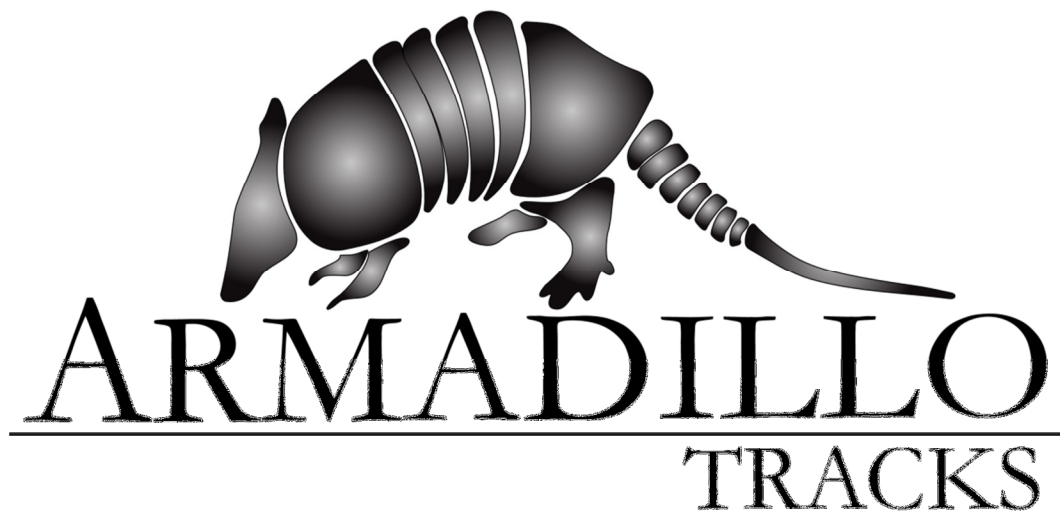


Armadillo Analyzer 2 USER'S GUIDE



*Installer Version 2.1.5
Application Version 2.1.4804.18564*

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Introduction

The Armadillo Analyzer is the software tool used to obtain and analyze data recorded by an Armadillo Above Ground Marker (or AGM).

The Analyzer can perform the following functions:

1. Set up Armadillo AGMs before a job
2. Synchronize a computer's time with the GPS time from an Armadillo AGM
3. Download data files from the Armadillo AGMs
4. Analyze Magnetic, 22 Hz, and Geophone data to accurately determine pig passage times
5. Export user-defined data from a list of supported fields to a user-defined format for correlation with Inline Inspection (ILI) tool logs
6. Delete files on the Armadillo AGMs
7. Batch firmware & boot loader updates to the Armadillo AGMs

This User's Guide describes the features of this program.

Changes From Prior Versions

This section details the changes between previously released versions.

| Date | Installer Version | Application Version | Changes |
|----------|-------------------|---------------------|---|
| | 2.1.5 | 2.1.4804.18564 | - Can zip up filtered passes for easy storage and/or distribution. |
| | 2.1.0 | 2.1.4682.21468 | <ul style="list-style-type: none"> - CRITICAL BUG FIX: UTC timestamped data may be off in the early portions of older files. This may affect pass times if the GPS sync hadn't been received by the AGM yet. This has been corrected and will auto-correct old files opened with the Analyzer. - Repository concept has been removed from the Analyzer. You now just "Open Files" - Downloaded filenames now specify job name, agm name, and correct time information. - Files of size 0 will no longer be downloaded from AGM. |
| | 2.0.10 | 2.0.4580.18952 | <ul style="list-style-type: none"> - Can set triggering on individual 22 Hz channels - Uploads data to 'Analyzed Runs' section of www.armadillotracks.com - Fixed bug when downloading by time (selection of data was off by 15 seconds) - User may now choose how often updates are checked |
| 02/25/15 | | | - Updated graphics to new logo, new company name (PureHM Inc.) |

Installing and Updating

Installing

The latest copy of the Armadillo Analyzer can be found on the internet at the following location: <http://www.armadillotracks.com/Analyzer/>

You will need to download this file and unzip it. Run the Armadillo Analyzer v2 Install.msi file and follow the instructions to install the application.

By default, this will install the Analyzer to the following directory for 32-bit operation systems (Windows XP 32-bit, Windows Vista 32-bit, and Windows 7 32-bit):

`C:\Program Files\PureHM Inc\Armadillo Analyzer\`

The Analyzer will be installed to the following directory for 64-bit operation systems (Windows XP 64-bit, Windows Vista 64-bit, and Windows 7 64-bit):

`C:\Program Files (x86)\PureHM Inc\Armadillo Analyzer\`

The Armadillo Analyzer installer also creates the following directories:

- AGMs – when Bluetooth® is used to successfully connect to an AGM, the connection information will be stored in this directory for future connections.
- Themes – any themes that you modify or create are stored here. Please refer to the section Other Features > Theming for further details. This folder is usually created in your My Documents folder (Documents\Armadillo\Themes\)\ so other Armadillo applications can reuse the themes.
- Templates – any export templates that you modify or create are stored here. Please refer to section Exporting Data > Export Templates for further details. This folder is created in your My Documents folder (Documents\Armadillo\Templates\).

Updating Your Version

Version 2 of the Armadillo Suite of programs will perform a version check against the Armadillo web service every time it is launched if your computer has an internet connection. You will be informed of any new version. You will be informed if the update is critical or not.

Updates to the Armadillo Analyzer are as simple as downloading the latest version of the Analyzer from the Armadillo Tracks web page and installing it on your system. Your AGMs, Themes, and Templates will not be modified and will persist between the old version and the new version so any customization that has been performed will be kept.

GPS vs. UTC Time

When the Analyzer is first run, you will be prompted to choose between UTC or GPS time.

This is a very important choice, and it will affect all software operation. It is vital that you confirm with your company which time standard is used end-to-end with your jobs. An erroneous choice may cause an incorrect correlation to dig locations.

UTC

This is the most common form of time used in the industry. It represents time in 'human-readable' terms - the same you would see on most clocks and watches. This time can actually shift up to twice a year due to the Earth's rotation slowing down or speeding up, although this is a rare change.

GPS

GPS time is guaranteed to be the most accurate and never adjusts forward or backward - it constant keeps ticking forward. It does not match what most GPS units display as time, but is the absolute most reliable format of time to use. The current offset from UTC time (at least until July 1, 2013) is 16 seconds.

If you make an incorrect choice and need to change this setting after the application has already run, you can open the Options dialog and change the time standard. A warning will display indicating the seriousness of this change.

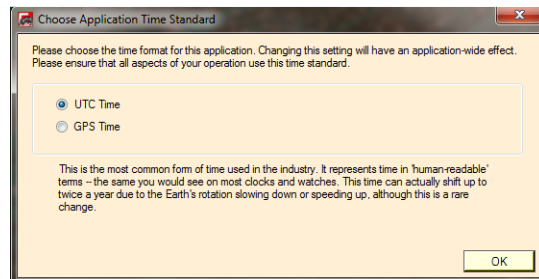
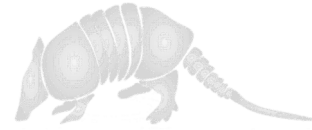


Figure 1 - Choose UTC vs. GPS

Overview

The Armadillo Analyzer consists of two main panels:

1. Detailed Info Pane
2. Pass Selection and Graphic Analysis



1. Detailed Info Panel

The detailed info pane is shown on the right-hand side. It can be collapsed by clicking on the bar on the right-hand side of the screen, or by hitting ctrl-I on the keyboard.

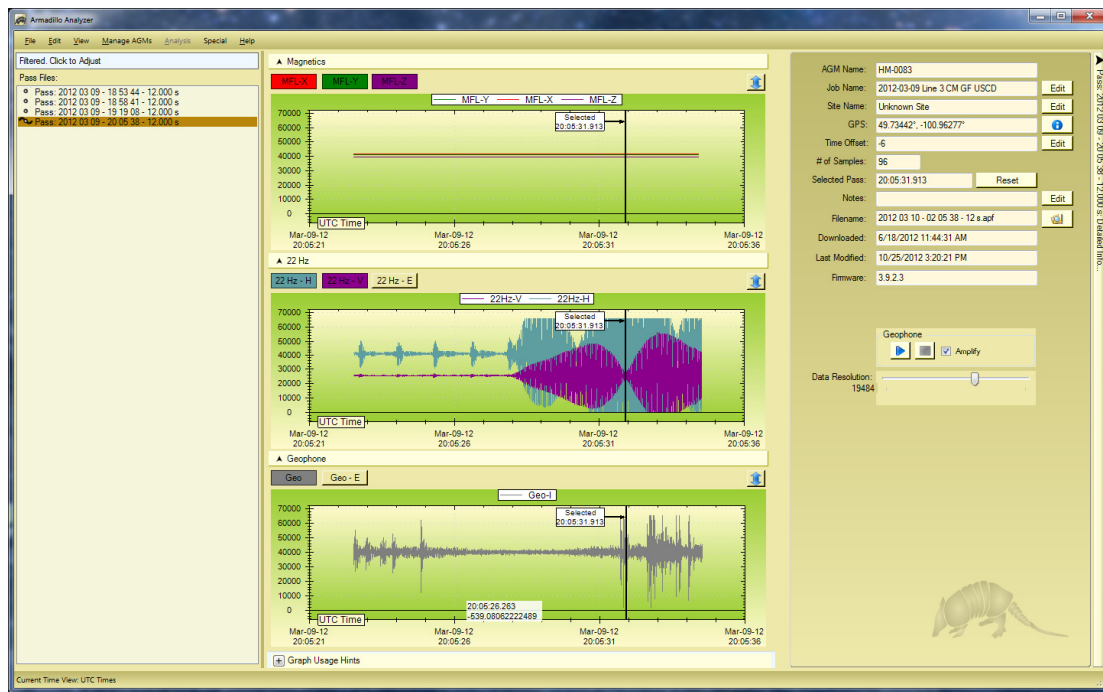


Figure 2 - Pass Selection & Graphic Analysis

2. Pass Selection & Graphic Analysis

In Figure 2 - Pass Selection & Graphic Analysis, we see the detailed info pane is still open on the right-hand side of the window. It can still be collapsed by clicking on the right-hand side bar or by hitting ctrl-I, and more screen real estate will be given to the graphs shown.

The remaining pane, on the left, is the workhorse of the Armadillo Analyzer application. This is probably where most of your time will be spent. Here you select the pass that you would like to analyze from the list on the left, and the pass' information is displayed in the graphs and in the detailed info pane on the right.

