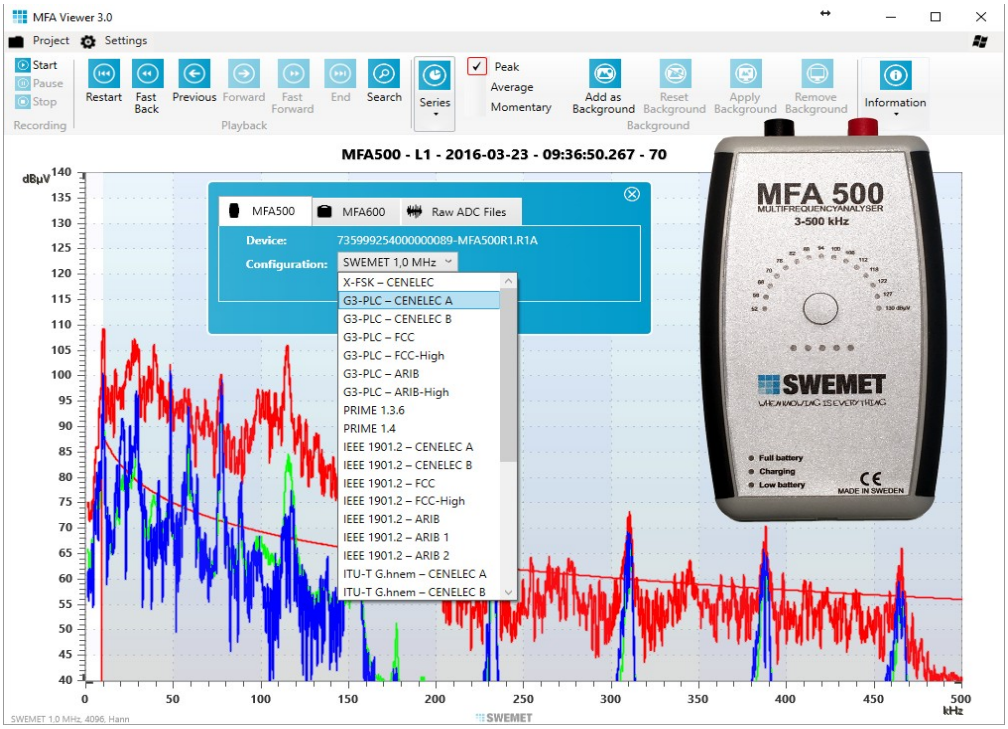

MFA Viewer 3.0

Getting Started Manual

Version: R1A

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More information about Swemet AB can be found at:
http://www.swemet.se

Telephone: +46 13 100580
Norra Oskarsgatan 34, SE-582 73 LINKÖPING

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1 Introduction

The MFA Viewer application reads both FFT and raw ADC data from the MFA500 instrument, as well as FFT data from MFA600 units, and presents those values as a linear curve of micro-volt decibel levels between 3 and up to 500 kHz, 3 and 150 kHz for the 3 phase MFA600. The purpose of the MFA Viewer is to provide an overview of the complete physical spectrum.

This version of the MFA Viewer requires an authentication key to be obtained from Swemet in order to be able to make use of the application. The key is specific to each particular computer, and users which have purchased the application are more than welcome to use the application on multiple computers, as long as the number of purchased applications cover the number of MFA500 devices owned by that company. If a user changes computer, a new authentication key will be required. Simply contact Swemet if the application requests a new authentication key and the old key doesn't work.

2 Getting Started

2.1 Downloading the Application from the Internet

The MFA Viewer 3.0 application is available from the Swemet MFAViewer web application, at https://smart.swemet.se/mfaviewer. When you have purchased the application, the account and password will be made available to you. Login with the appropriate account.

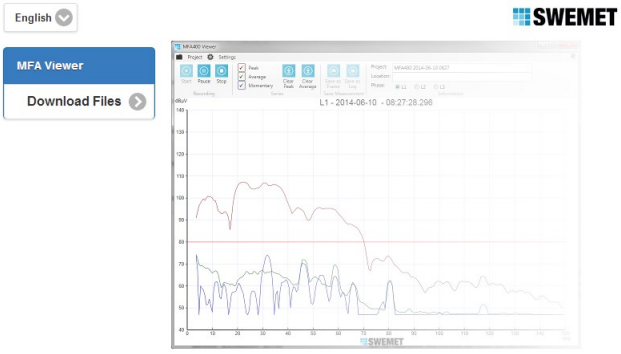

Image 1: MFA Viewer Download Application

The user can change the language of the site in the upper right corner. If any text has not been translated into the chosen language, it will be shown in English.

Click on the “Download Files” button.

