



CIMEL OPERATION MANUAL

JUNE 2011

CIMEL INSTRUMENT AND COMPONENTS

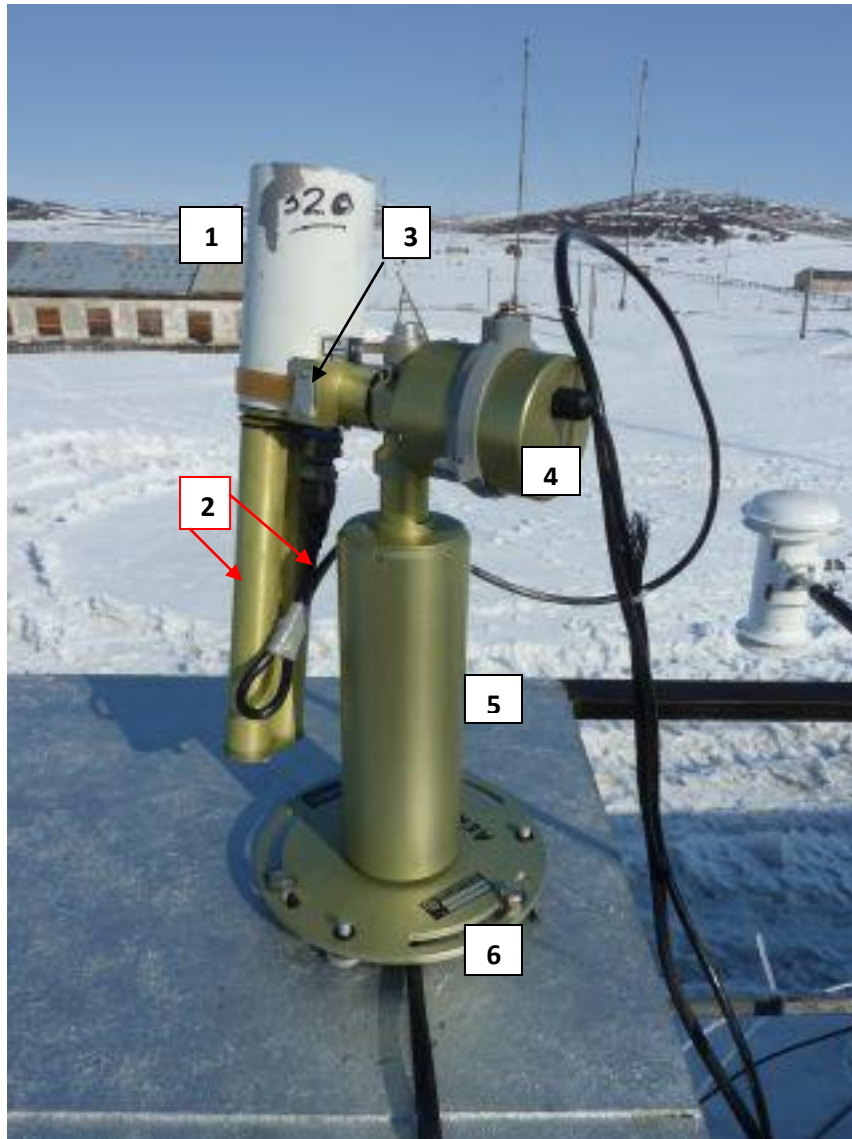


Figure 1

1 – Optical Head

2 – Collimator Unit and Photometer Cable (NOTE CABLE SHOULD LOOP IN OTHER DIRECTION – TO THE FRONT OF THE INSTRUMENT)

