

CL51 Ceilometer for High-Range Cloud Height Detection

The Vaisala Ceilometer CL51 is designed to measure high-range cirrus cloud heights without surpassing the low and middle layer clouds, or vertical visibility in harsh conditions.

The CL51 employs a pulsed diode laser LIDAR (Light Detection And Ranging) technology, where short, powerful laser pulses are sent out in a vertical or near-vertical direction. The reflection of light (backscatter) caused by clouds, precipitation or other obscuration is analyzed and used to determine the cloud base height.

Measurement from the ground level

The enhanced single lens technology applied in the CL51 ensures excellent performance starting at a height of virtually zero. The signal is strong and stable over the whole measurement range.

The CL51 is able to detect three cloud layers simultaneously. If the cloud base is obscured due to precipitation or ground-based fog, the CL51 reports Vertical Visibility. The CL51 is able to provide the backscatter profile over the full measurement range. This information provides a possibility for an advanced boundary layer and atmospheric analysis.

Designed for harsh weather

The CL51 has a shield with a blower and heater, which allows steady operation in precipitation and under extreme temperatures. Reliable solar protection is ensured by optical filters. A tiltable shield further protects the instrument

from precipitation and specular reflection from ice crystals. The tilt angle measurement and correction is automatic.

Self-diagnostics

In addition to cloud height data, the fully automatic CL51 outputs messages with information on the instrument status. The information is based on comprehensive self-diagnostic routines. In case of a malfunction the diagnostics help the user to identify the failed module.

Maintenance

Periodic maintenance of the CL51 is normally limited to window cleaning. There is no need for adjustments in the field. The automatic window blower with heater improves performance by keeping the window clean and dry. In cold conditions heating prevents frost generation on the window. Any malfunction is automatically reported in the data and status messages.



CL51

Features/Benefits

- Cloud reporting range up to 13 km (43,000 feet)
- Second-generation, advanced single-lens optics with excellent performance also at low altitudes
- Modular design for easy installation and maintenance
- Reliable operation in all weather: unsurpassed performance in precipitation
- Detection of Cirrus clouds
- Backscatter profiling over full range up to 15 km
- Field-proven, fully automatic 24/7 operation in all weather conditions
- Extensive self-diagnostics with fault analysis
- Based on robust and affordable laser diode technology
- Latest technology from the world leading manufacturer - installed base over 5,000 Ceilometers worldwide

Technical data

Performance

Cloud reporting range	0 ... 13 km (0 ... 43,000 ft.)
Backscatter profiling range	0 ... 15 km (0 ... 49,200 ft.)
Reporting cycle	programmable 6 ... 120 s, or polling
Reporting resolution	10 m /33ft, units selectable
Distance measurement accuracy	
against a hard target	greater of $\pm 1\%$ or ± 5 m
Laser	InGaAs diode, 910 nm
Eye safety	Class 1M IEC/EN 60825-1

Electrical

Power (*	100/115/230 VAC $\pm 10\%$, 50 ... 60 Hz max. 310 W incl. heating
Interfaces	
Data	RS232/RS485/Modem
Maintenance	RS232
Bits per second	
RS232/RS485	300 ... 115,200
Modem V.21,V.22,V.22bis	300 ... 2400
Backup battery	Internal, 2Ah

Data messages

Cloud hits (up to 3 layers) and status information
Cloud hits, status and backscatter profile
Emulation of CL31 and LD-40
Sky Condition (optional)

Mechanical

Dimensions	
Total	1531 x 364 x 354 mm
Measurement unit	834 x 266 x 264 mm
Weight	
Total	46 kg
Measurement unit	18.6 kg
Tilt positions	Vertical or 12° tilted
Automatic window blower/heater	
Radiation shield and pedestal	
Service access through a door	
Optical filters for protection against direct sunlight	

Environmental

Temperature range	-55 ... +60 °C (-67 ... +140 °F)
Humidity	0 ... 100 %RH
Wind	55 m/s
Housing classification	IP65
Vibration	Lloyds Register/IEC 60068-2-6
EMC	IEC/EN 61326
Electrical safety	IEC/EN 60950

Accessories and options (*)

Cable termination box Termbox-1200 with extra transient protection
PC maintenance cable QMZ101
Shock absorbing mounting pad CT35022 for ship installations
Modem module DMX501
Attachment mechanics for radio modem antenna CL51RADIOKIT
Graphical User Interface for Ceilometers CL-VIEW
Bird deterrent device CL51BIRDKIT

(* Please specify power and optional accessories when ordering.)

