

Release Notes

Vaisala Ceilometer CL51

CL51 SW version 2.105

Released: November 2022

This document lists the features implemented in the CL51 firmware versions up to 2.105.

Version 2.105

Released 22-11-30.

- Added parameter for selecting optics unit type (CLO511 or CLO521):
 - The parameter selects the overlap correction function used.
 - Set using command **set factory opt_type**.
 - Read using command **get params factory** (Opt. Type: CLO511/CLO521).
 - The default value is CLO511, so there is no need to set this parameter after updating the software of an older unit (having CLO511 and any older software).
 - Any older software versions do not work correctly with CLO521. If a CLE321 spare part board with older software is installed in a unit with CLO521, the software must be updated. There is no need to set the optics type parameter, as it is read from CLT EEPROM. A software update is enough.
- Fix for software update on old boards with flash chip A29L008:
 - Since version 2.000, the software update did not work on older boards having the alternative flash chip Amic A29L008.
 - The software update worked already before this fix on boards with the new flash chip S29AL008J, and on boards with the original old flash chip AM29LV008B.
- Optimize code to speed up report transmission.
 - Optimizing done to avoid unnecessary CPU load, which slowed down report transmission. The problem was that long reports could not be sent with the short intervals and low baud rates indicated in the manual.
 - The problem has been present since CL51 version 1.032, in which the secondary report was introduced.
 - Now all message type, message interval, and baud rate combinations listed in the manual are supported.
- Name and uptime added to dump command.
- Increase the tendency of CL51 to report vertical visibility in fog.
- Blower self-test logic changed.
 - Changed to check the blower (out) temperature rise instead of difference to ambient (blower in) temperature. The logic is now as follows:
 1. Turn blower on and blower heater off.
 2. Wait 2 minutes for cooling down in case the heater has been on.
 3. Turn blower heater on.
 4. Wait 2 minutes for temperature to rise.
 5. Check that blower temperature has risen more than 4 °C.
 - Blower self-test not run if external temperature is above +40 °C.



Release contents

Version 2.000

Released 2018-11-15.

- Flash memory AM29LV008B is EOL, replacement memory is Macronix MX29LV800C.
- (From CL31 v.2.028) Removed feature that opens service connection when #1 is received on serial port, and closes service connection when #2 is received. This feature caused problems with RS-485 communication when used with AWS310 weather station

Version 1.032

Released 2014-05-07.

Changes compared to version 1.031:

- Blower hot limit parameter added. When the external temperature is above this limit, the blower is kept on to cool down the ceilometer. Previously this limit was fixed at +40 °C.
 - The limit is set using command **set factory blower_hot_limit**.
 - The limit is read using command **get params factory** (shown as **Blower hot limit**).
 - The default is +40 °C.
 - The feature can be disabled by setting the parameter to its maximum value, 199. The blower is then never turned on based on this temperature limit.
 - Note that in direct sunshine, the external temperature measured by CL31 may be a lot higher than the actual air temperature (as it is measured inside the shield).
- Secondary message added. Two different messages can now be output independently to the 2 serial ports. Configured using the commands **set message secondary interval/transmission/type**.
- Command **set echo on/off** added. When set to **off**, received characters are not echoed to the user interface. By default, echo is on.
- Command **dump** added. Outputs the results of the following commands: **system, status, get failure status, get failure history, get params factory, get params message, get params port, get params algorithm, get failure diag**.
- Default message type changed to msg2_base (was msg2_10x1540).
- Miscellaneous fixes:
 - Software update was sometimes stuck. This happened if a long report was sent to the other port with an interval that was too short when the software update was started.
 - Warning instead of alarm generated for +12 VO (12 V output) voltage error.
 - Command **set message transmission periodic** sets message type to the configured type (the current type may have changed when polling).
 - Command **get params message** shows the configured type, not the last polled type.

Version 1.031

Released: 2013-05-08.

