MCETool V2 User Manual

iMOTION™ programming, debugging and tuning tool

Quality requirement category: Industry

Features

- Programming of RAM, Flash and OTP memory for IRMCKxxx and IRMCFxxx devices
- Debugging via standard JTAG interface
- Tuning of motor parameters via virtual UART
- All interfaces are galvanically isolated
- 3.3 VDC output voltage to target
- Internal generation of OTP programming voltage
- USB interface to PC for power and data
- Ships with all required cables

Supported Devices

- iMOTION™ IRMCK099
- iMOTION™ IRMCx100 series
- iMOTION™ IRMCx300 series
- iMOTION™ 2.0 Devices (virtual UART only)
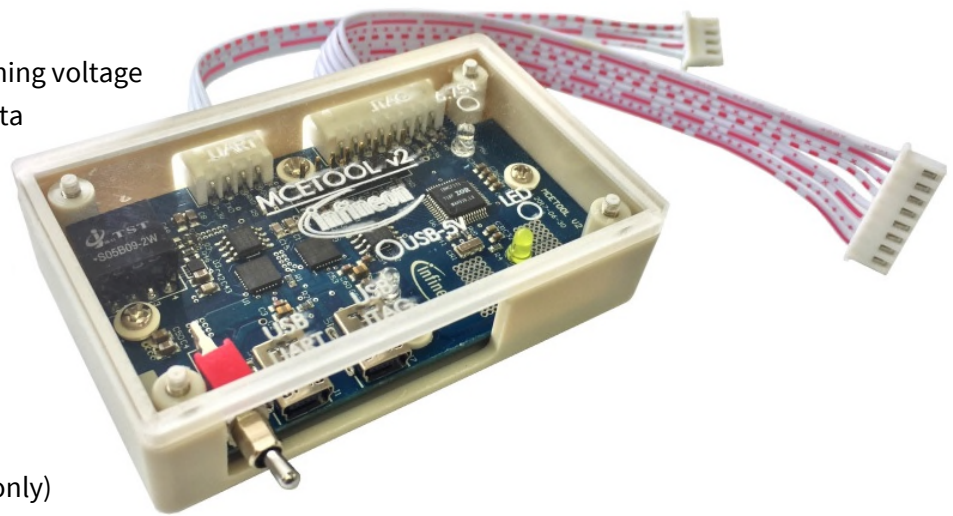
Description

MCETOOLV2 (formerly 'IR Cable V2') is designed to program and debug IRMCK099/ IRMCx100/ IRMCx300 series iMOTION™ motor control ICs on the user's target board (final application board) or on IRMCx evaluation boards.

The MCETOOLV2 can also be used for motor and inverter board parameter tuning via the UART to USB interface.

Infineon provides the respective PC tools (MCEProgrammer & MCEDesigner) for download on the http://www.infineon.com/imotion-software web page. Tools are delivered as a part of Installer package (e.g. "99 Series Installer" and "100 Series Installer")

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1 Introduction

MCETOOLV2 (in some older documents named 'IR Cable V2') is designed to program IRMCK099/ IRMCx100/ IRMCx300 series digital motor control ICs on the user's target board (final application board) or on corresponding Evaluation Kits, to enable engineers to design the application code during development.

