



METER
ENVIRONMENT

TECH NOTE: ZEROING WIND SPEED ON ATMOS 41 AND ATMOS 22

These instructions are for zeroing the wind speed measurement of the ATMOS 41 compact weather station.

NOTE: This process is *only* necessary when updating from firmware versions less than 5.00 to firmware versions 5.00 and greater. There is no need to re-zero firmware if upgrading from firmware versions 5.00 or greater to subsequent versions.

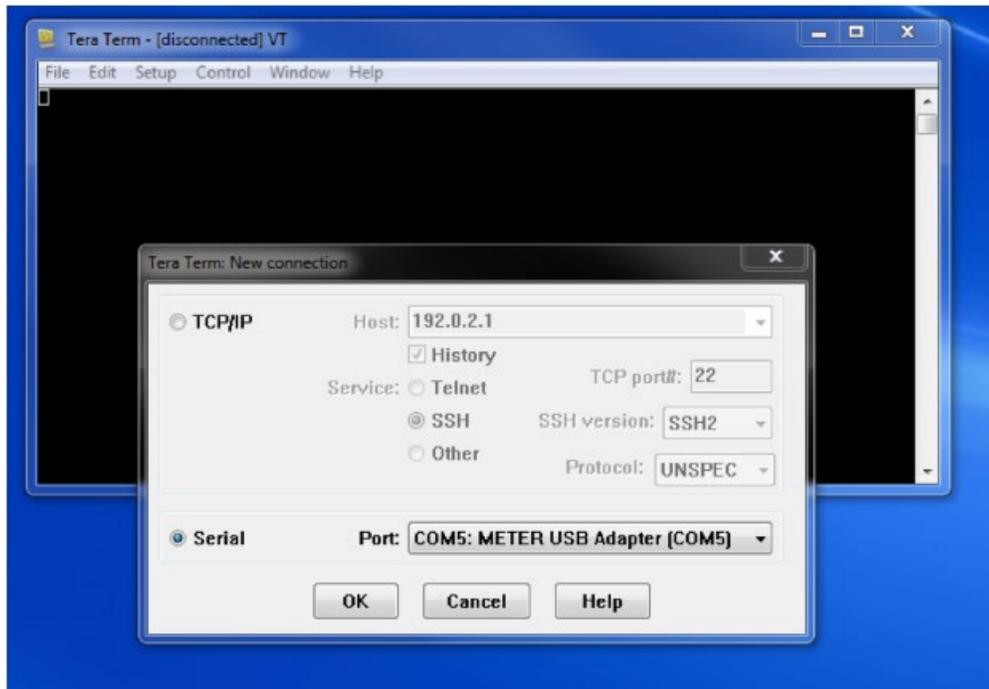
A new wind speed algorithm was implemented in versions 5.00 and greater, which requires a re-zeroing of the wind speed. First, [contact support](#) for instructions on how to update the firmware (FW), and then re-zero the instrument. Detailed instructions for zeroing the wind speed are shown below.

To perform the following actions, you will need access to a ProCheck handheld, EM60 series logger or ZL6 logger, terminal application (e.g., [TeraTerm](#)) if using a ProCheck or ZENTRA Utility software if using EM60 or ZL6, USB to serial cable adapter if using Procheck, microUSB cable if using EM60 or ZL6, wind shield (such as paper, cardboard, and fleece blanket), and computer with a Windows platform.

1. Update the ATMOS 41 firmware ([contact support for instructions](#))
2. The following steps are for re-zeroing the wind speed with the ProCheck. After updating the ATMOS 41 firmware, close the updater utility but keep your ATMOS 41 connected to the ProCheck and computer.