This pane is discussed in much more detail in the Analysis section.

Connection to Armadillo AGMs

A core feature of the Armadillo Analyzer is the ability to connect to multiple AGMs at the same time to perform the same function in parallel. The Analyzer connects to one or more AGMs in the same manner for all functions relating to the boxes. This section of the guide walks through how this is performed.

Any function that supports connection to the AGMs will open up with the following screen:

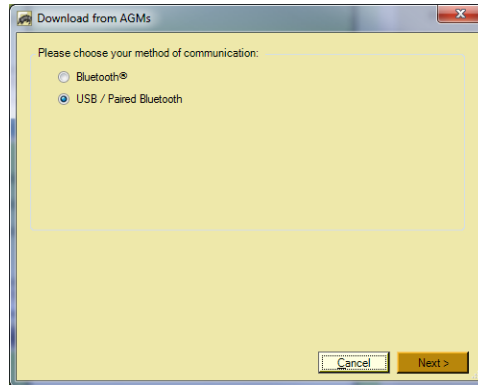


Figure 3 - Communication Selection

If Bluetooth® is not available, or an unsupported Bluetooth® Stack is installed, then the Analyzer will not allow this selection and will force you to select a “USB / Paired Bluetooth®” connection.

Bluetooth®

If Bluetooth® is selected, the device will search the surrounding area for any Bluetooth® device with a serial connection capability, *including devices that are not Armadillo AGMs*. By default only AGMs that start with a chosen prefix will be shown. The default prefix is “AGM-”, but this can be changed.




It is highly recommended that you use Class 1 Bluetooth® to connect to the AGMs. This has a much larger range (up to 300 feet) and will work the best with the AGMs. Class 2 devices can be used to connect to the AGMs, but Bluetooth® may not work consistently.

USB / Paired Bluetooth®

If “USB / Paired Bluetooth®” is selected, the Analyzer can search every communication serial port that is attached to the computer and attempt to find any connected Armadillo AGM. This detection will automatically detect any valid devices.



If you have manually “paired” with Bluetooth® to one or more Armadillo AGMs to a COM Port, this option is the one you would choose.

Once you have selected the mode of communication, the Analyzer will begin its search automatically with Bluetooth, or when you click the  Refresh button:

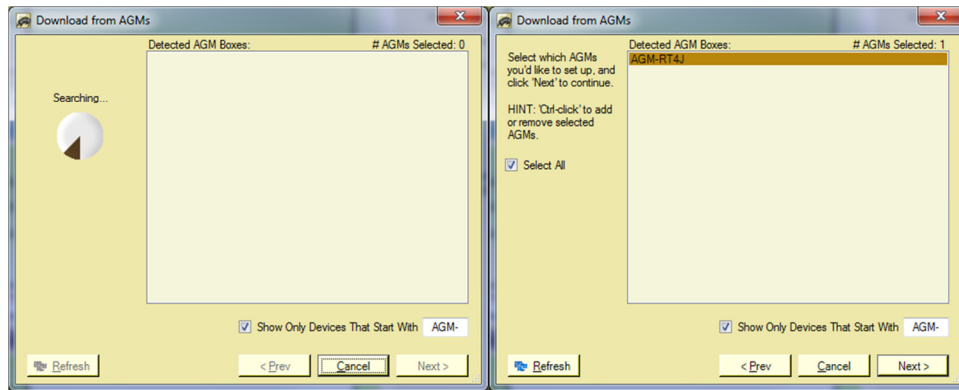


Figure 4 - AGM Selection

In order to speed up connection to our devices by Bluetooth®, once you have successfully connected to an AGM, it will be cached and shown on this screen by default. No automatic search will be performed. If you would like to add more devices that you haven't successfully connected to, you can click the [Refresh](#) button to scan the area once again.

When you have selected at least one AGM, you may click [Next >](#) to perform the operation you have chosen.

To select multiple AGMs in this window, you can hold down the ctrl key and select or deselect individual boxes. The checkbox [Show Only Devices That Start With AGM-](#) will not be checked when you first see this window, and will default to the prefix "AGM-". When this checkbox is checked, only those devices that begin with the specified prefix will be displayed in the list. If you uncheck this option, the list will show all the devices detected by your computer.

If you'd like to do a search again for any device (one that was either just turned on or connected the computer), clicking [Refresh](#) will perform the search again.



In some cases, the name of the AGM does not come through quickly enough for the AGM to show up in this list. Clicking [Refresh](#) will usually reveal it the second time.

Downloading Files

Once a pigging run is complete, the data needs to be downloaded from the Armadillo AGMs to your computer to be analyzed. You will be prompted to select the location of the downloaded files.

Download Steps

1. Select *Manage AGMs > Download...* from the main menu, or hit ctrl-D as a shortcut.
2. Select the Armadillo AGMs that you wish to download any data from. Please refer to *Connection to Armadillo* for the instructions on how to do this.
3. Once you have chosen the boxes you wish to connect to, click **Next >**. You will see a screen that will soon populate with an aggregate collection of the jobs that are present on the boxes that you've connected to:

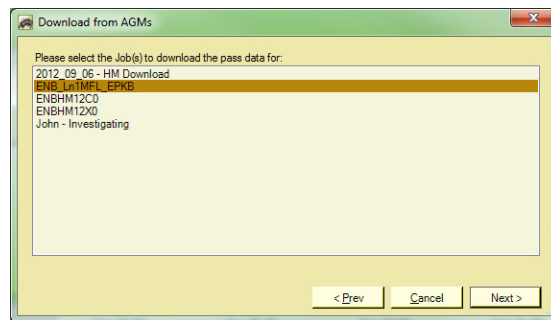


Figure 5 - Available Downloads

This screen aggregates all of the job information that is available on all of the boxes and presents your choices in one single list, allowing for easy selection of jobs.

You will only be able to download one job at a time. Make your selection here and click **Next >**.

4. The next screen will prompt you to choose a folder where the data will be downloaded. This folder location defaults to the last folder the Analyzer opened data from, or the last download location (whichever happened last).

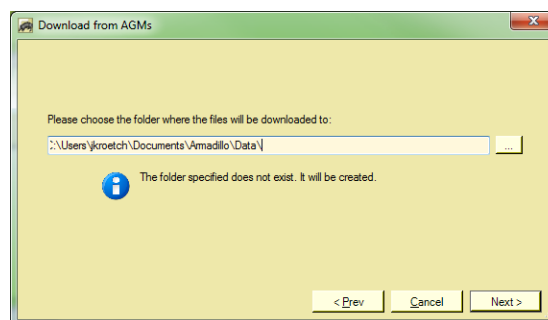


Figure 6 – Download Location

If the folder does not exist, it will be created when your download starts.

5. The next screen allows you to pick how you will choose your data to download.

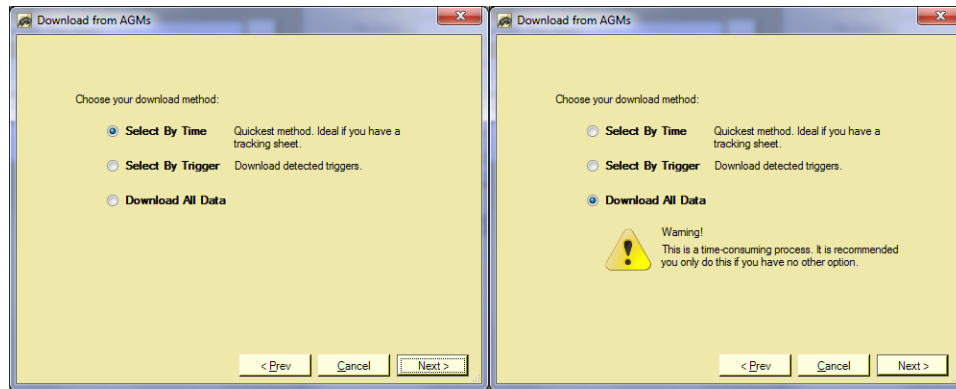


Figure 7 - Download Method

You can choose to download by specifying a list of times, or by using the times that the AGM indicated was a trigger. You may also choose to download all the data.

i. By Time

If you choose to download by time, you will need to enter a list of times, preferably from a tracking sheet. The screen shown in Figure 8 is very flexible and will accept multiple time formats.

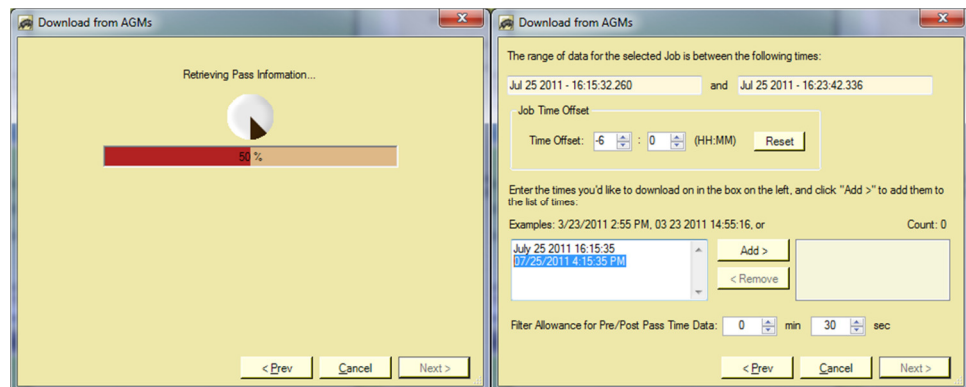


Figure 8 - Download by Time

Simply copy and paste the times from the tracking sheet into the text box on the left and click **Add >**. If the software cannot figure out what time you intended, it will not add the time and will inform you, allowing you to correct the format.

You have many options on this screen. The first is the time offset. When the job is setup, the operator can specify the time offset of the job (see the section “Set Up AGMs”, below). This value can be overridden here, but it should not need to be.

The option at the bottom (Filter Allowance for Pre/Post Pass Time Data: 0 min 30 sec) specifies the range of data to download before and after the specified times.

The default is 30 seconds, but if you're having trouble narrowing in on a pass, you may want to increase this value.

Once you have your times entered, click **Next >**. A summary of the times you've specified will be displayed.

