*This product is designed and manufactured by ETL for Embedded Wireless Laboratory Inc.

TC2xx FLASH Programmer

User Guide

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1. PREFACE

This manual will guide you through the installation and operation of the TC2xx FLASH Programmer, referenced hereafter as the TC2xx-Programmer.

The TC2xx-Programmer is designed for programming the DFLASH/PFLASH memory in the Infineon SAC-TC2xx Microcontroller Unit (MCU):

✓ SAK-TC222L 16F133x
The TC2xx-Programmer also supports next Ford modules:

✓ GN15-14B321-GG

☞ **Note:** The In-circuit, Serial Boot mode only available for the programming devices.

☞ **Note**: Devices that are not above-mentioned may not be programmable by the TC2xx-Programmer.

2. CHECKLIST AND REQUIREMENTS

The following list describes both what items are supplied with the TC2xx-Programmer and the system requirements if used by a PC.

✓ One ETL Hyper Programmer Board – *provided*
✓ One 9 Pin Flat Cable – *provided*
✓ One USB cable – *provided*

■ Desktop/Laptop PC with USB Port
■ Windows 7/8/10 64/32-bit
■ Microsoft.NET Framework Ver. 4.7.2 or later version.

☞ **Note:** The link can download Microsoft.NET Framework:

https://dotnet.microsoft.com/download/thank-you/net472

3. INSTALLATION AND USE

The TC2xx-Programmer uses the ETL HYPER PROG board to communicate with the target MCU. The ETL HYPER PROG has Optical Isolated interface to provide maximum safety at the time of connection and programming. Also, the ETL HYPER PROG board includes four LEDs (Figure 1).

LEDs indicate the HYPER PROG state and external power supply voltage (Table 1, 2).

GREEN	USB cable plugged, and the voltage applied to the HYPER PROG.
BLACK	No voltage applied to the HYPER PROG. Check the USB Connector and cable. Try another PC USB port.

Table 1. USB_POWER_OK LED color meaning

GREEN	No voltage applied to a target MCU. The HYPER PROG is connected to target MCU +5V circuit.
BLACK	No voltage applied to a target MCU. The HYPER PROG's 9-pin cable not plugged or not soldered to the MCU +5V circuit.

Table 2. EXT_POWER_OK LED color meaning

GREEN	The HYPER PROG receives data via TXD pin.
BLACK	The HYPER PROG receiver is in wait mode.

Table 3. RX_ACTIVE LED color meaning

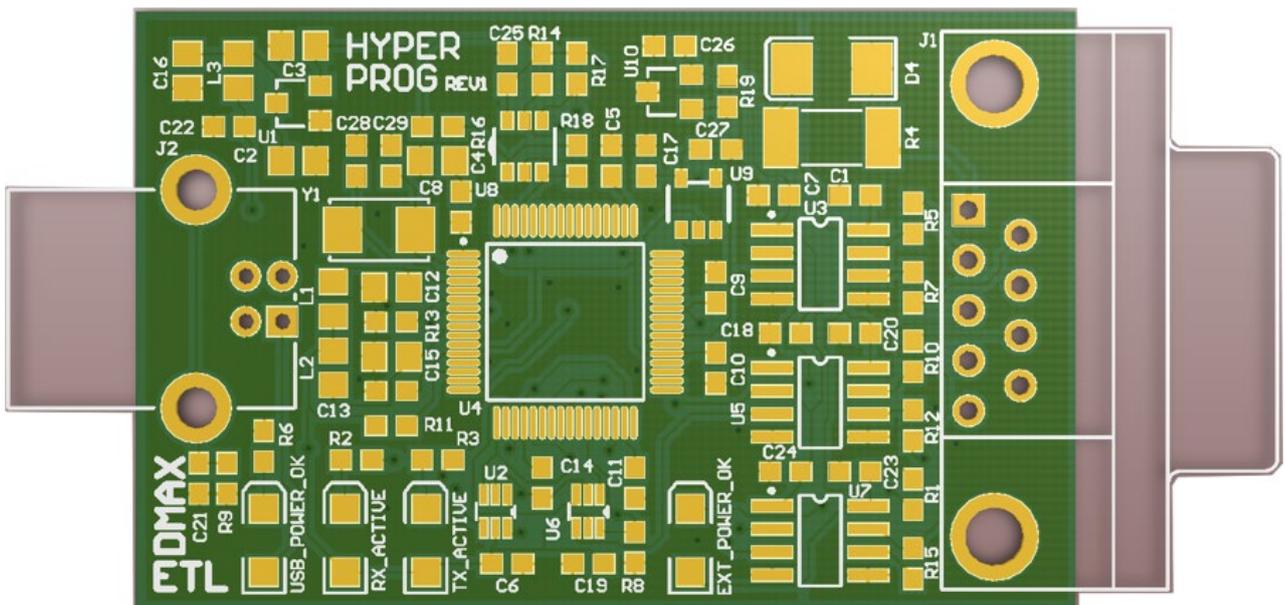|	
GREEN	The HYPER PROG transmits data via RXD pin
BLACK	The HYPER PROG transmitter is in wait mode.

Table 3. TX_ACTIVE LED color meaning

Figure 1. The ETL HYPER PROG board layout

3.1 USB DRIVERS INSTALLATION FOR WINDOWS 7

Normally the USB Driver will be installed automatically in time of software installation. In case if driver installation failures follow the instruction below.

This section describes how to install the USB drivers for the TC2xx-Programmer on the Windows 7,8 or 10 OS. The ETL HYPER PROG uses the driver supplied by "FTDI Chip" company. The Product ID (PID) was changed to meet the design requirements.

