ATA004A Smart Battery Data Reader / Logger

Operating Instructions

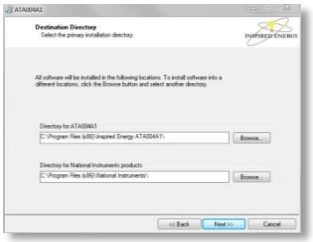
The ATA004A is a diagnostic tool which can be used to view the data fields stored by Inspired Energy smart battery packs. It uses a standard USB port, with software written by Inspired Energy, to display the battery data on any personal computer. The unit can be used to view and record static battery data, or to log dynamic battery data while the battery is charging or discharging. This makes it an invaluable tool for quality assessments, system testing, SMBus communications troubleshooting and battery end-of-life determinations. The ATA004A can also be used to write to those battery data fields which support external input.

What's in the box?

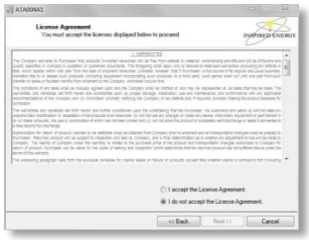
The ATA004 consists of:
- A "Y" cable with 3 connectors
- A CD containing the software

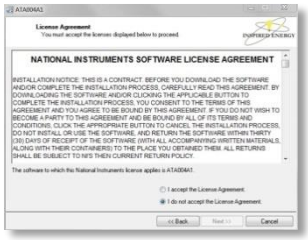
Getting Started:

1. Insert the CD into the drive on your PC
   a. If installation does not automatically begin, navigate to the root directory on the CD & click on "Setup.exe"
2. If you wish to load the software in the recommended directories click "Next" or browse to the directories into which you wish to save the software.

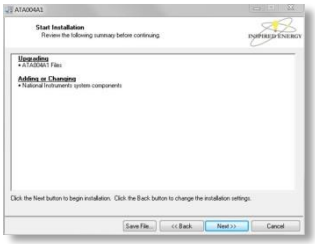


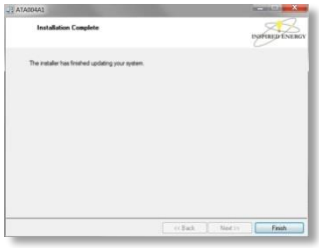
3. Accept the license agreements; one from Inspired Energy & one from National Instruments, and click "Next".





4. Click "Next" to begin the installation process & then Finish" to complete the installation.





5. The ATA004A software will be listed in your Start Menu alongside the light bulb icon:

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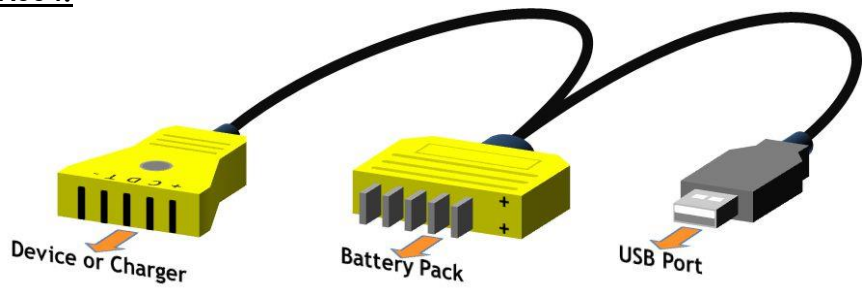
The Battery Data Screen:

- The battery data is displayed in boxes in the center of the window.
    - A full description and derivation of each data field can be found in the Smart Battery Data Specification rev.1.1. Please contact Inspired Energy or visit www.sbs-forum.org/specs/ for a copy.
- Clicking on the logo at the top of the page will take you to www.inspiredenergy.com.
- Along the bottom are the status indicators for the USB connection, data scanning and battery status codes.
- On the left of the window are the scanning buttons and the quick health check status indicators.

Connecting to the ATA004:



- Plug the USB connector into an available USB port (1.0 or higher) in your computer. The Blue LED will illuminate indicating power from the USB
- Plug the male blade connector into the battery pack observing the polarity. A green LED will flash during data transmission to & from the battery.
    - The ATA004 is protected against reverse polarity insertion.

At this point the software can read the battery data, and the system can be used to assess the state of health of the battery.

- If you wish to view &/or log dynamic battery data during a charge or discharge, plug the female connector into a charger or into your battery-powered device. This will enable the battery to operate the device as if it were inserted.

