Description of the input data for the usage of the nodal load observer

All data must be concentrated on one Microsoft Excel file (with 9 sheets). (For example see file example\_data\_grid.xlsx)

All sheets described in the bullet points below.

1. Data related to the topology of the grid (relationship nodes and edges of the given grid)
   * columns A and B represent the number of the nodes that, i.e. an edge exists between the nodes in column A and column B per one row (edge one A1 to B1, edge from two A2 to B2 and so on ...)
   * columns C and D represent the real parts and imaginary parts of complex numbers (line impedances) that are associated with row j with j = 1,...,N (zj = Cj + *i*Dj)
   * columns E and F represent the real parts and imaginary parts of complex numbers that are associated to row j, if a transformer on the edge (i.e. row) is available
2. Active power (Pk) on nodes
   * Represents the measurements of the active power on M time stamps on N nodes (i.e. the matrix of active power has the dimension N x M); column A represents the numbers of the nodes
3. Reactive power (Qk) on nodes
   * Represents the measurements of the reactive power on M time stamps on N nodes (i.e. the matrix of reactive power has the dimension N x M) ); column A represents the numbers of the nodes
4. Voltage measurements (Vk)
   * Voltage mesurements on M time stamps
5. Active power (Pl) on edges
   * Column A and column B represent the nodes that are defining an edge (i.e per row one edge between node in column A and node in column B)
   * The columns below measurements of active power on M time stamps
6. Reactive power (Ql) on edges
   * Column A and column B represent the nodes that are defining an edge (i.e per row one edge between node in column A and node in column B)
   * The columns below measurements of reactive power on M time stamps
7. Base values
   * Base value voltage in cell B1 and base value apparent power (mega volt ampere) in cell B2 (cell B2 is cell B1 squared)
8. Pseudo measurements, active power on nodes
   * If active power measurements for one node is not available, then pseudo measurements must be defined, i.e. on all nodes that are not a part of the sheet 3, pseudo measurements of active power on M time stamps must be listed
9. Pseudo measurements, reactive power on nodes
   * If reactive power measurements for one node is not available, then pseudo measurements must be defined, i.e. on all nodes that are not a part of the sheet 3, pseudo measurements of reactive power on M time stamps must be listed