3 – Claw Attachment

4 – Zenith Motor Casing

5 – Azimuth Motor Casing

6 – Mounting Plate

CIMEL ELECTRONICS BOX

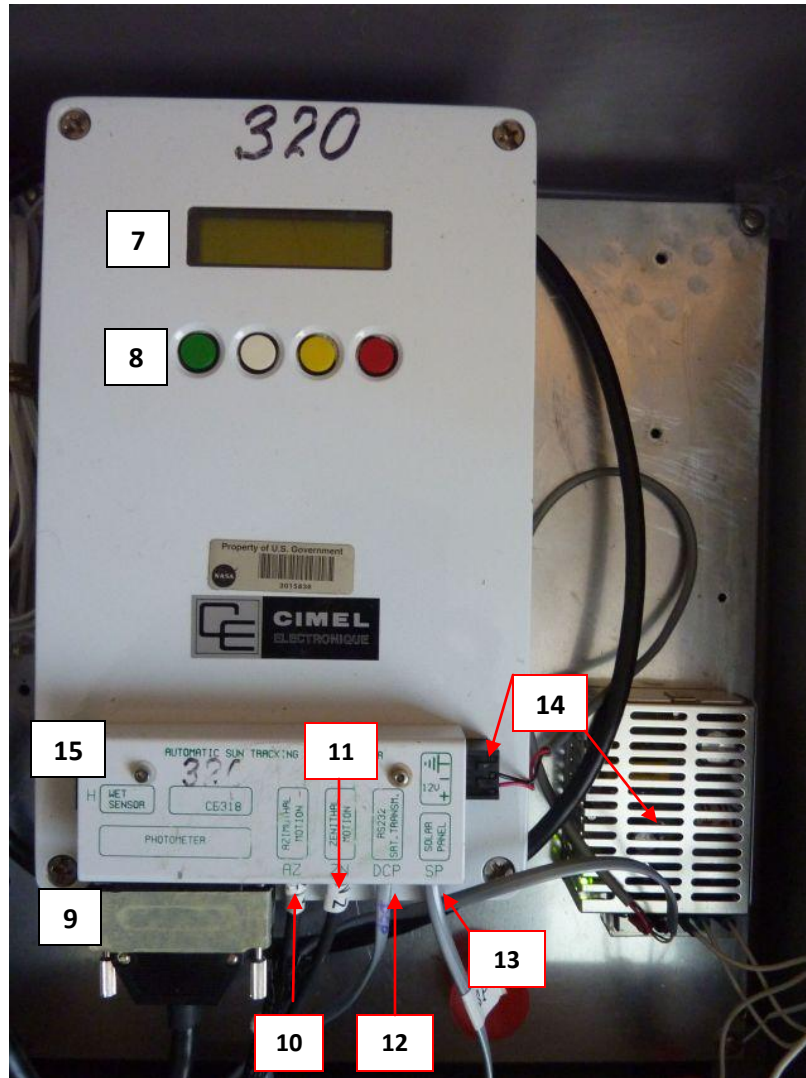


Figure 2

7 – Display Screen

8 – Control Buttons

9 – Photometer Cable

10 – Azimuth Robot Cable

11 – Zenith Robot Cable

12 – Serial Computer Cable

13 – Solar Panel Cable (from AC Power Supply)

14 – AC Power Supply and cable

15 – Rain Sensor

INSTALLATION and REMOVAL

1. Attach the Collimator Unit to the Optical Head using the screw that runs the length of the Collimator. It should only attach one way, but make sure the pinhole matches up with the sighting hole and the cut away section matches up with the lens on the Optical Head.



Figure 3

2. Bring the mounting plate, securing bolts and robot assembly (with cables) to the roof. Find the three holes in the table and align the mounting plate with the lines on the table. Also bring a 9/16" wrench and the small level.