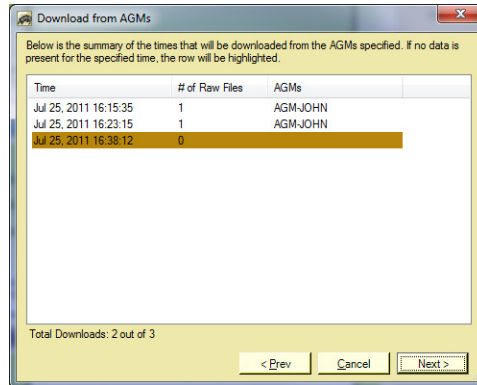


Figure 9 – Download by Time Summary

Each time will be listed, along with the number of data files that will be downloaded and from which AGMs they will be downloaded from. If the specified time is not found on any of the connected AGMs, the row will be highlighted.

ii. By Trigger

If you choose to download by trigger, you will be presented with a list of triggers from the box. Each trigger will show the time of trigger as well as what sensor triggered: Magnetics (MFL) or 22Hz.

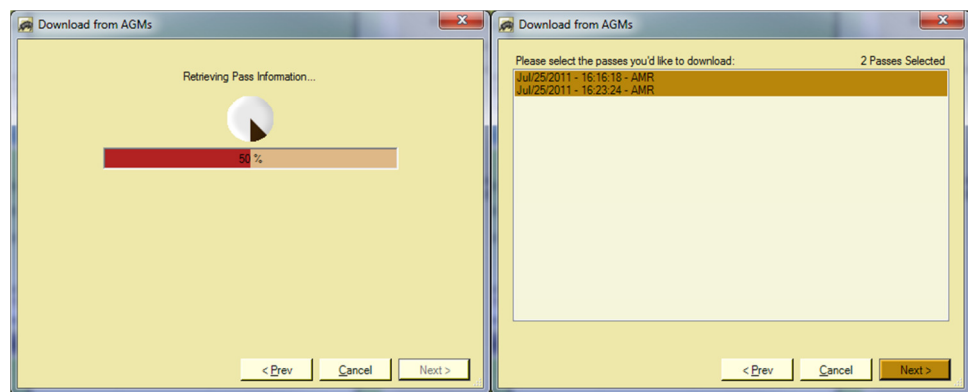


Figure 10 - Download by Trigger

Select the passes you would like to download and click **Next >**. You will then be asked how much data to download on either side of the specified trigger time. The software initially defaults to 6 seconds before and 3 seconds after. You can customize this as you see fit.

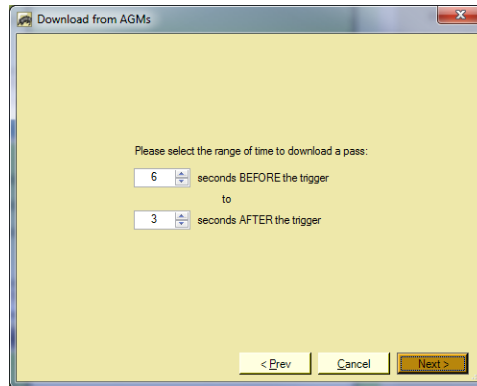


Figure 11 - Download by Trigger Padding

iii. All Data

If you choose to download all of the data on the box, you will be presented with a list of all the recorded data on the box for the selected job. Each data file will show the range of time recorded.

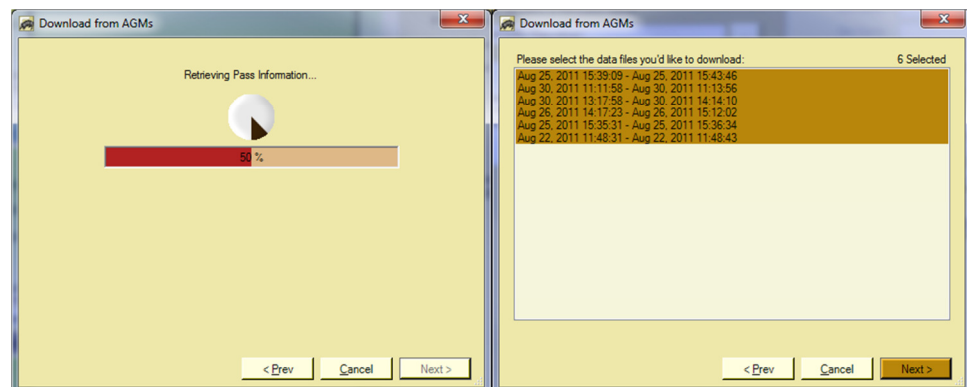



Figure 12 - Download All Data

Select the data files you would like to download and click .



Downloading all of the data is a very time-consuming process when compared to downloading by time or by trigger. It can take up to 10 times longer to transfer the data, in addition to the extra processing time for loading and analyzing the data. It is recommended you only download full data files when absolutely necessary.

Each data file will be downloaded in 10-minute increments of data with an overlap of 30 seconds. This increases the number of files created on your local computer, but ensures that they will load quickly and correctly within the Armadillo Analyzer program.



If you download all of the data, it is recommended that you use the *Crop Data To Shown* feature to remove extraneous data when analyzing for a pass time. See the Graphic Analysis section, below.

- The final screen shows the progress of each pass in the download. Each AGM will be downloaded in parallel, greatly speeding up data retrieval.

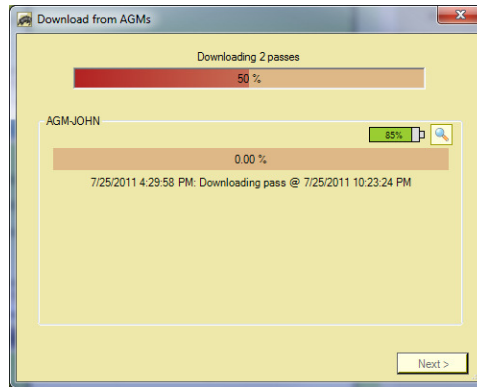


Figure 13 - Download Progress

Each AGM will show the current progress for downloading from that AGM.

- If you'd like to view a detailed report of the progress, click on the button. This will show a list of items for that particular AGM. You may right-click this list to save the messages – this is useful when investigating or reporting problems (see the Technical Support section).

If time was selected in the aggregation that is not available on an AGM, that data retrieval is skipped for the AGM.

- Once downloading has completed, the button will appear. Click it and the download screen will close.

- The downloaded files will not be automatically opened upon download. If you wish to view them you will need to explicitly open the files with **File > Open** command.

Opening Downloaded Files

Once files have been downloaded, you will want to open them with the Analyzer to view the data, find passes, and select pass times. Choose **File > Open** from the main menu, and select either the one file, or a range of files to open and analyze.

| | | | | |
|--|---|-------------------|--------------------|----------|
| | Holy Energy - HM-0065 - 2012 08 25 - 08 17 50 - 600 s.apf | 9/10/2012 9:31 AM | Analyzer Pass File | 3,638 KB |
| | Holy Energy - HM-0065 - 2012 08 25 - 08 27 20 - 600 s.apf | 9/10/2012 9:31 AM | Analyzer Pass File | 3,638 KB |
| | Holy Energy - HM-0065 - 2012 08 25 - 08 36 50 - 600 s.apf | 9/10/2012 9:32 AM | Analyzer Pass File | 3,638 KB |
| | Holy Energy - HM-0065 - 2012 08 25 - 08 46 20 - 600 s.apf | 9/10/2012 9:32 AM | Analyzer Pass File | 3,638 KB |
| | Holy Energy - HM-0065 - 2012 08 25 - 08 55 50 - 600 s.apf | 9/10/2012 9:33 AM | Analyzer Pass File | 3,638 KB |
| | Holy Energy - HM-0065 - 2012 08 25 - 09 05 20 - 600 s.apf | 9/10/2012 9:34 AM | Analyzer Pass File | 3,638 KB |
| | Holy Energy - HM-0065 - 2012 08 25 - 09 14 50 - 600 s.apf | 9/10/2012 9:34 AM | Analyzer Pass File | 3,638 KB |
| | Holy Energy - HM-0065 - 2012 08 25 - 09 24 20 - 600 s.apf | 9/10/2012 9:35 AM | Analyzer Pass File | 3,638 KB |
| | Holy Energy - HM-0065 - 2012 08 25 - 09 33 50 - 600 s.apf | 9/10/2012 9:35 AM | Analyzer Pass File | 3,638 KB |
| | Holy Energy - HM-0065 - 2012 08 25 - 09 43 20 - 600 s.apf | 9/10/2012 9:36 AM | Analyzer Pass File | 3,638 KB |
| | Holy Energy - HM-0065 - 2012 08 25 - 09 52 50 - 600 s.apf | 9/10/2012 9:36 AM | Analyzer Pass File | 3,638 KB |

Figure 14 – Data File Selection

Armadillo Pass Files (with the extension `.apf`) contain the data downloaded from the AGM.



An `.apf` file is merely the data recorded by an AGM over a specified time period. There is no guarantee there is an actual pass within the data.

There are two ways to select multiple data files:


- 1) Click the first file of a range you would like to select. Then hold the shift key and select the last file. All the files in the middle will be chosen.
- 2) Hold the Ctrl key, and select each file to open individually.

Deleting Files

The Armadillo Analyzer does not automatically delete files from the AGMs. This is to allow you to verify that the data was downloaded properly and to ensure that data integrity is maintained.

Once you have analyzed your data and are satisfied that all the information you needed has been retrieved, you may then connect to the boxes to delete the files on the AGMs.

File Deletion Steps

1. Select *Manage AGMs > Delete Files...* from the main menu.
2. Select the Armadillo AGMs that you wish to delete data from. Please refer to *Connection to Armadillo* for the instructions on how to do this.
3. Once you have chosen the boxes you wish to connect to, click . You will see a screen that will populate with the jobs that are present on your selected boxes.

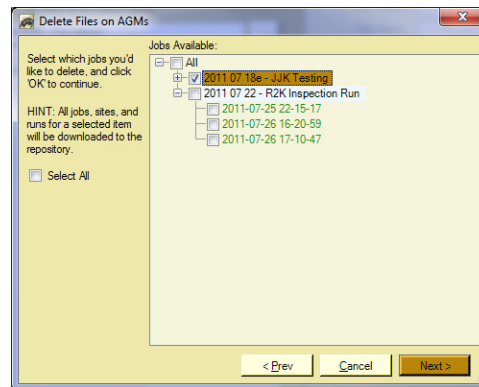




Figure 15 – Choose Folders To Delete

This screen aggregates all of the job and site folders that are available on all of the boxes and presents your choices in one folder tree.