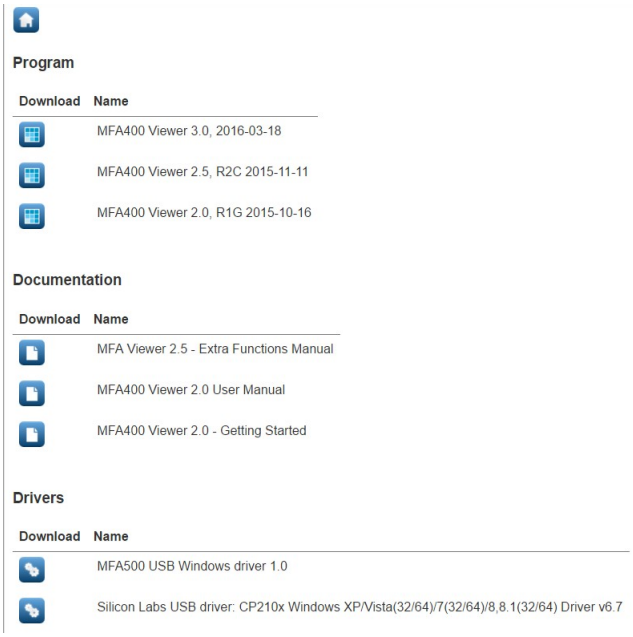

Image 2: Download Page

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The download page lists the program, drivers, languages, and color schemes which belong to the MFA500 instrument system.

Page description:

Home button. It returns the user to the main menu.

Program file button. This is the link to use for downloading the MFA Viewer 3.0 program.

Device drivers button. Use this link to download the MFA500 USB driver.

Language button. This link downloads extra languages for the MFA Viewer 3.0 program. Please note that the MFA Viewer 3.0 languages start with version 7. These languages can be added imported into the MFA Viewer program, and added to the list of available languages.

2.2 Installing the MFA500 USB Windows Driver

Click on the driver button, , to download the MFA500 USB Windows driver. Respond as necessary to your browser in order to save the file to your computer.

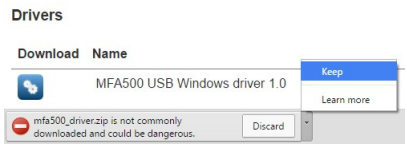

Image 3: Saving MFA500_driver.zip

Click on the file and open it in Windows Explorer.

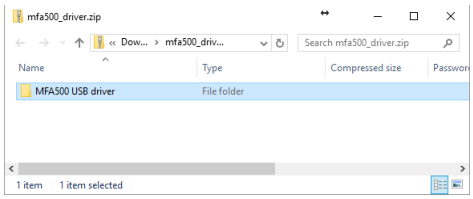

Image 4: Extracting the MFA500 USB driver

Extract the driver to an appropriate directory, and then click on the InstallDriver.exe program.

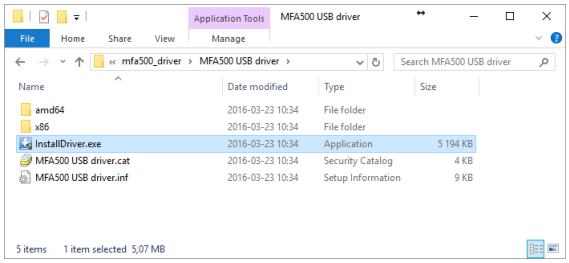

Image 5: Starting the USB driver installation

Remember that some computers may require administrator privileges in order to install a driver. If you can not install the driver and do not have administrator privileges, contact the person who has administrator rights to your computer. This driver is based on Microsoft's generic USB driver and is thus signed by Microsoft. The installation program itself is not signed.

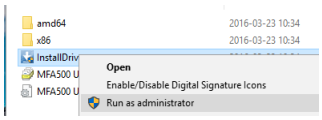

Image 6: Installing a driver as administrator

The driver application may require you to acknowledge that you wish to run the application. Click yes and the installation wizard will start.

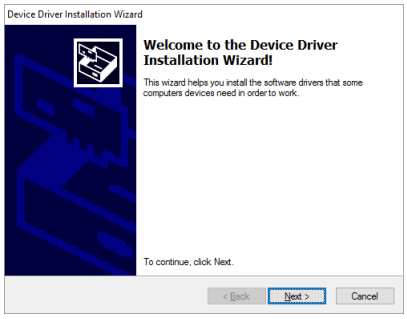

Image 7: USB driver installation wizard

Click on Next and the driver will be installed to the computer.

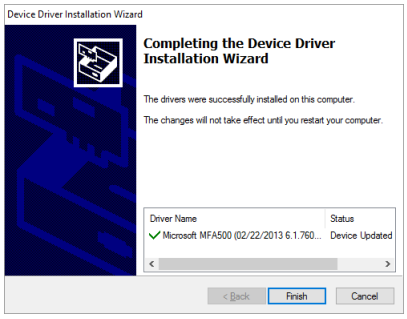

Image 8: USB driver installation complete

Click Finish. If you open the Control Panel / Device Manager the MFA500 should be listed as a Universal Serial Bus device, ie: USB device.