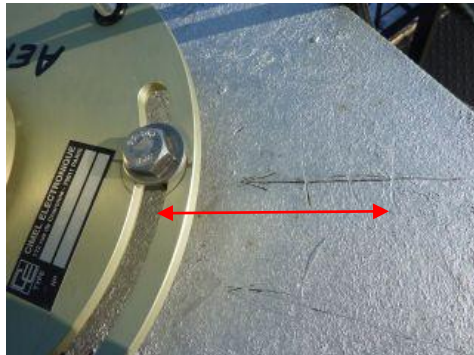


Figure 4



Figure 5

3. Place the three bolts through the mounting plate roughly in the sites indicated by the circles. Use the washers above the plate and tighten by hand the nuts on the bolts under the table.
4. Run the cables into the building through the port under the roof.
5. Check the level of the mounting plate on each side using the yellow level from the tool kit. **Do not use the bubble level on top of the instrument as it does not work properly.** Use the 2 adjusting screws on the plate to make any needed adjustments.

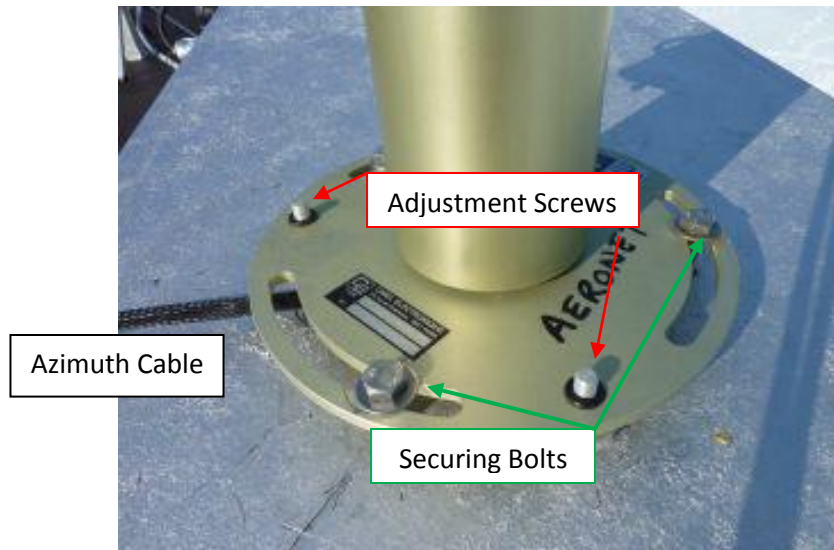


Figure 6

6. Once the plate is level, bring the Optical Head/Collimator assembly to the roof. Pass the photometer cable from inside to outside because the inside connector is too large to pass through the port (see #9 above).
7. Attach the Optical Head and Collimator to the Zenith Robot using the 'Claw Attachment'. Ensure the Optical Head is even with the edge of the claw and the photometer cable plug attachment is toward the robots.

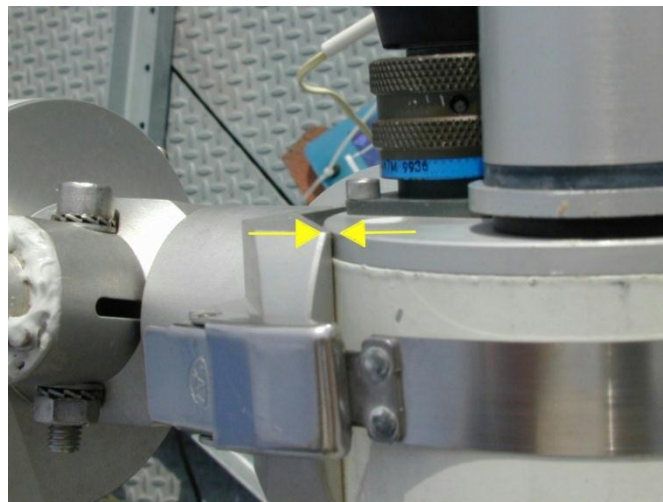


Figure 7

8. Attach the Photometer Cable to the Optical Head. Ensure a large loop is left to allow for smooth operation (see Figure 1). This will be checked and adjusted during the alignment phase.
9. If necessary, go inside and attach the cables to the CIMEL Electronics Box as shown in Figure 2 (9-15) above. Connect the rain sensor and pass it through so it is exposed outside from the lower port.
10. When the Sun has set for the winter, please remove the Optical Head and Collimator and send by mail to AARI. Remove Mounting Plate and Robots and bring inside; pass all cables back inside and shut off power to CIMEL use switch on the side of the box. Laptop can be left on.