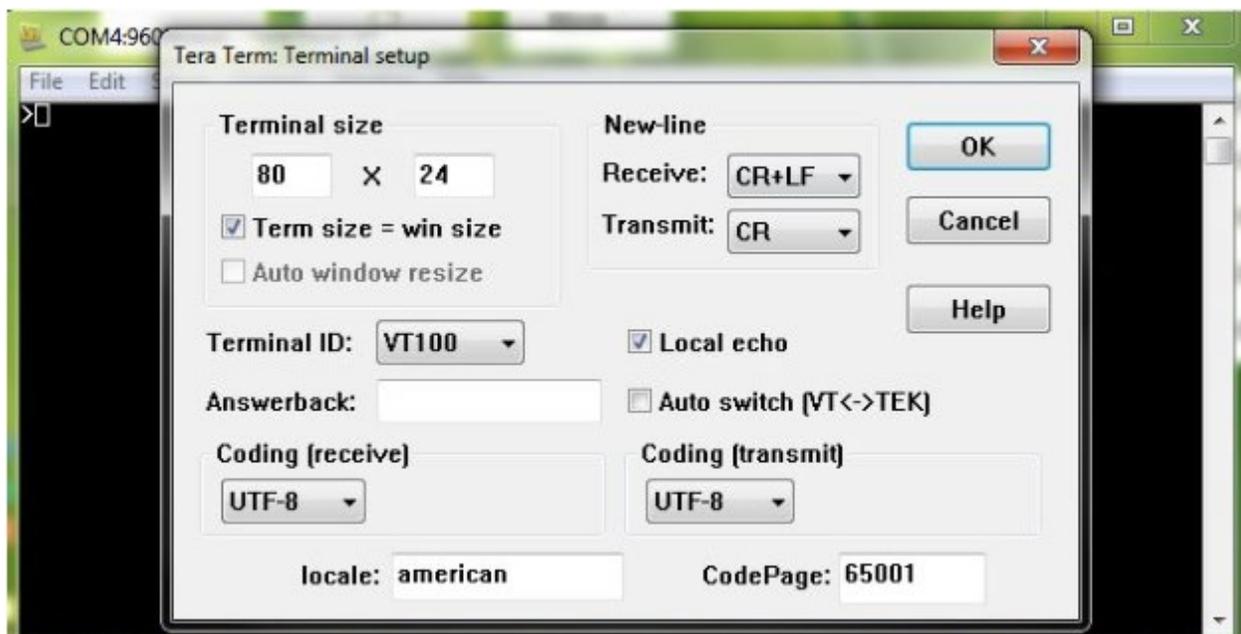
a. Instructions for ProCheck:

- i. Open TeraTerm (or other terminal application)
- ii. Connect to the ProCheck by selecting Serial and then “METER USB Adapter” in the dropdown menu. Select OK.



In Setup, select Terminal...

- Under "New-line" "Receive", select CR+LF.
- Put a checkmark next to "Local echo".
- Press OK.



iii. Type [to enter the direct communication mode on the ProCheck. After entering direct communication mode, if your sensor is address 0 the DDI string will look like a random string of characters (e.g. {VEy>ek). Type ?! to view sensor information.

iv. Type ?Xa!0 -0.099 -0.132 0.044 0.079 11.5 12.0 11.0 10.9

The command is shown in blue text, and the output example is shown in red text. If any of the last 4 values are 0, then perform **step v**, otherwise skip to **step vi**.

v. Type ?Xb 0.0 0.0 0.0 0.0 10.0 10.0 10.0 10.0!00K

Make sure the sensor returns OK. If there is an error, repeat this step.

The next steps need to be done with the sonic anemometer sensor covered so that there is no air movement! In the field, you will need something better than paper or cardboard when re-zeroing the wind speed. We have found it effective to use paper or cardboard first, then cover the sensor suite in a fleece blanket. This ensures no moving air or sound will enter the sensor during the re-zeroing step.