Changes compared to version 1.030:

- Commands that can be used to adjust laser power moved from advanced to factory level (for laser safety certification). The following commands were moved to factory level:
 - **set factory outlaser**
 - **set data_acq transmit inlaser**

Version 1.030

Released 2013-03-20.

Changes compared to CL51 version 1.029:

- Cloud algorithm improvements:
 - Temperature dependent tau correction factor is introduced in CL51 mode similar to CL31 with CLE321 and for CL51 in CL31 mode. This became necessary to correct signal curvature generated by the receiver APD tail effect. It is an improvement for all tail amounts monitored so far.

Version 1.029

Released 2012-12-12.

Changes compared to CL51 version 1.023:

- Cloud algorithm improvements:
 - “Look through haze” feature added. Enabled by command **set factory algo_sensit options 1**. Makes algorithm more sensitive to report clouds seen beyond haze instead of reporting vertical visibility.
 - Overlap correction factors updated.
 - Glitch correction added (in 10–80 m gates).
- Sky condition algorithm improvements:
 - Reports overcast in more cases.
- Miscellaneous fixes:
 - Fix of bug causing blower to be forgotten OFF after battery use when blower manually set ON.
 - If the blower is manually set on, then also the blower heater is set on after reset.
 - Self diagnostics improvement to avoid rare occasional false warnings (**Transmitter Expires** or **Receiver Warning**) in heavy snowfall.

Version 1.023

Released 2012-06-29.

Note that version 1.022 was not officially released (test version), and the changes of 1.022 are not included in 1.023.

Changes compared to CL51 version 1.021:

- Bang correction fix to solve purity test problems in production.

Version 1.021

Released 2010-02-09.

First production version.

Changes compared to CL51 version 1.020:

- Clouds above 13000 m or 43000 ft are not reported.
- Treatment of the 2 lowest range gates improved.
- CL31 emulation mode with 5 m resolution fixed.
- Message transmission timing improved to avoid sending the same message twice.

Version 1.020

Released 2009-10-28.

First official release.

Changes compared to CL51 version 1.010:

- Cloud algorithm overlap function updated.
- CL31 emulation mode added.
- LD40 message updated (maximum range).
- Cloud reporting resolution was changed to 10 m/30 ft in standard and high_end modes (it is still 5 m/10 ft in high_res mode).
- Serial receiving and transmission optimized. This avoids losing received characters and delays in timers, and makes user interface smoother.
- Command **get failure history** response fixed (time values were blank if zero).
- Humitter measurement used for internal heater control. The heater is set ON if RH > 80 % and OFF if RH < 78 %.
- Internal heater control logic was changed. The heater is set ON if internal–external temperature difference < 10 °C (previously < 6 °C).
- Gain switch point changed (to low gain: 0.80 → 0.65, to high gain: 0.70 → 0.55)

Version 1.010

Released 2009-07-29.

Unofficial version (for internal and NGNPN tests only).

Changes compared to CL51 version 1.001:

- Cloud algorithm changes:
 - Curvature detection uses 12 min running buffer to avoid differences between matlab and target version.
 - Long range detection starts already at 5000 m.
 - Sensitivity for clouds above 13500 m has been reduced.
 - The report profile also uses cloud regions detected by the long-range detection.
- The service replace instruction texts were updated.
- Self diagnostics:
 - Self diagnostics logic when the ceilometer is looking into the sun improved for cases when the sun suddenly comes or disappears (behind a cloud).
 - Inlaser adjustment blocked while ceilometer is looking into the sun.
 - Fix: command **service self_check** said N/A instead of FAIL for cross talk if it was too high.
- Inlaser control done every 6 s (was every 2 s like CL31).
- Message polling fixed to work according to the manual: "<space>", "<space><space>", "1", "1<space>", "2", "2<space>" or "S" allowed as CL message type.

Version 1.001

Released 2009-06-10.

Initial version, unofficial (for internal and NGNPN tests only).