Please follow next steps to install the driver:

- Download the TC2xx-Programmer software form the ETL website.
- Install the software. After installation, the driver will be located in the "C:\Program Files\ETL\TC2xx_Programmer\USB_Driver\" directory.
- Plug the HYPER PROG board into a USB port.
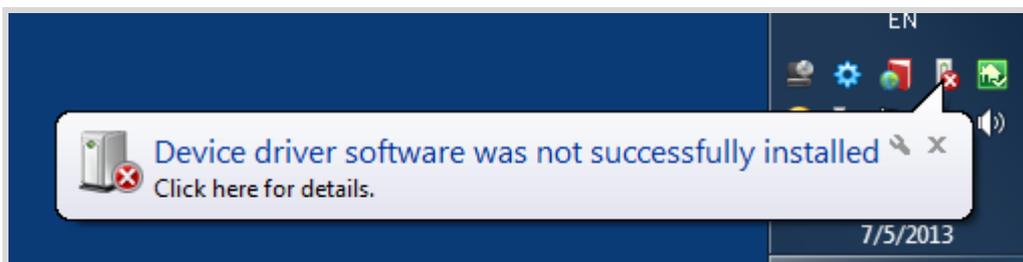- Wait until the Windows7 failed to install the driver(Figure 2)

Figure 2. The "Windows" driver installation failed

- Open the "Device Manager" and locate "ETL Hyper Programmer" devices (Figure 3).
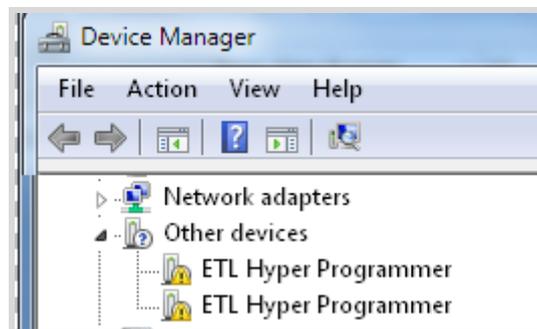

Figure 3. The "ETL Hyper Programmer" devices in the "Device Manager."

- Right Click on the first "ETL Hyper Programmer" device and then select "Update Driver Software" menu item (Figure 4).
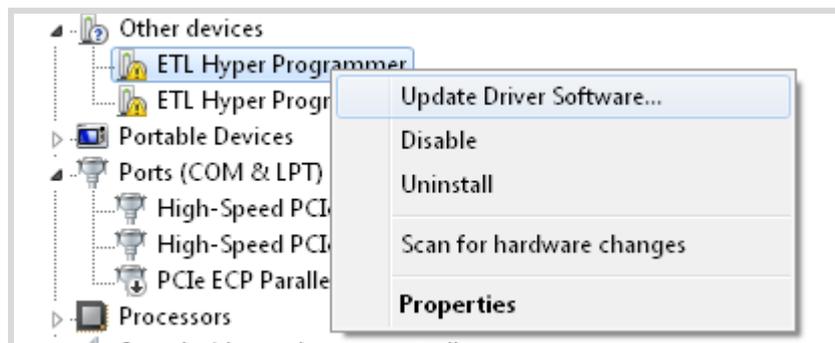

Figure 4. The "Update Driver Software" menu item selection

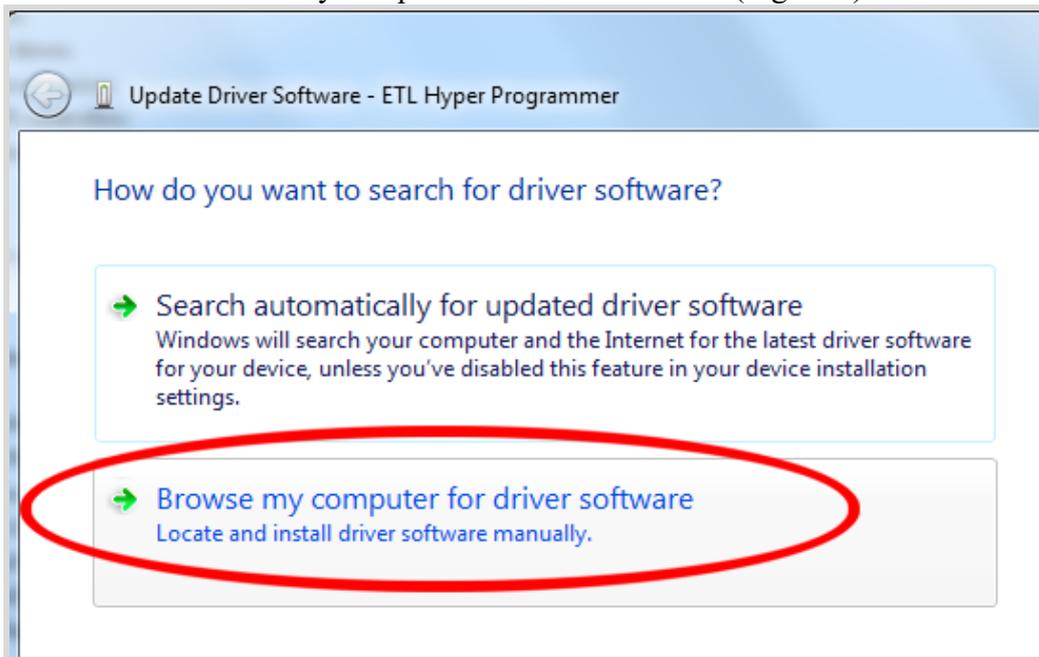■ Select the "Browse my computer for driver software" (Figure 5)

Figure 5. Update Driver Software - "ETL Hyper Programmer"