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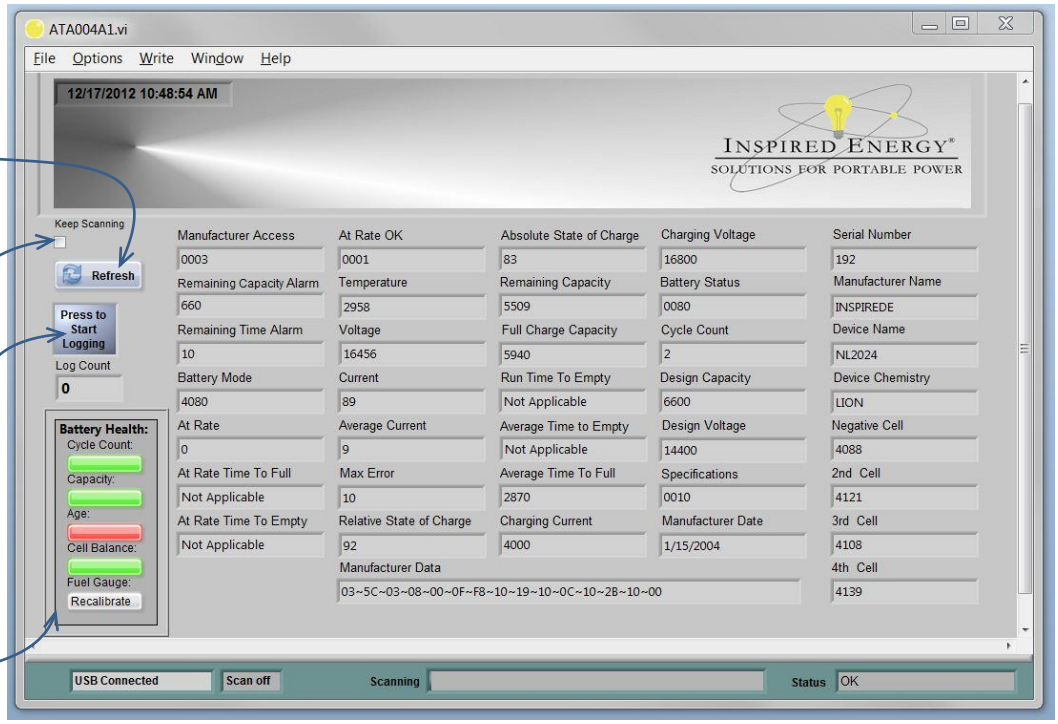
Operating the ATA004A:

With the battery & USB port connected, you can scan the battery manually by using the "Refresh" button.

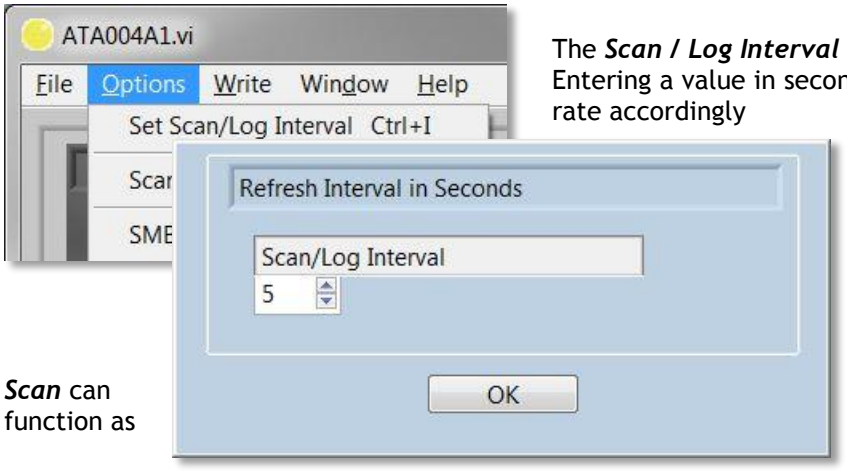
To scan the battery automatically click the "Keep Scanning" checkbox.

If you wish to save the scanned data, click the logging button. A screen will prompt you to enter a filename / location, and data logging will then begin with one full record saved for every scan.



The Battery Health monitor provides a quick check on a battery's state of health. The bars will change from green through amber to red depending on the health of the battery. These are only a guide, and a red bar does not necessarily mean that the battery requires replacement. We recommend that you establish acceptable limits for your particular application, and always re-calibrate the battery before making any end of life determination. For example; you may decide to replace the battery only if two or more red bars are showing.
In the example shown above, the battery is a few years old & the fuel gauge requires calibration, but otherwise it is in good health & will continue to provide good service.

