

CIR-4V

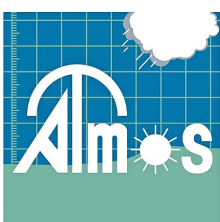


Day and Night ! Cloud cover monitoring

Automated and rugged solution for cloud fraction measurement and ceiling evaluation.

CIR-4V provides :

- Cloud fraction and associated parameters measurement during day and night, with a frequency up to once per minute.
- Transmission at the same rate to any type of remote systems with serial outputs (RS 485) and optionally with voltage outputs.
- Thermal and mechanical protection for the four detectors, with their own ventilation system.



Fields of use for CIR-4V Instrument

Airport activity

For take off and landing clearance ICAO regulation requires cloud cover data in terms of cloud fraction and ceiling. CIR-4V can provide real time data to dispatchers and allow the automatic implementation of cloud data in METAR and SYNOP meteorological messages.



Climatological studies

Up to now cloud data for meteorological forecast are mostly supplied by human observers every 3 hours. This method show a lack of sampling frequency and a lack of repeatability compared to CIR technology.



Solar radiation research

Due to atmospheric pollution and ozone depletion, the energy balance between earth and atmosphere is a growing field of concern and research around the world. This phenomenon has impact with skin cancers and green house effect and is directly linked to the cloud spatial distribution which could be retrieved through CIR-4V data.



Display and storage of data

In the field of the meteorology, most of instruments and data recorders use Terminal emulation software, such as Windows Hyper Terminal. Because of its own embedded CPU, the CIR-4V can integrate data during a predefined period, under master mode or polled mode. The CIR-4V instrument includes several accessories, among which the IHM CIR-4V software, for data retrieval and storage on PC, or still the 26800 data logger, with the aim of displaying cloud fraction state in real-time.



Data produced

The CIR-4V has been designed to be a monitoring instrument which means to have a numerous deployment and with an extremely compact design to ease the integration and avoid costly infrastructures in any automatic weather station. The CIR-4V is based on a passive thermal infrared technology creating no interferences with the environment. Each detector is shielded in a white PVC tube for a natural ventilation and avoid warmings as shown on picture here after.

Each of the four IR sensors provides a brightness temperature following the main geographic direction. This data is computed using a special algorithm designed by ATMOS to determine if the sensor watch a cloud or blue sky and determine an evaluation of the cloud height. The association of these two data allows a view of the cloud spatial distribution.

A time series concept allows determination of the global cloud cover and per cloud attitude class fraction also. As shown by several experimental and numerical studies, the fact to mix data from four detectors provides a much better accuracy in the retrieval of the cloud fraction than the ASOS algorithm applied on data released by a single ceilometer. Several studies around the world showed that satellites provide an interesting macro and meso scale description of the cloud cover but that there is a significant need to optimize them with micro scale observation through instruments like CIR-4.

The CIR-4 due to its static technology has low power consumption and could be used in remote or regular locations.

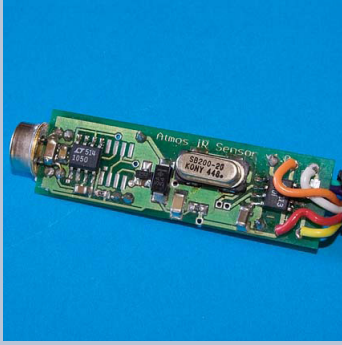
Ventilated pyrometers technology

To improve the protection of sensors against rain, ice, dust and bugs, and to limit solar radiations effects, ATMOS has developed its own ventilated technology for the CIR-4V pyrometers.



The efficiency of ventilated pyrometers could be compared to the accuracy improvement in air temperature measurements with motor aspirated shields.

Technical data



Pyrometric measurement technique has been widely developed for high temperature measurements.
ATMOS developed a rugged technique allowing measurement of low temperature from room temperature up to -50°C.
The ruggedness of the system is also ensured with the use of a mineral optical inlet more environmentally stable than polymeric devices.

Specifications

Nebulosity (cloud fraction)	Range : 0 à 100%	Accuracy : +/-6%
Data output	RS 485 (Full duplex)	
Ceiling Range	Range : 0 - 8000m	Accuracy : +/-6%
Power supply	18-36 VDC (1100 mA)	
Mounting	Several mounting device are available on request	
Baud Rate	38400 bauds, 8 data bits, 1 stop bit, no parity	
Dimensions	400 * 400 * 250 mm	
Data archive	Delimited ASCII strings for numeric data	

CIR-4V on site :