■ Press the "Browse" button to choose the USB driver location. For Windows7 32-bit the location will be C:\Program_Files\ETL\TC2xx_Programmer\USB_Driver".
■ For Windows7 64-bit the location will be C:\Program_Files_(x86)\ETL\TC2xx_Programmer\USB_Driver".
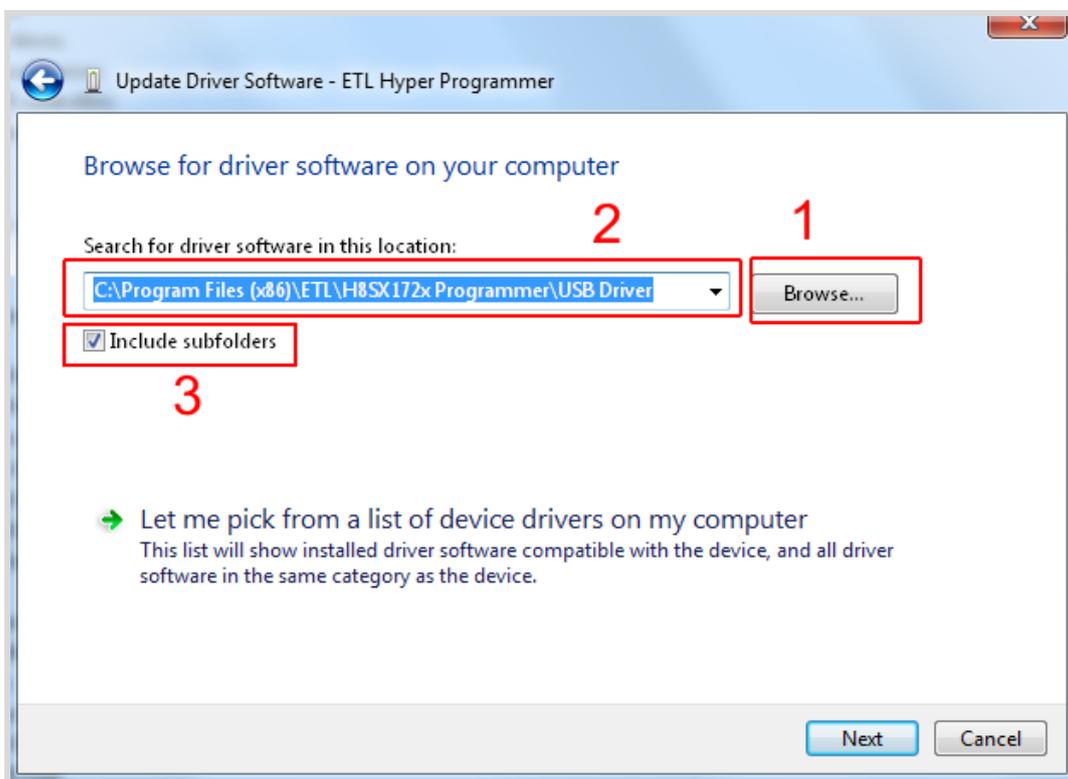

Figure 6. Update Driver Software - "ETL Hyper Programmer"

■ Check the "Include subfolders" checkmark. Click the "Next" Button.

■ In a couple of seconds, the Windows security alert screen will appear. Make sure the drivers are signed by "EMBEDDED WIRELESS LABORATORY Inc."
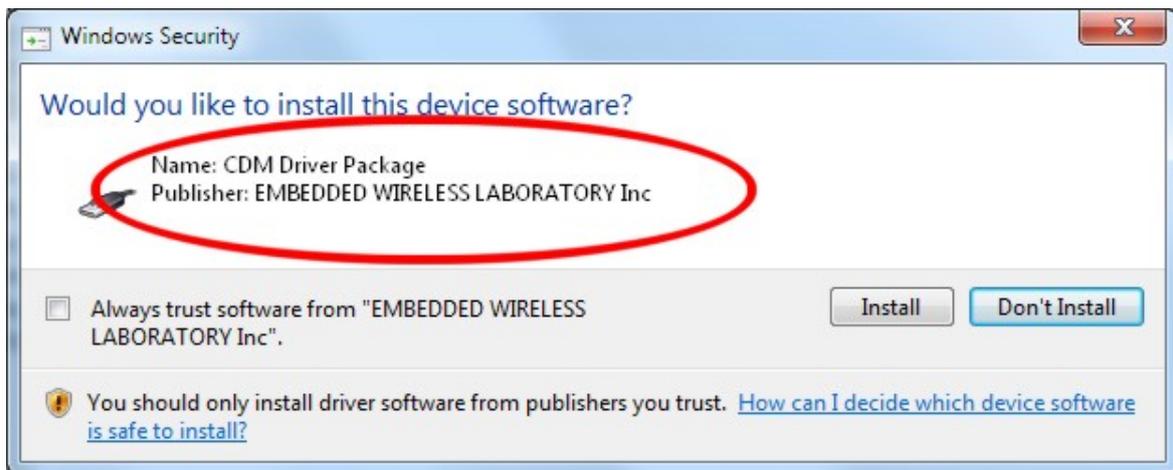Press the "Install" button (Figure 7)