-  You cannot delete any data from the *current job* folder, as the AGM is constantly using that folder for logging and writing data. If you'd like to delete the current job folder, you will need to change the current job of the AGM, power cycle it, and then you may delete the prior job folder.
- 4.  Deletion of files cannot be undone. The next screen warns you, and asks you to confirm that you would like to delete the selected files.
- 5. The final screen shows the progress of each deletion. Each AGM will be deleted in parallel, greatly speeding up the process.

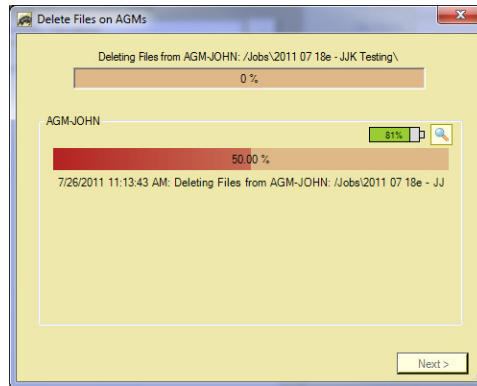






Figure 16 - Deletion Progress

Each AGM will show the current file deletion progress.

-  For jobs or sites that had a lot of data, the deletion step could take many seconds, as there is a lot of data to delete. This is normal.
-  If you'd like to view a detailed report of the progress, click on the  button. This will show a list of items for that particular AGM. You may right-click this list to save the messages – this is useful when investigating reporting problems (see the Technical Support section).


If a folder was selected in the aggregation that is not present on an AGM, that item is skipped for deletion from that AGM.

6. Once the deletions have fully completed, the  button will appear. Click it and the deletion screen will close.

Set Up AGMs

Before every job, each AGM should be set up with the parameters for that job.

Setup Steps

1. Select *Manage AGMs > Setup...* from the main menu.
2. Select the Armadillo AGMs that you wish to set up at this time. Please refer to *Connection to Armadillo* for the instructions on how to do this.
3. Once you have chosen the boxes you wish to connect to, click .

Each screen in this wizard will set up a different aspect of the job the AGM will be deployed to. The first screen specifies the job name:

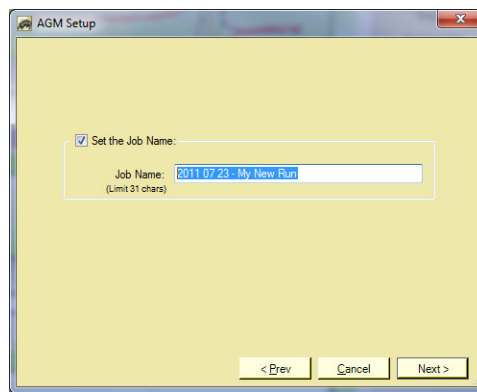


Figure 17 – Setup Screen – Job Name

The job name cannot exceed 31 characters, and is restricted to valid folder-name characters. The following characters are not allowed:

/ \ ? : * " < > | ; ^ & % @ ! () [] { } \$ # =



It is recommended that you precede the job name with the year, month, and day to keep track of your jobs by date in your file system, but this is not required.

4. The next screen specifies which sensors will cause the AGM to automatically trigger.

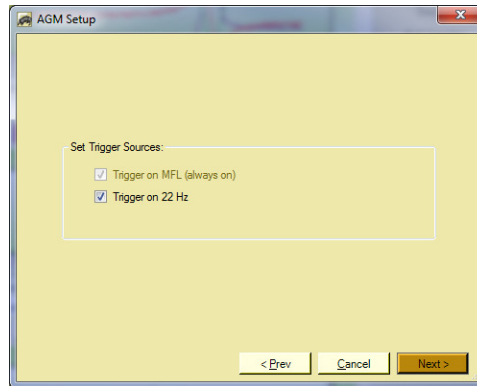


Figure 18 – Setup Screen – Triggers

At this time, the AGM will *always* trigger on the magnetics channel, and this cannot be turned off. You have the option of turning off the 22-Hz trigger to avoid false triggers on runs that do not have a 22-Hz transmitter.



Even though you can turn off what triggers the box, the AGM is *always* recording data from *all* the sensors.

5. The next screen specifies the hourly offset of the job.

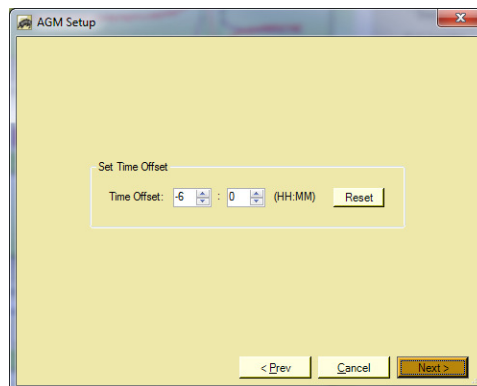


Figure 19 – Setup Screen – Time Offset

All the data on the AGM is recorded at Greenwich Mean Time (GMT). This offset specifies the 'real world' time that the job is being run at so the software can display the data at the expected, tracker-recorded time. This offset can also be adjusted after the fact.

6. The final screen shows the progress of each AGM to be set up. Each AGM will be set up in parallel, greatly speeding up setup.

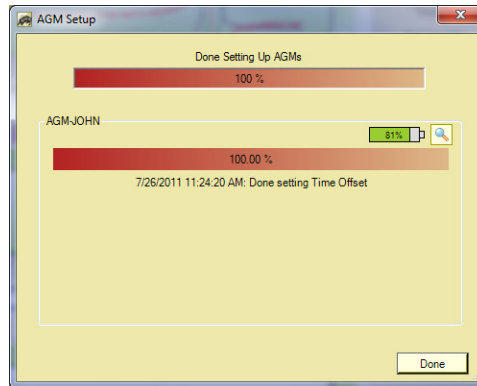






Figure 20 – Setup Progress

Each AGM will show the current setup progress.

 If you'd like to view a detailed report of the progress, click on the  button. This will show a list of items for that particular AGM. You may right-click this list to save the messages – this is useful when investigating reporting problems (see the Technical Support section).

7. Once each AGM has been set up, the  button will appear. Click it and the setup screen will close.


 The information that has been changed on the AGMs *will not take effect* until the AGMs have been power-cycled.

Hibernate AGMs

To extend the operational battery life of the AGMs, you can set a Hibernation time. The AGM will stay off until a time you specify for them to 'wake up'. When they wake up, it will be just as if you pressed the button to start them.

This feature allows for the predeployment of AGMs on the job for days or even weeks without consuming the life of the battery until the AGM is needed.

Hibernate Steps

1. Select *Manage AGMs > Hibernate AGMs...* from the main menu.
2. Select the Armadillo AGMs that you wish to Hibernate at this time. Please refer to Connection to Armadillo for the instructions on how to do this.
3. Once you have chosen the boxes you wish to connect to, click .

You will be presented with the screen to specify the time for the AGMs to wake up:

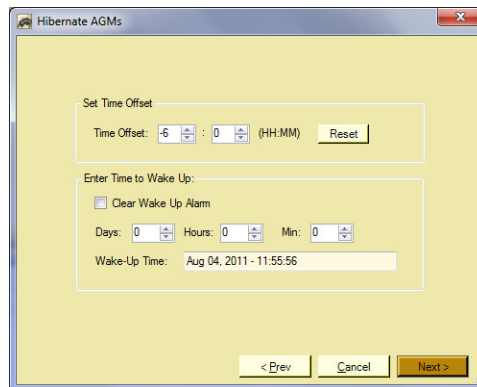




Figure 21 – Set Hibernation Time


The Time Offset at the top of the screen is for translation of your local time into the time the AGM understands – GMT Time. Changing this value only changes the displayed time at the bottom of the screen. It does not change the time offset of the AGM itself.


The second section, Enter Time To Wake Up, allows you to either Clear the Wake Up Alarm, or specify a time that the AGMs will Wake Up. If you choose to clear the wake up alarm, then the AGMs will not wake up if they are shut off.

If you choose to set a Wake Up time, you can specify how many days, hours, and minutes into the future. The displayed wake up time will adjust to estimate when the AGMs will power on.

4. The final screen shows the progress of each AGM to be set up. Each AGM will have its wake up alarm set in parallel, greatly speeding up setup.

 If you'd like to view a detailed report of the progress, click on the  button. This will show a list of items for that particular AGM. You may right-click this list to save the messages – this is useful when investigating reporting problems (see the Technical Support section).


5. Once each AGM has been set up, the  button will appear. Click it and the Hibernate AGMs wizard will close.

 Tip: If you set the hibernation using Bluetooth, the AGMs will automatically shut off when the wizard is closed.

Get Information

The Armadillo Analyzer can connect to one or more AGMs to retrieve the current setup and state information for those boxes. This is useful both as a diagnostic tool and for a quick check to ensure everything is set up correctly.

Get Information Steps

1. Select *Manage AGMs > Get Information...* from the main menu.
2. Select the Armadillo AGMs that you wish to see information about. Please refer to the Connection to Armadillo section for the instructions on how to do this.
3. Once you have chosen the boxes you wish to connect to, click . The software will connect to each box and display a window that has a tab for each connected AGM.

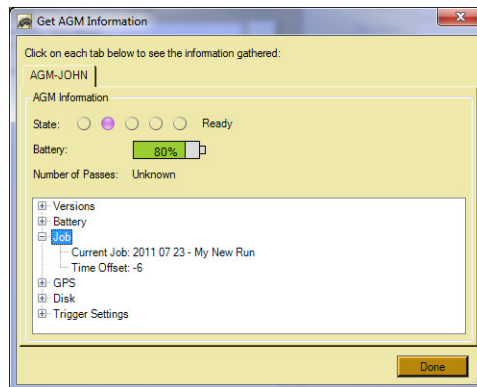


Figure 22 – Get Information

Each node can be expanded to provide more detailed information. For example, in Figure 22, above, the Job node is expanded to show the current job-related settings on the AGM.

Synchronize Computer Clock To AGM Time

The Armadillo Analyzer can connect to one AGM and adjust the local computer's clock to match the time reported by the AGM. You would do this to synchronize a pigging tool to the AGM, using the computer as an intermediary.

The software will use either the UTC or GPS time, depending on your selected Time Standard. Please see GPS vs. UTC Time, above, for more information on this.



Due to the varying speeds of wireless connections, it is recommended you perform this operation with a USB cable connection to ensure the most accurate synchronized time.

