High precision multiband infrared radiometer CLIMAT CE312

Good cost-efficiency ratio for excellent performance

The CE312 Infrared radiometer CLIMAT (*) is the benchmark precision instrument for measurements of spectral luminance in 4 to 6 thermal InfraRed bands

Thanks to differential measurement principle, it performs radiation highly accurate measurements. It is insensitive to environmental variations (temperature, radiations). It provides real time spectral luminance and brightness temperatures

The CE312 is a portable field instrument particularly suitable for thermal measurements during ground or atmosphere campaigns in the field and for continuous operation with robotized pointing within an observation network.

(*) Acronyme for Conveyable Low-noise Infrared radiometer for Measurements of Atmosphere and ground surface Targets.

APPLICATIONS

The CE312 radiometer is the benchmark scientific instrument for many demanding applications for accurate measurement of brightness temperature

- Validation of satellite-borne (AVHRR, ASTER,…) or airborne sensors
- Ground surface characterization (agronomy, geology…)Measurement of the ground surface temperatures
- Study of desert aerosols, cirrus and arctic cirrus
- Characterization of coarse aerosols (in colocation with CE318 photometer)

USER'S BENEFITS

Reliability and stability of the measurements

- High precision: 0,1°C
- Large temperature range : -100°C to +60°C
- Narrow strictly-defined field of view (10°)
- Long-life measurements stability even in harsh climatic conditions
- Measurement time : 1 s per band

Operation reliability

- No sensitivity to vibrations or climatic conditions
- High robustness and corrosion resistance (expected life-time more than 10 years)
- No maintenance

Flexibility of use

- **Autonomous**: operates without any human attendance in a complete automated way with its own solar generator
- **Practical**: Real time display of spectral luminances and brightness temperatures
- **Multi-tasks**: suitable for both long-term installation for observation networks and for measurement field campaign
- **Portable** : components are compact, light, easy to move in a hard case

TECHNOLOGY

MicroAmps® technology

The CE312 radiometer IR has been designed using all the MicroAmps® technologies that are specific to Cimel, in accordance to very demanding yet complementary requirements:

- Minimize electrical power consumption
- Use secure, highly redundant communications protocols
- Maximize the versatility of printed circuit boards
- Minimize the number of connectors

These MicroAmps® technologies result in CE312 radiometer exceptional performances widely proven under any sort of climate, in terms of operating reliability.

Optical head

- It includes a detector that covers the entire spectral band from 8µm to 14µm and three narrower filters (from 8.2µm to 12.5µm)
- The detector has an optical line-of-site channel with a narrow, strictly-defined field of view
- A motor-driven filter wheel positions up to five accurate monoband filters in turn
- The detector is silicon thermopile highly sensitive, low-noise, resistant to changes in temperature
- A gold coated mirror, mounted on a second wheel, retrieves to the detector its own thermal picture for internal radiation measurement
- A precision probe measures the detector temperature that is referenced
- Power supply by an external battery or by its charger block

OPERATION

Optical head

The CE312 InfraRed radiometer is mounted on a dual axis robotized mount, its optical head pointed toward the sky (Measurement performed by LOA in Lilles -France)

It performs automatic measurement scenarios of the differential radiation between the target and the reference mirror

Display box

It ensures the power supply to the optical head and the transmission between the head and the PC

Software functions:

- Configuration of measurement scenarios (filters, frequencies, self-calibrations…)
- Measurements are possible manually (no scenario)
- Real time determination of the brightness luminance and brightness temperature
- Raw and processed data real time recording on the PC
- Possibility of data export for post-processing

- ***In option***: the head can be mounted on a one or two axis robot (see below options) to automate:
- Multi targets measurement
- Blocking the aperture in case of bad weather

CHARACTERISTICS

	Features	*Value*
Measurement	Resolution	0.01°C
	Accuracy	0.1°
	Response time	1s
	Repeatability	>99.65%
	IFOV	10°
	Calibration	Provided with the instrument
Détector	Type	Silicon Thermopile
	Size	0.6 mm x 0.6mm
	Noise voltage	38nV $Hz^{-1/2}$
	Responsivity	120W m^{-2}
	Detectivity	1.6x 10^8 cm $Hz^{-1/2}/W^{-1}$
	Time constant	12 ms
Filters	Steep pass band filter	
	Out of band Optical density.	OD 3
Spectral bands	Canal W	8-14µm
	Canal N12	11.50-12.50µm
	Canal N11	10.30-11.30µm
	Canal N9	8.20-9.20µm
Output signal	RS-232	
	Or current loop	
Power	Display box batteries	Reloaded via electric power
Environment	Temperature	From -20° to +50°
Système informatique	PC type EeePC Windows already set up	
	AstpWIN software with radiometer application	
	Free download at: www.cimel.fr	
	Data transfer	
Housing	Head	Ø = 80 mm x 250 mm Weight = < 1kg
	Measurement cable	3 m link between the head and the interface box
	Interface box	With power supply block
	Link to PC	See output options

OPTIONS

Band options

Sale reference	*Spectral bands*
CE312-N1	8 à 13 µm (large band) 8.2 à 9.2 µm 10.3 à 11.3 µm
CE312-N2	Adapted to ASTER 8 à 13 µm (large band) 8.1 à 8.5 µm 8.5 à 8.9 µm 8.9 à 9.3 µm 10.3 à 11 µm 11 à 11.7 µm
Other bands	Consult us

Output options

Sales reference	*Connection types*	*Supply*
CE312-L	Current loop with RS-232 compatible connector for connection up to 1000m	Cable kit (3m length)
CE312-MU	Local connection via PC or USB	PC Cable or USB
Extension	For current loop only	Extension cable custom-built

Automation options

Sales reference	*Type*
CE316-A	Two axis automated tracking mount
CE316-A1	One axis automated tracking mount