Figure 7. "Windows Security" alert

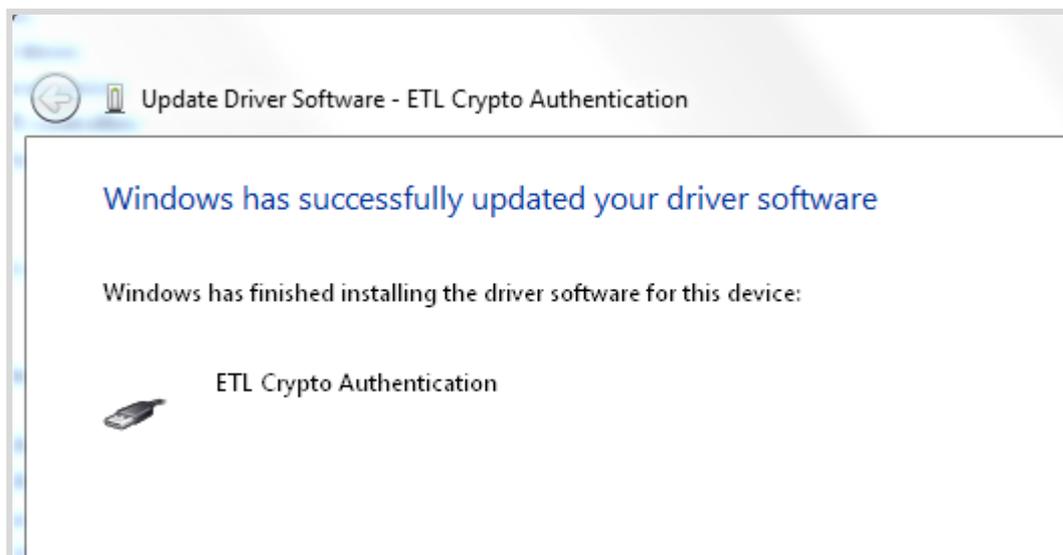■ Shortly the "Update Driver Software" screen will appear(Figure 8)

Figure 8. The successfully "Update Driver Software " screen

☞ **Note**: If an error occurred during the driver installation, probably the user does not have administrative rights on this Windows account. Log in as an Administrator and repeat steps described above.

■ One of the drivers was installed successfully (Figure 9). Install another driver for the "ETL Hyper Programmer" same way.
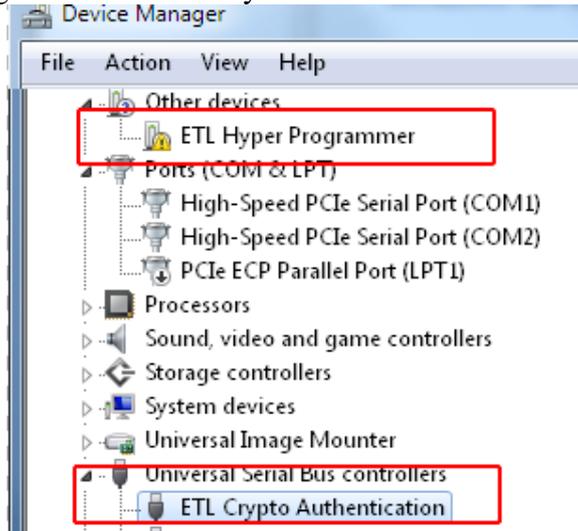

Figure 9. The "ETL Crypto Authentication" device successful installation

■ Open the "Device Manager" and locate "ETL Hyper Programmer" devices (Figure 3).
■ Right Click on the first "ETL Hyper Programmer" device and then select "Update Driver Software" menu item.(Figure 4).
■ Select the "Browse my computer for driver software" (Figure 5).
■ Press "Next" button.
■ In a couple of seconds, the Windows security alert screen will appear. Select the "Install this driver software anyway"(Figure 7)
■ Finally, you will see the driver installation confirmation for the second device. (Figure 10).
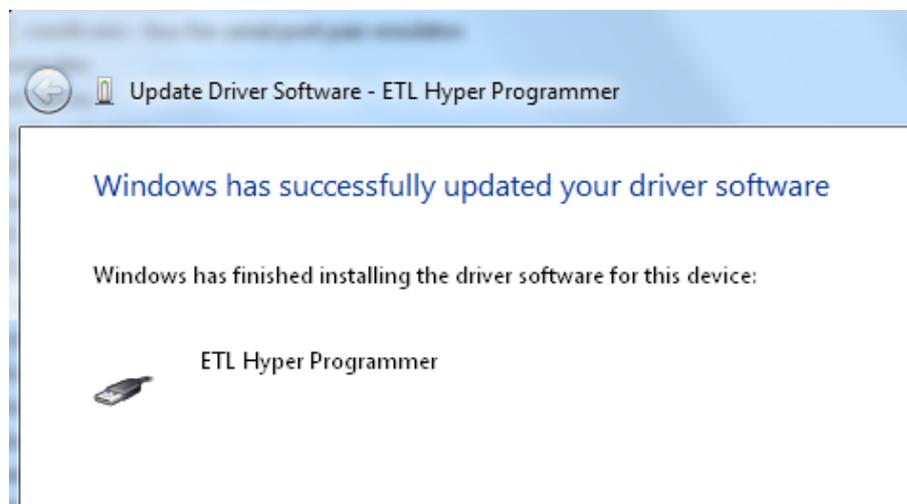

Figure 10. The "ETL Hyper Programmer" device successful installation

■ To make sure that the drivers were installed successfully open the "Device Manager" and locate the "ETL Crypto Authentication" and "ETL Hyper Programmer"(Figure 11).

Figure 11 The "ETL Crypto Authentication" and "ETL Hyper Programmer" devices

3.3 USB DRIVERS UNINSTALLATION

This section describes how to uninstall the USB drivers for the TC2xx-Programmer. Also, the driver un-installation will be helpful if "Windows" installed the wrong or old driver automatically. The ETL HYPER PROG uses the driver supplied by "FTDI Chip" company. The Product ID (PID) was changed to meet the design requirements. The Product PID of the HYPER PROG is 6692. The Vendor ID (VID) remained the same 0403. To uninstall the driver, we will use the CDMUninstaller software provided by "FTDI Chip" company. Download software at the http://www.ftdichip.com/Support/Utilities.htm website.

