USER INTERFACE FOR PTC04 LIN

Contents

1 Introduction

This document describes the UI (User Interface) for PTC04 LIN. It covers activation the UI module under MPT application, configuration of LIN specific parameters, basic usage for sending and receiving single messages and uploading and downloading of MelexCM firmware. Explanations hereafter assume that PTCLIN PSF and UI are successfully installed on the PC.

In order to activate the PTCLIN UI start-up the MPT application. When the software is loaded a window similar to that on figure 1 pops up. If "Workspace" is not visible it can be shown from the menu View->Workspace. Now UI can be started either by double-click on "PTCLIN" or via the menu Tools->Search device. PTC04 device must be connected to PC before starting the UI. For more info about MPT application please refer to the corresponding document.

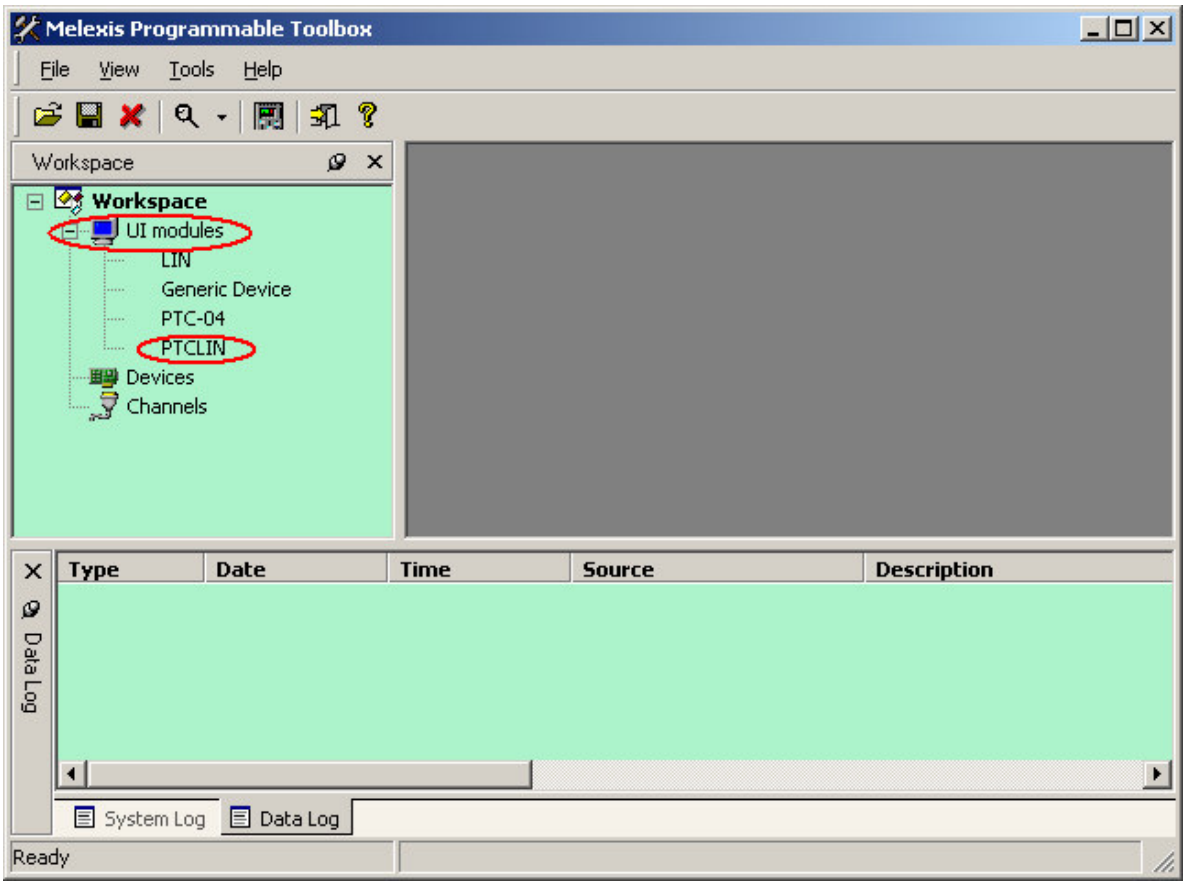

Figure 1 – MPT application window

When connection to the device is established the window of PTCLIN UI is shown (Figure 2).

