

Instrument 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. For each sonic anemometer used to calculate eddy covariance fluxes that is currently deployed:

- Enter the sonic anemometer model in the INST_MODEL row. Select from the list of controlled vocabulary (CV) for INST_MODEL on the LIST(xxx) sheet. All the sonic anemometers start with SA-.
- Enter the sonic anemometer serial number in the INST_SN row. If the anemometer doesn't have a serial number or if it is not readable anymore, assign a serial number that however must be unique across the networks. For this reason it is suggested to start the new serial number with an identifier of the site or institute (e.g. UNITUS or UCB)
- Enter the orientation of the sonic anemometer relative to magnetic north (0-359 degrees) in the INST_SA_OFFSET_NORTH row.
- Enter the format used in reporting wind components in the INST_SA_WIND_FORMAT row: "U, V, W", "Polar and W" or "Axis".
- For Gill brand sonic anemometers, in the INST_SA_GILL_ALIGN row, enter either "spar" or "axis" depending on which element of the anemometer is aligned with due north. If neither of these options applies, enter "NA".
- Optionally, enter the sonic anemometer firmware version in the INST_FIRMWARE row.
- Optionally, enter the sampling interval in the INST_SAMPLING_INT. If individual measurements are averaged in the logger, also enter the averaging interval in the INST_AVERAGING_INT row.
- Optionally, indicate if the sonic anemometer is heated in the INST_HEAT row selecting from the CV in the LIST(xxx) sheet.
- Enter the date that this configuration first applies in the INST_DATE row. Use YYYYMMDDMMHH format.

3. For each *open path* gas analyzer used to calculate eddy covariance fluxes that is currently deployed:

- Enter the gas analyzer model in the INST_MODEL row. Select from the list of CV for INST_MODEL on the LIST(xxx) sheet. All the open path gas analyzers start with GA_OP-

- Enter the gas analyzer serial number in the INSTOM_SN row. If the serial number is not available assign a SN following the indications given for the anemometers.
- Enter the angle with respect to vertical (zenith angle) of the open path gas analyzer as installed in the INST_GA_OP_VERT_MOUNT row.
- If INST_GA_OP_VERT_MOUNT is non-zero, enter the azimuth angle from north of the open path gas analyzer as installed in the INST_GA_OP_AZIM_MOUNT row.
- Optionally, enter the gas analyzer firmware version in the INST_FIRMWARE row and the sampling interval in the INST_SAMPLING_INT. If individual measurements are averaged in the logger, also enter the averaging interval in the INST_AVERAGING_INT row.
- Optionally, indicate if the gas analyzer is heated in the INST_HEAT row and if the instrument is shielded in INST_SHIELDING row. Select from the CV for INST_HEAT and INST_SHIELDING in the LIST(xxx) sheet.
- Enter the date that this gas analyzer configuration first applies in the INST_DATE row.

4. For each *closed path* gas analyzer used to calculate eddy covariance fluxes that is currently deployed:

- Enter the gas analyzer model in the INST_MODEL row. Select from the list of CV for INST_MODEL on the LIST(xxx) sheet. All the open path gas analyzers start with GA_CP-
- Enter the gas analyzer serial number in the INSTOM_SN row. If the serial number is not available assign a SN following the indications given for the anemometers.
- Describe the number and sizes of the filters in the INST_GA_CP_FILTERS row.
- Enter the tube length in centimeters in the INST_GA_CP_TUBE_LENGTH row and the tube diameter in millimeters in the INST_GA_CP_TUBE_IN_DIAM row.
- Enter the gas analyzer intake tube material in the INST_GA_CP_TUBE_MAT row choosing from the CV in the LIST(xxx) sheet.
- Report if the tube is insulated or heated in the INST_GA_CP_TUBE_THERM row, choosing from the CV in the LIST(xxx) sheet..
- Enter the nominal flow rate of the gas analyzer intake tube in the INST_GA_CP_FLOW_RATE row.
- Enter “yes” in the INST_GA_CP_MFC row if the mass flow controller (MFC) is present or “no” if it is not.
- Optionally, enter the sampling interval in the INST_SAMPLING_INT. If the individual measurements are averaged in the logger, also enter the averaging interval in the INST_AVERAGING_INT row.
- Optionally, enter the gas analyzer firmware version in the INST_FIRMWARE row.
- Optionally, indicate if the gas analyzer is heated in the INST_HEAT row and if the instrument is shielded in INST_SHIELDING row. Select from the CV for INST_HEAT and INST_SHIELDING in the LIST(xxx) sheet.

