

BL-VIEW Graphical User Interface for Boundary Layer Analysis



Air pollution over a city.

Features/Benefits

- Displays and logs data from a ceilometer while running other Windows-based applications
- Viewing and analyzing of already logged data simultaneously while logging and displaying real-time data
- Boundary layer analysis in a clear graphical format
- Real-time boundary layer evolution with quality index with 24/7 operation
- Easy export of the boundary layer data to other applications
- A large variety of user selections
- Maintenance access to Ceilometer via an internal terminal program
- Real-time cloud height reporting

The Vaisala Boundary Layer View (BL-VIEW) is an application software for planetary boundary layer analysis. The BL-VIEW is an independent data collection, storage, analysis, and presentation program designed to be used with the Vaisala Ceilometers CL31 and CL51.

Applications

The planetary boundary layer height is also known as the mixing layer height (MLH). It is a key parameter for characterization of air pollution together with urban emission source strengths, traffic emissions, further weather influences such as wind, long-range transportation and deposition. It is a necessary parameter for the verification of numerical simulations of air pollution.

When connected to a computer, the Vaisala Ceilometer sends the

backscatter profile data via the serial port. The BL-VIEW software calculates the vertical structure of the planetary boundary layer based on the mixing height algorithm. Cloud height is also continuously measured with the Vaisala Ceilometer and shown in the BL-VIEW graphical user interface.

Algorithm

The BL-VIEW calculation is based on so called Gradient Method. It is a technique that selects the maximum of the negative gradient of the backscatter coefficient to be the top of the mixing layer height. To reduce sensitivity to noise and temporary, atmospheric details, vertical and temporal averaging needs to be applied for differentiation.

Data Logging and Storage

The BL-VIEW program runs on a PC with Microsoft Windows® XP and 7 operating systems, providing all conveniences of a graphical user interface. The communication between the ceilometer and PC is arranged via a serial line.

The ceilometer messages are stored in a database located on the pc's hard disk. The database allows for operators to analyze the data automatically. Then the automatically analyzed boundary layer data is stored into log files that are easily transferred to other applications. The program automatically creates a new log file for each day.

Data Analysis and Presentation

The ceilometer backscatter profile data is automatically analyzed by default parameters to report the boundary layer structure, like

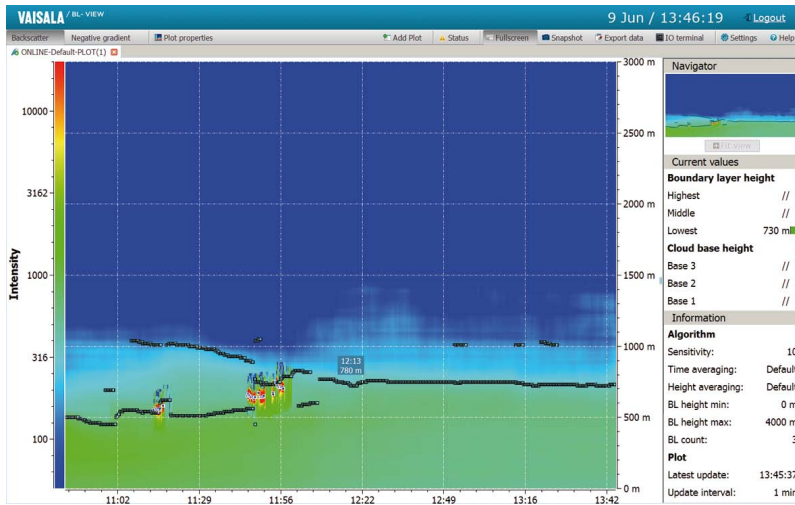
convective and residual boundary layer heights. It is also possible to run simultaneous, operator-specific analysis with preset algorithm parameters.

The already stored profiles can be re-analyzed by any user-set parameters

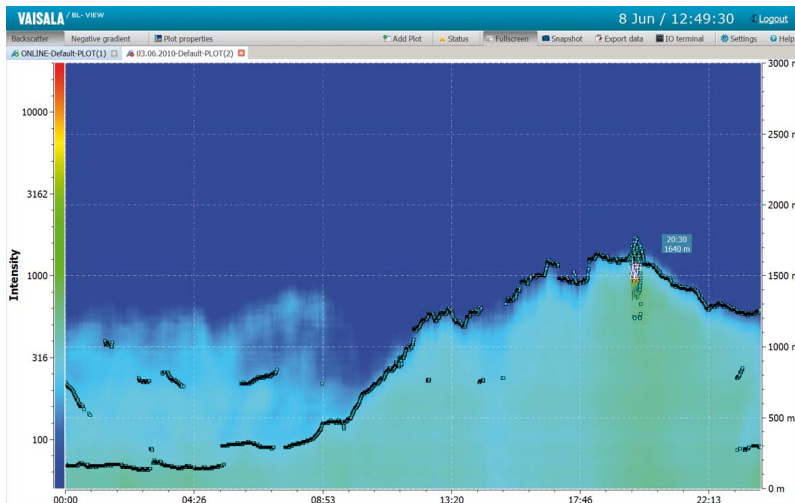
without interfering with the real-time data analysis and presentation.

The user interface allows for easy and convenient multi processing. Operators can zoom in on any point in a detailed analysis. The ceilometer and communication status is shown

on the main screen all the time giving the option of examining possible warnings and alarms which are also stored automatically to log files. These features provide operators with excellent support and reliability.



An example of an online view.



An example of an offline view.

Minimum system requirements

PC	Serial port or USB serial converter
Operating system	Microsoft Windows® XP Windows® 7 Ultimate (32-bit or 64-bit) Windows® 7 Professional (32-bit or 64-bit)
RAM	2 GB
Hard disk space	
for installation	600 MB
for data files	4 ... 4.5 GB / year
Drives	CD-ROM drive

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