Instrument_Ops Template Step-by-Step Instructions

Version 20150415

1. On the first sheet in column D (rows 2 to 6), fill in the site ID, the site name, and the submission information including the person who is filling in the template (likely you). These info should be reported only in column D and not repeated in the other columns

2. Installation of a sensor. Enter also the installation information for the instruments currently deployed at your site. Use a different column for each instrument (columns D and higher). For each instrument:

- Enter “Installation” in the Instrument operations and maintenance type (INSTOM_TYPE) row (note, it is a CV variable, options available in the LIST(xxx) sheet).
- Enter the instrument model in the INSTOM_MODEL row. Select from the list of controlled vocabulary (CV) for INST_MODEL on the LIST(xxx) sheet. Note that the instrument must be one of the sensors described in the Instrument Template in order to establish the link between the installation and the sensor characteristics..
- Enter the serial number in the INSTOM_SN row. Note that the serial number must be one of the SN used in the Instrument Template in order to establish the link between the installation and the sensor characteristics.
- Enter the installation date in the INSTOM_DATE row. Use YYYYMMDDHHMM format.
- Enter the instrument height above the ground surface in the INSTOM_HEIGHT row.
- Enter the location of the instrument relative to the site reference point using the INSTOM_EASTWARD_DIST and INSTOM_NORTHWARD_DIST rows. The reference point is the one corresponding to the site geographic coordinates submitted.

3. Link installed instruments to the variables they are measuring using a different column for each variable. Otherwise, skip to step 4 if the sensors at the moment is not producing variables that are submitted. For each variable:

- Enter “Variable map” in the INSTOM_TYPE row.
- Enter the instrument model in the INSTOM_MODEL row. Select from the list of CV for INST_MODEL on the LIST(xxx) sheet. Note that the instrument must be one of the sensors described in the Instrument Template in order to establish the link between the variable and the sensor characteristics.

- Enter the instrument serial number in the INSTOM_SN row. Note that the serial number must be one of the SN used in the Instrument Template in order to establish the link between the variable and the sensor characteristics.
- Enter the date the variable measured by the instrument was first reported to your regional network in the INSTOM_DATE row.
- Enter the variable name in the INSTOM_VARIABLE_H_V_R row. Select the first part of the variable name from the VAR_CODE For example, for friction velocity, use the CV “USTAR”. Then add positional indices to indicate the relative position of this measurement. If you are measuring a variable at a single location with no replicates, use 1s for the positional indices, e.g. USTAR_1_1_1. If you are measuring a variable at more than one location or taking replicate measurements at the same location, see the separate instructions for selecting positional indices here above.
- The variable mapping can be reported also together with the instrument installation description (same column). In this case enter “Installation” in the INSTOM_TYPE variable (note it is a CV variable). If the same instrument is also measuring other variables they have to be mapped in separate columns using “Variable map” in the INSTOM_TYPE row and with an INSTOM_DATE equal or following the installation of the sensor. Same should be done if you decide to change the name of the variable produced by the sensor (same sensor and in the same position)
- When the INSTOM_TYPE is “Variable map” not information about the sensor position are possible. The sensor position is taken from the INSTOM_TYPE “Installation”.
- In case only one sonic anemometer and one CO2/H2O gas analyzer are present at the site, it will be sufficient to map the FC (turbulent CO2 flux) and we will automatically map to these two sensors all the other variables originated by them (if submitted) using for all the indexes _1_1_1 (e.g. USTAR_1_1_1). The variables we will map to the two sensors are: LE, H, USTAR, TAU, CO2, H2O, T_SONIC, T_SONIC_SIGMA, FC_SSITC_TEST, LE_SSITC_TEST, H_SSITC_TEST, TAU_SSITC_TEST, ZL, MO_LENGTH, U_SIGMA, V_SIGMA, W_SIGMA. In case one of these variables is not linked or originated by the SA and GA reported, they must be associated to their sensor(s) in a separate column.

4. Report the installation of instruments previously deployed at your site but since removed, going back to the start of data collection at the site if possible. Repeat step 2 for each installation. With each installation of an instrument, map the newly installed instrument to the variable or variables that it measured using step 3.

5. For each installation of an instrument that has since been removed, also report the removal of the instrument in a separate column as follows:

- Enter “Removal” in the INSTOM_TYPE row.

- Enter the instrument model in the INSTOM_MODEL row. Select from the list of controlled vocabulary (CV) for INST_MODEL on the LIST(xxx) sheet. Note that the instrument must be one of the sensors described in the Instrument Template and that has been installed previously in order to clearly identify which sensor has been removed.
- Enter the instrument serial number in the INSTOM_SN row. Note that the serial number must be one of the SN used in the Instrument Template and that has been used in one installation of sensor before the removal in order clearly identify which sensor has been removed.
- Enter the instrument removal date in the INSTOM_DATE row. Use YYYYMMDDHHMM format.
- Note that once a sensor is removed we expect that the variable mapped with it is not any more submitted unless there is a new installation and mapping to a new sensor.

6. Calibration (and check of calibration) are an important aspects that is important to track because can enter in the data processing or help data analysis. Enter instrument calibrations in separate columns.

- If the calibration happen at the site enter “Field calibration” or “QAQC visit calibration” in the INSTOM_TYPE row (CV variable).
- If the calibration happen in the lab or at the factory enter “Lab calibration”, “QAQC lab calibration” or “Factory calibration” in the INSTOM_TYPE row.
- Enter the instrument model in the INSTOM_MODEL row, selecting from the list of controlled vocabulary (CV) for INST_MODEL on the LIST(xxx) sheet. Note that the instrument must be one of the sensors described in the Instrument Template in order to establish the link between the calibration, the sensor and the variable produced.
- Enter the instrument serial number in the INSTOM_SN row. Note that the serial number must be one of the SN used in the Instrument Template in order to establish the link between the calibration, the sensor and the variable produced.
- Enter the calibration date in the INSTOM_DATE row.
- Use the INSTOM_COMMENT variable to report details and new coefficient set during the calibration.
- In case of gas analyzer it is important also to check the level of calibration (without adjusting the sensor parameters) or to record the readings before the calibration because can be used in the data correction and processing., In this case enter gas analyzer reading before any calibration in the INSTOM_GA_CO2_ZERO, INSTOM_GA_CO2_OFFSET, INSTOM_GA_H2O_ZERO and INSTOM_GA_H2O_OFFSET rows. Enter also the reference concentrations used to check the offset in the INSTOM_GA_CO2_REF and INSTOM_GA_H2O_REF rows and the environmental temperature when the calibration (or check) has been done using the INSTOM_GA_CAL_TA variable.

7. Enter other types of operations and maintenance events such as disturbances (e.g. lightning strikes), firmware updates or cleanings. For the instrument operations and maintenance type (INSTOM_TYPE) row, select from the list of controlled vocabulary for INSTOM_TYPE on the LIST(xxx) sheet. For each event, also report the INSTOM_MODEL, INSTOM_SN, and INSTOM_DATE. Also in this case the INSTOM_MODEL and INSTOM_SN must be related to a sensor that has been described (Instrument Template) and installed at the site.