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Norra Oskarsgatan 34, SE-582 73 LINKÖPING

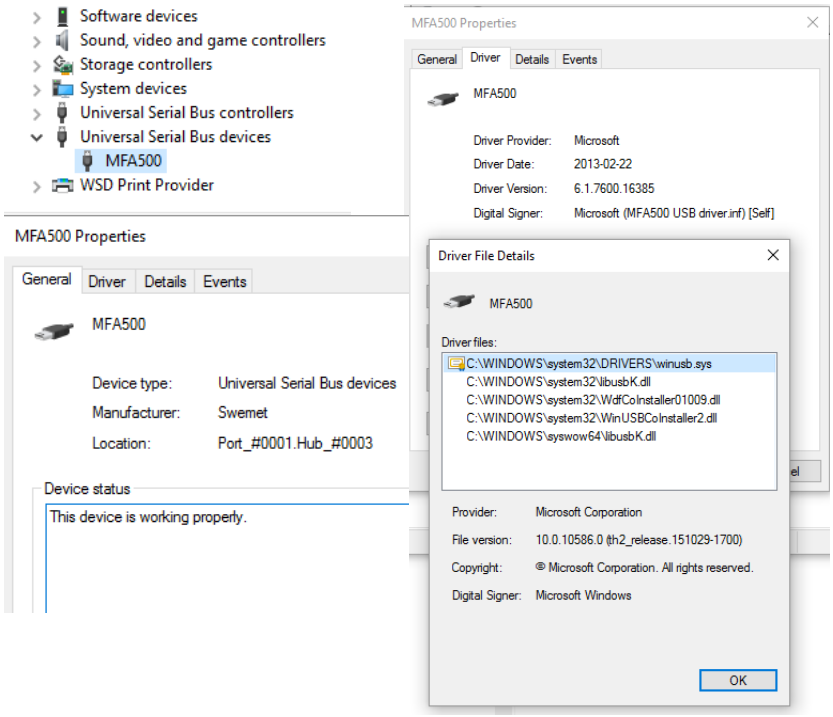

Image 9: MFA500 driver in the Device Manager

2.3 Installing the MFA Viewer 3.0 Application

Start by clicking on the button besides the text for MFA Viewer 3.0. The setup.exe file is downloaded to your computer.

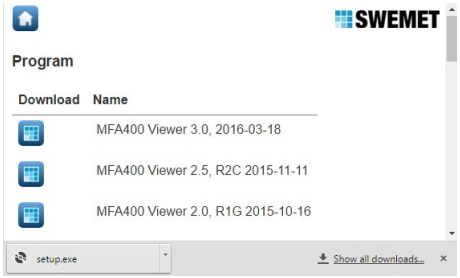

Image 10: Downloading the MFA Viewer setup.exe file

Double click on the setup.exe file to start installation of the MFA Viewer 3.0 application. The setup.exe program will check that Microsoft's .NET Framework 4.6 and Visual C++ “14” runtime are installed, and then start the installation of the MFA Viewer over the Internet. The application will check for upgrades and ask if you want to install the latest version as they become available. When asked if you want to run this program, click on the run button, and the MFA Viewer 3.0 Installation starts.

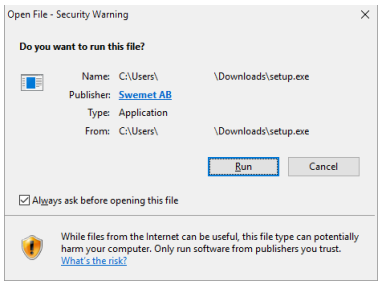

Image 11: Installation

This is an introductory page to let you know what program you are installing and that it has been signed by Swemet. Click on the “Run” button.

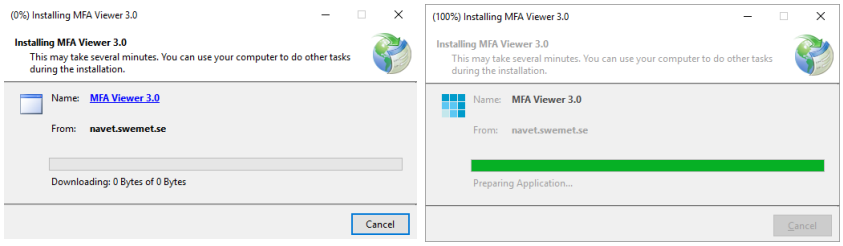

Image 12: Installation progress

The MFA Viewer application is now installed and will try to start immediately.

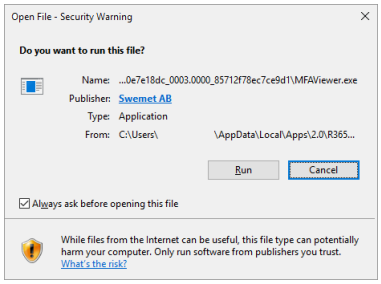

Image 13: Starting the MFA Viewer application the first time

You can avoid this security warning from popping up each time by click on the “Always ask before opening this file” checkbox and removing the check mark.

Notice that the program directory is not “C:\Program Files”. The application is stored in the user's profile on the local computer, Microsoft's choice. Each upgrade will create a new version, and thus it is important to remember that if you upgrade the application, you should remove it from the task bar and then start the new version of MFA Viewer and re-add it to the task bar again, so that you start the new version the next time and not the old one.

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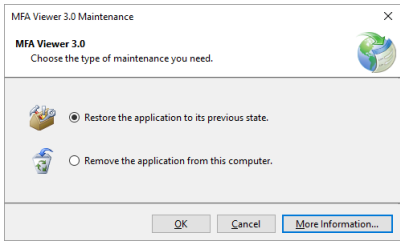

Image 14: Repairing or removing the application

The MFA Viewer 3.0 can be repaired or removed via the Control Panel / Programs and Features.