Please follow the next steps to uninstall the driver:
- Unplug the HYPER PROG board from the USB port.
- Run the "CDMuninstallerGUI.exe" file.
- Change the PID to 6692(Figure 12).
- Click the "Add" button.
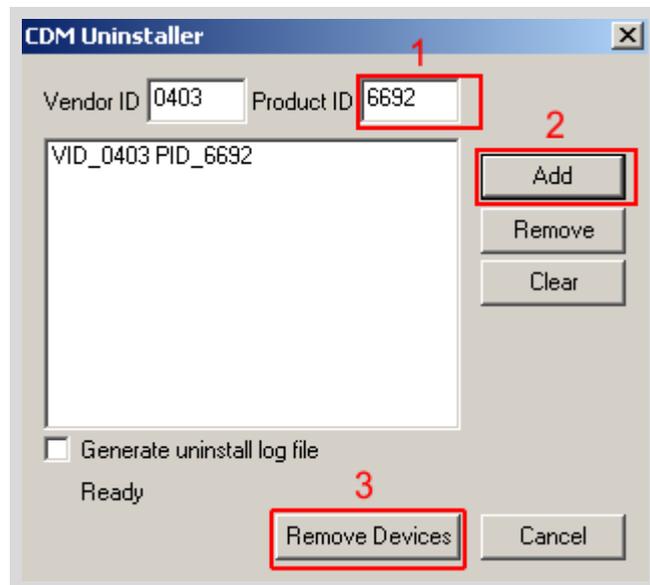- Click the "Remove Devices" Button.

Figure 12 The Drivers are uninstalled by the CDM Uninstaller software

- If there were installed drivers in the system, you will see the confirmation of un-installation.

4. SOFTWARE ACTIVATION

This section describes the software activation procedure. For activation, the user will need the "License key" provided in the time of TC2xx-Programmer purchase. Also, the "ETL HYPER PROG" board has to be connected to the USB port and drivers previously installed. Refer to the Section 3. Note that the software can be activated on five computers only. If you are going to activate the TC2xx-Programmer software on more computers, please contact the ETL technical support. Activation is valid for 14 days. After that period, the user has to activate the software again. The activation procedure is done automatically via the Internet. Make sure there is internet connection before activation procedure.

Follow next steps to complete the registration process:

- Connect the ETL HYPER PROG board to the computer.
- Execute the TC2xx-Programmer software.
- Press the "Connect Programmer" button.
- Wait until the "ETL Programmer is connected!" and the HYPER PROG serial number messages appear.
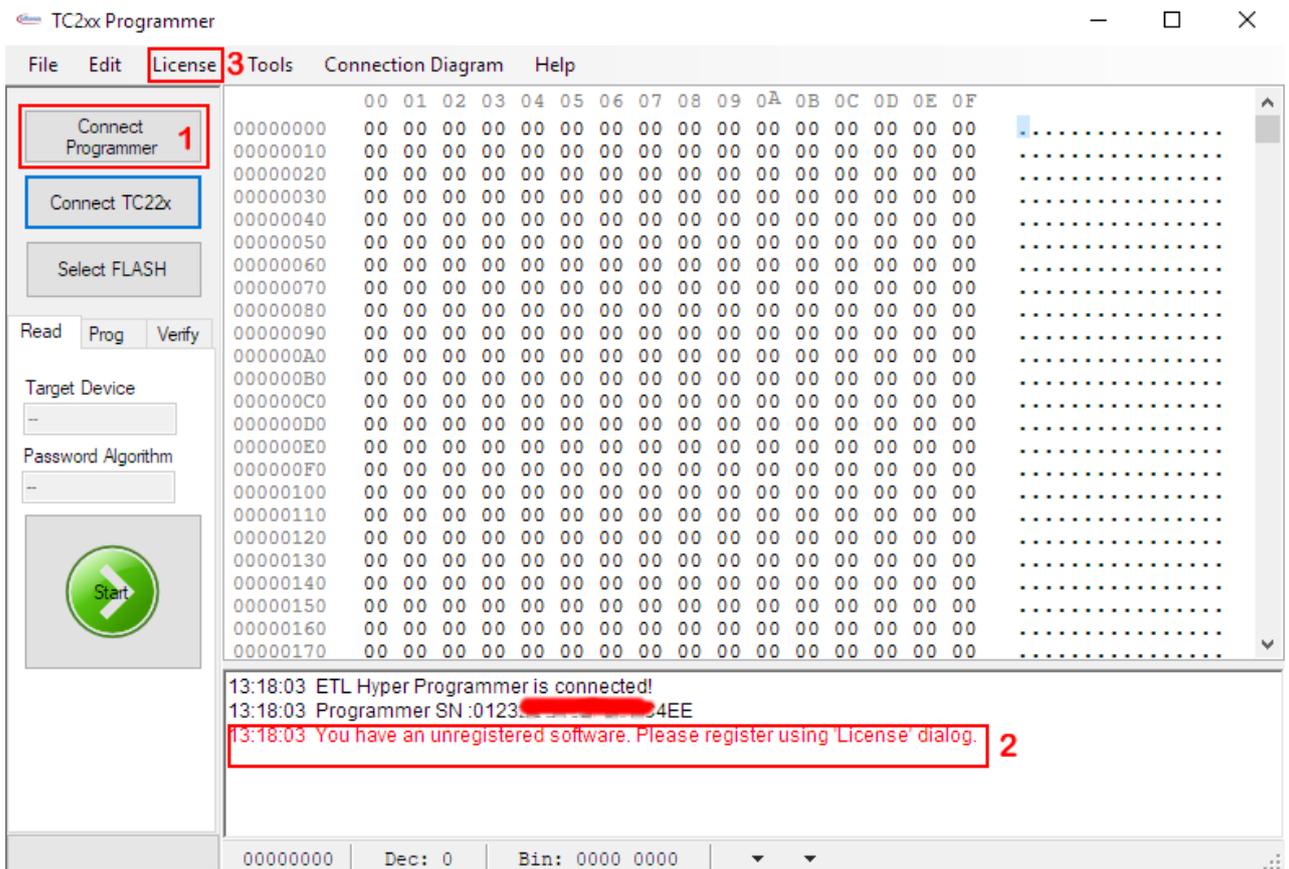

Figure 13 TC2xx-Programmer software

- Select the "License" menu item and then press "Register Product".
- Enter License Key.
- Enter the Programmer Serial Number (Figure 14).
- Press the "Activate" button.
- After Activation process completed, the "Registration Status" must be "REGISTERED" and "Clock Manipulation" is "NOT DETECTED" (Figure 15).