ALIGNING and STARTING THE CIMEL

1. A clear, sunny day is required to correctly align the CIMEL Sun Photometer. It is most easily done with 2 people; one inside and one outside, using the two-way radios. Tools you will need are a level, 9/16" wrench, and 3/16" allen wrench.

2. There are 2 modes of operation for the CIMEL: Manual and Automatic. For the calibration you will need to ensure it is in Manual mode. In Manual Mode the screen looks like this:

PW MAN SCN VIEW

If it is in Auto the screen will look like this:

PW AutoRun VIEW

To change to Manual mode from Auto Mode: Press Green Button for PW (Password), Press Red Button for +1, Press Green Button to enter, Press Red Button for PAR (Parameters – you will see "Reading from Eeprom"). You will see "Auto YES". Press Red Button for NO and Green Button for OK, then RED button (for YES to be VALID).

3. Two Parameters must be checked on the Electronics Box: the date/time (in UT) and the coordinates. To check the time, Press the Green Button (PW) and compare the time displayed with the seconds to a reference clock. It should be accurate within 1-2 seconds of UT. If it is not, follow the next procedure to set the date and time.

Access to the DAT parameter

- Press the green button (PW)

```
31 / 12 / 93      23 : 59
PW MAN SCN VIEW
```

- Enter the Password 1 with the red button

```
23 : 59 : 59      PW  1
Pass  Word      -  +
```

- Press the green button to Confirm your password

- Press the yellow button (DAT) to change the date and time.

```
23 : 59 : 59
RTN INI DAT PAR
```

Enter the date and time parameters

Increase and decrease the values with the +/- command (red and yellow button)

Also, validate your choice with the 'X' button (white button)

- Enter the year.

```
Year      :      93
OK       X  -  +
```

- Enter the month.

```
Month     :      12
OK       X  -  +
```

- Enter the day

```
Day       :      31
OK       X  -  +
```

- Enter the hour
- Enter the minute one unit ahead as compared to the reference clock.
- Press the Green Button (OK) exactly at the top of the minute (HH:MM:00). Press the Green button (RTN).

Hour	:		23
OK	X	-	+

Minute	:		59
OK	X	-	+

23 : 59 : 59			
RTN INI DAT PAR			

NOTE: The seconds are implicitly set at zero, the time must be set exactly when the minute appear at the reference clock. Each entrance in the DAT menu, even without any modification, sets the seconds at zero so do not enter the DAT menu unless setting the clock.

4. The coordinates should never change in the Electronics Box. To check, enter the PAR menu as in #2 above. Press the Red Button to go through the settings. Check the LAT = 4295 and the LONHH = e8, LONMM = 35, and LONSS = 41.
5. Once at the Manual Menu, Press the Yellow Button for SCN (Scenario), and press the Red Button until you see "PARK". Press the White Button to Select "GO".
6. After PARK, press the Red Button until you see "GOSUN". Press the White Button to Select "GO". Have a person on the roof check to see if the sun is aligned through the pinhole on the Collimator.



