New Sensors for Waspmote Plug & Sense! Smart Water Xtreme

Table 1: Parameters, units, ranges, resolutions and accuracies of every sensor

Sensor name	Parameters	Units	Range	Resolution	Accuracy
Aqualabo OPTOD	Temperature	degrees Celsius	0,00 to + 50,00 ºC	0,01 ºC	± 0,5 °C
	Oxygen	% saturation	0,0 to 200,0 % SAT	0,1	± 1 %
		mg/L	0,00 to 20,00 mg/L	0,01	± 0,1 mg/L
		Ppm	0,00 to 20,00 ppm	0,01	±0,1 ppm
Aqualabo PHEHT	Temperature	degrees Celsius	0,00 to + 50,00 ºC	0,01 ºC	± 0,5 °C
	pH	pH	0,00 to 14,00 pH	0,01 pH	± 0,1 pH
	Redox (ORP)	mV	- 1000,0 to + 1000,0 mV	0,1mV	± 2 mV
	pH	mV	-	-	-
Aqualabo C4E	Temperature	degrees Celsius	0,00 to + 50,00 ºC	0,01 ºC	± 0,5 °C
	Conductivity	µS/cm	4 ranges to choose (or automatic): 0-200,0 µS/cm 0 –2000 µS/cm 0,00 –20,00 mS/cm 0,0 –200,0 mS/cm Automatic	0,01 to 1 according the range	± 1 % full range
	Salinity	Ppt = g/Kg	5-60 g/Kg	0,01 to 1 according the range	± 1 % full range
	TDS – Kcl (Total dissolved solids)	ppm	0-133 000 ppm		
Aqualabo NTU	Temperature	degrees Celsius	0,00 to + 50,00 ºC	0,01 ºC	± 0,5 °C
	Nephelometric Turbidity	NTU	0-4000 NTU 4 ranges to choose for Parameters 1 and 2 (or automatic): - range 1: 0 / 50 NTU (FNU) - range 2: 0 / 200 NTU (FNU) - range 3: 0 / 1000 NTU (FNU) - range 4: 0 / 4000 NTU (FNU) -Automatic	0,01 to 1 NTU – mg/L	± < 5 % full range Range 1: ±2,5NTU Range 2: ±10NTU Range 3: ±50 NTU Range 4: ±200NTU
		FNU (1 FNU = 1 NTU)	Same ranges than the previous parameter		
	SS (Suspended Solids)	mg/L	0 to 4500 mg/L		

Sensor name	Parameters	Units	Range	Resolution	Accuracy
Aqualabo CTZN	Temperature	degrees Celsius	0,00 to + 50,00 °C	0,01 °C	± 0,5 °C
	Conductivity	mS/cm	0,0 –100,0 mS/cm	0,1 mS/cm	Check dependency tables
	Salinity	Ppt = g/Kg	0-78 g/Kg	0,1 mS/cm	
	Conductivity not compensated with temperature	mS/cm	0,0 –100,0 mS/cm	0,1 mS/cm	
Aqualabo MES 5	Temperature	degrees Celsius	0,00 to + 50,00 °C	0,01 °C	± 0,5 °C
	Sludge blanket	%	0-100 %	0.01 to 0.1 %	0,02
	SS (Suspended Solids)	g/L	0-50 g/L	0.01 g/L	<10%
	Turbidity	FAU	0-400 FAU	0.01 to 1 FAU	0,05
Eureka Fluorometer: Chlorophyll a - blue	Chlorophyll a - blue	µg/l	0 to 500 µg/l	6 digits with maximum of two decimals	linearity of 0.99R²
Eureka Fluorometer: Chlorophyll a - red	Chlorophyll a - red	µg/l	> 500 µg/l	6 digits with maximum of two decimals	linearity of 0.99R²
Eureka Fluorometer: Phycocyanin (freshwater BGA)	Phycocyanin (freshwater BGA)	ppb	0 to 40,000 ppb	6 digits with maximum of two decimals	linearity of 0.99R²
Eureka Fluorometer: Phycoerythrin (marine BGA)	Ammonium	ppb	0 to 750 ppb	6 digits with maximum of two decimals	linearity of 0.99R²
Eureka Fluorometer: CDOM/fDOM	CDOM/fDOM (Colored Dissolved Organic Matter/ Fluorescent Dissolved Organic Matter)	ppb	0 to 1250 or 0 to 5000 ppb	6 digits with maximum of two decimals	linearity of 0.99R²
Eureka Ion-selective electrodes (ISE's): Ammonium	Ammonium	mg/l	0 to 100 mg/l as nitrogen	0.1	5% or 2 mg/l
Eureka Ion-selective electrodes (ISE's): Nitrate	Nitrate	mg/l	0 to 100 mg/l as nitrogen	0.1	5% or 2 mg/l
Eureka Ion-selective electrodes (ISE's): Chloride	Chloride	mg/l	0 to 18,000 mg/l	0.1	5% or 2 mg/l
Eureka Ion-selective electrodes (ISE's): Sodium	Sodium	mg/l	0 to 20,000 mg/l	0.1	5% or 2 mg/l
Eureka Ion-selective electrodes (ISE's): Calcium	Calcium	mg/l	0 to 40,000 mg/l	0.1	5% or 2 mg/l