MCETOOLV2 contains the following basic configuration and functions:
- Power: 5V DC power supply (Powered through USB Mini B type interface)
- PC interface: USB to virtual communication port with baud rate of up to 256Kbps
- Isolated 3.3V DC Output for target
- Isolated output interface:
  - o 8 Pin JTAG
  - o 4 Pin UART
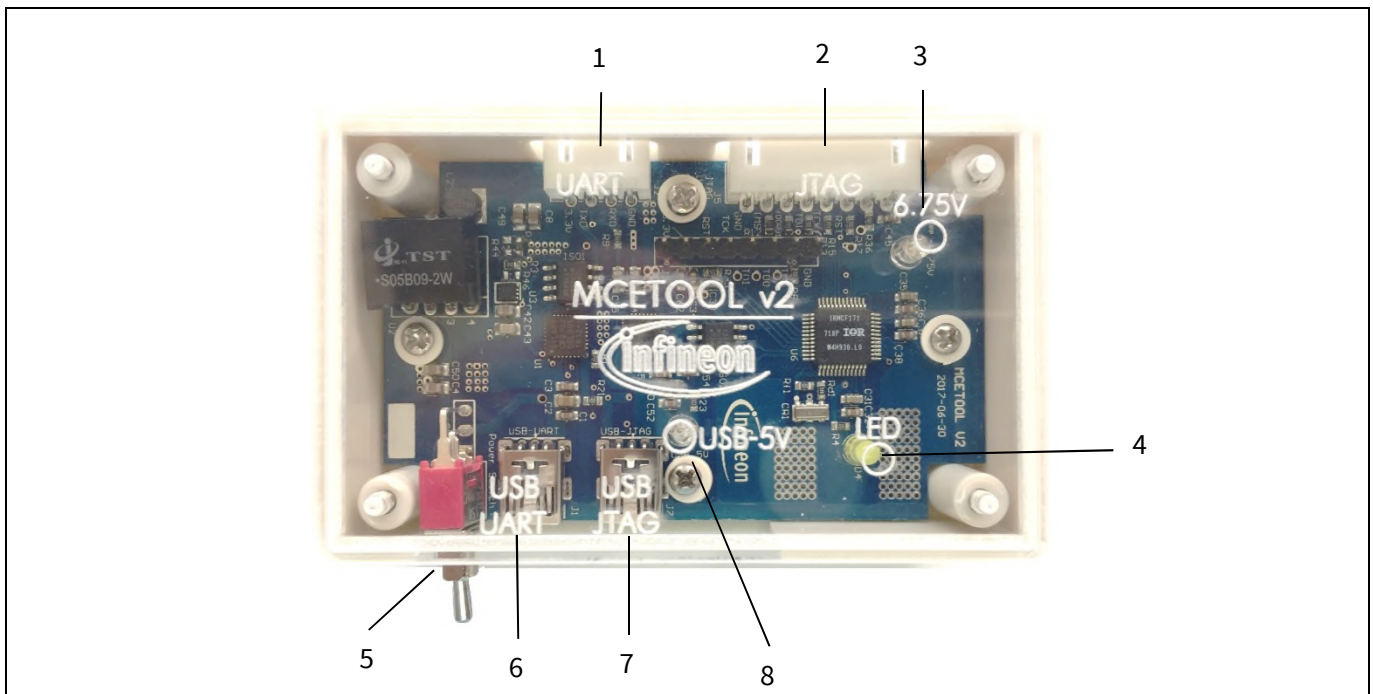
Figure 1   Picture of MCETOOLV2

Function description
1. Isolated UART port
2. Isolated JTAG port
3. Green LED1: Indicates when Vpp is enabled during programming the target
4. Yellow LED: When blinking indicates that MCETOOLV2 is powered and MCU is working.
5. Switch SW1: Provides 3.3V to target board, and provides program voltage Vpp when programming OTP.
6. PC USB cable port for UART operation
7. PC USB cable port for JTAG operation
8. Red LED6: Indicates presence of 5V USB power supply. When MCETOOLV2 connects to PC, this LED shows that the MCETOOLV2 has been powered from 5V USB power.

Introduction

To use as an isolated USB to UART converter, PC USB cable plugs in to "USB-UART", and the UART output port is used. The pinout for UART connector (J2) is as shown in figure below
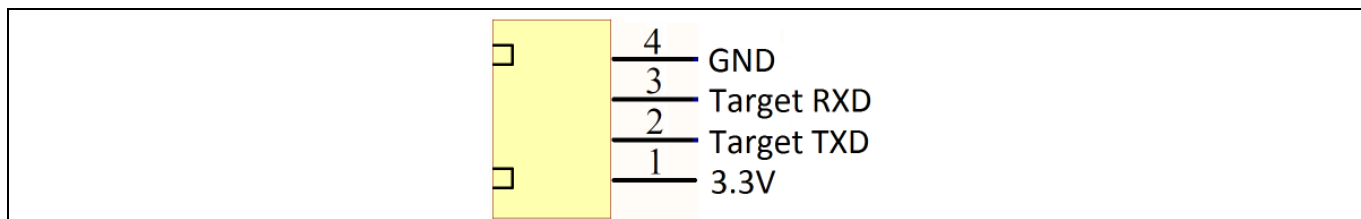
Figure 2   UART Connector pinout

