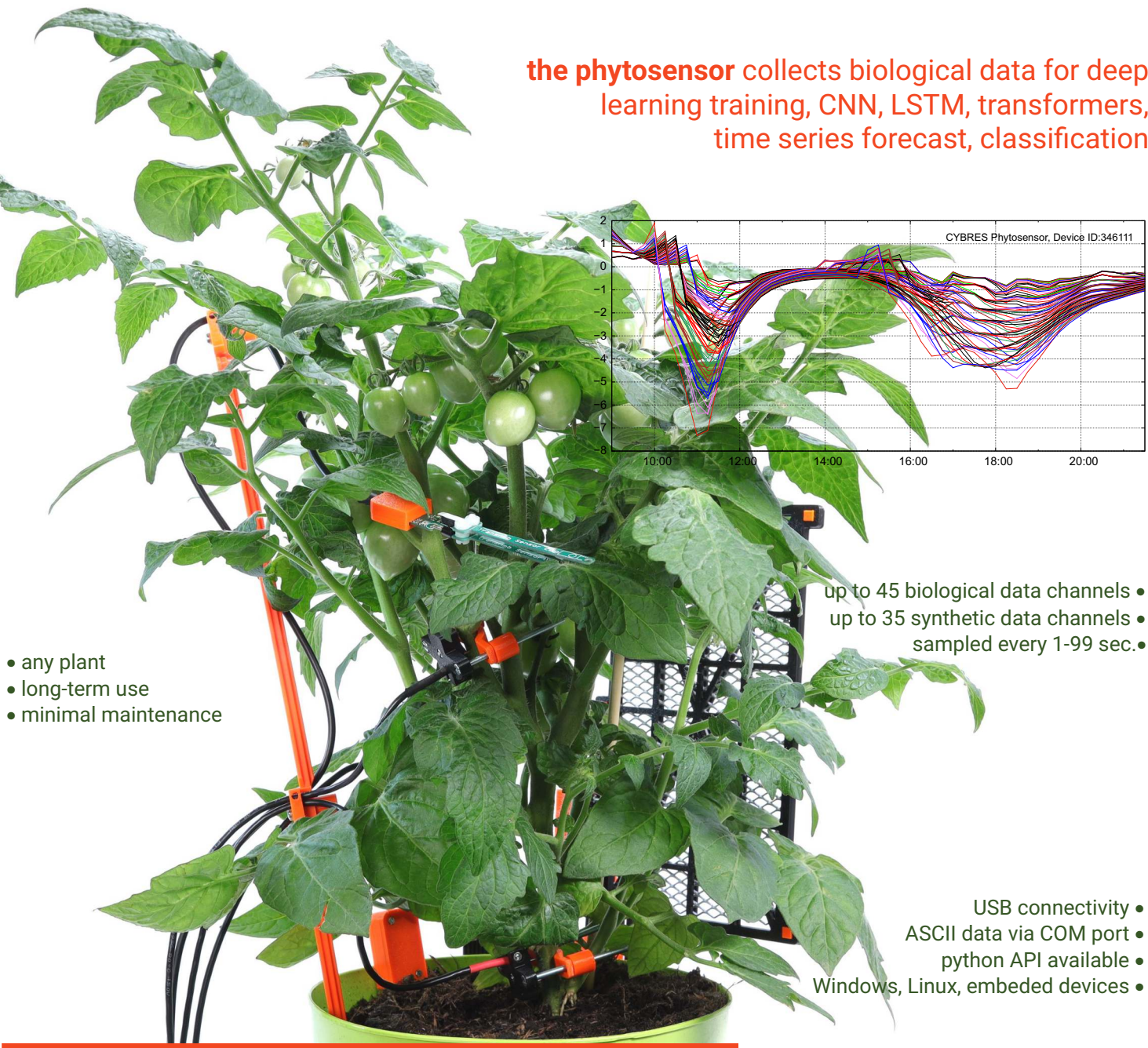


“Biological mini-lab” for AI applications

the **phytosensor** collects biological data for deep learning training, CNN, LSTM, transformers, time series forecast, classification



- any plant
- long-term use
- minimal maintenance

- up to 45 biological data channels •
- up to 35 synthetic data channels •
- sampled every 1-99 sec. •

- USB connectivity •
- ASCII data via COM port •
- python API available •
- Windows, Linux, embeded devices •

Measured Biological Parameters*

read more

Advanced Phytosensing System, short description



parameters	description
phytosensing	
tissue impedance, ionic content	differential, 4x Ag99 electrodes, 0.01-1V excitation
electrochemical imp. spectroscopy (EIS)	time-frequencyEIS, fast EIS for in-situ sap analysis
biopotentials	differential, 4x Ag99 electrodes, input impedance/current 10^{-15} Ohm, ± 70 pA
leaf transpiration	differential air-humidity-based method, CYBRES
leaf temperature	precision LM35 sensor, Texas Instruments, optional
thermal sap flow	heat-balance and heat-pulse, 3x t-sensing, PID stabilized, CYBRES, optional
electrochemical sap flow	4x electrode method, CYBRES, included in EIS sensors
wet green biomass	dielectric spectroscopy, 0.5-3 MHz, CYBRES
root biomass and irrigation (RBI)	dielectric spectroscopy, 0.5-3 MHz, CYBRES
chlorophyll content	excitation spectroscopy, fluorometry 430nm
photosynthates vs ionic fluids	EIS-based analysis, CYBRES, included in EIS sensors
soil moisture, RBI, temperature	capacitive-based sensor, CYBRES
canopy	photosynthetically active radiation (PAR), spectral reflectance (SRS), optional
fluid/tissues	portable nuclear magnetic resonance sensor (EF-NMR), in validation
environmental sensing	
light, humidity, temperature	APDS-9008-020, HIH-5031-001, LM35CA
EM emission	450Mhz-2.5Ghz RF power meter, MAX2204
magnetometer	3-axis, LIS3MDL
CO ₂ , PM1-2.5-10, O ₃	SCD4x, accuracy $\pm(40\text{ppm}+5\%)$; SPS30, accuracy 10%, CENSIRION
I2C sensors	different digital external sensors
water sensors	e.g. conductivity, pH, dissolved oxygen, etc. optional, external electrodes
(phyto-)actuation	
220V/110V	ON-OFF, 4 channels, up to 3kW
12V-48V	ON-OFF, PWM, 2 channels, up to 10A
analytic tools	
real-time (synthetic data channel)	regression/spectral/correlation/statistics, 35 synthetic channels, DA engine
post-measurement	ASCII data, any external analytic tools