- Enter the date that this gas analyzer configuration first applies in the INST_DATE row.

5. For any other instruments currently deployed at your site:

- Enter the instrument model in the INST_MODEL row. Select from the list of controlled vocabulary (CV) for INST_MODEL on the LIST(xxx) sheet.
- Enter the instrument serial number in the INST_SN row. If the serial number is not available assign a SN following the indications given for the anemometers.
- Enter sampling interval in the INST_SAMPLING_INT. If the individual measurements are averaged in the logger, also enter the averaging interval in the INST_AVERAGING_INT row.
- Enter the instrument firmware version in the INST_FIRMWARE row.
- Indicate whether the instrument is heated in the INST_HEAT row, whether the instrument is shielded in the INST_SHIELDING row and whether the instrument is aspirated in the INST_ASPIRATION row. Select from the CV for INST_HEAT, INST_SHIELDING and INST_ASPIRATION on the LIST(xxx) sheet.
- Enter the date that this configuration first applies in the INST_DATE row.

6. Report previous configurations of the instruments currently at your site. Repeat step 2 for each previously used configuration of the sonic anemometer and step 3 or 4 for each previously used configuration of a gas analyzer. Repeat step 5 for previously used configurations of other instruments currently at your site.

7. Report the configuration 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 new installation of a sonic anemometer and step 3 or 4 for each new installation of a gas analyzer. Repeat step 5 for new installations of other instruments that have since been removed.

8. To calculate the eddy covariance fluxes we need the spatial separation between anemometer and gas analyzer. For this reason, for each sonic anemometer – gas analyzer pair at your site used to measure gas flux via eddy covariance:

- Enter the sonic anemometer model in the INSTPAIR_MODEL_1 Select from the list of controlled vocabulary (CV) for INST_MODEL on the LIST(xxx) sheet. The model must be one of the reported SA- in step 2.
- Enter the sonic anemometer serial number in the INSTPAIR_SN_1 row. This serial number must be one of the used SN in step 2.
- Enter the gas analyzer model in the INSTPAIR_MODEL_2 Select from the list of CV for INST_MODEL on the LIST(xxx) sheet. The model must be one of the reported in steps 3 or 4
- Enter the gas analyzer serial number in the INSTPAIR_SN_2 row. This serial number must be one of the used SN in step 3 or 4.
- Enter the vertical separation in meters between the two instruments, using negative values if the gas analyzer is below the sonic anemometer. As reference

take the center of the anemometer (between the transducers) and the GA intake or center of the path in case of open path GA.

- Enter the east-west separation between the two instruments, using negative values if the gas analyzer is west of the sonic anemometer. References as in the vertical separation.
- Enter the north-south separation between the two instruments, using negative values if the gas analyzer is south of the sonic anemometer. Reference as in the vertical separation.
- Enter the date that these vertical, east-west and north-south separation values first apply in the INSTPAIR_DATE row. Use YYYYMMDDHHMM format.

9. Optionally, for other pairs of instrument used at your site to measure one variable:

- Enter the model of the first instrument in the INSTPAIR_MODEL_1 Select from the list of CV for INST_MODEL on the LIST(xxx) sheet.
- Enter the serial number of the first instrument in the INSTPAIR_SN_1 row.
- Enter the model of the second instrument in the INSTPAIR_MODEL_1 Select from the list of CV for INST_MODEL on the LIST(xxx) sheet.
- Enter the serial number of the second instrument in the INSTPAIR_SN_1 row.
- Enter the vertical separation in meters between the two instruments, using negative values if instrument 2 is below instrument 1.
- Enter the east-west separation in meters between the two instruments, using negative values if instrument 2 is west of instrument 1.
- Enter the north-south separation in meters between the two instruments, using negative values if instrument 2 is south of instrument 1.
- Enter the date that these vertical, east-west and north-south separation values first apply in the INSTPAIR_DATE row.

10. If the vertical, east-west and north-south separation has changed since a pair of SA and GA was installed, repeat step 8 to report these earlier separation distances.

11. Report the vertical, east-west and north-south separation of SA and GA pairs previously deployed at your site but since removed, going back to the start of data collection at the site if possible. Repeat step 8 for each sonic anemometer – gas analyzer pair that has since been removed.