VARIABLES FOR THE INITIAL NEW FLUXNET SYSTEM

Variables with An (e.g. A1) are alternatives, meaning that at least one of them is mandatory

* = To be submitted ONLY if calculated using a profile

Code	Units	Description	Mandatory	Strongly Suggested	Possible
Timekeeping variables					
TIMESTAMP_END	YYYYMMDDHHMM	ISO timestamp end of averaging period - short format (12-digit integer)	X		
TIMESTAMP_START	YYYYMMDDHHMM	ISO timestamp start of averaging period - short format (12-digit integer)	X		
Gases and Fluxes variables					
CH4	nmolCH4 mol-1	Methane (CH4) mole fraction in wet air			X
CH4_MIXING_RATIO	nmolCH4 mol-1	Methane (CH4) in mole fraction of dry air			X
CO	nmolCO mol-1	Carbon Monoxide (CO) mole fraction in wet air			X
CO2	µmolCO2 mol-1	Carbon Dioxide (CO2) mole fraction in wet air	A5		
CO2_MIXING_RATIO	µmolCO2 mol-1	Carbon Dioxide (CO2) in mole fraction of dry air	A5		
CO2_SIGMA	µmolCO2 mol-1	Standard deviation of carbon dioxide mole fraction in wet air			X
CO2C13	‰ (permil)	Stable isotopic composition of CO2 - C13 (i.e., d13C of CO2)			X
FC	µmolCO2 m-2 s-1	Carbon Dioxide (CO2) turbulent flux (no storage correction)	X		
FCH4	nmolCH4 m-2 s-1	Methane (CH4) turbulent flux (no storage correction)			X
FN2O	nmolN2O m-2 s-1	Nitrous oxide (N2O) turbulent flux (no storage correction)			X
FNO	nmolNO m-2 s-1	Nitric oxide (NO) turbulent flux (no storage correction)			X
FNO2	nmolNO2 m-2 s-1	Nitrogen dioxide (NO2) turbulent flux (no storage correction)			X
FO3	nmolO3 m-2 s-1	Ozone (O3) turbulent flux (no storage correction)			X
H2O	mmolH2O mol-1	Water (H2O) vapor in mole fraction of wet air		X	
H2O_MIXING_RATIO	mmolH2O mol-1	Water (H2O) vapor in mole fraction of dry air		X	
H2O_SIGMA	mmolH2O mol-1	Standard deviation of water vapor mole fraction			X
N2O	nmolN2O mol-1	Nitrous Oxide (N2O) mole fraction in wet air			X

N2O_MIXING_RATIO	nmolN2O mol-1	Nitrous Oxide (N2O) in mole fraction of dry air			X
NO	nmolNO mol-1	Nitric oxide (NO) mole fraction in wet air			X
NO2	nmolNO2 mol-1	Nitrogen dioxide (NO2) mole fraction in wet air			X
O3	nmolO3 mol-1	Ozone (O3) mole fraction in wet air			X
SC	µmolCO2 m-2 s-1	Carbon Dioxide (CO2) storage flux	A5*		
SCH4	nmolCH4 m-2 s-1	Methane (CH4) storage flux			X
SN2O	nmolN2O m-2 s-1	Nitrous oxide (N2O) storage flux			X
SNO	nmolNO m-2 s-1	Nitric oxide (NO) storage flux			X
SNO2	nmolNO2 m-2 s-1	Nitrogen dioxide (NO2) storage flux			X
SO2	nmolSO2 mol-1	Sulfur Dioxide (SO2) mole fraction in wet air			X
SO3	nmolO3 m-2 s-1	Ozone (O3) storage flux			X
Heat Fluxes variables					
G	W m-2	Soil heat flux		X	
H	W m-2	Sensible heat turbulent flux (no storage correction)	X		
LE	W m-2	Latent heat turbulent flux (no storage correction)	X		
SB	W m-2	Heat storage flux in biomass			X
SG	W m-2	Heat storage flux in the soil above the soil heat fluxes measurement			X
SH	W m-2	Sensible heat (H) storage flux		X*	
SLE	W m-2	Latent heat (LE) storage flux		X*	
Quality Check Flags					
FC_SSITC_TEST	nondimensional	Results of the quality flagging for FC according to Foken et al 2004, based on a combination of Steady State and Integral Turbulence Characteristics tests by Foken and Wichura (1996) (i.e., 0, 1, 2)		X	
FCH4_SSITC_TEST	nondimensional	Results of the quality flagging for FCH4 according to Foken et al 2004, based on a combination of Steady State and Integral Turbulence Characteristics tests by Foken and Wichura (1996) (i.e., 0, 1, 2)			X
FN2O_SSITC_TEST	nondimensional	Results of the quality flagging for FN2O according to Foken et al 2004, based on a combination of Steady State and Integral Turbulence Characteristics tests by Foken and Wichura (1996) (i.e., 0, 1, 2)			X