2 Main Form

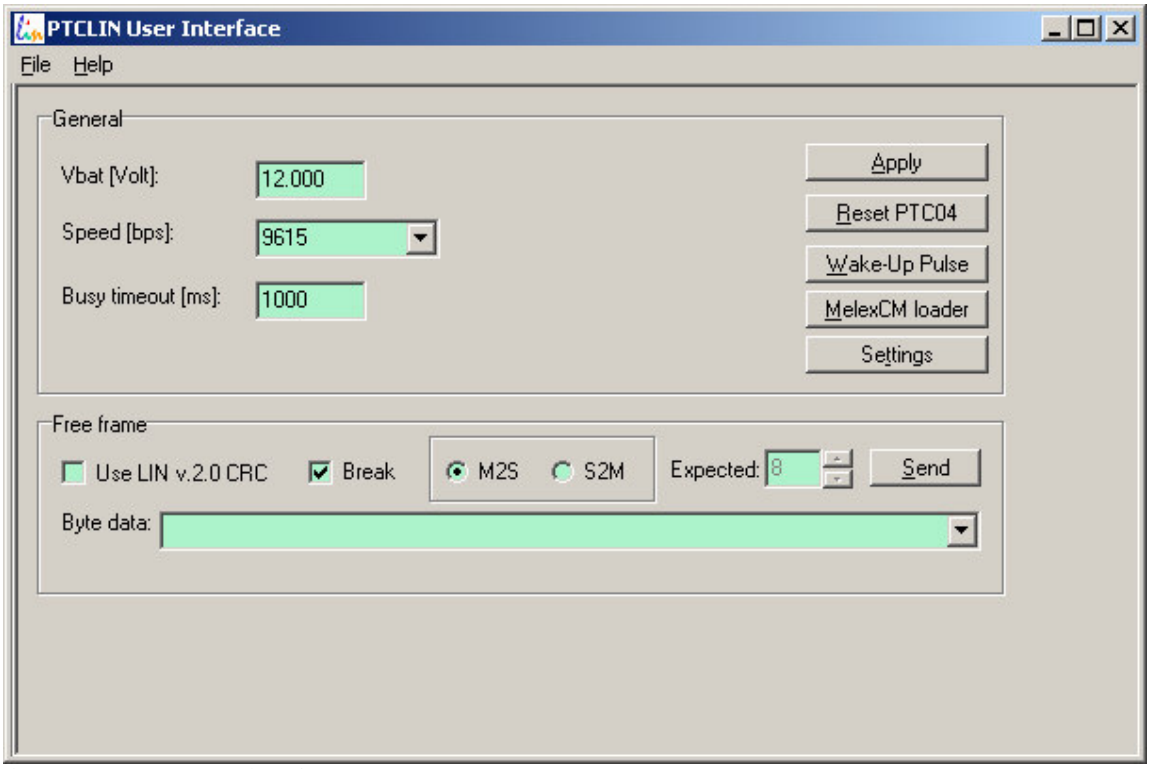

Figure 2 – PTCLIN user interface

Description of the controls in "General" box follows:

- "Vbat" – specifies Vbat voltage to be immediately set by Apply button. Can be used for example to set voltage to 0V for safely connecting slaves to the bus. Note that voltage on the Vbat might be changed with all methods on MelexCM Loader form.
- "Speed" – specifies the speed of LIN protocol in bps. As soon as it is set to device the real clock value is shown in the box.
- "Busy timeout" – defines how long PC software will try to get an answer from PTC04 while it is reading S2M (slave to master) message.
- "Apply" button – used to confirm changes in above listed controls
- "Reset PTC04" – resets the device
- "Wake-Up pulse" – sends a wake-up pulse over the LIN bus
- "MelexCM loader" – shows a separate window for uploading and downloading memory of MelexCM slaves using LIN or Fast protocol. See MelexCM loader window for more info.
- "Settings" – opens a window with different settings.