2.4 Authenticating MFA Viewer 3.0

The application is installed to the users Windows menu, and an icon is added to the Desktop. Clicking on the menu or the desktop icon will start the application. Some things to notice is that the scale is dBµV, not dB. And the kHz access is from 0 to 500. At present, only English is available as a language until others can be imported, but other languages can perhaps be included with the installation in future updates.

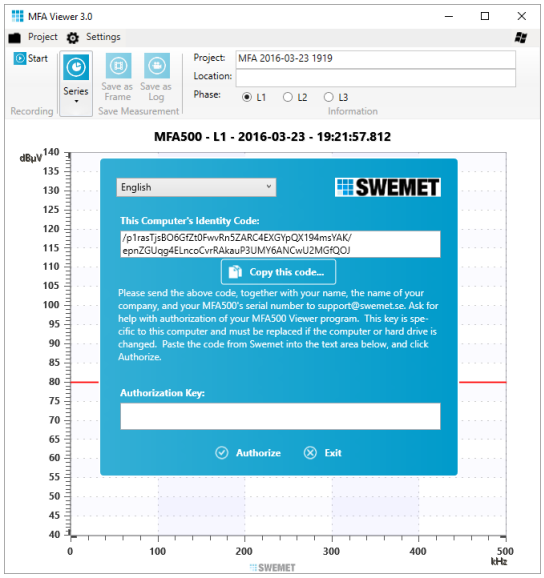

Image 15: Authentication

Click on the “Copy this code...” button to copy the computer's identity code to you cut and paste buffer and a message with the code will appear. If there is any problems, try and mark the text and then copy it. Remember that it is much longer than it appears in the window. Also, each time you start this application until it is authorized, it will present a different identity code. The authorization key will match any of these codes.

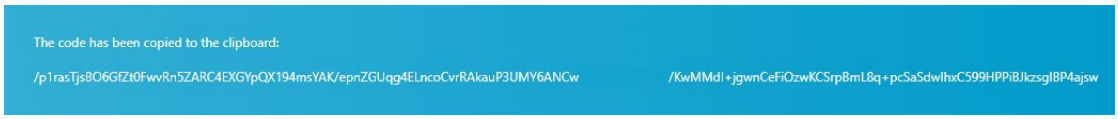

Image 16: The computer's identity code

Paste this text into an email, and send it to Swemet Support: support@swemet.se

Hi,

My name is John Doe, and I work for Atlas Unlimited. My MFA500 device has serial number 000001. I've installed the MFA Viewer 3.0 application and I need a Security Code. My Computer's Identity Code is 4aEHdqZqtX7ZveFb4uLpNaKiuk7....EbpbdsXIfmZBB/gNX4.....

Sincerely,

John Doe

As soon as possible, Swemet will respond with the code:

Hi Mr Doe,

Your Authentication Key is euef0Nd29qyB/MYOA3YhNXn4wc1....kxs4c9vAEiXrYvHfJX5.....

Sincerely,

Swemet Support

John Doe wrote 2014-06-26 15:41:
> Hi,
>
> My name is John Doe, and I work for Atlas Unlimited. My MFA500 device has serial number 000001. I've installed the MFA Viewer 3.0 application and I need a Security Code. My Computer's Identity Code is 4aEHdqZqtX7ZveFb4uLpNaKiuk7....EbpbdsXIfmZBB/gNX4.....
>
> Sincerely,
>
> John Doe

Copy your verification code and send it in an email, together with your name, company, and MFA serial number to support@swemet.se. When you receive an authentication key, copy and paste it into the text box for the “Authentication Key”.

If your computer or hardware configuration changes, the application will require a new authentication key. Contact Swemet support with the new verification code.

When you have pasted the key into the text box for the Authorization Key, click on the “Authorize” button.

2.5 The MFA Viewer Application Layout

When the MFA Viewer 3.0 application is started, the “MFA Viewer 3.0” window, otherwise known as the “Project” window, will open with an empty diagram of decibel micro volt, dBµV, over 0 – 500 kHz, with a red line in the middle at 80 dBµV. Anything above this red line is considered as being either communication or a disturbance. Curves below this line may be communication or just background noise. Some communication protocols such as G3-PLC communicate at a level that is only 9-12 dBµV above the background noise. This may or may not be above the red line.

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Norra Oskarsgatan 34, SE-582 73 LINKÖPING

