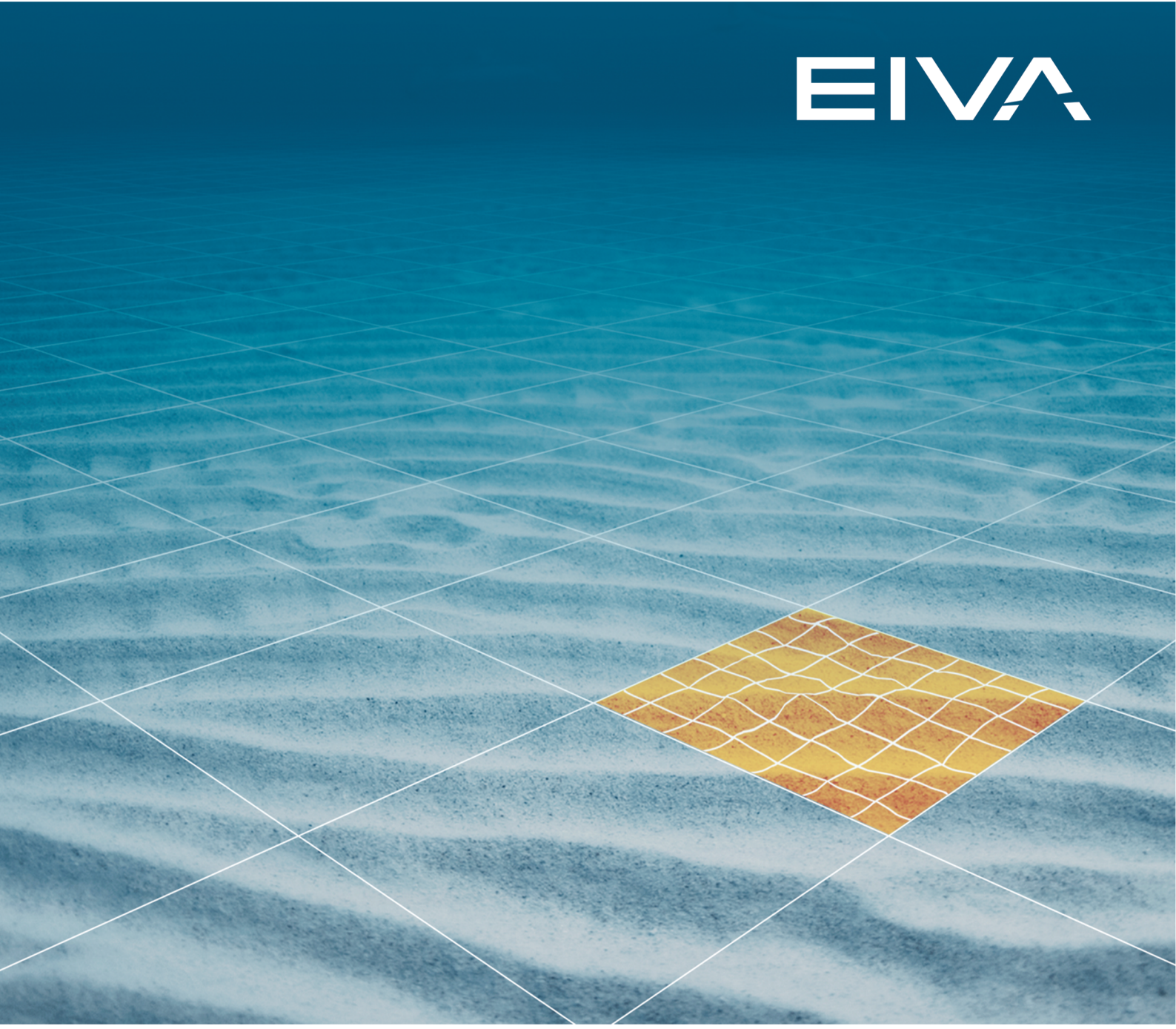


AttuMon User Guide

Last update: 27-05-2020
Version: 1.0

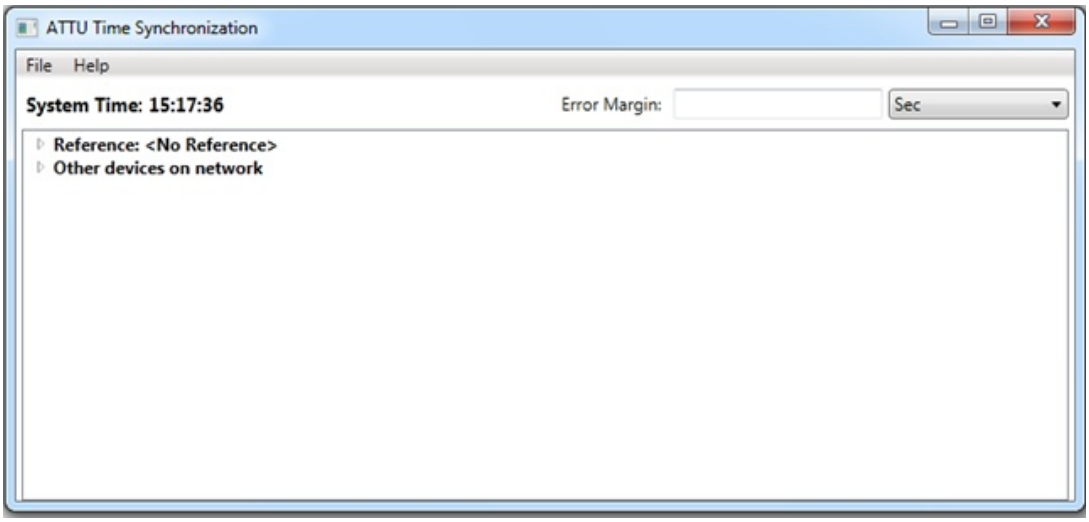
Contents

1 Introduction

The purpose of this document is to describe the day to day use of the ATTU (Accurate Time Tagging Unit) Time Synchronisation program.
It was created for the purposes of monitoring the ATTUs and synchronisation the system time of the computer with one of them.

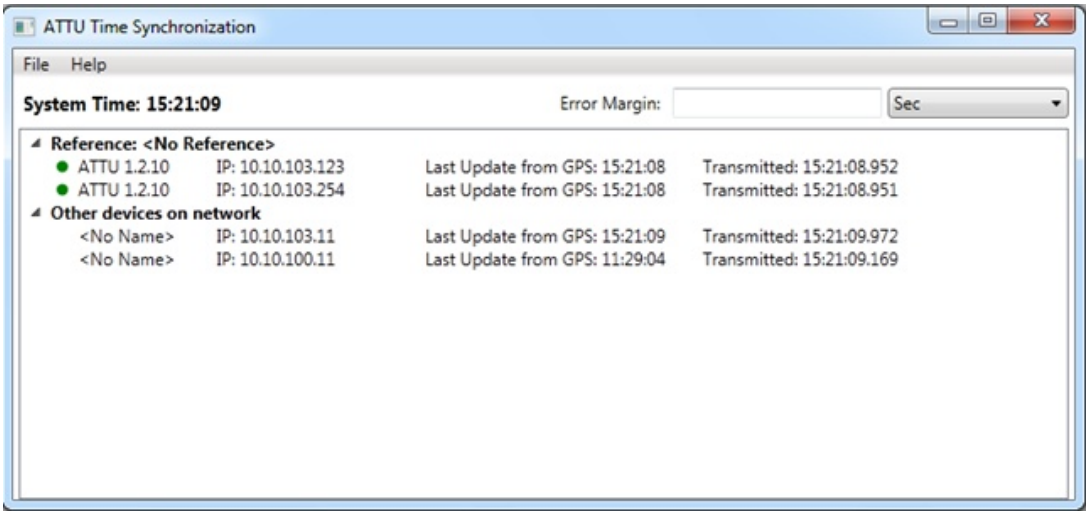
1.1 Getting started

When opening the program, the first thing the user will be shown is this screen:



from here the user has multiple choices depending on what he wants to do.

Firstly there is the Main Menu, this will described in the later topic **Main Menu** under **Menues**.
Secondly there is the option of setting the Error Margin, which will be described in a later topic **Faulty ATTU**
Thirdly the user can unfold the two lists to see the total number of devices responding to NTP. This will be described in the section **Day to day operations** under **Devices**
When the user unfolds the lists the screen will look like this:



When the user has unfolded the two lists, depending on what item he right clicks on, a menu will be show. This will also be described in **Menues**

2 Day to day operations

This part of the document will describe the day to day operations, the operations that the user can access while running the program.