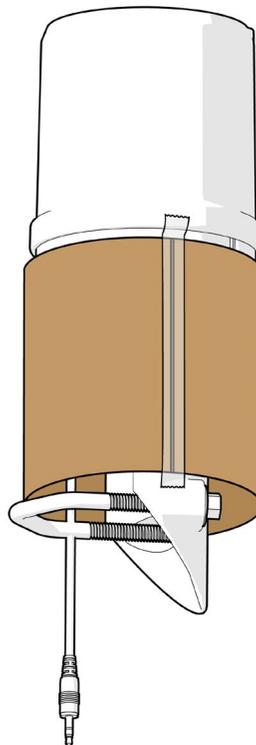


Figure 1. First, use paper or cardboard

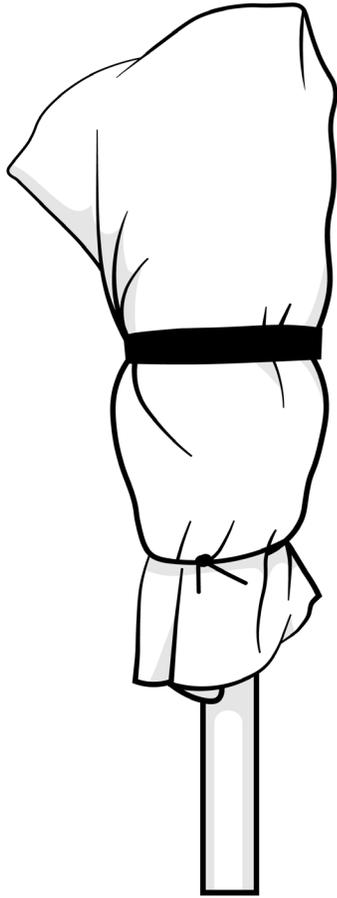


Figure 2. Second, cover the sensor suite in a fleece blanket

vi. With the sonic anemometer covered, type `?X1!00K`

This will set the phase to zero. Make sure the sensor returns OK. If there is an error, repeat this step.

Type `?X6!0 0.000 -0.000 -0.000 0.000 360 361 360 360 0.00 -0.00 0.00 500`

The command is shown in blue text, and the output example is shown in red text. This command returns the SDI-12 sensor address, four phase values, four values that you don't need to worry about, two wind velocity components, wind speed, and lightning sensor frequency respectively. The phase values should be 0.000 ± 0.002 when they are set. The wind velocity and wind speed values should be 0.00 ± 0.02 . The final number is the lightning sensor frequency which can be ignored. Repeat step vi if the values are outside of the tolerance (see the example below).

```
>[
<UEy>ek?I!013METER  ATM41 500ATM-410002242
?Xa!0 0.502 0.602 0.659 0.666 1.000 9.700 9.300 9.200
?Xb 0.0 0.0 0.0 0.0 10.0 10.0 10.0 10.0!00K
?X!0ERROR
?X1!00K
?X6!0 -0.001 -0.001 -0.001 -0.000 184 185 183 184 0.01 0.00 0.01 500
□
```

3. Exit the terminal program.
4. Remove the wind shield.
5. Reconnect the sensor suite to the data acquisition setup.
6. Ensure that the engraved N is pointing toward True North.
7. Re-level ATMOS 41, ± 2 degrees from (0,0).

A METER data logger (EM60 or ZL6) can be used to re-zero wind speed after the firmware is updated to 5.00.

b. Instructions for METER data logger:

- i. Open Zentra Utility and connect to the data logger
- ii. Under Actions, select Digital Sensor Terminal
- iii. Select the correct sensor port and send the **?!** Command