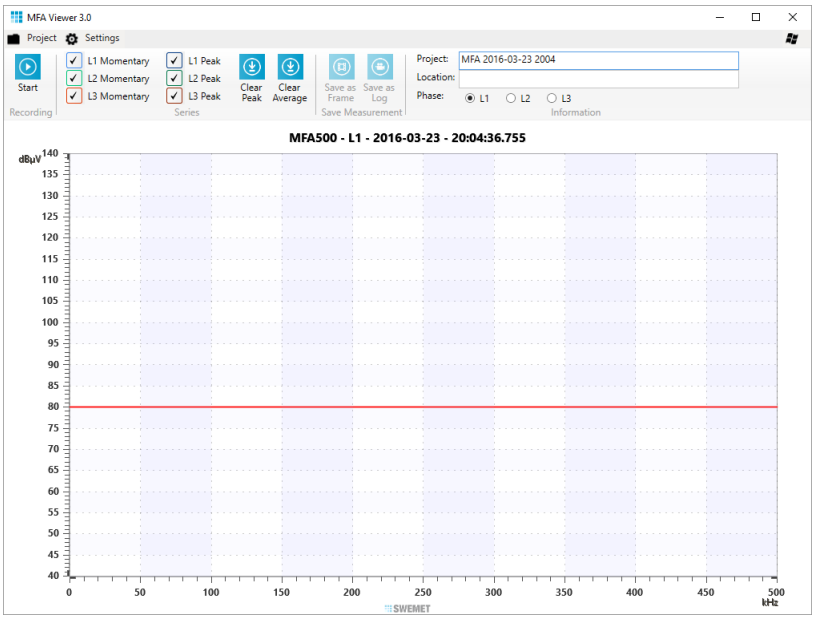

Image 17: MFA Viewer 3.0 Start Page

By default, the name of the project is set to MFA500 plus the date and time in ISO 8601 format, minus the characters which cannot be used in a Windows file name. The project name can be changed at any time, and you can change it when choosing which directory to save it to. By default, your user account's My Documents folder is used to save project files. However, you can change the default directory for projects under “Settings” in the menu row.

The MFA Viewer page is divided into a menu row at the top, then a header with icons and text, and finally the MFA cha This layout is consistent for the project and measurement windows in the MFA500 application. The menu at the top is for working with projects, saving images, printing and changing all the settings in the program. The menu's function is for the connection to the Windows environment, and the connection between MFA Viewer windows.

When the MFA Viewer project window is opened, it has an empty project. As you save measurements, the menu will show a list of all the measurements in the project. Clicking on measurements will open them in a new “measurement” window. Measurement windows can be av various types depending upon which instrument and mode was used to record the data. Icons are used in front of the measurement name to help tell you what type of recording it is, and if it is a single frame or image, or multiple frames in what is called a log that has been recorded over time.

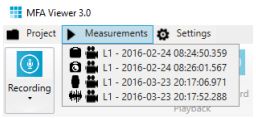

Image 18: MFA Viewer Menu Row

The header bar is for working with the application on the present page. Buttons will be added or activated as different functions become available. This header is quite dynamic, and will change it's layout considerably based on how large the window is, and how much room it has to

show the various buttons available. Right clicking on the header provides a menu where you can hide the header if desired. Click on Minimize the Ribbon. To restore the header, click on the middle of the menu row, and then click on Minimize the Ribbon again to remove the check mark.

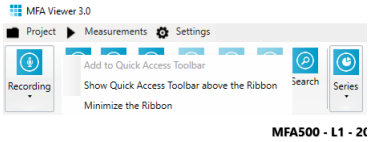

Image 19: Hiding the header bar

If the height of the window drops below a certain level, the header will be hidden automatically. This is true of the menu as well.

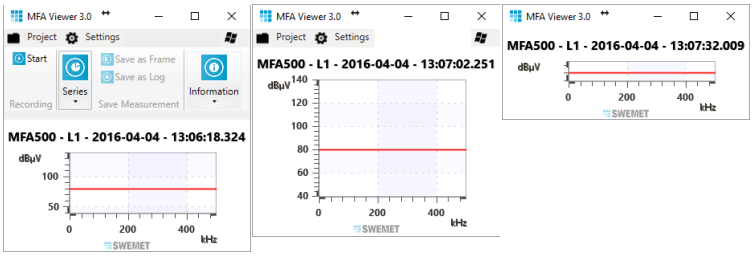

Image 20: Dynamic window size changes

The MFA diagram is the main focus of the application. The horizontal X axis at the bottom is in kHz from 0 up to 500, and the vertical Y axis is from 40 to 140 dBµV. The red signal / noise level line is at 80 dBµV, but can be changed using different standards as explained later. The title of the diagram is type of unit making the recording, the phase, and then date and time.

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Norra Oskarsgatan 34, SE-582 73 LINKÖPING

2.6 Connecting to the MFA500 Instrument

The application can connect to several instruments, and if a USB connection to a MFA500 is missing, it will automatically assume you wish to make a TCP/IP connection to a MFA600 3 phase instrument. Open the start popup window by clicking on the start button in the top left corner. The MFA500 title will be red if not available.

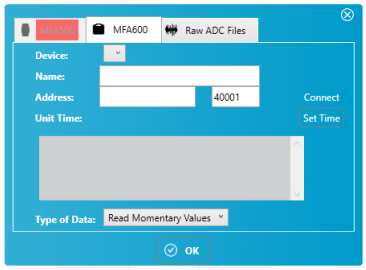

Image 21: Opening the start window without a MFA500 connected

If a MFA500 is connected and the driver is working, the application should recognize the MFA500, read it's serial number and firmware, and make the MFA500 part of the start window accessible.

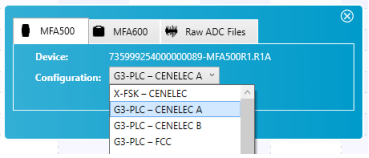

Image 22: Opening the start window and a MFA500 is connected

2.6.1 Recording from a MFA500

With a MFA500 connected, click on the start recording button and the start window opens. The start window is divided into several tabs for the MFA500, MFA600, ADC files, etc… The first tab is for the MFA500, and it should be enabled and the open tab when the start popup window opens, if the MFA500 is connected. If the title for the MFA500 is red and the tab is not enabled, then the MFA500 is not available to the application. Check your device manager in the control panel for the USB, “Universal Serial Bus” device, MFA500.