Figure 8

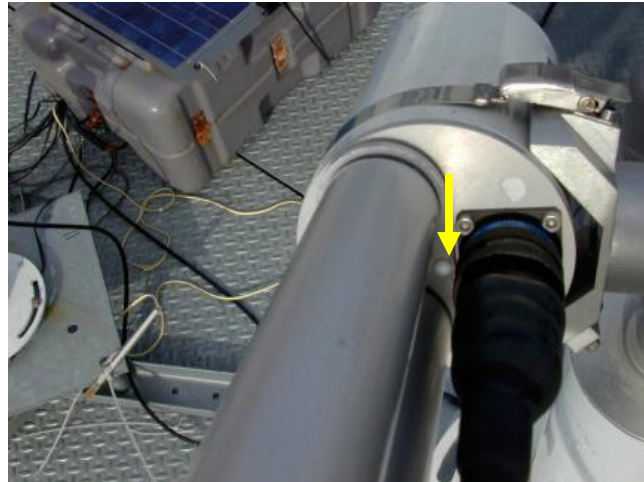


Figure 9

7. If the Sun Spot is not aligned, you will need to adjust the Azimuth (Horizontal) or Zenith (Vertical) angles.
8. To adjust the Azimuth, loosen the 3 securing bolts and rotate the mounting plate until the Sun Spot is aligned with the target. Recheck the level after moving the plate and re-level if necessary. Retighten the bolts when finished, but do not over-tighten.

- To adjust the Zenith, use the 3/16" allen key to fully loosen the Zenith Nut. Once it is undone, the Collimator can be rotated by hand to align the Sun Spot on the alignment hole. Once in place, retighten the Zenith Nut tightly.

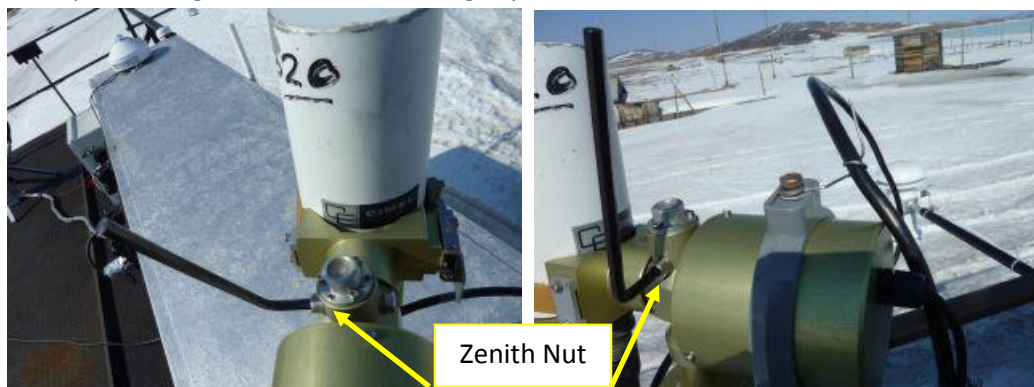


Figure 10

Figure 11

- After Adjusting the Zenith and/or Azimuth, use the "PARK" and "GOSUN" commands again and check the alignment. You may have to repeat steps 3-7 a few times to get the instrument aligned. It is necessary for the instrument to be level on the table for a good alignment so ensure this is so. Also, once you believe it is aligned, repeat the PARK and GOSUN commands a few times over a few minutes to ensure it is stable.
- Once the alignment is stable, the cable length must be check. Select GOSUN as before. Once it is pointing at the sun, continue through the menu and select ALMUNC. Watch the instrument while it moves through this process to ensure the cable does not prohibit movement. This will take a few minutes.
- After ALMUNC is complete, select PPLAN and watch the instrument again. Adjust the cable loop length if necessary. Return to PARK.
- Once the alignment is complete, set the instrument to AUTO run as in #2 above (except select YES for AUTO instead of NO).
- At the CIMEL Laptop, ensure the instrument cable is connected to the USB port on the side and open the ASTPWin program from the desktop. Select the "Connect" button if it does not connect automatically. Watch for the instrument to start working and the program to start collecting data. Also, ensure the network cable is attached so the data can be transferred to AARI.

DAILY CHECKS

- Check that Instrument is operating smoothly (cable not caught) and aligned with sun (if it is a clear day).
- Check that software is running and data is being saved to the C:\CIMEL_Data folder
- If there are any problems or questions, please contact:
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Matt Okraszewski - Matt.Okraszewski@noaa.gov and Vasily Kustov - Kustov@aari.ru