FNO_SSITC_TEST	nondimensional	Results of the quality flagging for FNO according to Foken et al 2004, based on a combination of Steady State and Integral Turbulence Characteristics tests by Foken and Wichura (1996) (i.e., 0, 1, 2)			X
FNO2_SSITC_TEST	nondimensional	Results of the quality flagging for FNO2 according to Foken et al 2004, based on a combination of Steady State and Integral Turbulence Characteristics tests by Foken and Wichura (1996) (i.e., 0, 1, 2)			X
FO3_SSITC_TEST	nondimensional	Results of the quality flagging for FO3 according to Foken et al 2004, based on a combination of Steady State and Integral Turbulence Characteristics tests by Foken and Wichura (1996) (i.e., 0, 1, 2)			X
H_SSITC_TEST	nondimensional	Results of the quality flagging for H according to Foken et al 2004, based on a combination of Steady State and Integral Turbulence Characteristics tests by Foken and Wichura (1996) (i.e., 0, 1, 2)		X	
LE_SSITC_TEST	nondimensional	Results of the quality flagging for LE according to Foken et al 2004, based on a combination of Steady State and Integral Turbulence Characteristics tests by Foken and Wichura (1996) (i.e., 0, 1, 2)		X	
TAU_SSITC_TEST	nondimensional	Results of the quality flagging for TAU according to Foken et al 2004, based on a combination of Steady State and Integral Turbulence Characteristics tests by Foken and Wichura (1996) (i.e., 0, 1, 2)		X	
Footprint variables					
FETCH_70	m	Distance at which cross-wind integrated footprint cumulative probability is 70%		X	
FETCH_80	m	Distance at which cross-wind integrated footprint cumulative probability is 80%		X	
FETCH_90	m	Distance at which cross-wind integrated footprint cumulative probability is 90%		X	
FETCH_FILTER	nondimensional	Footprint quality flag (i.e., 0, 1): 0 and 1 indicate data measured when wind coming from direction that should be discarded and kept, respectively		X	

FETCH_MAX	m	Distance at which cross-wind integrated footprint contribution is maximum		X	
Atmospheric Meteorological variables					
PA	kPa	Atmospheric pressure		X	
PBLH	m	Planetary boundary layer height			X
RH	%	Relative humidity, range 0-100	A1		
T_SONIC	deg C	Sonic temperature		X	
T_SONIC_SIGMA	deg C	Standard deviation of sonic temperature			X
TA	deg C	Air temperature	X		
VPD	hPa	Vapor Pressure Deficit	A1		
Precipitation Meteorological variables					
D_SNOW	cm	Snow depth		X	
P	mm	Precipitation		X	
P_RAIN	mm	Rainfall		X	
P_SNOW	mm	Snowfall			X
RUNOFF	mm	Run off			X
STEMFLOW	mm	Excess precipitation that drains from outlying branches and leaves and is channeled through the stems to the ground			X
THROUGHFALL	mm	Excess precipitation that passes directly through a canopy or drips from wet leaves to the ground			X
TSN	deg C	Snow temperature			X
Radiation Meteorological variables					
ALB	%	Albedo, range 0-100			X
APAR	µmolPhoton m-2 s-1	Absorbed PAR			X
EVI	nondimensional	Enhanced Vegetation Index			X
FAPAR	%	Fraction of absorbed PAR, range 0-100			X
FIPAR	%	Fraction of intercepted PAR, range 0-100			X
LW_BC_IN	W m-2	Longwave radiation, below canopy incoming			X
LW_BC_OUT	W m-2	Longwave radiation, below canopy outgoing			X
LW_IN	W m-2	Longwave radiation, incoming		X	
LW_OUT	W m-2	Longwave radiation, outgoing		X	
MCRI	nondimensional	Carotenoid Reflectance Index (Gitelson et al., 2002)			X