If the MFA500 is connected and available, then the MFA500 tab will be enabled and you can choose how to configure the MFA500 for recording.

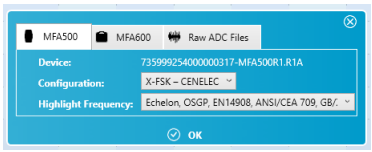

Image 23: Start Recording with the MFA500

The MFA500 tab opens by default to the “X”-FSK configuration. This configuration can be used for all older non-OFDM powerline protocols which use one or more frequencies, rather than a spectrum of frequencies like OFDM, ie: S-FSK, B-FSK, P-FSK… The application will choose the sample rate that works best for the highlight frequency chosen. The user can add highlight frequencies and they will be available in the drop down list if they are not OFDM protocols.

The MFA500 supports a wide range of configurations, including raw ADC value export.

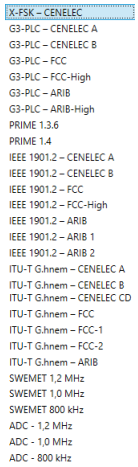

Image 24: MFA500 configurations

The OFDM protocols G3-PLC, PRIME, 1901.2, and G.hnem are supported for all their narrowband versions. And Swemet has included 3 extra configurations with maximum resolution for each frequency. The ADC configuration are used for exporting raw 16 bit ADC values form the MFA500.

Depending upon the configuration chosen, the resolution and frequency shown varies. Choose a configuration and click on the OK button.

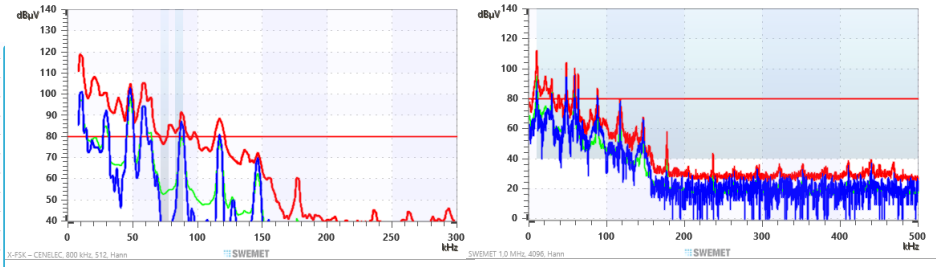

Image 25: Recording MFA500 data

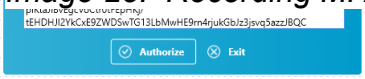

Image 26: Authorization by key

As seen above, different resolutions effect the outcome of how the curve is displayed. The configuration is designed to match the specified protocol, but may be oversampled.

Telephone: +46 13 100580
Norra Oskarsgatan 34, SE-582 73 LINKÖPING

2.6.2 Recording ADC data from a MFA500

The MFA500 can record raw data from it's ADC directly to disk, or displayed on screen. The graphical presentation cannot keep up with the amount of data being created, but all data will be saved. Raw data recorded to disk is saved with a 30 byte header and then raw 16 bit ADC values, the amount of data and recording time is updated continuously. Raw data saved to disk is over 1 GB for 10 minutes, and is limited to 2 GB. Data displayed can be stored as part of a project in the standard project format, and this creates files which are 2x larger than raw format. Raw MFA500 files can be opened in the application and display.

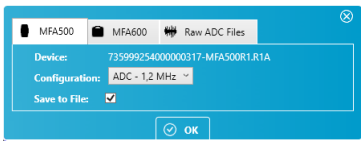

Image 27: Recording ADC data with the MFA500

Click on OK to start recording.

2.6.3 Recording from a MFA600

The application can make a TCP/IP connection to a MFA600. The MFA600 is a 3 phase instrument, and it can be connected to your local network with DHCP, or accessed over the Internet from a remote location. If you have connected to a MFA600 before then the application will remember its information, but the first time it will be blank.

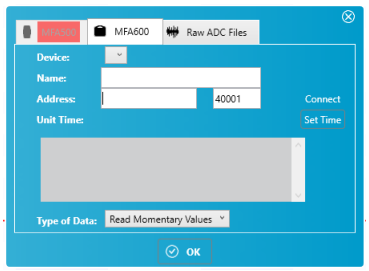

Image 28: Recording the MFA600

The Address of the MFA600 can be a DNS name, a TCP/IP address, or the MAC address of the unit if it is connected on your local network.

MAC addresses will work with “B” and “C” networks, even if they are subdivided. MAC addresses are used when the MFA600 is setup with DHCP, and you are not an administrator that can check the DHCP server to find the right TCP/IP address. The application will check all the subnets being used by the computer, and ping the addresses to find a match for the MAC address given in the start window.

The port is by default 40001. The MFA600 will always listen on this port, even if it is setup to use another port. If the MFA600 is setup to use DHCP, and it doesn't find a DHCP Server to give it a TCP/IP address, it will default to 192.168.0.10. This address can be changed by the user.
To connect to a MFA600 using DHCP in the local network, you can use the MAC address as written on the label under the unit.