"Free frame" box is aimed to send single messages over LIN bus:

- "Use LIN v.2.0 CRC" checkbox must be checked if message have to conform to LIN v.2.0 checksum. If not marked LIN v.1.3 checksum will be used.
- "Break" – if checked a "break" signal will be sent in the beginning of the message.
- "M2S" and "S2M" – specifies direction of the message master to slave (M2S) or slave to master (S2M). In case of S2M the number of expected bytes must be defined.
- "Expected" – defines the number of bytes (1 to 8) that will be read from the slave.

- "Byte data" – the actual message. Must have at least one byte (ID). Different bytes should be separated by spaces. Numbers can be decimal or hexadecimal with prefix ("0x").
- "Send" button – transmit/receive the message

The menu of the window gives the following options:

- "File"
  - "Open Settings" – reads the settings from an INI file
  - "Save Settings" – saves the settings to the last used INI file
  - "Save Settings As" – saves the settings to a new INI file
  - "Upload Firmware" – uploads a firmware from a HEX file into PTC04. Note that this can make PTC04 incompatible with PTCLIN software if an inappropriate firmware is uploaded. In such cases PTC04 user interface must be used in order to upload the correct firmware.
  - "MelexCM Loader" – the same action as described for "MelexCM Loader" button above
  - "Settings" – the same action as described for "Settings" button above
  - "Exit" – closes the user interface. This doesn't close MPT application.
- "Help"
  - "About" – Shows about window

3 MelexCM loader window

With "MelexCM flash loader" window (Figure 3) the user can manipulate memory of a MelexCM device connected to PTC04. Communication between the PTC04 and MelexCM could be done via LIN and/or Fast protocol.