Synchronization Steps

4. Select *Manage AGMs > Synchronize Time from AGM...* from the Manage AGMs menu.
5. Select the Armadillo AGM that you wish to get the time from. For this function, you will only be allowed to choose one box to connect to.
6. Once you have chosen the box you wish to connect to, click . The final screen shows the progress of retrieving the AGMs time.

The first step is to Ping the box to determine the length of time it takes for a message to reach the box and return. The AGM's current time is then retrieved, along with the length of time since the last GPS fix was obtained.

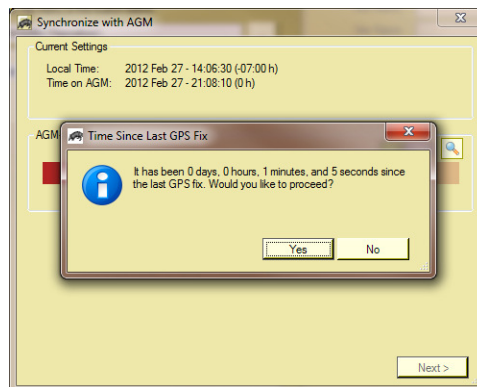






Figure 23 – Synchronization Confirmation

You will be prompted with the time since the last GPS fix, and can decide if you wish to synchronize the local computer's time against that AGM. In this example, the time since the last GPS fix is only 1 minute and 5 seconds. You would probably click . It is generally recommended that you only synchronize with AGMs that have gotten a valid fix within the last 2 hours.


If you choose to click , the local computer's time will be updated to be in sync with the AGM.

 If you'd like to view a detailed report of the progress, click on the  button. This will show a list of items for that particular AGM. You may right-click this list to save the messages – this is useful when investigating reporting problems (see the Technical Support section).

7. Once the time has been retrieved and the computer's time has been synchronized, the  button will appear. Click it and the synchronization screen will close.

 In order to perform this operation, you must have sufficient permissions to change your computer's time. If you do not, please speak with your system administrator.

PLEASE VERIFY THE TIME CHANGE BEFORE & AFTER TO
ENSURE YOUR COMPUTER CLOCK HAS BEEN UPDATED

 The time on your computer is updated to the UTC time from the AGM.

Analysis

The main purpose of the Armadillo Analyzer is to review data from the AGMs and select valid pass times from that data. This section describes this in more detail.

Choose Which Files To Analyze

Please open the files you wish to analyze. See the section “Opening Downloaded Files” for more information.

Once you have selected your data files and opened them, they will be available for selection in the File Selection list in the Analysis pane. The first file will be automatically selected and it's detailed information shown.



Initially, only Pass Files that are marked as Valid will be visible due to an automatic filter that is applied (see below). All passes are initially Valid by default.

File Selection, Filtering, Viewing, & Sorting

In the Analysis pane, there will be a list of files that are available for Analysis.

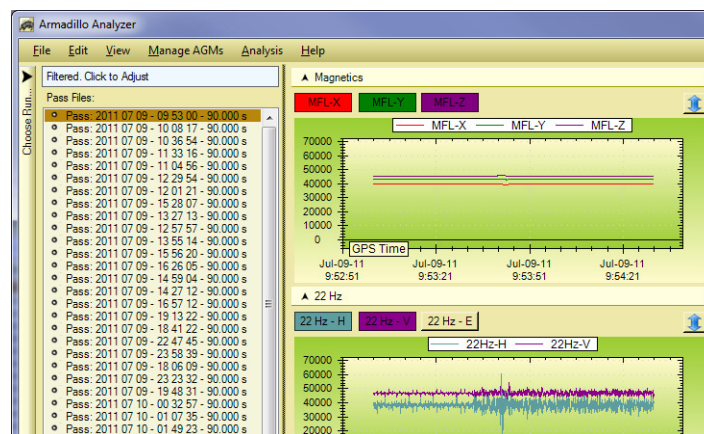


Figure 24 - File Selection

Modified Files

When you have modified a Pass File, either by selecting a pass time, modifying the time offset, changing the Job or Site name, etc., the changes will not be persisted until the data is saved.

Any modified Pass File will be *italicized* in the Pass Files list to indicate it has unsaved changes. If you try to close the Analyzer without saving, you will be warned that you are about to lose your changes.

You can save your changes by hitting Ctrl-S or by selecting *File > Save* from the main menu.

Filtering

When the Analysis pane is initially populated, it is filtered to the list of **Valid Pass Files** available. If you'd like to remove or change this filter, right-click on the list as seen in Figure 26, or click on the highlighted Filter Bar, as seen in Figure 25.

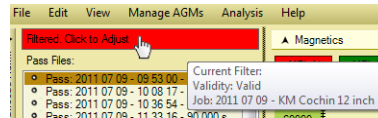


Figure 25 – Filter Bar

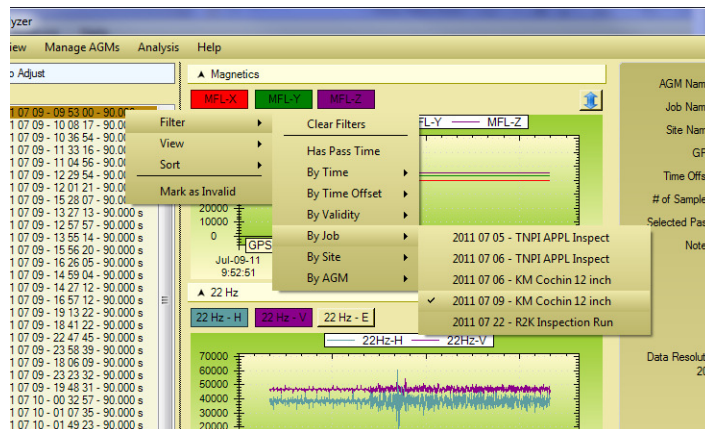


Figure 26 - Changing the Filter by Right-Click Menu

The Filter Bar will open a Filter Window that will stay open while you are analyzing your pass file data. You can use this Filter Window to modify the filters, and the Pass File list will adjust as you select or deselect filters.

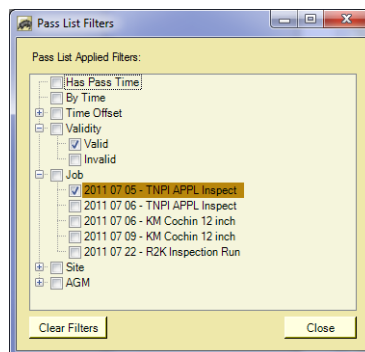



Figure 27 – Filter Window

You can clear all filters, or choose to filter by many criteria.

 You can see what filter is currently applied by hovering your mouse over the Filter Bar above the File Selection list.

Multiple filters can be applied. As an example, if you'd like to view the data from only two jobs from the five in the repository:


1. Open the Repository pane and open the *Entire Repository* node.

2. Open the Filter Window and expand the Job filter (see Figure 27, above).
3. Select the first job you'd like to include. The Pass File list will update in the Analysis Pane.
4. Select the second job you'd like to include. The Pass File list will update in the Analysis Pane.

Filters are a powerful tool that can greatly speed up your data analysis. It is highly encouraged that you experiment with them.

File Selection

You can choose which file you would like to examine by selecting it in the Pass File list. The graphs containing the data from that file will automatically update, and the Detailed Information from that file will update on the right-hand side.

 If you need to quickly mark many files INVALID or VALID, you can do so by clearing the Filter so all the files are shown in the list. Then, select the first file in the list, and use the right arrow to mark the file as INVALID or the left arrow key mark the file as VALID.

File Viewing

By default, pass files in the Pass File list are shown by date and then by length of data that is recorded. You have the option of changing the view to by Site.

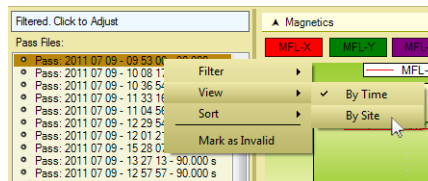


Figure 28 – Change File View

File Sorting

By default, pass files in the Pass File list are sorted by date of recording. You have the option of changing the sort to sort by Site as well.

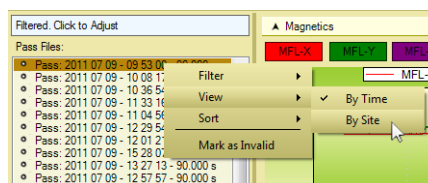



Figure 29 – Change File Sort

Graphic Analysis

Once you have found a file to edit, the data from that file is viewed in graphic format in the Analysis pane. The types of data you can view include:

1. Magnetics (MFL in the X-plane, Y-plane, and Z-plane)

2. 22 Hz Antenna (Internal Horizontal, Internal Vertical, and External if available)
3. Geophone (Internal, and External if available)

 Hovering over a currently-active toggle button will highlight that data line on the graph, and bring it to the front of the data. **This is a very useful feature.** It is recommended you use this.

The view consists of three graphs, one for each type of data. Each can be collapsed to make more room for the other graphs by clicking on the header bar for each type.

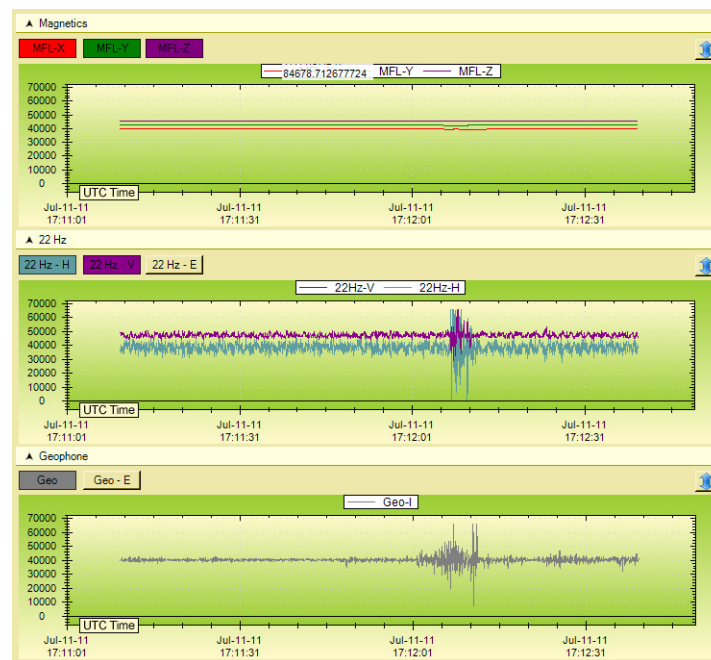



Figure 30 – Three Graphs

You can zoom in on the graphs by left-clicking on any one and dragging the mouse. When you let go, the graph will zoom into the region outlined.

