http://joyce.cloud

# Laser based ceilometer CHM15k-01

Instrument name: Ceilometer-01
Instrument type: CHM15k
Manufacturer: Jenoptik AG www.jenoptik.com
Location: Institute for Geoscience, Section Meteorology, Bonn
Coordinates: Lat: 50.731233° N, Lon: 7.070733° E, Alt: 76 m asl

The Jenoptik ceilometer is a laser-based profiling instrument for measuring backscatter signal from aerosols and hydrometeors. The CHM15k ceilometer is a robust, autonomous and low power LIDAR. From the backscatter profiles cloud base heights and signal penetration depths, aerosol layer heights and vertical visibility are determined. Within its operating range up to 15 kilometers (50,000 feet), the ceilometer reliably detects multiple cloud layers and cirrus clouds.
The ceilometer is mounted on the instrument platform on the top roof of the Section Meteorology, Institute for Geoscience, University of Bonn, Bonn, and is continuously operating.

## Instrument specifications

| Parameter | Specification |
|---|---|
| Wavelength | 1064 nm |
| Measuring range | 5 m - 15 km (15 – 50,000 ft) |
| Resolution | 5 m measurement, 15 m standard resolution in NetCDF file |
| Measuring time | 2 s to 10 min;<br>standard use: 15, 30, 60 s |
| Light source | laser protection class 1M under EN 60825-1 |
| Beam diameter (1/e²) | expanded to: 90 mm |
| Laser divergence | < 0.3 mrad |
| Energy per pulse | 8 µJ |
| Long-time stability over 12 months (pulse repetition rate) | < 10 % |
| Pulse-to-pulse variance of laser energy | < 3 % |
| FOV Receiver | 0.45 mrad |
| Nominal voltage | 230 VAC, ±10 %;<br>optional: 110 VAC |
| Line frequency | 50 Hz |
| Max. power consumption | 0.8 kW in maximum (all heater are running) |
| Temperature range | -40 °C to +50 °C |

| | |
|---|---|
| Rel. air humidity range | 0 % to 100 % |
| Dimensions of casing | W x H x L = 0.5 m x 0.5 m x 1.55 m |
| Weight | 70 kg |

## Instrument time-line

| | |
|---|---|
| 04/08/2011 – today | top roof at Section Meteorology, Institute for Geoscience, University of Bonn, Bonn |

## Available measurement modes

- Standard operation mode with 15 s temporal resolution

## JOYCE-CF Standard Operation Procedures

- Continuous operation with 15 s temporal resolution, 30 m vertical resolution

## Data quality assurance procedures

- Raw data provided by the instrument. Quality control by operator.

## Available datasets

Cloud heights can be requested via the 'Messdatenportal' (https://www.ifgeo.uni-bonn.de/abteilungen/meteorologie/messdaten/messdatenportal).
Additional data or measurement time can be requested via the JOYCE-CF request sheets.

### Level 1

- Cloud height:
  - Temporal resolution 15 seconds
  - Horizontal resolution 30 m
  - Cloud height and classification by instrument
  - File size approx. 1.5 MB per day

### Contact

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