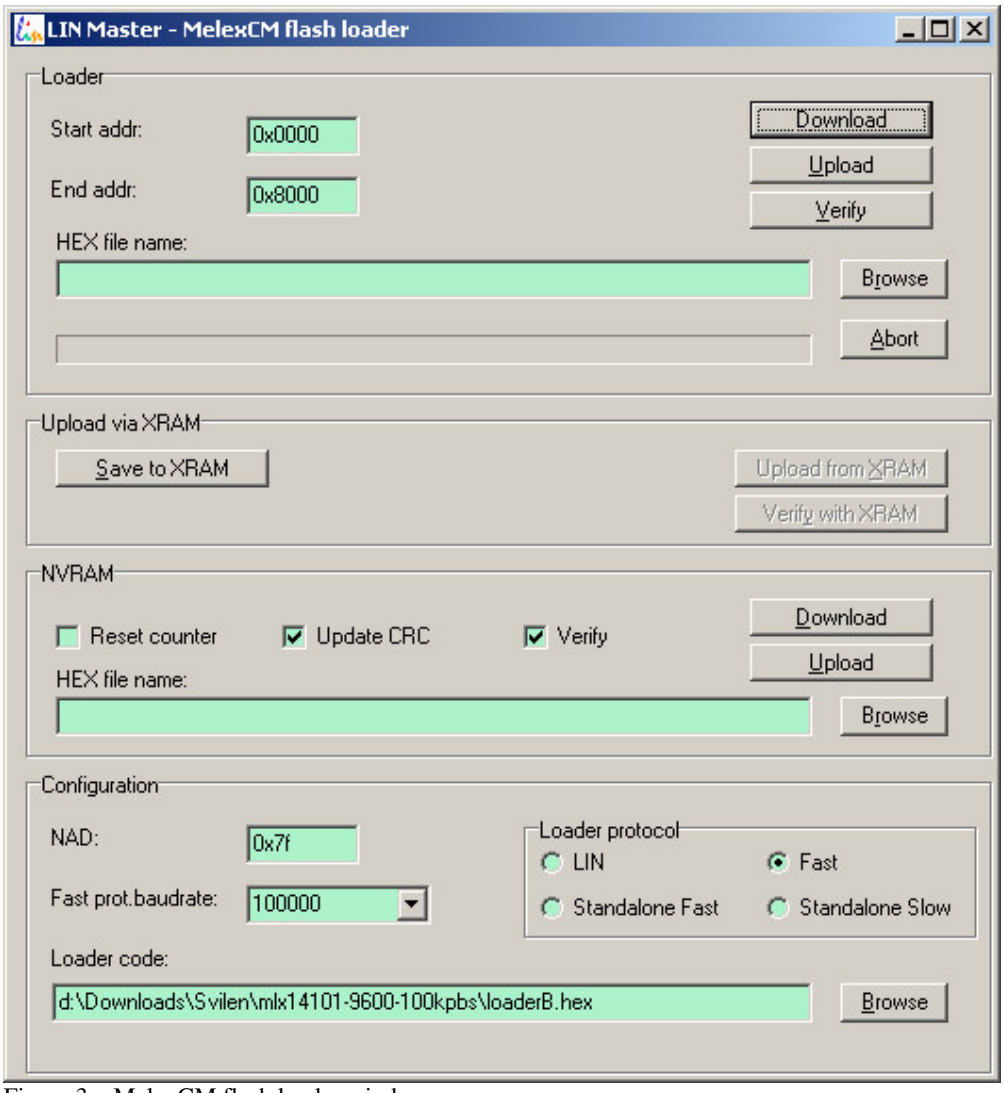

Figure 3 – MelexCM flash loader window

Prior using the buttons in "Loader" box the user must configure the loader. The meaning of controls in "Configuration" box is as follows:

- "NAD" – a number specifying the LIN address of the node to be accessed. The number can be decimal or hexadecimal with prefix "0x". This address must be set even if Fast protocol is going to be used. This is because MelexCM device always starts in LIN mode and then can be switched to Fast mode. The default number 0x7F can be used when a single LIN slave is on the bus. NAD is not relevant for "Standalone Fast" mode.
- "Loader protocol" – used to select the protocol. It is important to note that when using Fast, Standalone Fast or Standalone Slow protocol ONLY one slave can be on the bus.
- "Fast prot.baudrate" – specifies the speed of fast protocol. Can vary between 5000 and 200000 bps.
- "Loader code" – the full path to .HEX file containing the code of special firmware program, provided by Melexis. This is required for uploading data. "Browse" button can be used to select the file.
- "Hex file name" - the full path to .HEX file containing the user firmware. "Browse" button can be used to select the file.

There are three possible actions, initiated by the following buttons:

- "Download" – Memory area between "Start addr" and "End addr" will be read from the device. The date will be saved in the file specified by "Hex file name".
- "Upload" – The data from the .HEX file, specified in "Hex file name" will be read and uploaded to device. For this operation it is mandatory to have correctly specified "Loader code".
- "Verify" – The data from the .HEX file, specified in "Hex file name" will be compared to corresponding memory of the device. At the end a message will show the result of comparison.
- "Abort" button stops current operation

There are separate controls to deal with MelexCM's NVRAM, found in the "NVRAM" box. Before any action, there must be a "Hex file name" provided or selected using the "Browse" button. Two possible actions:

- "Download" – The contents of the NVRAM will be read from the device and stored into the Hex file.
- "Upload" – The data will be read from the Hex file and uploaded to the device. If "Reset counter" is checked, the internal counter of the NVRAM will be reset before uploading. If "Update CRC" is checked, the CRC will be recalculated before uploading. If "Verify" is checked, uploading will be verified.

For speeding up the uploading and verifying of many slaves it is worth using "Upload via XRAM" group of controls. In this case the loader code and the firmware are stored in PTC04 XRAM only once. Then each slave can be programmed and/or verified by the corresponding buttons.

- "Save to XRAM" – The data from the .HEX file, specified in "Hex file name" will be read and saved in PTC04's XRAM. For this operation it is mandatory to have correctly specified "Loader code".
- "Upload from XRAM" – uploads the loader code and the user firmware stored in XRAM to the slave device
- "Verify with XRAM" – compares the firmware stored in XRAM to corresponding memory of the device. At the end a message will show the result of comparison.

4 Settings window

On the "Settings" window (Figure 4) the user can specify different settings, that affect communication between PTC04 and slave devices.