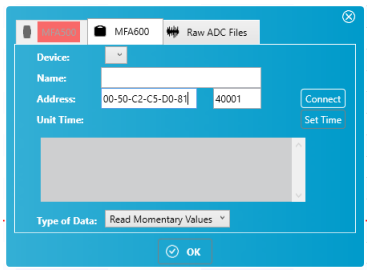

Image 29: MAC address connection

The MAC address can be as written: 00-50-C2-C5-D0-81, in small letters 00-50-c2-c5-d0-81, or without the dashes, 0050C2C5D081. Clicking on the Connect button will cause the application to begin the Pinging the network in order to check MAC addresses. When a match is found, the application will attempt a connection.

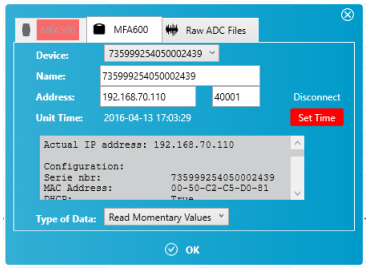

Image 30: MFA600 connection

If the application finds the MFA600, it will change the address to the TCP/IP address for future use, and save the configuration of this unit. The start window provides a basic overview of the MFA600's configuration.

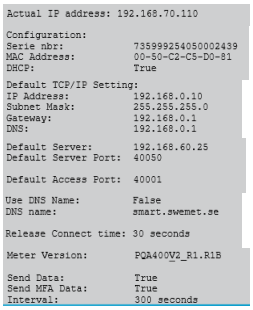

Image 31: MFA600 configuration overview

The configuration overview gives a quick log of the important configuration settings for the unit.

The Type of Data drop down shows the different modes for reading the MFA600 data.

Telephone: +46 13 100580
Norra Oskarsgatan 34, SE-582 73 LINKÖPING

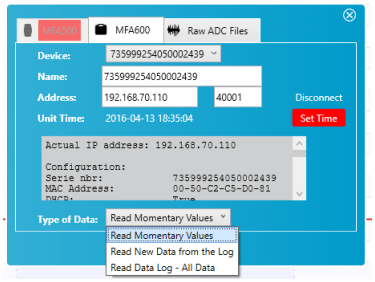

Image 32: Reading data from the MFA600

The MFA600 can be read in 3 different ways: momentary data, new log data, or all log data. Momentary data is the actual peak and momentary data is sent frame by frame from the unit, as quickly as TCP/IP commands allow. Log data is peak and average data saved as 5 minute records. New log data allows you to specify data from a particular time, and all data sends all records to the application.

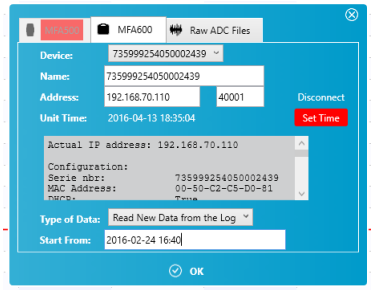

Image 33: Reading data by date from the MFA600

The application will keep track of the last log data read from the unit, and suggests reading all data after that period, the next time you make a connection to the same unit.

Click on the OK button, and the application will start recording data from the MFA600

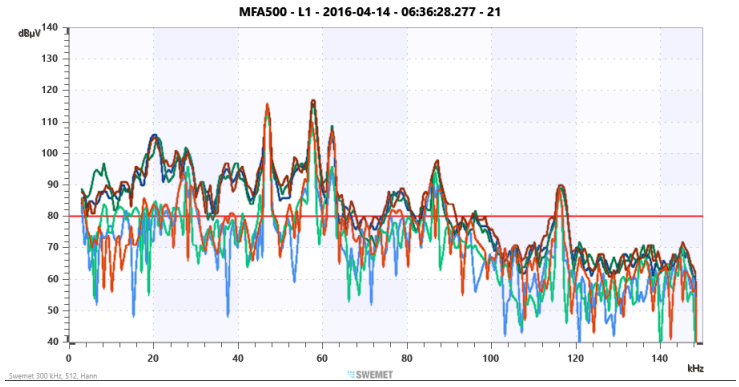

Image 34: Momentary MFA600 data

Curves will be shown for the peak, average, and momentary levels, from 3 to 150 kHz.

2.7 Recording data

Since the MFA Viewer is recording, the Pause and Stop buttons have been added. Pausing the diagram will not stop recording, all data during time that the recording is paused, is still being added to the recording. Pausing the diagram allows you a chance to inspect something of interest while the MFA500 or MFA600 is still recording.

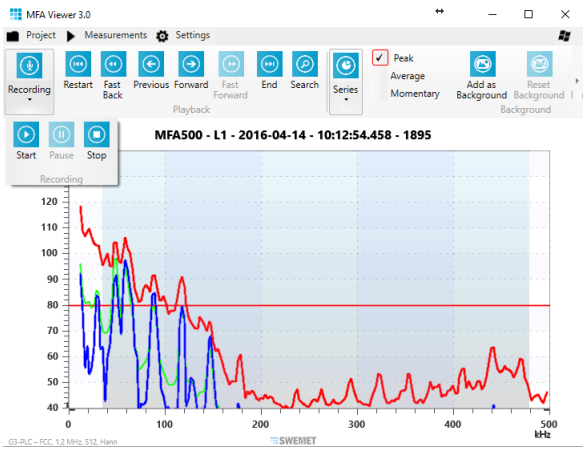

Image 35: Pausing a Recording

While the recording is still going in the background, you can move backwards and even forwards as new frames are being added to the recording. Notice that when paused you can save a particular frame as a new measurement in the project, but not the entire recording as a log. This gives you the opportunity to save individual measurements as items of particular interest.