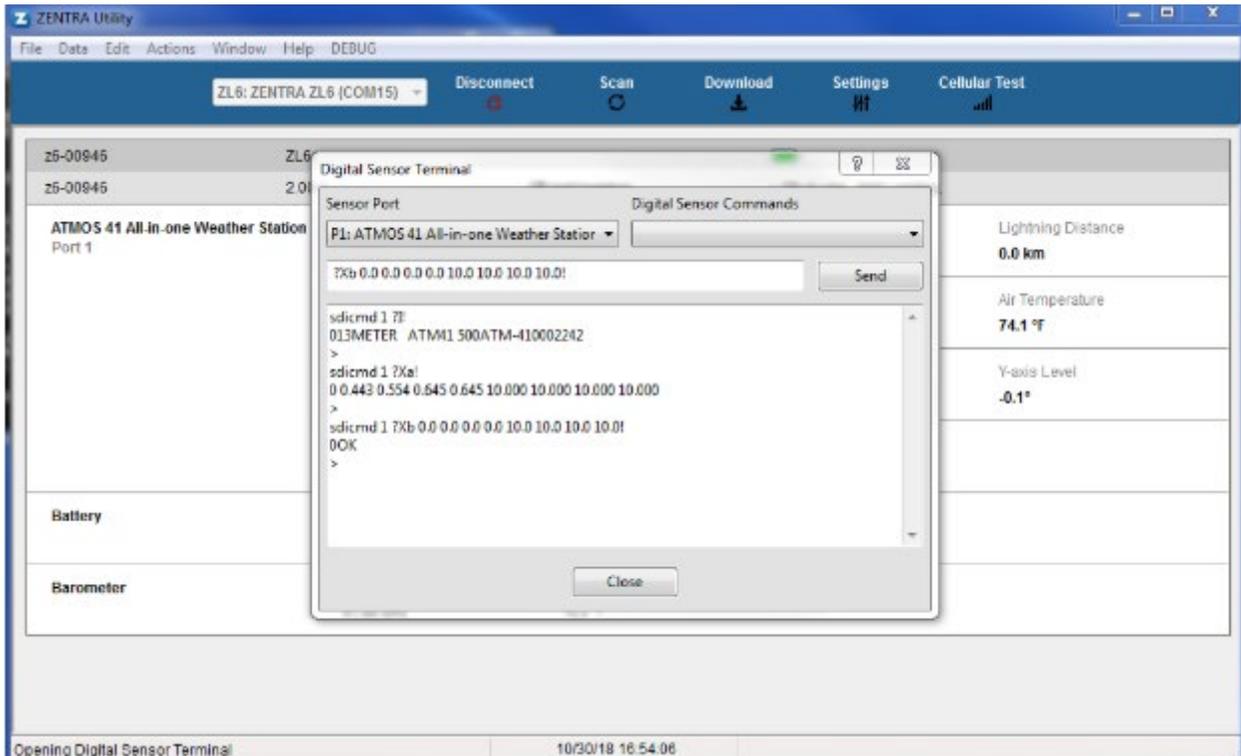
You should see **013METER ATM41 XXXATM-41000XXXX** output returned, when the SDI-12 address is 0

- iv. Type **?Xa!0 -0.099 -0.132 0.044 0.079 11.5 12.0 11.0 10.9**

If any of the last 4 values are 0, then perform **step v**, otherwise skip to **step vi**.

v. Type `?Xb 0.0 0.0 0.0 0.0 10.0 10.0 10.0 10.0!OOK`

Make sure the sensor returns OK. If there is an error, repeat this step.



The next steps need to be done with the sonic anemometer sensor covered so that there is no air movement! In the field, you will need something better than paper or cardboard when re-zeroing the wind speed. We have found it effective to use paper or cardboard first, then cover the sensor suite in a fleece blanket. This ensures no moving air or sound will enter the sensor during the re-zeroing step.