2.1 Devices

The devices on the network will fall into two categories:

- The devices that will respond to **EIVA LLC:REQ** (ATTUs and the ScanFishes) and to NTP requests.
- The devices that won't respond to **EIVA LLC:REQ**, but will still respond to the NTP requests.

Whenever a device of the first type is found by the NTP communication, it will be added to the first list (that has the header **Reference: <No reference>** if no reference is set). A ScanFish may respond in this case, but they will also be sorted as the second type.
Whenever a device of the second type is found by the NTP communication, it will be added to the second list (that has the header Other Devices)

The first list will contain only ATTUs and the second list will contain random other devices.

The other devices aren't a crucial part of the daily usage of the program, but more of an user service, to see which devices on the network that responds to NTP requests.

They contain no name, but an IP, the last time update from the GPS and the transmitted time from the device.

2.2 The Reference ATTU System

The purpose of this program is to be able to set one ATTU as the one every other ATTU is checking its values against. The way to set the referenced ATTU is described in the **Device Menu** section.

When an ATTU has been set to the referenced one, every other ATTU will check every time it updates, if the last input from the GPS is off by a user defined amount. How is described in the **Faulty ATTU** section.

2.2.1 ATTU

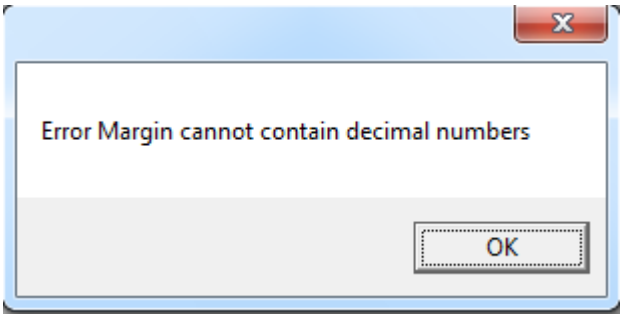
An ATTU (Accurate Time Tagging Unit) is used for tagging data from whatever with a timestamp.
The way an ATTU is represented on the list is by four values;

- The Name, which is depicted as "ATTU" and the firmware version (e.g. "ATTU 1.2.9")
- The IP address of the ATTU.
- The last update from the GPS. A GPS can be attached to the ATTU, which feeds the ATTU with timestamps. This is depicted as "hours:minutes:seconds"
- The transmitted time from the ATTU. Whenever the client transmits a package to a device, a transmit timestamp is set. When the package returns the transmit timestamp contains the time when the device send the package back to the client.
  It is depicted as "hours:minutes:seconds.three decimals of milliseconds"

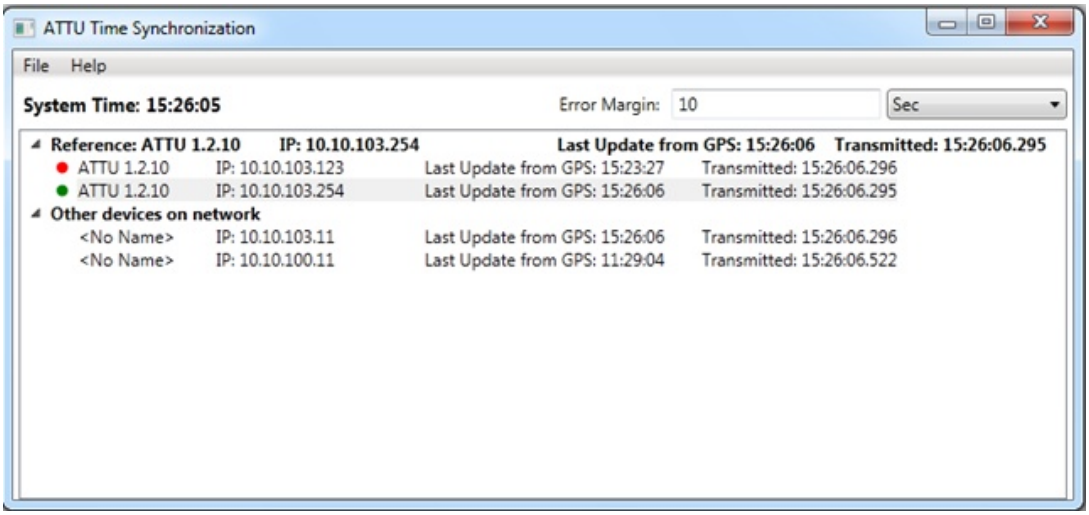
Next to an ATTU device there will always be a marker depicting the status of the ATTU. This will be described further in the "Faulty ATTU" section.

