Portable Tilt Meter Unit Instruction Guide

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1   Kit Components

This kit contains all components needed to record two axis tilt meter data in the field, provided an external 7-23 VDC power source. Before shipping this kit, be sure that all kit components are in place.

1. Unit power cord x 1

2. GPS Antenna x 1

3. Tilt meter logger x 1

4. Tilt meter sensor x 1

5. Tilt meter computer connection cable x1

6. Micro SD Card and Adapter x 1
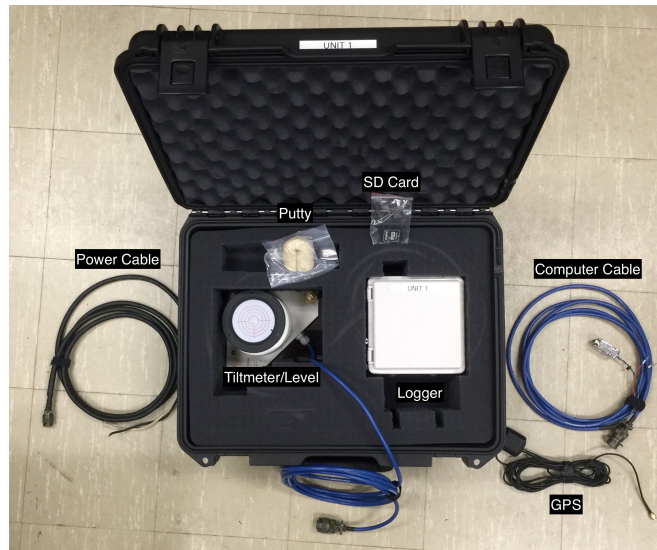
7. Sealing putty x 1

8. Instruction Manual x 1

Figure 1: Kit contents essential for a deployment.

2 Setup

Carefully follow these instructions to ensure a reliable and useful field deployment of the portable tilt meter package.

1. Select a location on stable, flat ground.

2. Place the equipment case and remove the cables and GPS antenna.

3. Level the tilt meter with the bubble level. Loosen the brass lock nuts if needed. Tighten lock nuts finger tight when level. Recheck level!

4. *Optional:* Connect the computer link cable to power and the serial port of a computer. Connect the cable to the tilt meter.

5. *Optional:* Open a serial terminal utility and connect to the tilt meter (9800,N,0,1).

6. *Optional:* Enter *9900XY into the terminal and press return (if no response make sure your terminal is sending <CR><LF> at the end of the serial sequence).

7. *Optional:* The tilt meter should return the x tilt, y tilt, temperature, and its serial number.

8. *Optional:* Adjust the level of the until and repeat the process above until the unit is nearly centered in the measurement range. Use the lock nuts to secure the setting.

9. *Optional:* Remove power and disconnect the computer cable.

10. Connect the tilt meter cable to the tilt port on the logger.

11. Open the logging unit with the two latches.

12. Ensure that the GPS and tilt serial switches and in the positions shown in figure 2.

13. Connect the GPS antenna to the antenna connector on the logger and place it outside the box.

14. Insert a formatted (FAT32) SD card into the top SD card holder.

15. Check that a backup battery is inserted into the coin cell battery holder. This battery lasts for years and is a CR1220.

16. Connect the power cable to a 7-23 VDC power source (battery, etc). Black to ground and white to positive. DO NOT REVERSE THESE!

17. Connect the power cable to the logging box.

18. Large red and green LEDs will illuminate to indicate the the logger is completing setup routines. These lights flash twice to verify that setup was completed successfully (about 20-30 seconds). This process may repeat if the GPS lock takes longer than 30 seconds.

19. The small yellow LED labeled L13 should flash once per second. The green PWR LED should be on solid. The red FIX led should flash approximately once every 15 seconds once GPS lock is established. If any other lights are on or flashing the unit is not functioning correctly. Check the error codes.

20. Close and seal the logging electronics (white) box.

21. Carefully route the power and GPS antenna cables though the slots in the case. Seal with a small strip of putty if necessary.

22. Stow all extra cables.

23. Close the case gently so the unit stays level and lock the case shut. Deployment is complete.
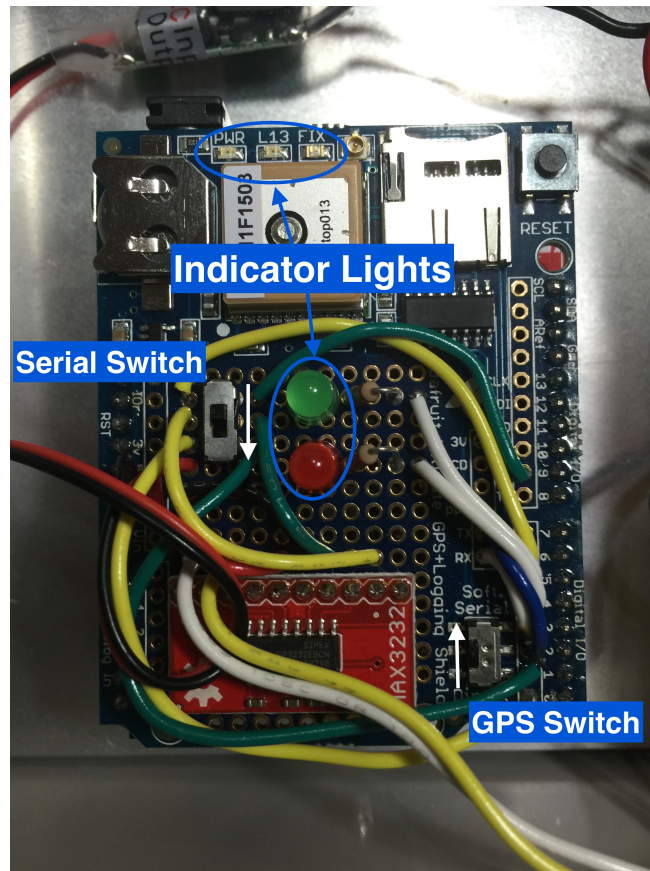
Figure 2: Essential controls and indicators in the logger box.

3 Take Down

Take down procedures render the unit safe and prepare it for shipping. Failure to follow these instructions could result in damage or data loss.

1. Carefully open the case.

2. Remove power from the logging unit by disconnecting the power cable.

3. Disconnect the power cable from the power source.

4. Disconnect the tilt meter cable from the logging unit.

5. Disconnect the GPS antenna from the logging unit. Stow.

6. Open the logging unit and recover the SD card with your data on it.

7. Seal and replace the logging unit.

8. Carefully wind, bind, and replace all cables and materials.

9. Seal the box. Take down is complete.

4   Error Codes

Error Code	Error Description
1 red flash	Cannot open file to write on SD card.
2 red flashes	Cannot start SD card, check card and formatting.
3 red flashes	Error writing GPS data to SD card.
4 red flashes	Error writing tilt data to SD card.
red and green simultaneous flashes	Check serial switch positions.

5   Troubleshooting

When encountering problems with the unit, the following steps will solve most issues.

- Check all connectors for cleanliness and firm connection. Clean if necessary.

- Verify that tilt meter can be read from computer interface.

- Check that SD card is inserted into the right slot and is FAT32 formatted.

- Verify the position of the two serial switches on the logging unit.

- Power cycle the unit.