 If at any time you would like to ‘reset’ the view of the graph, right-click and select “Restore to 100%”. This will snap the graphs back to show the entire range of data again.

Stretching

It can sometimes be very useful to identify a pass by exaggerating the data to the upper and lower limits of the graph. Within the context of the Armadillo Analyzer, this is called Stretching.

As an example, see Figure 31, below. This data represents the magnetic signature from a tool going by. At first glance, you might assume there was no data here to make a valid pass selection... the magnetic signature appears flat.

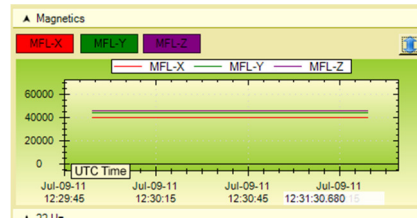


Figure 31 - Unstretched Magnetic Data

When the magnetic graph is Stretched, however, we see an exaggerated signature. This allows for a pass time selection that you can have a much greater confidence in.

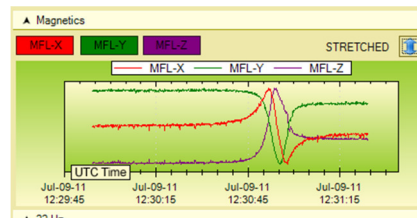


Figure 32 - Stretched Magnetic Data

In some cases this signal can be very weak due to the depth of cover at the site the AGM was placed. This stretching capability is one of the most useful tools in the Armadillo Analyzer for verifying a pass and selecting a pass time.

Cropping

If you have too much data within your pass, it can be difficult to locate the specific point you need to select without zooming in. Although zooming is effective, it is an unnecessary step once you've identified the "important" data. If you'd like to remove the extraneous data, you can crop your pass down to the zoomed-in view. This option will not be available if you are not zoomed in.

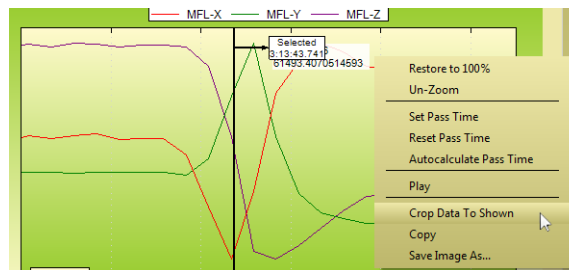


Figure 33 – Crop Data To Shown

You can right-click on your graph and select *Crop Data To Shown* or select *Edit > Crop Data To Shown* from the Main Menu.

Selecting Pass Times

The primary purpose of the Analyzer is to confirm and adjust the recorded pig passage times which will be exported and correlated with an Inline Inspection (ILI) tool clock and odometer.

There are two ways to choose pass times for the Pass files:

1. Right-Click Menu
2. Mouse Left Click + Alt key

In each case, you may choose to undo this action by using ctrl-Z or selecting *Edit > Undo* from the main menu.



Tip: You can save an image of a graph that you are analyzing by right-clicking and selecting 'Save As'. A snapshot of the graph *as it looks* will be saved, including all text, lines, and hover messages.

Right-Click Menu

If your mouse is over a position that you would like to set as the pass time, you can simply right-click and select the “*Set Pass Time*” option. The pass time will be set right where the mouse was when you initially right-clicked.

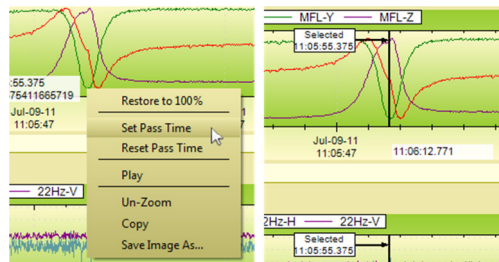


Figure 34 - Set Pass Time

Mouse Left Click + Alt Key


The easiest and most natural way to set the pass time is to hold down the Alt key while left-clicking on the graph. It can sometimes help to zoom in to more accurately select a time, especially if the range of data downloaded is larger. Continue to hold both the Alt key and the left mouse button, and move the line to the most appropriate position for the pass time to be set.

Data Resolution

Sometimes you will be working with a very large data set, and your computer may be very slow. The Data Resolution slider was integrated into the Detailed Info pane to give you flexibility in how much data is to be shown on your graph at all times. The lower the data resolution, the less data points actually shown. All data in between these points are dropped in favor of speed.

It is in your best interest to keep the Data Resolution as high as possible to give the best representation of the data recorded.

Listening to Recorded Geophone Data

If audio data is present for a selected Pass file, you can listen to it using the Geophone Play  button on the Detailed Info pane, by right-clicking on the graph and selecting “Play”, or by clicking on *Analysis > Audio > Play* on the main menu.



It is highly recommended that you listen to this recorded geophone data with headphones or at least with amplified speakers. The sound quality will be much better.

Only the current data range shown on the graphs will play, so if you would like to listen to a section in the middle of the data, just zoom in on it and play the audio.

The quality of sound produced is directly proportional to how busy your computer is. It is recommended you reduce the Data Quality slider down while listening as this will increase the quality of sound output.

When the amplify option is selected, the sound will be made as loud as possible without clipping. When deselected, the sound will be the original as recorded by the AGM.

Exporting Data

Once you've confirmed the pass times, you will need to export the data.

Export Steps

1. Select *Analysis > Export Data...* from the main menu.
2. The first screen of the wizard will show you the list of Pass files that were filtered in the Pass File List of the Analysis pane.

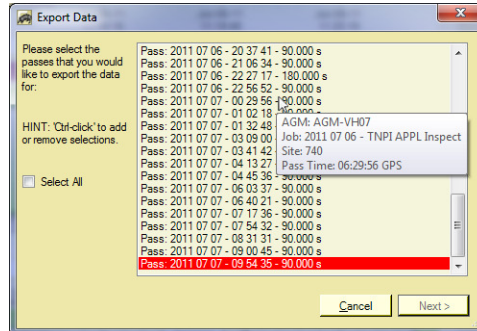


Figure 35 - Choose Passes to Export

Any files that you have in the filter that do not have a selected pass time will appear highlighted to let you know there is no selected pass time. To confirm, hover your mouse over each file and view the tooltip for file information:

3. You can either select each file you'd like individually (using the ctrl-click method) or by right-clicking and choosing Select All. Once you have chosen the passes that you wish to export, click .
4. Choose an export template. There are built-in templates that you can use, or you can create your own (see Figure 36 – Choose Export Template, below).

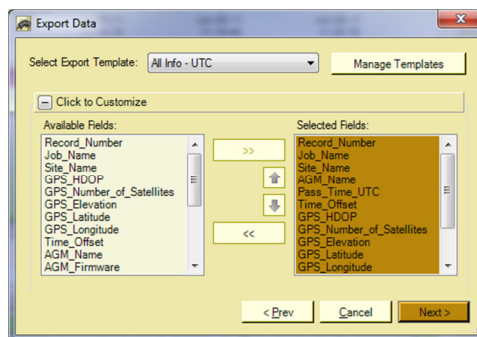


Figure 36 – Choose Export Template

5. If you would like to change the fields being exported, or the order of those fields, you can do so by highlighting the fields in either list and using the arrow buttons to move them. Once you are done, click .
6. Choose the file to export the data to:

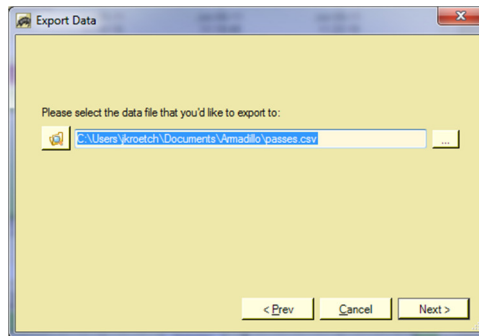




Figure 37 – Choose Export File

If the file already exists, when you click **Next >**, you will be asked if you would like to append the data. If you choose no, you will need to choose a new file.

If the file selected does not exist, a new file will be created.

 You can click on the  button to open a new windows explorer to the location where the export file will be created.

7. The next screen will show the progress of the data export.

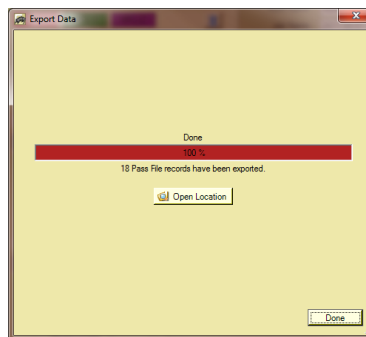



Figure 38 - Export Completed Successfully

8. You may click the  **Open Location** button to open a Windows Explorer window at the location of your export file. This is convenient to verify the export.

Export Templates

If you find that you are consistently exporting data to a set format, or you have multiple supported formats, you can create an Export Template to make your exporting task simpler.

An Export Template is simply a list of defined exportable fields from the Analyzer, organized in a manner you specify, and separated by the delimiter character or string that you specify.

To create or manage your list of Export Templates, you can click on Manage Templates during the export flow (see Figure 36 – Choose Export Template), or you can click on *File > Manage Export Templates*.

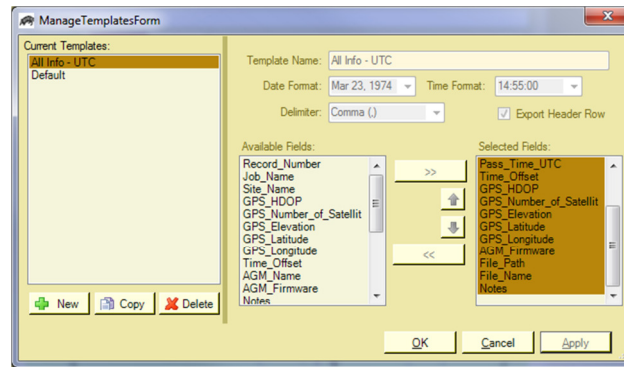





Figure 39 - Manage Export Templates

Using the Manage Templates window, you can create new templates, or delete old templates.



You cannot edit a template once it is made and saved. If you need to do this, select the template you'd like to change, click , and edit the fields.

When you create a new template you can choose the format of all dates and times that will be exported. Using the Date Format and Time Format drop-down boxes.