2.2.2 Faulty ATTU

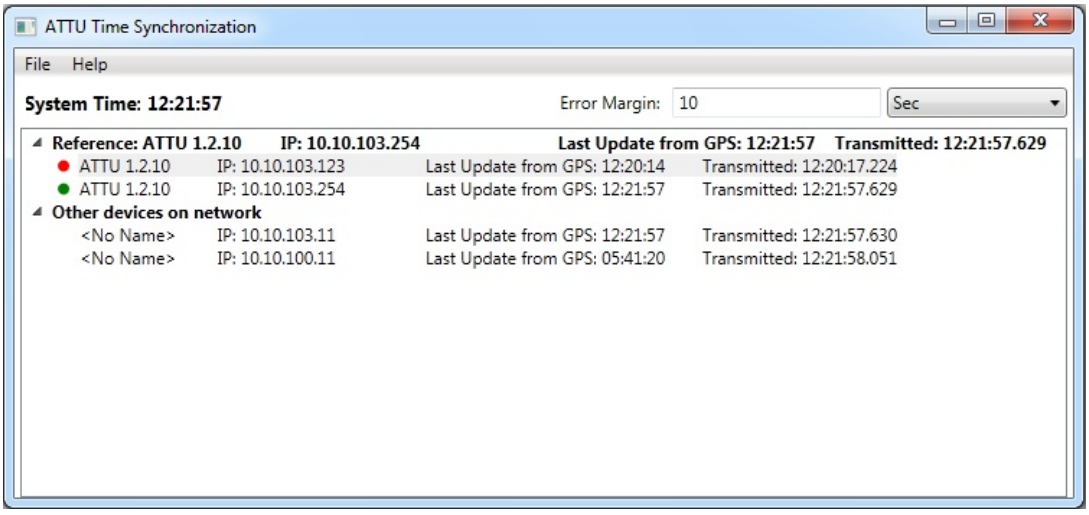
The user can write a number in the Error margin textbox and choose a unit. This number describes how much an ATTU may be off in the last time update of the GPS, before it should be depicted as faulty.
The user can write whatever number he chooses, however it may not be a decimal number. If the user writes a decimal number, this error will be shown:



A faulty ATTU is depicted by the marker next to the ATTU. Whenever everything is well, the marker will be green, but if the ATTU is off by the user defined error margin, it will become red.
This means that something has gone wrong with the GPS and should be investigated. Below it can be seen how a faulty ATTU representation can be seen:



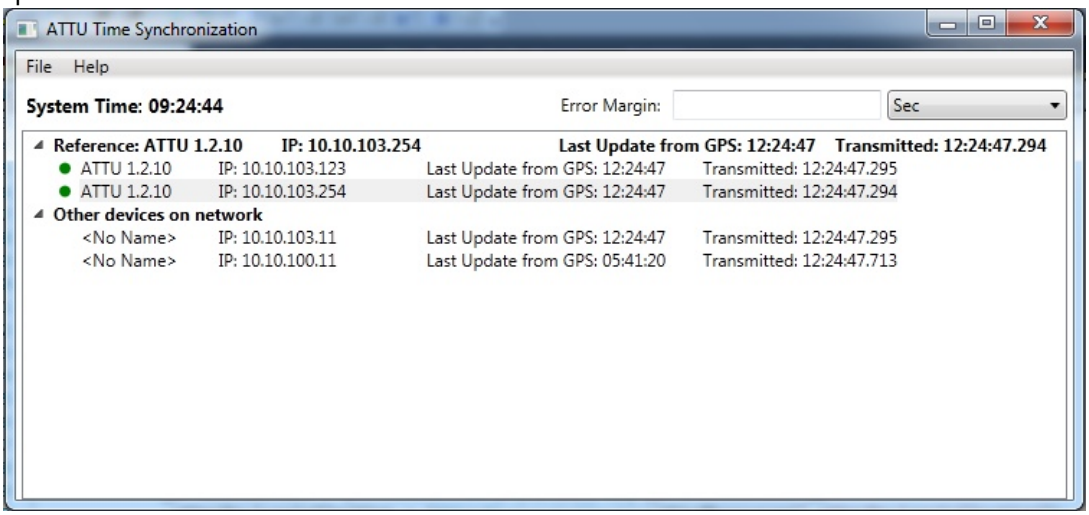
Notice, that the transmitted time is still accurate, this is because a package will still be recieved and transmitted back, but it will hold the last update of the GPS which potentially hasn't happend for a while.
The transmitted timestamp isn't created by the device, but set on the client side and then altered on the device. Basically it will be possible to say that if the GPS time isn't running and the transmitted is, there is still connection to the ATTU, but no GPS input.
if both times aren't running it means that there is no connection to the device at all, since nothing is transmitted. It is only the GPS time that is marked however, but when the connection to the ATTU disappears, the GPS time will also stop, so it will be marked none the less. Below an example of this can be seen.