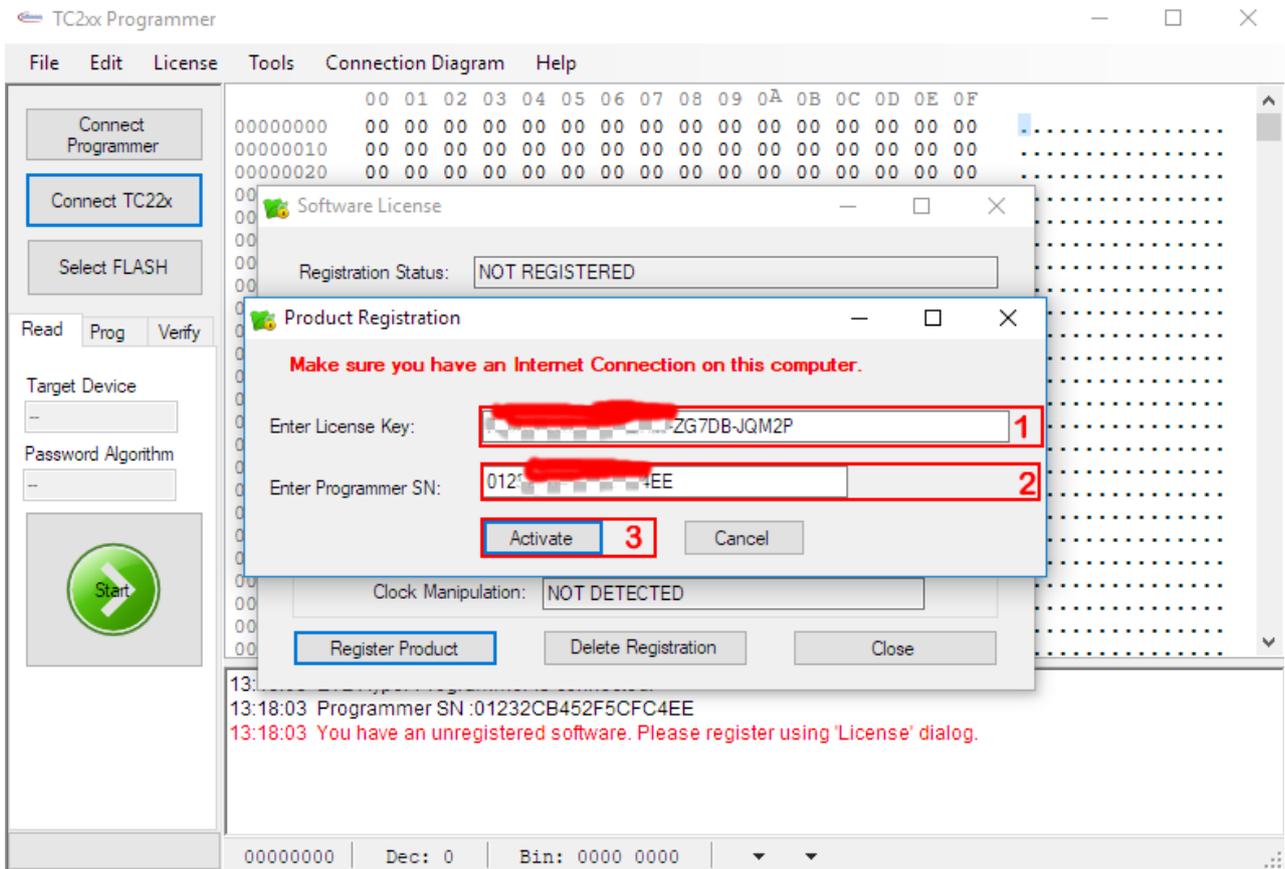Figure 14 TC2xx-Programmer software activation

