are displayed on screen and updated regularly. Values with a *blue* background are valid (within the limits of the system and consistent with the other values). Values with a *red* background are invalid

(outside the limits of the system or not consistent with other values). Values with a *grey* background are blocked (SAMOS is not collecting the values from those sensors).

There are two ways of entering data (for items not recorded by SAMOS or when sensors are unserviceable, for example).

- Using the Observations menu at the top of the screen
- At the request of the 'To do' list (which will automatically appear when an observation is due)

Each measurement is shown in a 'field' box. Move to the field where you want to enter data by using the 'Tab', 'Enter' or 'Arrow' keys, or the mouse. Remember that you can't change a value that is not directly measured, such as dew-point temperature. You have to alter the value(s) that SAMOS uses to calculate it.

Enter your readings into the fields, making sure you have filled in the fields that SAMOS does not record (cloud types and state of ground, for example).

The screenshot shows the SAMOS NT software interface. At the top is a menu bar with 'Observations', 'Collections', 'Transmission', 'Engineering', 'Printer', 'Options', 'Settings', and 'Help'. Below the menu bar, the title '11:50 METAR' is displayed. The main area contains several sections of data entry fields:

- 10 Minute Wind:** Direction (330), Speed (04), Gust (08).
- Ambient Temperatures:** Dry (17.5), Wet (13.9), Dew Pt (10.9), RH (65).
- Pressure:** Read (1019.3), QFF (1028.4), QFE (1018.8), QNH (1028.5), QFE inHg (30.07), QNH inHg (30.37).
- Minimum Visibility:** Vis (39000).
- METAR Present Weather:** NIL.
- METAR Recent Weather:** BE Wxt.
- Cloud:** Total Cloud (for QC check) is 7. Below this are four columns for cloud layers, each with fields for N, Type, and Height. The first layer is SC5 at 3300. The other three layers are red, indicating they are invalid.
- Remarks:** b, bc, c.
- TREND:** NOSIG.
- Colour State:** BLU.
- Initials:** ASV.

Please keep a weather diary by entering comments into the remarks section of SAMOS.

Once you are happy with all the values, choose 'Check observation' from the Observations menu, then 'Process observation' from the same menu. SAMOS will check that the values are consistent and will then send the coded observation.

If you want to add '9' group data or Beaufort letters, use 'Enter Special Remark' from the Options menu.

As SAMOS does not observe as comprehensively as you, pay particular attention to the following points.

- ✓ Patchy fog — because SAMOS measures visibility at a single point but you observe the whole station area
- ✓ Cloud cover — because SAMOS detects clouds at a single point in the sky but you observe the whole sky
- ✓ Present weather features — because SAMOS has some problems detecting sleet or very slight precipitation

- ✓ Rainfall — you must include the liquid equivalent of any solid precipitation. You must ensure that you melt any solid precipitation and add it to the liquid value in SAMOS

- ✓ National Climatological Message (NCM) rainfall — do NOT amend the NCM when the rain gauge has tipped only because of dew, frost melt, etc. (a 'non-precipitation tip') because it has to show what the system records. Other rainfall values can be amended as required

Manual observing using SAMOS

- ✓ When precipitation tips occur because of dew, frost-melt or likewise, amend the SREW (manual entry of rainfall data into SAMOS) to 000. However, the NCM total should NOT be altered.
- ✓ When the precipitation is frozen, amend the SREW to 999 (unmeasurable), but try to derive the NCM value from melting.

Automatic observing using SAMOS

- ✓ All gusts are observed, but only those of 25 kn or more are reported by SAMOS.
- ✓ Hourly and daily radiation and sunshine values from automatic sensors are included in groups 5j1j2j3j4 j5j6j7j8j9 of the SYNOP.
- ✓ Station pressure (QFE) and time are included in groups 3PPPP 9GGgg of the SYNOP using SAMOS NT.

Stations with Campbell–Stokes sunshine recorders and radiation sensors

- ✓ If your station is continually manned, carry on doing sunshine measurements.
- ✓ If your station is *not* manned continually, provide the daily sunshine total in the NCM for those days when a complete record is available.
- ✓ Summed hourly values of radiation and sunshine will not always equal the daily totals due to rounding of the hourly amounts. Sunshine duration from radiation sensors will usually be lower than from Campbell–Stokes burns due to the inaccuracy of the analysis of the burns.

Checks

All manned SAMOS stations have to make check readings and send check messages. Check sheets should also be sent in each month with any additional information.

You will be sent printouts of your station NCM and wind records to check for missing reports or make corrections. Remember:

- do not change SAMOS sensor values to those from ‘manual’ instruments (e.g. liquid-in-glass thermometers) unless a known fault is occurring or has occurred in the system;
- do not adjust SAMOS rainfall or temperature sensor values to agree with manually observed values;
- there is a known fault in the printout where ‘t’ = 9 does not appear but ‘0’ is printed instead. Do not correct for this reason alone;
- only amend the final page of the wind printout (warning of possible errors and omissions) when the system is known to be at fault.

Repeat sending of reports

If requested, 'OLD' reports, more than 23.5 hours from the original time of observation, should be sent using the appropriate indicators.

- SYNOP OS@OLDS
- NCM OC@OLDC
- SREW OR@OLDR
- HCM OE@OLDE

Note: the HCM (Hourly Climate Message) is sometimes known as the ESAWS report.

The six-figure date/time group in the header should be the **CURRENT** date/time, while the four-figure date/time group following Ox@OLDx is the date/hour of the late observation.

For example, reports from station 001 for 0100 UTC on the 12th, re-sent at 0900 UTC on the 18th, would be transmitted thus:

180900 OS@OLDS 1201

001 41675 32904 10024 20008 40324 52008=

180900 OR@OLDR 1201

001000=

180900 OE@OLDE 1201

001 13004 33410 52353 60024=

To ensure success, remember:

- ✓ each OLD observation must be sent separately under its own header;
- ✓ for OLD observations for the same type of report (e.g. successive SYNOPs) from the same station number, allow a few minutes between transmissions.

Problems arising when system clocks are not synchronised

Rainfall

There can be incompatibility between the sum of SREW data, '6' groups in the SYNOP and the NCM total.

Temperature

There can be incompatibility between the hourly '6' group and NCM maximum and minimum temperatures. The grass minimum reported at 0600 UTC or in the SYNOP and at 0900 UTC in the NCM may also be incompatible.

NCM

The appropriate format for the 0900 and 2100 UTC NCM messages may occur at the wrong time. For example, the 0900 UTC NCM may be reported at 2100 UTC.

Solution

It is essential to synchronise the system clocks on a daily basis. It is recommended that this task is carried out on arrival at the office. If your station is not continuously manned, synchronise the clocks on those days you are present.

Procedure to synchronise the system clocks

Press the 'Ctrl' and 'F1' keys together.

The following is displayed:

PLEASE ENTER CURRENT DATE AND TIME

Is the date TUESDAY 28 NOVEMBER 2000? Y/N

Respond by pressing 'Y' or 'N'.

Set the time in UTC using the 24-hour clock in the format hh:mm, e.g. 09:15.

Once the correct time is entered, followed by pressing the 'Return' or 'Enter' key, the default display screen will appear showing the correct time.

Further problems

Rainfall

If the Intelligent Sensor Unit (ISU) is reset, any earlier precipitation tips will be lost and not included in the NCM. This can be overcome by changing the NCM total manually.

Pressure

The calculated pressure tendency may occasionally be in serious error. This can be changed manually.