



Photometer

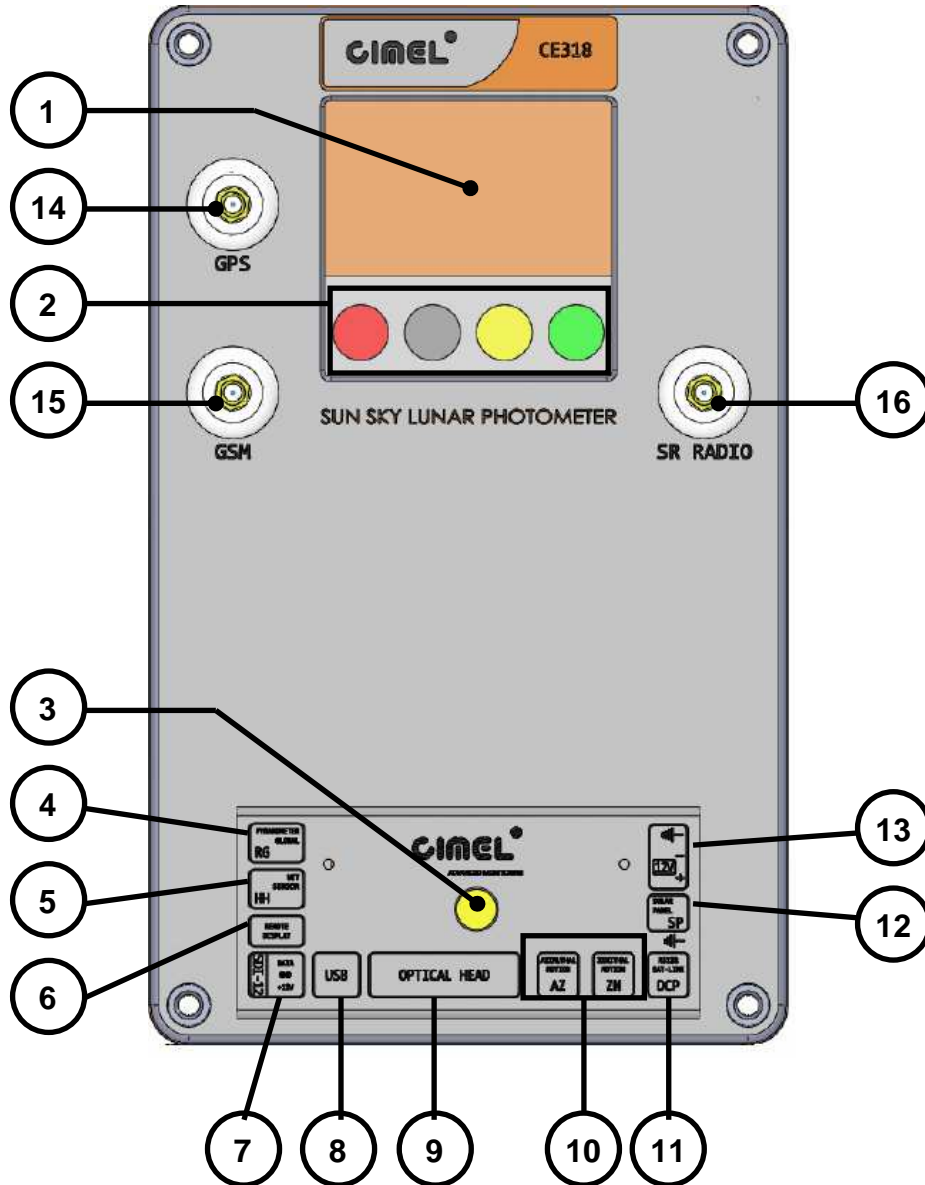
Quick start

Version 1.03

1 Document history

Rev	Chapter	Description of modification / changes	Date
1.00		Initial release.	21/04/2013
1.01	2.4	Detail settings information.	30/07/2013
1.02	All	Add document history Modify document according to software release.	03/06/2014
1.03	3.1	Add Polarized Photometer. Add BRDF 12 filters Polarized Photometer.	28/07/2014

2 Presentation



- User interface:
 - > 1: Graphical display.
 - > 2: Capacitive touches.
 - > 3: Mechanical push button.
- Connexions:
 - > 4: Pyranometer.
 - > 5: Wet sensor.
 - > 6: Remote display.
 - > 7: SDI12.
 - > 8: USB.
 - > 9: Optical head.
 - > 10: Robot azimuth and zenith motion.