Click on the  button to apply your current changes without closing the window, or on  to apply the changes and close the window.

Export Template Fields

The Armadillo Analyzer supports many fields for export. Most are self-explanatory, but the following fields need some clarification:

| | |
|---------------------------|--|
| Record Number | When the pass data is exported, this number will start at 1 and increment by one for each pass. |
| Pass Time UTC | This represents the pass time as a full date/time timestamp, including the milliseconds, using the UTC time. |
| Pass Time Date UTC | This represents the pass time as a date only, using the UTC time. |
| Pass Time Time UTC | This represents the pass time as a time only, using the UTC time. The milliseconds are <i>not</i> included. |
| Pass Time MS | This represents the pass time's millisecond component <i>only</i> . |

Zippping Up Data

You may wish to gather the list of filtered passes into a single file for archiving or simply for distribution to interested parties.

Zip Steps

1. Select *Analysis > Zip Filtered Passes...* from the main menu.
2. Choose the name and location of the zip file that will be generated.
3. Click OK
4. All filtered passes (in the File Selection list) will be added to the zip file you have specified.

You may now store this .zip file, or send it to anybody to unzip and view with their Armadillo Analyzer software.

Program Options

The general operation of the Armadillo Analyzer can be modified by selection *File > Options...* from the main menu.

The Options window has three tabs: Settings, Directories, and Diagnostics.

Settings

The Settings tab has the following settings.

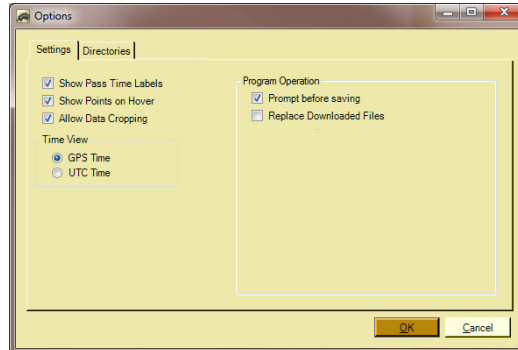


Figure 40 - Options - Settings

- | | |
|---------------------------------|---|
| Show Pass Time Labels | When a pass time is selected for a pass, a text box with the selected pass time will be flagged on that line if this option is checked. This option is checked by default. |
| Show Points on Hover | When this option is checked, a textbox will follow the mouse and show the current timestamp and relative value of the point “under” the mouse. This option is checked by default. |
| Allow Data Cropping | This setting allows the user to delete extraneous data around a zoom-in pass. This option is checked by default. |
| Prompt Before Saving | When this option is checked, the Analyzer will double-check with you before saving. This is to ensure you do not accidentally save changes which cannot then be undone. This option is checked by default. |
| GPS vs. UTC Time | This choice reflects the policy chosen at first-time run. Please see GPS vs. UTC Time, above, for more information regarding this setting. This option does not have a default – it is chosen when the application is first run. |
| Replace Downloaded Files | If you select an exact range of data to be downloaded again, the existing data file in your repository will be replaced with this new download if this option is checked. If this option is not checked, the new data will be downloaded with an incrementing number on the end of the filename. This option is not checked by default. |

Directories

The Directories tab has the following settings.

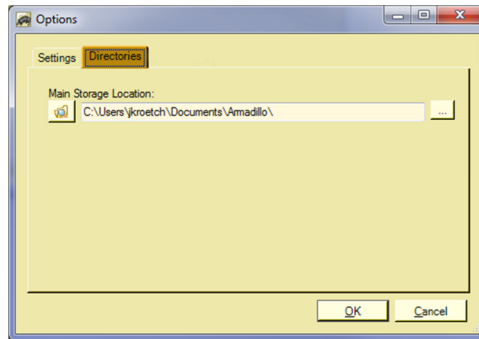


Figure 41 - Options – Directories

Main Storage Location All storage paths within the Armadillo Analyzer will be relative to this main storage location. This includes the following subdirectories: Themes, Templates, and Cached AGMs.

Firmware Updates


From time to time, there may be updates for the firmware that controls the AGM's operation. It is recommended that you check regularly to see if there is a new firmware file to upload to all the AGMs that you use regularly.

Checking for New Firmware Files

1. The current Firmware version is specified on the Armadillo website:
<http://www.armadillotracks.com/AGMInfo/AGMInfo.aspx>
2. Contact us using the link provided. This is to ensure that any firmware you install can be managed by us to ensure a smooth upgrade.

Update Steps

Once you have the firmware file, you can upgrade your AGMs.

1. Select *Manage AGMs > Update Firmware...* from the Manage AGMs menu.
2. Select the Armadillo AGMs that you wish to set up at this time. Please refer to the Connection to Armadillo section for the instructions on how to do this.
3. Once you have chosen the boxes you wish to connect to, click . The next screen prompts you to select a firmware file.

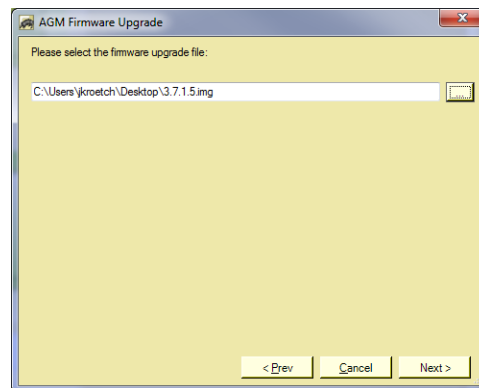



Figure 42 – Firmware File Selection

Please browse to the location where you have downloaded the firmware file. Select it, and click .

4. The final screen shows the progress of each AGM being upgraded. Each AGM will be upgraded in parallel, greatly speeding up the firmware updates.

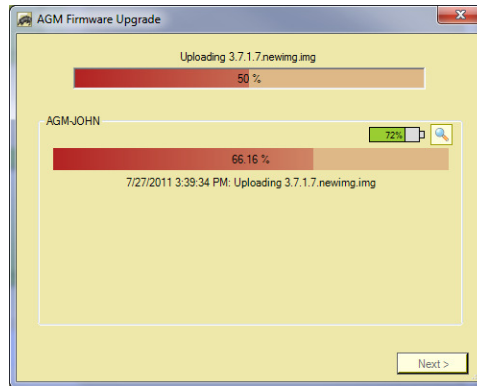






Figure 43 – Firmware Update Progress

Each AGM will show the current progress for uploading the firmware.

 If you'd like to view a detailed report, click on the  button. This will show a list of items for that particular AGM. You may right-click this list to save the messages – this is useful when investigating reporting problems (see the Technical Support section).

5. Once each AGM's firmware update has completed, the  button will appear. Click it and the update screen will close.
6. You will need to power cycle the AGMs that were updated.

 If you are connected using Bluetooth®, each AGM will automatically reboot itself after the window is closed.

7. On startup, the LED will be red while the update is applied.


Bootloader Updates


From time to time, there may be updates for the bootloader, which controls the initial behaviour of the AGM startup.

Checking for New Bootloader Files

Bootloader files will *very rarely* need to be applied. You will be notified when you contact us about new firmware whether a new bootloader needs to be uploaded to your AGMs.

Update Steps


1. Select *Manage AGMs > Update Bootloader...* from the Manage AGMs menu.
2. Select the Armadillo AGMs that you wish to set up at this time. Please refer to the Connection to Armadillo section for the instructions on how to do this.
3. Once you have chosen the boxes you wish to connect to, click . The next screen prompts you to select a bootloader file.

Please browse to the location where you have downloaded the bootloader file. Select it, and click .

4. The final screen shows the progress of each AGM being upgraded. Each AGM will be upgraded in parallel, greatly speeding up the bootloader updates.

Each AGM will show the current progress for uploading the bootloader.



If you'd like to view a detailed report, click on the  button. This will show a list of items for that particular AGM. You may right-click this list to save the messages – this is useful when investigating reporting problems (see the Technical Support section).

8. You will need to power cycle the AGMs that were updated.



If you are connected using Bluetooth®, each AGM will automatically reboot itself after the window is closed.

9. On startup, the LED will be red while the update is applied.

Other Features

This section details other features of the Analyzer that were not discussed elsewhere in this document

Viewing All Filtered Passes on Google Maps

At any time, you can view all of the pass files using a Google map by selecting *View > View Filtered Passes in Google Maps* from the View menu. This option will only be available if you have an internet connection.

Your default web browser will launch and display each pass on a single map represented by an AGM Marker. Each marker may be clicked on for more details about that pass, as shown below.

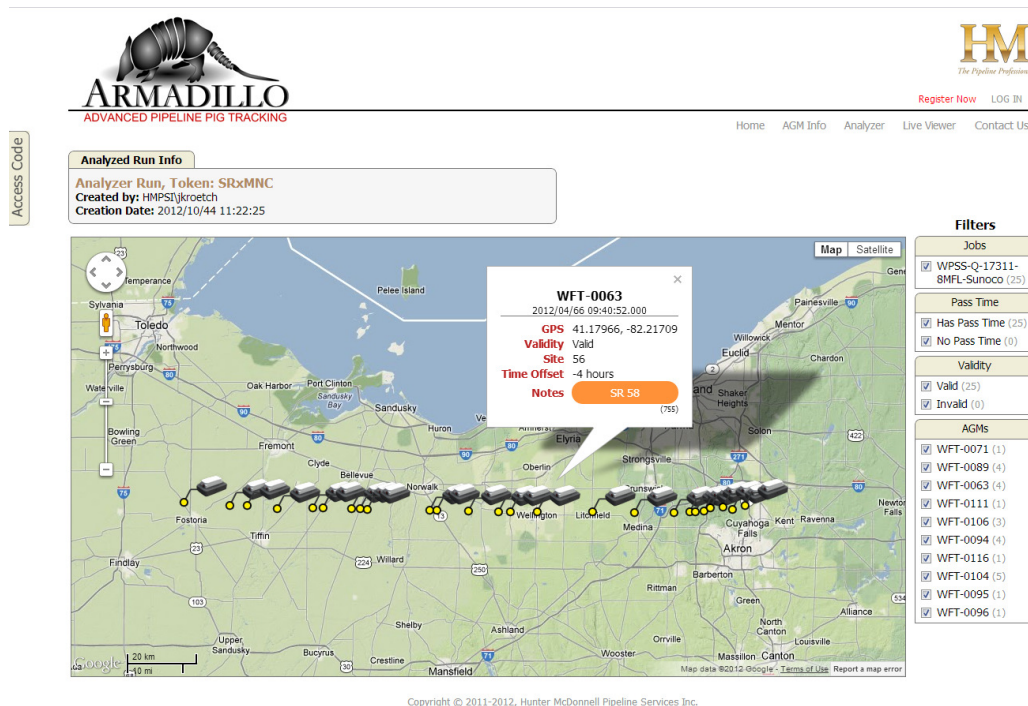


Figure 44 - View All Filtered Passes

A randomly-generated Access Code will be provided that you can share with anybody. They may then navigate to <http://www.armadillotracks.com/AnalyzedRuns/> and enter this Access Code to view the same information.