☞ **Note**: If activation procedure failed, please contact ETL technical support at the Email: info@etlweb.net
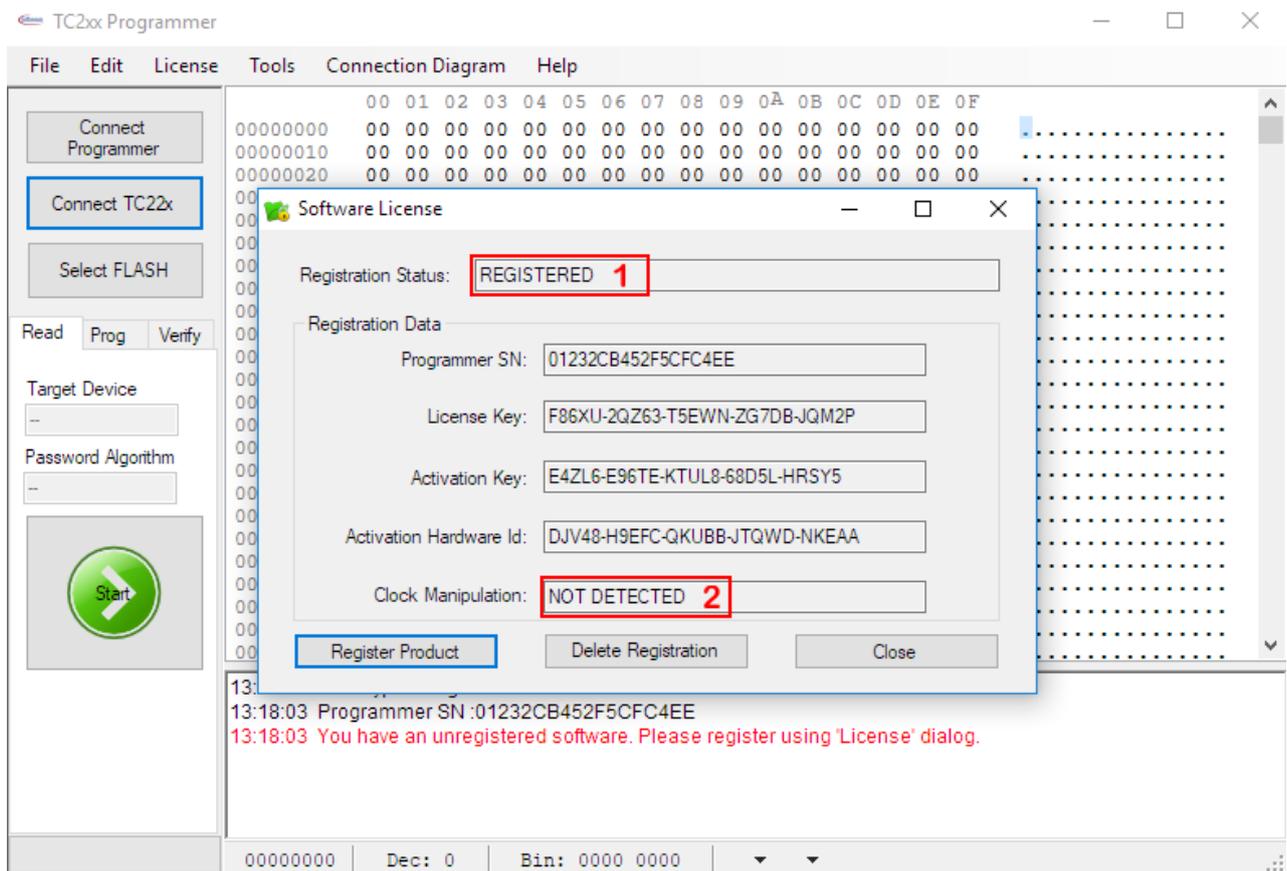
Figure 15 Successful TC2xx-Programmer software activation

- Close the "License" the "Software License" window.
- Press the "Connect Programmer" button.
- Wait until the "Software is active. Programmer is ready to use" message appear (Figure 16).

Figure 16 Successful TC2xx-Programmer activation and connection

☞ **Note**: If message "You have unregistered software." appeared, make sure your "ETL HYPER PROG" board has same serial number as in "Software License" form.

5. FILES DOWNLOAD

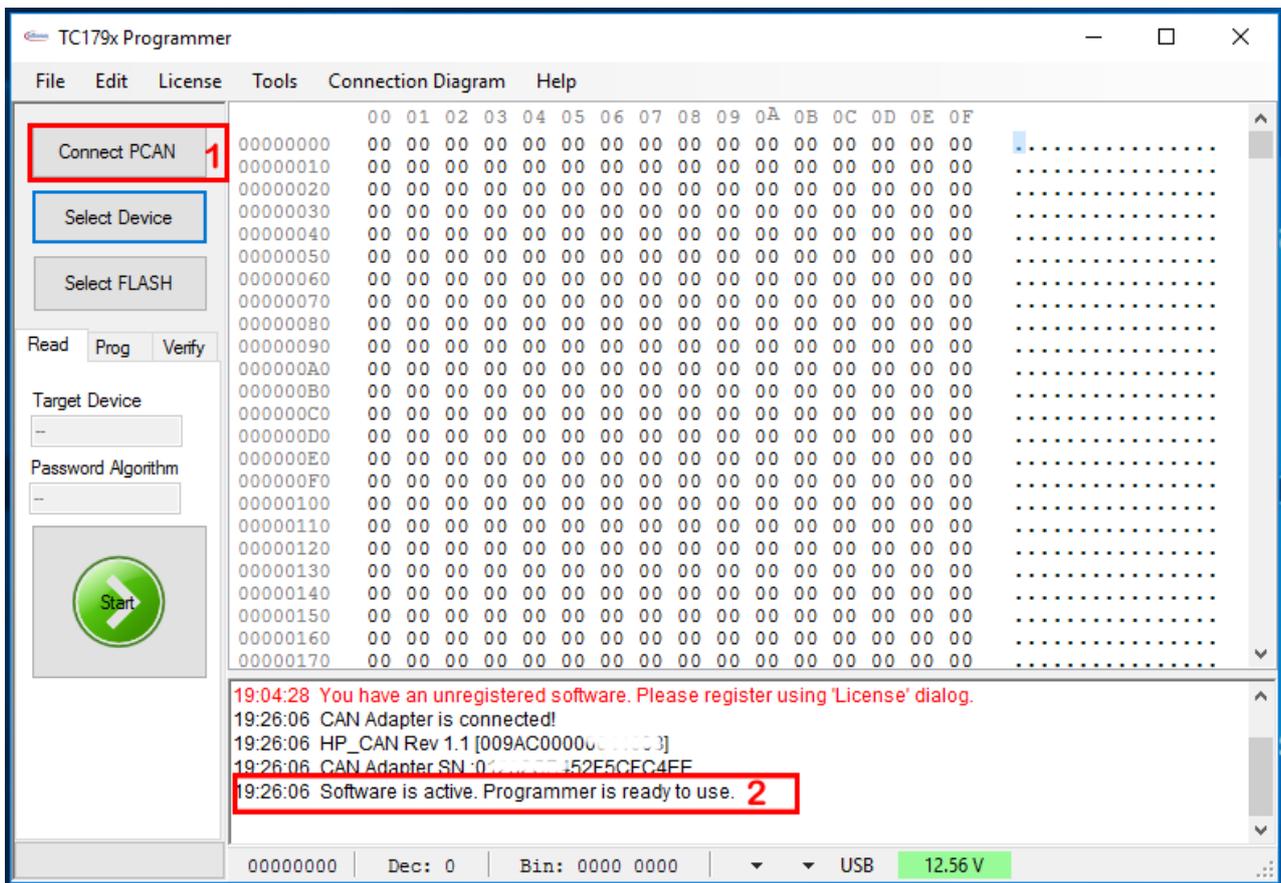After the successful installation and activation of the TC2xx-Programmer software, the user is eligible to download the "BIN" files. The connection diagrams and pictures will be loaded automatically as well. The new files and connection diagrams will be posted on the website and will be available for download (see figure 17).