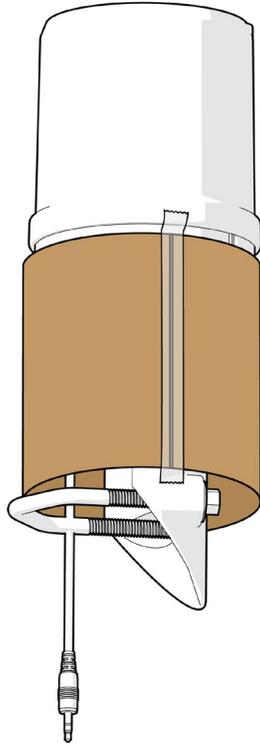


Figure 1. First, use paper or cardboard

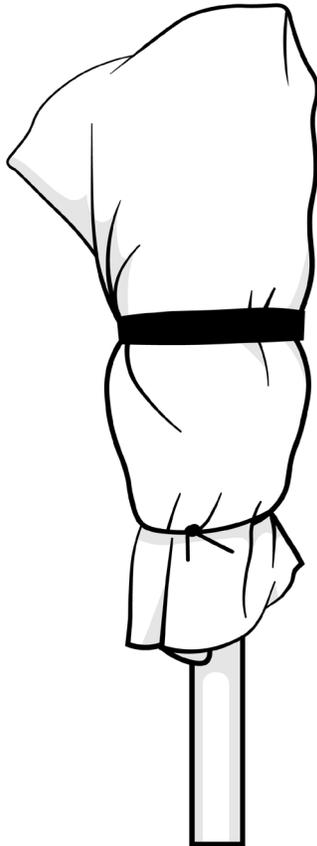


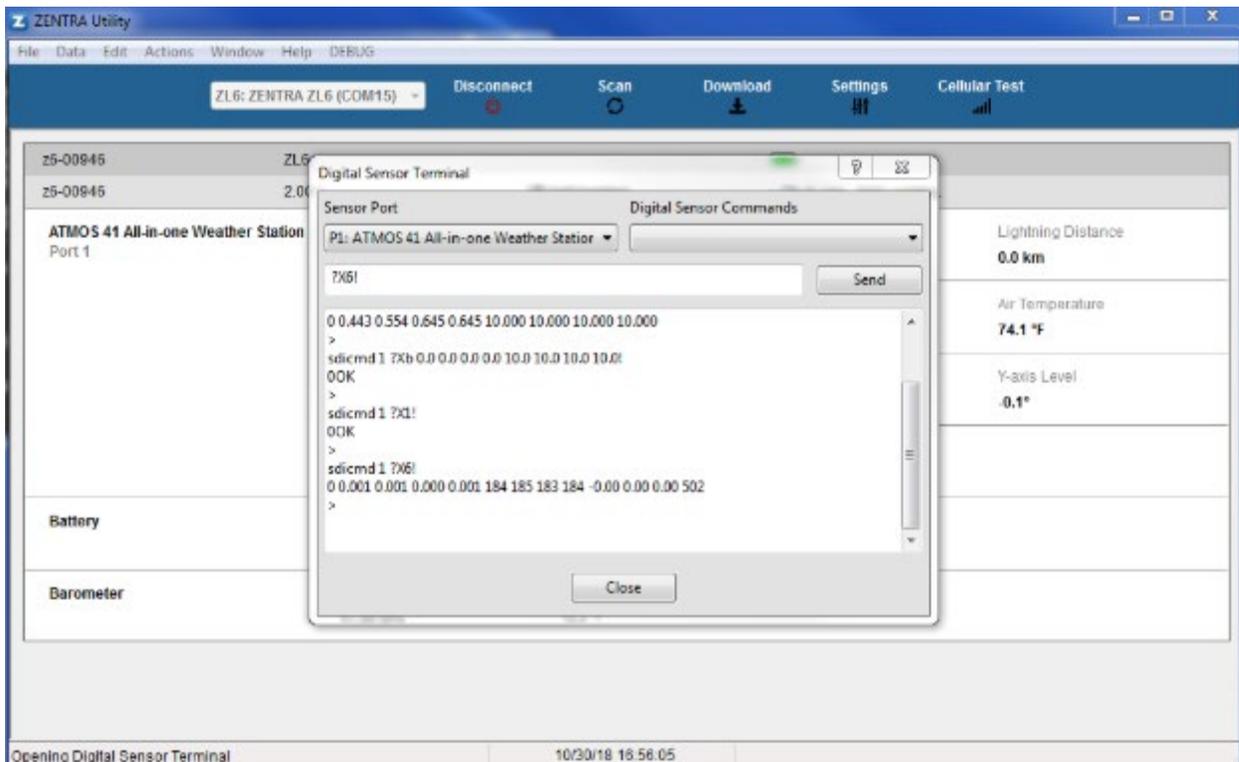
Figure 2. Second, cover the sensor suite in a fleece blanket

vi. With the sonic anemometer covered, type `?X1!OOK`

This will set the phase to zero. Make sure the sensor returns OK. If there is an error, repeat this step.

Type `?X6!0 0.000 -0.000 -0.000 0.000 360 361 360 360 0.00 -0.00 0.00 500`

This command returns the SDI-12 sensor address, four phase values, four values that you don't need to worry about, two wind velocity components, wind speed, and lightning sensor frequency respectively. The phase values should be 0.000 +/- 0.002 when they are set. The wind velocity and wind speed values should be 0.00 +/- 0.02. The final number is the lightning sensor frequency which can be ignored. Repeat **step vi** if the values are outside of the tolerance (see the example below).



3. Exit the terminal program.
4. Remove the wind shield.
5. Reconnect the sensor suite to the data acquisition setup.
6. Ensure that the engraved N is pointing toward True North.
7. Re-level ATMOS 41, ± 2 degrees from (0,0).