Viewing Single Pass on Google Maps

When a Pass is selected in the Pass List, the Detailed Information pane will show the GPS coordinates of the AGM location when the data was recorded:

If you click on the info button next to the GPS coordinates, you will be presented with the GPS-related info for this viewed pass file. If you then click on the coordinates link, an internet browser will launch to Google maps with the GPS coordinate visible.

If no internet connectivity is available, this button will be disabled.

Theming

The Armadillo suite of desktop applications all support coloured themes. This feature is for personal taste as well as to adjust colors and contrast for bright situations or poor reading eyesight.

To change the theme, select *View > Change Theme > [Name of Theme]*. The application will update immediately to the new defined look.


You can also modify an existing theme or make your own.

Managing Themes

Select *View > Change Theme > Manage & Select...* The list of current themes will be shown. The Armadillo Analyzer will always support Earth, Air, Fire, Water, and a basic Windows Default theme. If these themes are not present in the Themes directory of the application they will always be created.

You can select each theme within the list and the color scheme of the application will instantly change in the background.

You can also change a specific color and the application will change to allow a preview. Try it by changing the `BackColor` property.

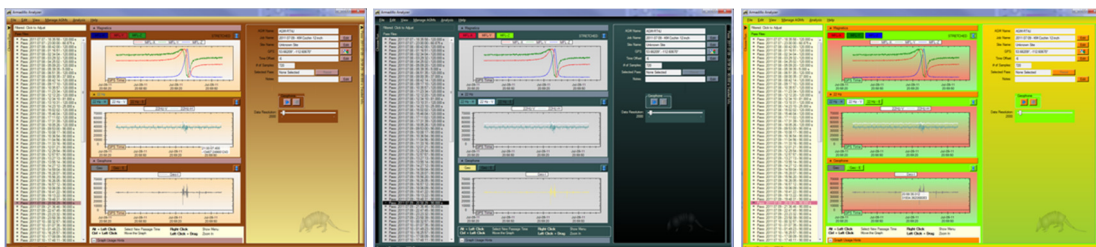
If at any point you'd like to save your changes, you can click  and the changes will be saved without closing the window. If you have made a mistake, click Cancel and the window will close, reverting to the prior theme.

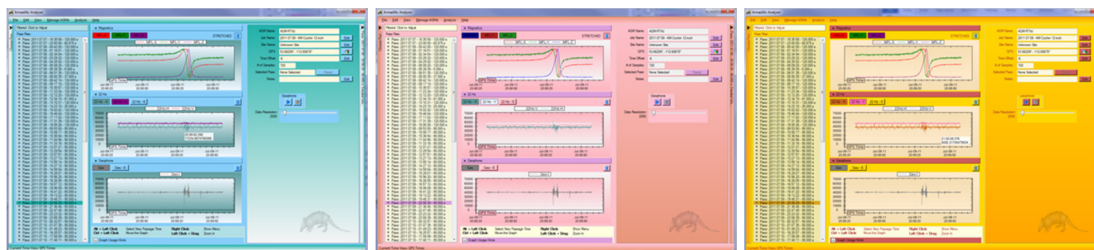


It is recommended that you not modify existing themes. If you'd like to try something new, copy the theme and edit the copy.

Your themes are stored in your “My Documents\Armadillo\Themes\” folder. You can share your theme files with others... just have them put the file in their Themes folder.

Here are some sample screen shots from themes:





Troubleshooting

I am having trouble connecting with Bluetooth®. When I select this option and hit Refresh, my device shows up but the following dialog appears:

Unfortunately, this is a limitation of using unpaired Bluetooth® devices. Please try the following sequence of actions to try and get communication working.

- 1) Ensure the built-in Bluetooth® on your computer is turned off.
- 2) Unplug and replug your Bluetooth® dongle.
- 3) Close the Armadillo Analyzer and restart it.
- 4) Reboot your computer.
- 5) Turn the AGM off and back on and try again.

Alternately, if you are familiar with how to pair Bluetooth® devices, please do so and select USB/Paired Bluetooth to connect. This is usually much more reliable.



When I select Bluetooth® to connect to the AGMs, I get a changing list of devices, even when I hit refresh.

Please check to ensure you are using a Class 1 Bluetooth® device to connect to the Armadillo AGMs. Class 2 Bluetooth® devices do not consistently detect all the AGMs in its vicinity and is unpredictable.

Even with Class 1, however, the Bluetooth® search function is not perfectly reliable. Sometimes it just will not detect all the devices. It is recommended you use a USB cable to connect to any device that doesn't show up in the Bluetooth® detection.

When I select USB / Paired Bluetooth® to connect to the AGMs, my connected AGM does not show up.

There may be a number of causes for this. Please perform the following steps:

1. Please ensure your AGM is on before plugging in the USB cable. Communication with the AGM will be unsuccessful if the AGM is off when plugged in.
2. Try unplugging the AGM and plugging it back in again.
3. Hit  to see if your AGM shows up this time. If not, try power cycling the AGM, plug it in again, and hit  one more time.
4. If you do not know the COM Port that your AGM is connected to, open the Device Manager on your operating system:
 - 1) Right-click 'My Computer' and select 'Manage'
 - 2) Select 'Device Manager'
 - 3) Expand 'Ports (COM & LPT)'
 - 4) Your connected AGMs should show up here as ARMADILLO AGM with the COM port number after

5. Select 'Choose Port' and select that COM port to force the software to use that COM port. You may need to uncheck the 'Only show AGMs' checkbox to view the port for selection.

If you are still not able to connect, try plugging the AGM into a different USB port on your computer. This will assign a different COM port number and may allow the connection.



If you are running Windows XP or earlier, the Armadillo USB driver needs to be installed for *each* USB port on your computer that you would like to use. This can be downloaded from our website:

<http://www.armadillotracks.com/AGMInfo/AGMInfo.aspx>

If this is the first time you are connecting an Armadillo AGM on that computer, you will need to install the driver. Here are the steps to do so:

- 1) Open up the device manager (select "My Computer", right click and select 'Manage...'. Then select 'Device Manager' in the list)
- 2) Turn an AGM on, and plug it into the computer's USB port
- 3) You should see the Device list refresh, and a device will show up that says "AGM Lite". It is normally under "Other Devices" with a small warning icon
- 4) Right-click on that node, and select 'Update Driver'
- 5) Select "Browse my computer for driver software". Do not select 'Search Automatically'... it will not work
- 6) Browse to your Analyzer installation folder.
 - a. This should be on
C:\Program Files\PureHM Inc\Armadillo Analyzer\
 - b. If you use 64-bit computer, it should be
C:\Program Files (x86)\PureHM Inc\Armadillo Analyzer\
- 7) Click Ok
- 8) The system will detect the driver and install it for these devices.

When I select Bluetooth® there is a list of AGMs shown that are not present. Why are they there?

Bluetooth searches can take a long time, so the Armadillo Analyzer automatically caches a list of AGMs that you've successfully connected to in the past. This greatly speeds up reconnections.

If you do not want certain AGMs to reappear in this list, you can select them, right-click and choose 'Forget Selected AGMs'

I'm familiar with how to pair a Bluetooth® device to my computer. Can I pair the AGM and use it that way?

Yes, you can.

Every Bluetooth stack has its own software and behavior for pairing a device which is why we do not explicitly support this, but the process of device pairing is generally like this:

- 1) Search for Bluetooth Devices
- 2) Select the AGM and select "Add" or "Pair"
- 3) If prompted, enter the PIN code of "0000"
- 4) Wait until pairing is completed and make a note of the assigned virtual COM Port (eg: COM49)
- 5) Choose "USB / Paired Bluetooth" from the communication window and select that COM port

Why do my selected pass times differ by around 15 seconds from what the Pig Trackers report?

This is most likely because the incorrect Time Standard has been chosen for the application. Please confirm the time standard used by your organization (UTC or GPS) and update the settings for the application in the Options dialog. If you are unable to find this out, chances are UTC is the correct option.

Please update your software by visiting our website: www.armadillotracks.com

The data of one channel is obscuring the data from another channel – especially for the 22 Hz. How do I see the data behind it?

All you need to do is hover the mouse over the button of the data channel you would like to see. It will be highlighted and brought to the *front* of the graph.

Optionally, you can turn each channel on or off by clicking on the corresponding button on the graph.

I've tried to synchronize the time on my computer using the time on the AGM, but it's not working. The time on my computer stays the same.

Chances are that this is a permissions issue. You must have the proper user permissions on your system to adjust your system time. This is most commonly a problem on Windows 7, but there is a work-around.

To launch Analyzer, hold shift and right-click. There should be an option in the menu that says "Run as administrator". Select that option.

Optionally, you can manually edit your shortcut on your desktop by right-clicking it and selecting 'Properties'. Select 'Advanced Properties' and check the box that says 'Run as administrator'. This will ensure that each time the Analyzer is run, it will be with full administrator privileges, but you will be prompted by Windows to confirm this every time you launch.

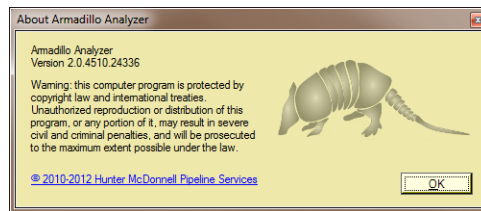
Technical Support

Support is available for this application through the following methods:

Email: support@armadillotracks.com
Telephone: 1-866-434-7872
Internet: http://www.armadillotracks.com

Please ensure you have the following information available when you call:

1. Your Name
2. Company Name
3. The Software Version Number (In the Help > About menu)



Log Files

The Armadillo Analyzer saves detailed log files in the following location:

My Documents\HM\Analyzer\LOGS\

There is a new log file for each day of use. Please locate the appropriate file and prepare to send them to our technical support personnel.