Table 2: Applications and measuring principles

Sensor name	Parameters	Applications	Measuring principle
Aqualabo OPTOD	Temperature Oxygen	- Industrial and municipal sewage treatment plants - Wastewater management (nitrification and de-nitrification) - Surface water monitoring - Fish farming, aquaculture - Drinking water monitoring	Optical measure by luminescence technology
Aqualabo PHEHT	Temperature pH Redox (ORP) pH	- Industrial and municipal sewage treatment plants - Wastewater management (nitrification and de-nitrification) - Surface water monitoring - Drinking water monitoring	ORP: Platinum electrode - Ag/AgCl reference PH: plasticized PONSEL PLAS-TOGEL®. Electrolyte – Ag/AgCl reference
Aqualabo C4E	Temperature Conductivity Salinity TDS – Kcl (Total dissolved solids)	- Industrial and municipal sewage treatment plants - Wastewater management (nitrification and de-nitrification)* - Surface water monitoring - Drinking water monitoring	Electrochemical conductivity sensor with 4 electrodes (2 graphite, 2 platinum)
Aqualabo NTU	Temperature Nephelometric Turbidity SS (Suspended Solids)	- Urban wastewater treatment (inlet/ outlet controls) - Sanitation network - Industrial effluent treatment - Surface water monitoring - Drinking water	Nephelometry: Optical IR (850 nm) sensor based on IR diffusion at 90 degrees
Aqualabo CTZN	Temperature Conductivity Salinity Conductivity not compensated with tempera-ture	- Urban wastewater treatment - Industrial effluent treatment - Surface water monitoring - Sea water - Fish farming	Inductive conductivity sensor regulated in temperature
Aqualabo MES 5	Temperature Sludge blanket SS (Suspended Solids) Turbidity	- Urban Waste water treatment (Inlet/ sewa-ge water (SS, Turbidity), Aeration basin (SS), Outlet (Turbidity). - Treatment of industrial effluents (Aeration b asin (SS)), Clarifier (Sludge blanket), Outlet (Turbidity) - Sludge treatment (Centrifugation) - Dredging site (turbidity)	Absorptometry: Optical IR (870 nm) sensor based on IR absorption at 180 degrees
Eureka Fluorometer: Chlorophyll a - blue	Chlorophyll a - blue	- lakes, rivers, ground water... - oceanographic - process waters - waste waters - laboratory research	Turner Designs fluorometric sensors, with each tuned to the slightly different wavelengths. Fluorometric sensors emit light at a certain wavelength, and look for a very specific, different wavelen-gth in return. The magnitude of the return light is relatable to the amount of analyte present.