The Search button allows you to quickly scan the entire recording for the particular section you're looking for.

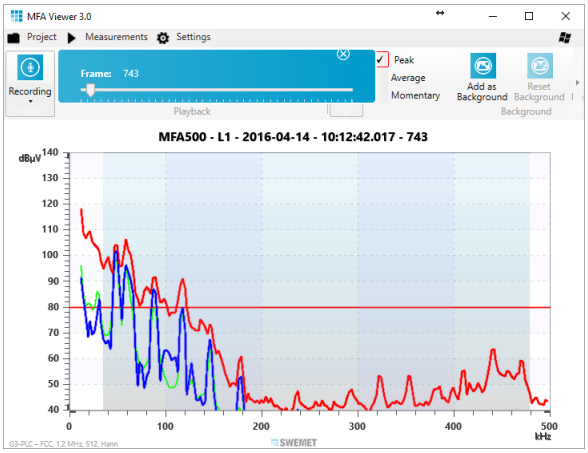

Image 36: Searching a Recording While Paused

Clicking on the Stop button ends the recording from the MFA500, however, it does not save the recording.

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Norra Oskarsgatan 34, SE-582 73 LINKÖPING

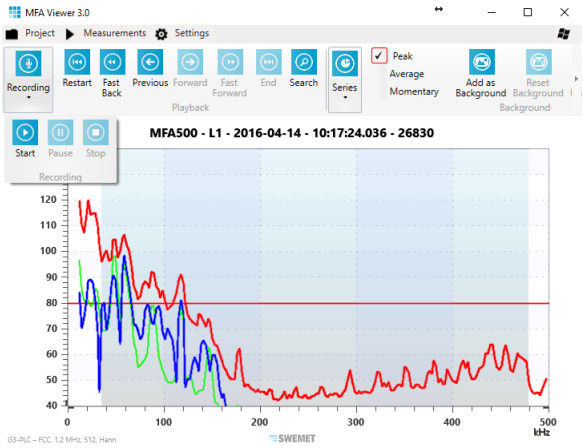

Image 37: Stopping the Recording

When the Stop button is pressed, the application stops receiving data. You can reexamine the entire recording, save individual frames as measurements or save the entire recording as a log measurement.

2.8 Saving data

Clicking on Save as Log will save the entire recording as a new measurement in the project.

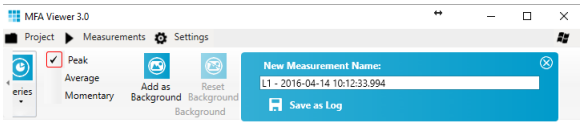

Image 38: Saving as Log

As default, the name suggested is the title from the diagram, but you can change it as desired. Clicking on the Save as Log button saves the measurement into the project, and it is opened in a separate window.

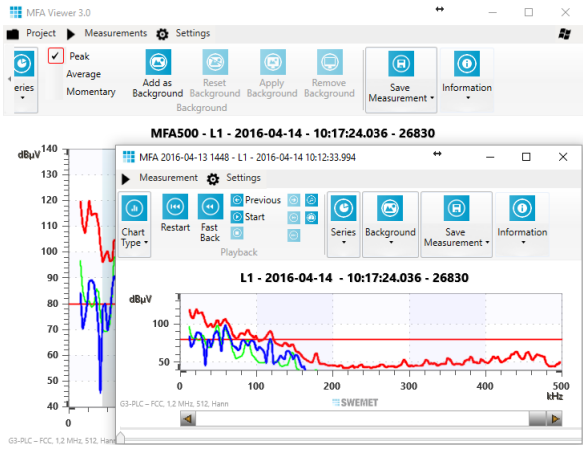

Image 39: Adding a Measurement to the Project

New recordings are always done in the project window, and measurements are always viewed in separate windows. In measurement windows, previous recordings can be played back and reanalyzed more closely. Peak and average values can be cleared repeatedly, and then restored.

A particular frame may be of interest when examining the measurement, and you can save it as a separate measurement in the project. Just click on the Save as Frame button.

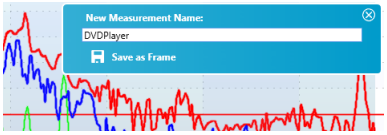

Image 40: Saving a Frame

This frame is then saved into the project as a separate measurement, consisting of one single recording from the MFA500.

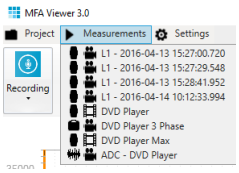

Image 41: Project Measurements

Clicking on any measurement will open it in another window.

Telephone: +46 13 100580
Norra Oskarsgatan 34, SE-582 73 LINKÖPING