- > 11: DCP / Serial communication.
- > 12: Solar panel.
- > 13: External battery.
- Other:
 - > 14: GPS antenna.
 - > 15: GSM antenna.
 - > 16: Short range radio antenna.

2.1. *Capacitive touches functions*

All touch actions are displayed above it on the sixth line.

The RED touch is used to exit a menu or to cancel an action.

The GREEN touch is used to enter in a menu or to valid an action.

The YELLOW and WHITE touches are used respectively to go up/down in a menu or to increase/decrease an edit value.

2.2. *Turn on*

When the electronic box is power supplied, press the “yellow” push button on the connector board to turn on the display.

2.3. *Turn off*

The electronic box turns off the display after one minute of user inactivity. If the scenario menu is open and a scenario is running, the electronic box doesn't turn off the display until the current scenario has finished.

3 *Menus description*

The menu system is a hierarchical menu system.

The menu is actually structured as below (every uppercase word indicates button and lowercase edit variable):

- SCENARIOS
 - > See Chapter 2.1 for description.
- MEASURES
 - > Battery
 - > Ibattery
 - > Vsolar
 - > Isolar
 - > Vcoin, Vcpu, Vgsm, Vradio
 - > Vrg
 - > Wetting
 - > Temperature

- > Humidity
- > Pressure
- MEMORY
 - > SD CARD
 - State: Indicate the size of the SD card.
 - FORMAT
 - SAVE
 - EXPORT ASCII
- SETTINGS
 - > Auto
 - > Moon
 - > P.Moon
 - > Country
 - > District
 - > Number
 - > Latitude
 - > Longitude
 - > Altitude
 - > Turbo
 - > P.Turbo
 - > Bclsky
 - > P. Bclsun
 - > AZ offset
 - > ZN offset
 - > DCP
 - > DCP Channel
 - > DCP Type
 - > DCP ID
 - > DCP Max
 - > DCP Interval
 - > DCP Offset
- DATE
 - > Date
 - > Hour
- CIMEL
 - > TSV
 - > ROBOT
 - > GPS INFO
 - > Password

3.1. **SCENARIOS menu**

The scenario menu is different depending on the type of the Photometer (NE, BRDF...).

Each scenario can be executed manually from this menu.

When a scenario is executed in manual mode, it starts in step by step mode. The Photometer measures and loops on the current filter until the “Next” or “Run” button is pressed. If the “Next” button is pressed, the Photometer loops on the next filter and waits for a user action. If the “Run” button is pressed, the Photometer executes the scenario entirely.

In this mode, the “Return” button aborts the current scenario.

If a scenario starts automatically from the scheduler, it cannot be aborted. If you enter in the SCENARIO menu while an automatic scenario is running, you will see the current action of the electronic box (GOSUN, SUN...). At this point, a press on “Return” will close the SCENARIO dialog but won’t stop the active scenario.

If a manual scenario is running and the auto mode is active, the next automatic scenario will be inserted in a stack and will be executed after the current one.

In manual or automatic mode, the generated data are saved automatically in the internal memory at the end of the executed scenario.

3.1.1. NE Photometer scenario menu

- SCENARIOS
 - > OFF
 - > PARK
 - > GOSUN
 - > TRACK SUN
 - > ORIGIN
 - > SUN
 - > SKY
 - > BLACK
 - > HYBRID
 - > ALMUCANTAR
 - > PPLAN
 - > LTRACK SUN
 - > SKY CALIBRATE
 - > BCLSUN
 - > BCLSKY
 - > CROSS
 - > CURVE CROSS
 - > 3SUN
 - > GOMOON ⁽¹⁾
 - > TRACK MOON ⁽¹⁾
 - > MOON ⁽¹⁾
 - > LTRACK MOON ⁽¹⁾
 - > CROSS MOON ⁽¹⁾
 - > 3MOON ⁽¹⁾

⁽¹⁾: These moon scenarios are visible only if the Moon setting is ON.

