

## RAMSES

40SXXX010



### Spectral imaging radiometer to measure radiance or irradiance in UV, VIS and UV/VIS

RAMSES radiometers are spectral imaging radiometers to measure radiance, irradiance, or scalar irradiance in the UV, VIS and UV/VIS ranges. Thanks to their ultra small size and weight as well as very low power consumption, they are especially suitable for hand-held and autonomous applications. RAMSES radiometers combine precision hyperspectral light measurements with a maximum of flexibility. The modular system increases cost-effectiveness, while the many accessories and special solutions enable a wide range of applications such as installation on ships, handheld usage or autonomous measurements in remote places, like the Arctic or Antarctica.

#### Benefits

- Extremely low power consumption
- Environmentally robust
- World market leader

#### Applications

- Water quality
- Field measurements
- Satellite validation
- Biology
- Photosynthesis
- Color measurements
- Climate research



Frame 1



Frame 2



Frame 3

# RAMSES

## Technical Specifications

<b>Measurement technology</b>	detector	High-end miniature spectrometer 256 Channels
<b>Measurement principle</b>		Radiance or irradiance
<b>Parameter</b>		See parameter list p. 3
<b>Measuring range</b>		See parameter list p. 3
<b>Measurement accuracy</b>		See parameter list p. 3
<b>Data logger</b>		-
<b>T100 response time</b>		min. 16 s (burst mode)
<b>Measurement interval</b>		min. 8 s (burst mode)
<b>Housing material</b>		Stainless steel (1.4571/1.4404) or titanium (3.7035), POM
<b>Dimensions (L x Ø)</b>		ACC 260 mm x 48 mm ASC 245 mm x 48 mm ARC 300 mm x 48 mm
<b>Weight</b>	stainless steel	0.9 kg
	titanium	0.7 kg
<b>Interface</b>	digital	RS-232 (TriOS)
<b>Power consumption</b>		≤ 0.85 W
<b>Power supply</b>		8...12 VDC (± 3 %)
<b>Maintenance effort</b>		≤ 0.5 h/month (typical)
<b>Calibration/maintenance interval</b>		24 months
<b>System compatibility</b>		RS-232 (TriOS protocol)
<b>Warranty</b>	1 year (EU: 2 years)	US: 2 years
<b>INSTALLATION</b>		
<b>Max. pressure</b>	with SubConn	30 bar ~ 435 psig
<b>Protection type</b>		IP68 NEMA 6P
<b>Sample temperature</b>		+2...+40 °C ~ +36 °F to +104 °F
<b>Ambient temperature</b>		+2...+40 °C ~ +36 °F to +104 °F
<b>Storage temperature</b>		-20...+80 °C ~ -4 °F to +176 °F
<b>Inflow velocity</b>		0.1...10 m/s ~ 0.33 fps to 33 fps

## RAMSES PARAMETER LIST

	ACC	ARC	ASC		
	UV	UV/VIS	VIS	VIS	VIS
<b>Wavelength range* [nm]</b>	280...500	280...720	320...950	320...950	320...950
<b>Detector*</b>					
			256 channel silicon photo diode array		
<b>Pixel dispersion* [nm/pixel]</b>	2.2	2.2	3.3	3.3	3.3
<b>Wavelength accuracy*</b>	0.2	0.2	0.3	0.3	0.3
<b>Usable channels</b>	100	200	190	190	190

	ACC-UV	ACC-VIS	ARC-VIS	ASC-VIS
	UV A / UV B irradiance	VIS irradiance	VIS radiance	VIS scalar irradiance
<b>Wavelength range*</b>	280...500 nm		320...950 nm	
<b>Typical saturation (IT: 4 ms)**</b>	20 W m <sup>-2</sup> nm <sup>-1</sup> (at 300 nm) 17 W m <sup>-2</sup> nm <sup>-1</sup> (at 360 nm) 18 W m <sup>-2</sup> nm <sup>-1</sup> (at 500 nm)	10 W m <sup>-2</sup> nm <sup>-1</sup> (at 400 nm) 8 W m <sup>-2</sup> nm <sup>-1</sup> (at 500 nm) 14 W m <sup>-2</sup> nm <sup>-1</sup> (at 700 nm)	1 W m <sup>-2</sup> nm <sup>-1</sup> sr <sup>-1</sup> (at 500 nm)	20 W m <sup>-2</sup> nm <sup>-1</sup> (at 400 nm) 12 W m <sup>-2</sup> nm <sup>-1</sup> (at 500 nm) 15 W m <sup>-2</sup> nm <sup>-1</sup> (at 700 nm)
<b>Typical NEI (IT: 8 s)**</b>	0.85 µW m <sup>-2</sup> nm <sup>-1</sup> (at 300 nm) 0.75 µW m <sup>-2</sup> nm <sup>-1</sup> (at 360 nm) 0.80 µW m <sup>-2</sup> nm <sup>-1</sup> (at 500 nm)	0.4 µW m <sup>-2</sup> nm <sup>-1</sup> (at 400 nm) 0.4 µW m <sup>-2</sup> nm <sup>-1</sup> (at 500 nm) 0.6 µW m <sup>-2</sup> nm <sup>-1</sup> (at 700 nm)	0.25 µW m <sup>-2</sup> nm <sup>-1</sup> sr <sup>-1</sup>	0.8 µW m <sup>-2</sup> nm <sup>-1</sup> (at 400 nm) 0.6 µW m <sup>-2</sup> nm <sup>-1</sup> (at 500 nm) 0.8 µW m <sup>-2</sup> nm <sup>-1</sup> (at 700 nm)
<b>Collector type</b>	cosine response		FOV: 7° in air	Spherical, 2 Pi
<b>Accuracy</b>	Better than 6-10 % ***		Better than 6 % ***	Better than 5 % ***
<b>Integration time</b>	4 ms...8 s			

\*) Specifications of Carl ZEISS AG, Germany

\*\*) IT: integration time

\*\*\*) Depends on wavelength range