Sensor name	Parameters	Applications	Measuring principle
Eureka Fluorometer: Chlorophyll a - red	Chlorophyll a - red	- lakes, rivers, ground water... - oceanographic - process waters - waste waters - laboratory research	Turner Designs fluorometric sensors, with each tuned to the slightly different wavelengths. Fluorometric sensors emit light at a certain wavelength, and look for a very specific, different wavelength in return. The magnitude of the return light is relatable to the amount of analyte present.
Eureka Fluorometer: Phycocyanin (freshwater BGA)	Phycocyanin (freshwater BGA)	- lakes, rivers, ground water... - oceanographic - process waters - waste waters - laboratory research	Turner Designs fluorometric sensors, with each tuned to the slightly different wavelengths. Fluorometric sensors emit light at a certain wavelength, and look for a very specific, different wavelength in return. The magnitude of the return light is relatable to the amount of analyte present.
Eureka Fluorometer: Phycoerythrin (marine BGA)	Ammonium	- lakes, rivers, ground water... - oceanographic - process waters - waste waters - laboratory research	Turner Designs fluorometric sensors, with each tuned to the slightly different wavelengths. Fluorometric sensors emit light at a certain wavelength, and look for a very specific, different wavelength in return. The magnitude of the return light is relatable to the amount of analyte present.
Eureka Fluorometer: CDOM/fDOM	CDOM/fDOM (Colored Dissolved Organic Matter/ Fluorescent Dissolved Organic Matter)	- lakes, rivers, ground water... - oceanographic - process waters - waste waters - laboratory research	Turner Designs fluorometric sensors, with each tuned to the slightly different wavelengths. Fluorometric sensors emit light at a certain wavelength, and look for a very specific, different wavelength in return. The magnitude of the return light is relatable to the amount of analyte present.
Eureka Ion-selective electrodes (ISE's): Ammonium	Ammonium	- lakes, rivers, ground water... - oceanographic - process waters - waste waters - laboratory research	Membrane that is selective for the analyte of ammonium. The electrode's filling solution contains a salt of the analyte, and the difference between that salt's concentration and the analyte concentration in the measured water produces a charge separation. That charge separation is measured, relative to the reference electrode, as a voltage that changes predictably with changes in the analyte concentration in the water adjacent the membrane.

Sensor name	Parameters	Applications	Measuring principle
Eureka Ion-selective electrodes (ISE's): Nitrate	Nitrate	- lakes, rivers, ground water... - oceanographic - process waters - waste waters - laboratory research	Membrane that is selective for the analyte of nitrate. The electrode's filling solution contains a salt of the analyte, and the difference between that salt's concentration and the analyte concentration in the measured water produces a charge separation. That charge separation is measured, relative to the reference electrode, as a voltage that changes predictably with changes in the analyte concentration in the water adjacent the membrane.
Eureka Ion-selective electrodes (ISE's): Chloride	Chloride	- lakes, rivers, ground water... - oceanographic - process waters - waste waters - laboratory research	Membrane that is selective for the analyte of chloride. The electrode's filling solution contains a salt of the analyte, and the difference between that salt's concentration and the analyte concentration in the measured water produces a charge separation. That charge separation is measured, relative to the reference electrode, as a voltage that changes predictably with changes in the analyte concentration in the water adjacent the membrane.
Eureka Ion-selective electrodes (ISE's): Sodium	Sodium	- lakes, rivers, ground water... - oceanographic - process waters - waste waters - laboratory research	Membrane that is selective for the analyte of sodium. The electrode's filling solution contains a salt of the analyte, and the difference between that salt's concentration and the analyte concentration in the measured water produces a charge separation. That charge separation is measured, relative to the reference electrode, as a voltage that changes predictably with changes in the analyte concentration in the water adjacent the membrane.
Eureka Ion-selective electrodes (ISE's): Calcium	Calcium	- lakes, rivers, ground water... - oceanographic - process waters - waste waters - laboratory research	Membrane that is selective for the analyte of calcium. The electrode's filling solution contains a salt of the analyte, and the difference between that salt's concentration and the analyte concentration in the measured water produces a charge separation. That charge separation is measured, relative to the reference electrode, as a voltage that changes predictably with changes in the analyte concentration in the water adjacent the membrane.