3.1.2. BRDF Photometer scenario menu

- SCENARIOS
 - > OFF
 - > PARK
 - > GOSUN
 - > TRACK SUN
 - > ORIGIN
 - > SUN
 - > SKY
 - > BLACK
 - > ALMUCANTAR
 - > PPLAN
 - > CIRCLE
 - > LTRACK SUN
 - > SKY CALIBRATE
 - > BCLSUN
 - > BCLSKY
 - > CURVE CROSS
 - > 3SUN

3.1.3. Polarized Photometer scenario menu

- SCENARIOS
 - > OFF
 - > PARK
 - > GOSUN
 - > TRACK SUN
 - > ORIGIN
 - > SUN
 - > SKY
 - > BLACK
 - > HYBRID
 - > ALMUCANTAR
 - > PPLAN
 - > POL. ALMUCANTAR
 - > POL. PPLAN
 - > POL. HYBRYD
 - > LTRACK SUN
 - > SKY CALIBRATE
 - > BCLSUN
 - > BCLSKY
 - > CROSS
 - > CURVE CROSS
 - > 3SUN
 - > GOMOON (¹)
 - > TRACK MOON (¹)

- > MOON (1)
- > LTRACK MOON (1)
- > CROSS MOON (1)
- > 3MOON (1)

(1): These moon scenarios are visible only if the Moon setting is ON.

3.1.4. BRDF 12 filters Photometer scenario menu

- SCENARIOS
 - > OFF
 - > PARK
 - > GOSUN
 - > TRACK SUN
 - > ORIGIN
 - > SUN
 - > SKY
 - > BLACK
 - > ALMUCANTAR
 - > PPLAN
 - > CIRCLE
 - > LTRACK SUN
 - > SKY CALIBRATE
 - > BCLSUN
 - > BCLSKY
 - > CURVE CROSS
 - > 3SUN

3.2. *MEASURES* menu

The electronic box can measure itself internal power supplies, temperature, pressure...

All of these measures are visible in the MEASURES menu. These data are updated every 5 seconds.

List of measures:

- *Battery*: Voltage of the external battery.
- *Ibattery*: Consumption by the electronic box.
- *Vsolar*: Voltage of the solar panel.
- *Isolar*: Charging current.
- *Vcoin, Vcpu, Vgsm, Vradio*: Internal power supplies.
- *Vrg*: Pyranometer.
- *Wetting*: Measure of the wet sensor.
- *Temperature*: Temperature inside the electronic box.
- *Humidity*: Humidity inside the electronic box.
- *Pressure*: Current atmospheric pressure.

Some power supplies are provided in this menu only for measure and have an impact on the consumption. So, if no user actions are executed on the touches during 10 minutes, the Photometer leaves this menu automatically.

3.3. **MEMORY menu**

The produced datas are stored in a non volatile flash device in the electronic box.

A backup of the non-volatile flash memory is done in K8 binary format every morning when the sun zenith is air mass -8.

The PC displays the internal Photometer SD card as a mass storage disk.

3.3.1. **SD card**

3.3.1.1. **SD card file structure**

On the SD card memory, all data use this name syntax: YYYYMMDDhhmmss. The name of the file (date/time) corresponds to the date of file saving.

Where:

- YYYY: Year
- MM: Month
- DD: Day
- hh: Hour
- mm: Minute
- ss: Second

All data are stored on the SD card with the following structure:

- [HEAD NUMBER]
 - > [YEAR]
 - [MONTH]
 - File 1
 - File 2
 - ...
- IE:
- [0001]
 - > [2013]
 - [12]
 - 20131231122530.k8
 - 20131231122530.STA
 - 20131231122530.NSU
 - ...
 - > [2014]
 - [01]
 - 20140101081711.k8
 - 20140101081711.STA

- ...
- [0002]
 - > [2014]
 - [01]
 - 20140101102530.k8
 - 20140101102530.STA
 - 20140101102530.NSU
 - ...

3.3.1.2. State

“State” displays the SD card size. If the Photometer is linked to a PC through an USB cable then when entering in the “SD card” menu, the “State” information displays “Busy” instead of the SD card size.

If the USB is connected, a (U) suffix is added at the end of the time at the root menu.

3.3.1.3. Format

The SD card could be formatted through the “MEMORY\SD CARD\FORMAT” menu. The SD card will be formatted in FAT32 file system.