The "Options" Menu:



The ***Scan / Log Interval*** can be adjusted using this tab.
Entering a value in seconds will change the scanning / data logging rate accordingly

Scan can be toggled on or off. This has the same function as the "Keep Scanning" checkbox.

The ***SMBus Pullups*** in the battery can be set low or high to suit the requirements of your device. Please note. The default is for the internal battery pullups to be ON. Changing them to off may cause communications difficulties.

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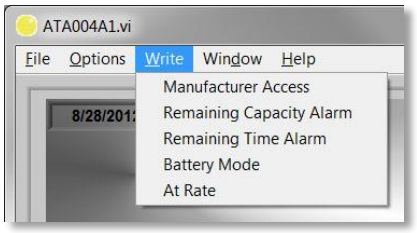
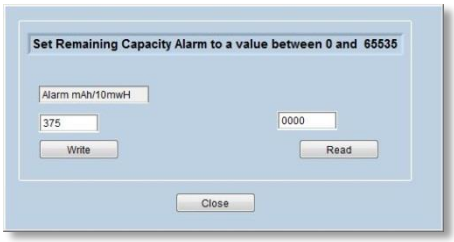
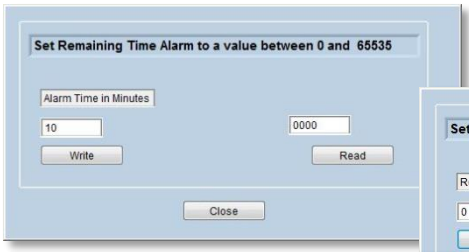
Writing to the Battery:

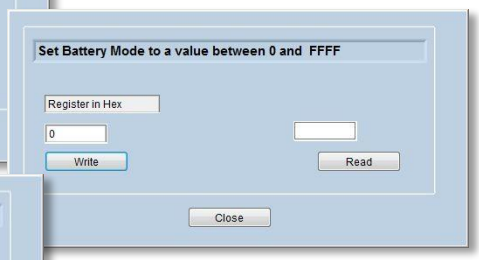


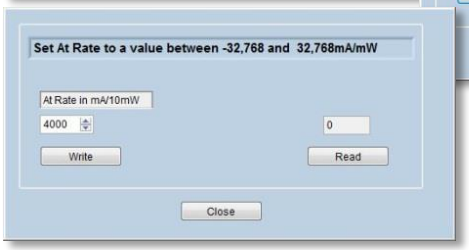
Manufacturer Access is used only internally by Inspired Energy.



The ***Remaining Capacity Alarm*** can be altered to suit the needs of your device. By default, all Inspired Energy products have this value set to 10% of the design capacity. Open this window & enter a value to a value that will enable your device to shutdown in an orderly manner, & press the "write button. The "Read" button can be used to check that the battery has accepted the new data.







Similarly the ***Remaining Time Alarm*** can be adjusted to suit the length of time your users require to save their work and shut down the device. The default is set to 10 minutes on all Inspired Energy products.

The ***Battery Mode*** feature can be used to select the various operational modes for the battery; for example whether the battery capacity is reported in mAh or mWh etc..

The ***"AT-Rate"*** function allows you to ask the battery questions. Literally "If I were to charge / discharge the battery ***AT*** the following ***RATE***, how long will it take until the battery is full /empty?" Enter a negative integer for a discharge current and a positive integer for a charge current.

Note: if you have used the battery Mode feature to change the capacity reporting from mAh to mWh you'll need to enter a value in mWh.

Using the ATA004A to Determine End of Life For A Battery:

The ATA004A can be used to check the state of health of a population of batteries. The following guidelines can be used to run a quick assessment of whether a battery should be returned to service or replaced. For example, it may be time to replace the battery if:

- Cycle Life: If the Cycle Life count has exceeded 355
- Manufacture Date: If this shows a date older than 4 years
- Full Charge Capacity: If this value is less than 65% of the Design Capacity

These are guidelines only. Each application is different and may have differing thresholds for battery replacement. To assist in your decisions the battery state of health monitor uses a "traffic light" system to monitor & communicate those battery parameters which are typically used in end of life determinations.

NOTE: The Max Error value should be below 5% before making any end of life determinations.

Thresholds used by the battery health monitor	Green	Amber	Red
Cycle Count	<250	250 - 355	>355
Full Charge Capacity	>80%	80% - 65%	<65%
Age	<2yrs	2 – 4yrs	>4yrs
Cell Balance (Max cell voltage deviation)	<60mV	n/a	>60mV
The "Fuel Gauge" box changes from "OK" to "Recalibrate" when Max Error >= 10%			

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