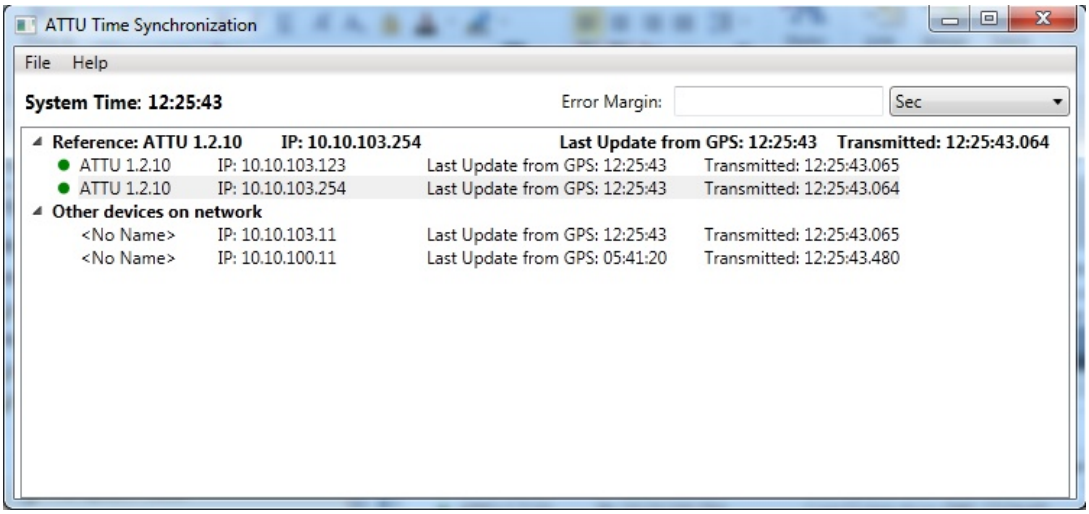


It is also possible that the reference ATTU will show an error. This can be seen by the tag "Reference:" will change to "REF ERROR" and the reference ATTU will turn red.
This happens when the System Time is 4 seconds ahead of the Transmitted time of the reference ATTU, and will have that effect that the system time no longer will be updated from the referenced ATTU.