Here is a description of the different settings:

- "TLinToFast" – timing in [µs] specifying the delay when Loader switches from LIN to Fast mode.
- "TFastToLin" – timing in [µs] specifying the delay when Loader switches from Fast to LIN mode.
- "TLinSingleCmd" – timing in [µs] specifying the delay after Loader sends a single frame LIN command.
- "TFastSingleCmd" – timing in [µs] specifying the delay after Loader sends a single frame Fast command.
- "TWriteFlash" – timing in [µs] specifying the delay after Loader sends command for writing to Flash.
- "TRestart" – timing in [µs] specifying the delay after Loader sends Restart command to a slave.
- "TFastMultiFrame" – timing in [µs] specifying the delay between sub-frames in Fast mode.
- "MeasureDelay" – timing in [µs] a delay before each measurement done by PTC04.
- "MeasureFilter" – number of samples for single measurement of PTC04.

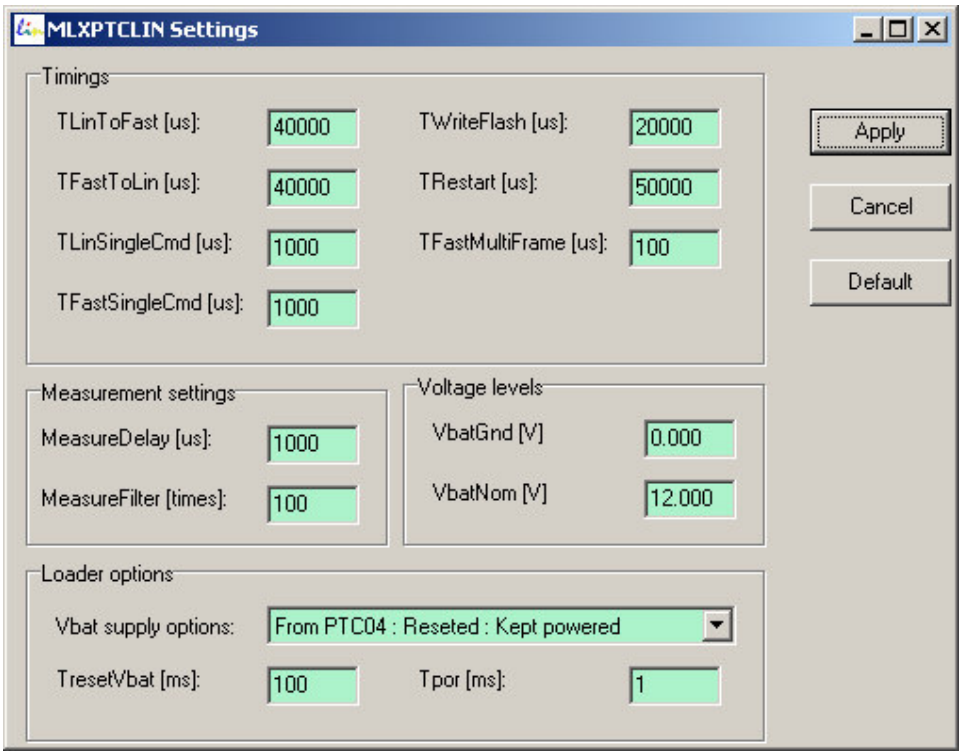

Figure 4 – Settings window

- "VbatGnd" – Voltage level of GND.
- "VbatNom" – Nominal voltage level of Vbat line.
- "Vbat supply options" – Four different options to choose how Vbat is handled by Loader:
  - "External" – Vbat is disconnected from PTC04 and should be supplied externally
  - "From PTC04 : Not reseted" – Vbat is supplied by PTC04. Loader do not reset slaves before download, upload or verify, but ensures that nominal voltage is set on the line.
  - "From PTC04 : Reseted : Not kept powered" – Vbat is supplied by PTC04. Loader resets slaves before download, upload or verify, and after finishing sets Vbat to GND.
  - "From PTC04 : Reseted : Kept powered" - Vbat is supplied by PTC04. Loader resets slaves before download, upload or verify, but after finishing keeps the line to nominal level.
- "TresetVbat" – timing in [ms] specifying how much time to keep Vbat to GND in order to reset slaves.
- "Tpor" – timing in [ms] specifying the delay after raising Vbat to nominal level.

Actions of the three buttons of the window is as follows:

- "Apply" – accepts settings as seen in the form.
- "Cancel" – closes the form without accepting the modifications.
- "Default" – fills default settings in all the controls (as shown on the screenshot) and accepts them.

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