To start download, follow next steps:
- Connect the ETL HYPER PROG board to the computer.
- Press the "Connect Programmer" button.
- Make sure that the software is active and HYPER PROG is ready to use.
- Select the "File->Download new files" menu item.

Figure 17 New Files Download

☞ **Note**: Make sure the computer has the Internet connection before downloading.

☞ **Note**: In the case that the download license has expired contact ETL support to renew it.

6. READING EXAMPLE with SAK-TC222L 16F133

- Solder the TC2xx-Programmer 9 pin Connector to a target board (airbag).
- Plug the 9 pin connector to the ETL HYPER PROG board.
- Press "Connect Programmer" button on TC2xx-Programmer software (Figure 18)
- Press "Connect TC2xx" button.
- Select FLASH area(s) by "Select FLASH" button.
- Press "Start Button".
- Wait until reading procedure finishes with the message: "Reading is Completed Successfully!"

☞   **Note**: Use the "Connection Diagram" menu item to see the 9 pin cable connection to the specific module.
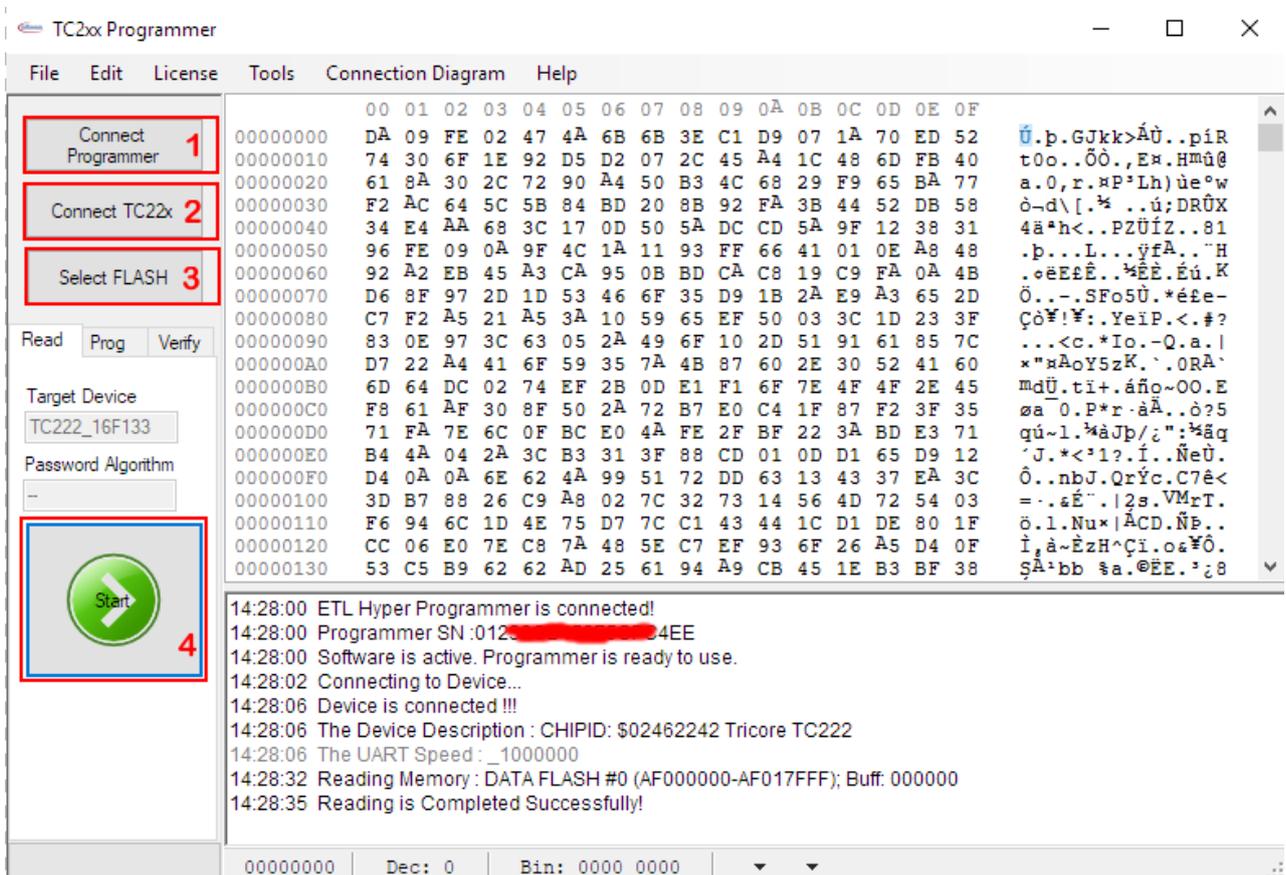

Figure 18 TC2xx-Programmer reading sequence.

8. WARRANTY STATEMENT

ETL guarantees all delivered products for 60 days from registration date against manufactory defects.