2.2.3 The system clock

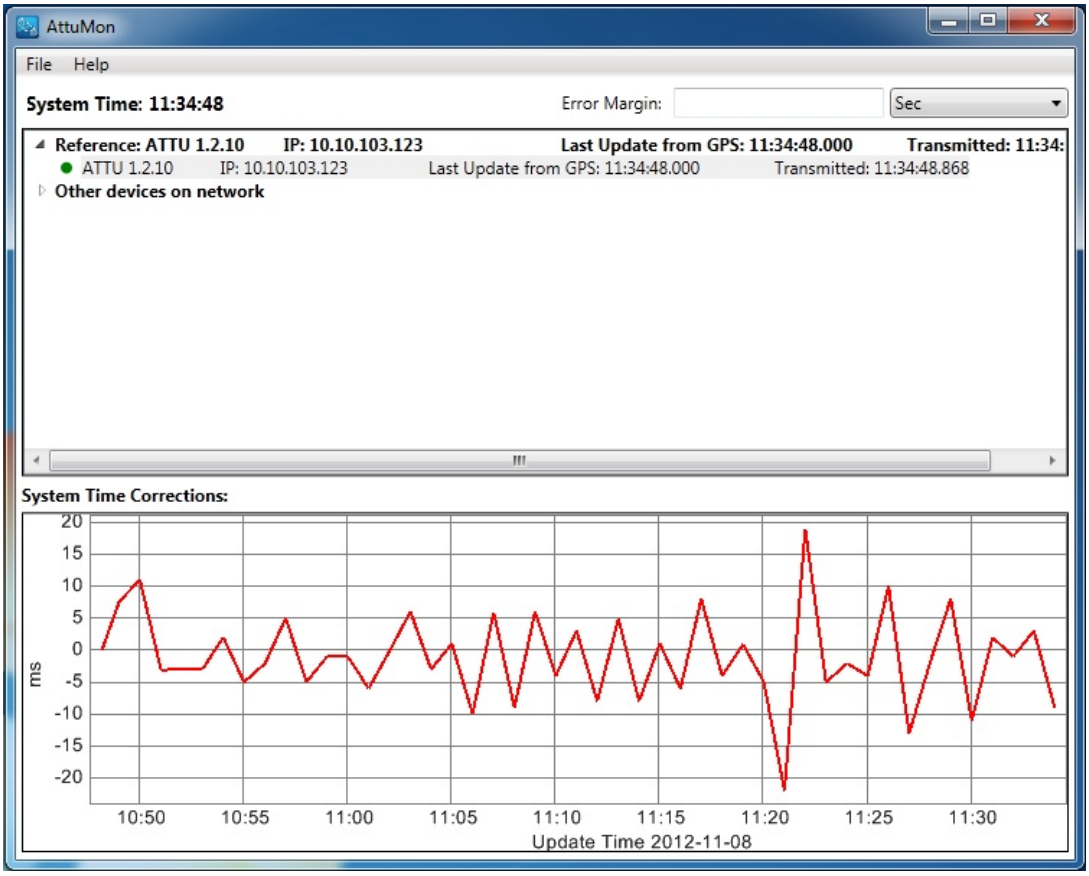
Another task of the reference ATTU is to keep the clock of the computer the program is running on, up to date.
The GPS time of the reference ATTU will update the clock every minute, but it takes about a second for the system time to update, so an additional second is added to the systemtime, besides the GPS time.
Below it can be seen the system clock before an update, and the system clock after an update.





2.2.4 The graph

Whenever the System Clock has been set, the time correction will be displayed on the graph as the number of milliseconds on y-axis and the time of the update on the x-axis.
Every minute the graph is updated with a new observation. On the figure below a reference ATTU has been set for a couple of minutes and it can be seen how a graph has been created.



Whenever removing the reference ATTU, the ATTU that is referenced or setting a new ATTU the graph will be reset and started again.
Everytime the graph is reset, an observation at (0,0) is added to the graph automatically. This is done so that the graph starts to create lines on the first minute rather on it's second minute.
This will make the second observation rise or fall from 0, depending if the time correction is positive or negative.

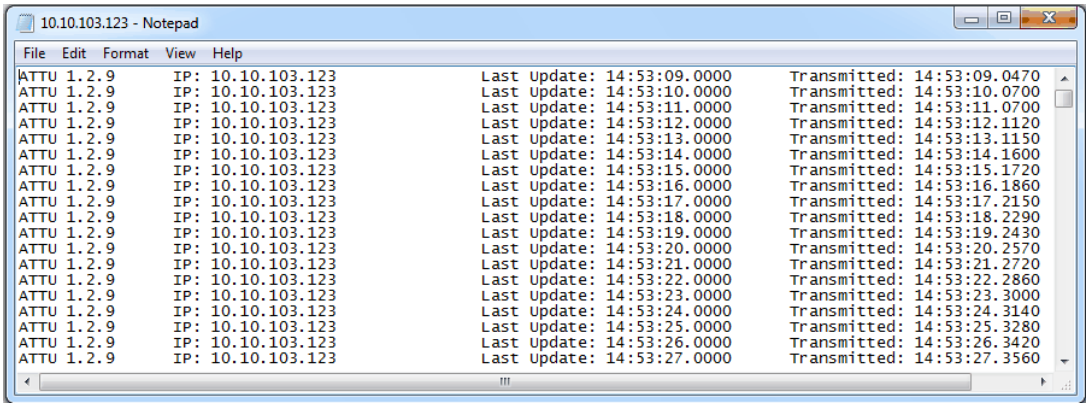
2.3 Logging and Saving

For diagnostic purposes every ATTU can be chosen to be logged.
This is done by opening the menu for the ATTU and choosing to log it. When a ATTU is chosen to be logged, the logging process can be started by clicking the logging button in the main menu.