MTCI	nondimensional	Meris Terrestrial Chlorophyll Index (Dash and Curran, 2004)			X
NDVI	nondimensional	Normalized Difference Vegetation Index			X
NETRAD	W m-2	Net radiation		X	
NIRV	W m-2 sr-1 nm-1	Near Infrared Vegetation Index (Badgley et al., 2017)			X
PPFD_BC_IN	µmolPhoton m-2 s-1	Photosynthetic photon flux density, below canopy incoming		X	
PPFD_BC_OUT	µmolPhoton m-2 s-1	Photosynthetic photon flux density, below canopy outgoing		X	
PPFD_DIF	µmolPhoton m-2 s-1	Photosynthetic photon flux density, diffuse incoming		X	
PPFD_DIR	µmolPhoton m-2 s-1	Photosynthetic photon flux density, direct incoming		X	
PPFD_IN	µmolPhoton m-2 s-1	Photosynthetic photon flux density, incoming	A2		
PPFD_OUT	µmolPhoton m-2 s-1	Photosynthetic photon flux density, outgoing		X	
PRI	nondimensional	Photochemical Reflectance Index			X
R_UVA	W m-2	UVA radiation, incoming			X
R_UVB	W m-2	UVB radiation, incoming			X
REDCI	nondimensional	Red Edge Chlorophyll Index			X
REP	nm	Red Edge Position (Dash and Curran, 2004)			X
SPEC_NIR_IN	W m-2 nm-1	Radiation (near infra-red band), incoming			X
SPEC_NIR_OUT	W m-2 sr-1 nm-1	Radiation (near infra-red band), outgoing			X
SPEC_NIR_REFL	nondimensional	Reflectance (near infra-red band)			X
SPEC_PRI_REF_IN	W m-2 nm-1	Radiation for PRI reference band (e.g., 570 nm), incoming			X
SPEC_PRI_REF_OUT	W m-2 sr-1 nm-1	Radiation for PRI reference band (e.g., 570 nm), outgoing			X
SPEC_PRI_REF_REFL	nondimensional	Reflectance for PRI reference band (e.g., 570 nm)			X
SPEC_PRI_TGT_IN	W m-2 nm-1	Radiation for PRI target band (e.g., 531 nm), incoming			X
SPEC_PRI_TGT_OUT	W m-2 sr-1 nm-1	Radiation for PRI target band (e.g., 531 nm), outgoing			X
SPEC_PRI_TGT_REFL	nondimensional	Reflectance for PRI target band (e.g., 531 nm)			X
SPEC_RED_IN	W m-2 nm-1	Radiation (red band), incoming			X
SPEC_RED_OUT	W m-2 sr-1 nm-1	Radiation (red band), outgoing			X
SPEC_RED_REFL	nondimensional	Reflectance (red band)			X
SR	nondimensional	Simple Ratio			X
SW_BC_IN	W m-2	Shortwave radiation, below canopy incoming			X

SW_BC_OUT	W m-2	Shortwave radiation, below canopy outgoing			X
SW_DIF	W m-2	Shortwave radiation, diffuse incoming		X	
SW_DIR	W m-2	Shortwave radiation, direct incoming		X	
SW_IN	W m-2	Shortwave radiation, incoming	A2		
SW_OUT	W m-2	Shortwave radiation, outgoing		X	
TCARI	nondimensional	Transformed Chlorophyll Absorption in Reflectance Index			X
Soil Meteorological variables					
SWC	%	Soil water content (volumetric), range 0-100		X	
SWP	kPa	Soil water potential			X
TS	deg C	Soil temperature		X	
WTD	m	Water table depth		X	
Water bodies Meteorological variables					
TW	deg C	Water temperature		X	
PPFD_UW_IN	µmolPhotons m-2 s-	Photosynthetic photon flux density, underwater, incoming		X	
COND_WATER	µS cm-1	Conductivity (i.e., electrical conductivity) of water		X	
PCO2	µmolCO2 mol-1	Dissolved carbon dioxide (CO2) in water		X	
PCH4	nmolCH4 mol-1	Dissolved methane (CH4) in water			X
PN2O	nmolN2O mol-1	Dissolved nitrous oxide (N2O) in water			X
DO	µmol L-1	Dissolved oxygen in water			X
Wind related Meteorological and Fluxes variables					
MO_LENGTH	m	Monin-Obukhov length		X	
TAU	kg m-1 s-2	Momentum flux	A3		
U_SIGMA	m s-1	Standard deviation of velocity fluctuations (towards main-wind direction after coordinates rotation)			X
USTAR	m s-1	Friction velocity	A3		
V_SIGMA	m s-1	Standard deviation of lateral velocity fluctuations (cross main-wind direction after coordinates rotation)		X	
W_SIGMA	m s-1	Standard deviation of vertical velocity fluctuations		X	
WD	Decimal degrees	Wind direction		X	
WS	m s-1	Wind speed		X	
WS_MAX	m s-1	maximum WS in the averaging period			X
ZL	nondimensional	Monin-Obukhov Stability parameter		X	

Biological continuous variables					
DBH	cm	Diameter of tree measured at breast height (1.3m) with continuous dendrometers			X
LEAF_WET	%	Leaf wetness, range 0-100			X
SAP_DT	deg C	Difference of probes temperature for sapflow measurements			X
SAP_FLOW	mmolH2O m-2 s-1	Sap flow			X
T_BOLE	deg C	Bole temperature			X
T_CANOPY	deg C	Temperature of the canopy and\/or surface underneath the sensor			X