To optimize SD card access when using a new SD card, it's advised to format the new SD card through this menu.

3.3.1.4. Save

The flash content could be stored in the SD card through the “MEMORY\SD CARD\SAVE” menu. The generated file is a backup of all of the internal non-volatile flash in binary.

3.3.1.5. Export ASCII

The photometer can generate ASCII files through the “MEMORY\SD CARD\EXPORT ASCII” menu.

4 SETTINGS menu

List and description of parameters (default value in bold):

- *Auto*: Enable or disable automatic measurement. The internal scheduler is executed automatically [OFF; ON]: **OFF**.
- *Moon* (1): Enable or disable moon measurement. The moon menus are invisible in the SCENARIO menu if this setting is OFF. [OFF; ON]: **OFF**.
- *P. Moon* (1): Period between two Group L scenarios. [2min; 15min]: **3min**.
- *Country*: Country identification. [0; 255]: **0**.
- *District*: District identification. [0; 255]: **0**.
- *Number*: Number identification. [0; 9999]: **0**.
- *Latitude*: Latitude of the current electronic box. [-90.00°; +90.00°]: **0.0000°**.

- *Longitude*: Longitude of the current electronic box. [-180.00°; +180.00°]: **0.0000°**.
 - *Altitude*: Altitude of the current electronic box. [0m; 6000m]: **0m**.
 - *Turbo* ⁽¹⁾: Enable or disable the Turbo mode. [OFF; ON]: **OFF**.
 - *P. Turbo* ⁽¹⁾: Period between two GROUPA scenarios. [2min; 6min]: **3min**.
 - *Bclsky*: Enable Bclsky mode. [OFF; ON]: **OFF**.
 - *P. Bclsun*: Bclsun scenario period. [30s; 360s]: **30min**.
 - *AZ offset*: Azimuth robot offset. [-180°; +180°]: **0°**.
 - *ZN offset*: Zenith robot offset. [-180°; +180°]: **0°**.
 - *DCP*: Enable the DCP communication. [OFF; ON]: **OFF**.
 - *DCP Channel*: DCP assigned channel. [0; 266]: **0**.
 - *DCP Type*: Type of the used satellite:
 - > **METEOSAT**
 - > GOES 100
 - > GOES 300
 - *DCP ID*: DCP assigned ID. [00000000; FFFFFFFF]: **00000000**.
 - *DCP Max*: Define the maximum number of bytes allowed to be transferred to the DCP. [150; 1292]: **625**.
 - *DCP Interval*: DCP transmission period. [00:00:00; 23:59:59]: **00:30:00**.
 - *DCP Offset*: DCP start period. [00:00:00; 23:59:59]: **00:00:00**.
- ⁽¹⁾: In BRDF Photometer type, these settings have no effect.

To save new settings, exit from the menu. If a parameter is changed, a message dialog appears and asks to confirm the modification.

4.1. *DATE menu*

The electronic box date and time can be settled manually via the “DATE” menu. After the modification, exit from this menu, a message dialog appears and asks to confirm the modification.

4.2. *Cimel menu*

4.2.1. **GPS INFO menu**

Enter in this menu to enable automatic GPS acquisition. The acquisition starts when the State information is set to “Wait GPS...”. The GPS stops after acquisition or timeout.

If the GPS is active, a (G) suffix is added at the end of the time at the root menu.

The first time, the GPS could take up to 15 min to get the GPS information.

5 Start measurement

After the material installation, these actions have to be executed (or verified):

- Format the SD card.
- Set the Date / Time manually through the DATE menu or automatically through the "CIMEL\GPS INFO" menu.
- Set the site coordinate in the settings manually through the SETTINGS menu or automatically through the "CIMEL\GPS INFO" menu.
- Enable or disable moon measurement.
- Enable or disable Turbo mode.
- Enable Auto mode.

6 Photometer daily operation

6.1. *Memory*

Every Day, a backup of the all of the internal non-volatile flash memory is executed at air mass -8 in K8 binary file.

6.2. *Coordinates*

The photometer verifies its geographical position thanks to the internal GPS every morning at air mass -9. If the position changes, the new coordinates are stored in the settings and a status is inserted in the memory. A difference of 0.01° is considered as a position movement.