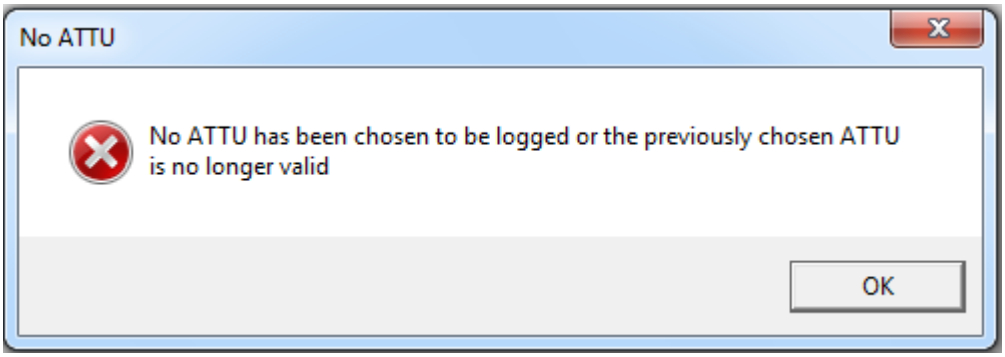
The logged string contains the string also depicted on the list, and it is logged every second.

The standard Windows Save As dialog can be accessed to choose where the logging files should be saved.

If no path is chosen, the path will default to a folder called **Default Logging**, and the files will be named by the ATTUs IP.
Below it can be seen how an ATTU is logged



The chosen ATTU for logging is saved between openings of the program, but if no ATTU has been chosen as the logged one, or the chosen one doesn't exist anymore this error will be shown:



2.4 Webpage access

Double-click an ATTU and the ATTU's webpage is opened in the users default browser.
The webpage is defined by the ATTU's IP, and at that page every information about the ATTU can be seen, and the options for that ATTU can be changed.

2.5 Menus

There are two different menus in the program.
The **Main Menu**, always visible at the top of the screen, and the **Device Menu** visible when right clicking a device on the list.
The content of the Device Menu is different depending on what device have been clicked.

2.5.1 Main Menu

The Main Menu contains two submenus.

File:
In the file submenu, three functions can be accessed:

Save As:
Opens the standard Windows Save As dialog where a path and file name can be chosen. The default file name is **Log Name** and the default file extension is **.txt**

Log IP:
Starts the logging of the ATTU with that IP. If no ATTU has been chosen it will simply say **Log IP:**, but if an ATTU has been chosen, the IP of that ATTU will follow after the colon. If not ATTU has been chosen or the ATTU no longer exist on the list, a click on this button will show the user an error.

Exit:
Closes the application

Help:
In the Help submenu, two functions can be accessed:

Help:
Shows this document

About:
Show the information about the program.

2.5.2 Device menu

Depending on what device has been right clicked a different device menu will pop up.

If the referenced ATTU is right clicked, the only option the user gets is **Remove Reference.** This will reset the referenced ATTU and set it to **Reference: <No Reference>**

if device in the **Other devices on the network** is clicked the user only gets the option to **Remove other device.** This simply removes the device, but it will reappear if it still exists on the network.

If an ATTU is clicked in the main list, the user will get three options:

Make Reference ATTU:
Sets this ATTU as the reference, but the ATTU doesn't disappear from the list of all ATTUs, it will simply be copied. See **The Reference ATTU System** for more information

Remove ATTU from list:

Removes the ATTU from the list. If the ATTU still exists on the network and can respond it will simply return after its next update.

Make logged ATTU:
Makes this ATTU the logged one, saving it in settings to persist it, and setting its IP to the Main Menu option Log IP. See Main Menu for more information

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