To use as an isolated USB to JTAG converter, PC USB cable plugs in to "USB-JTAG", and the JTAG output port is used. The pinout for JTAG connector (J3) is as shown in figure below
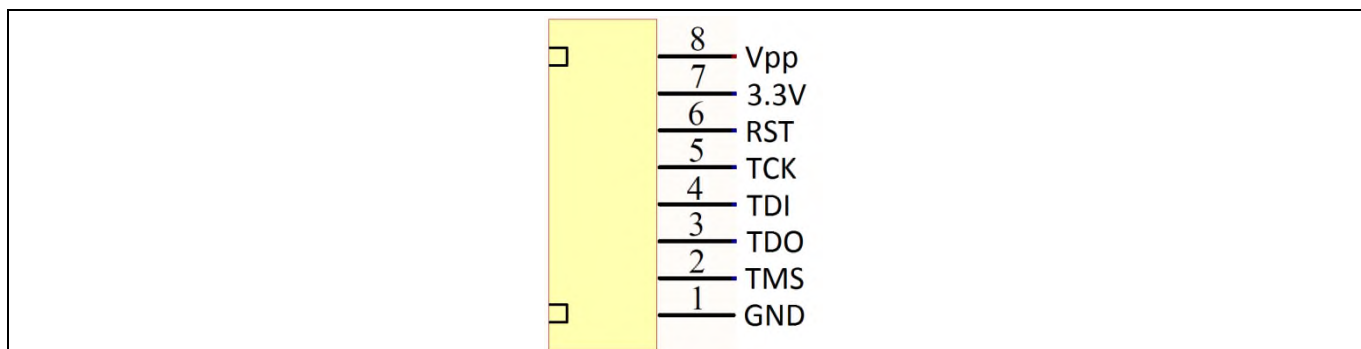
Figure 3   JTAG Connector pinout

Switch SW1 is used to power target from isolated DC-DC converted on MCETOOLV2. If switch is in upward position, target is powered from MCETOOLV2 and if it's in downward position, target is powered from external source.

The MCETOOLV2 is supported by following software tools:
- MCE Programmer (v3.0.1.9 and above)
- MCE Designer (v1.2.0.0 and above)

2 Software installation for MCETOOLV2

MCETOOLV2 is supported by MCE Programmer as well as by MCE Designer and needs CP210x virtual com port drivers to communicate with PC. The installation procedure for MCE Programmer, MCE Designer and CP210x virtual com port drivers is as follows.

## 2.1 MCE Programmer, MCE Designer and CP210x driver installation

MCE Programmer, MCE Designer and CP210x drivers are available for download from the Infineon website and are also part of the software package Infineon-99series-kit-mce-installer-SW-v02_02-EN.exe (or higher version) in "99 Series Installer" or Infineon-100serieskitmceinstaller-SW-v03_05-EN.exe (or higher version) in "100 Series Installer" which contains the following support items for MCETOOLV2:

- Pre-Requisite software
- MCE Programmer software
- MCE Designer software
- CP2102 driver.

Note: *The following description is based on the use of the all-in-one installation package "Infineon-99series-kit-mce-installer-SW-v02_02-EN". The installation procedure might differ slightly if individual installation files are used for the software tools above.*

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Software installation for MCETOOLV2

2.2 Software installation step by step

Step 1: Double click the "Infineon-99series-kit-mce-installer-SW-v02_02-EN.exe" file. Installation process will check if the PC already has the software: "Microsoft Visual C ++ Runtime 11.0" and "Microsoft .NET Framework 3.5"or above version. If there is no such software, the installation will install them, otherwise it will go to the next step.
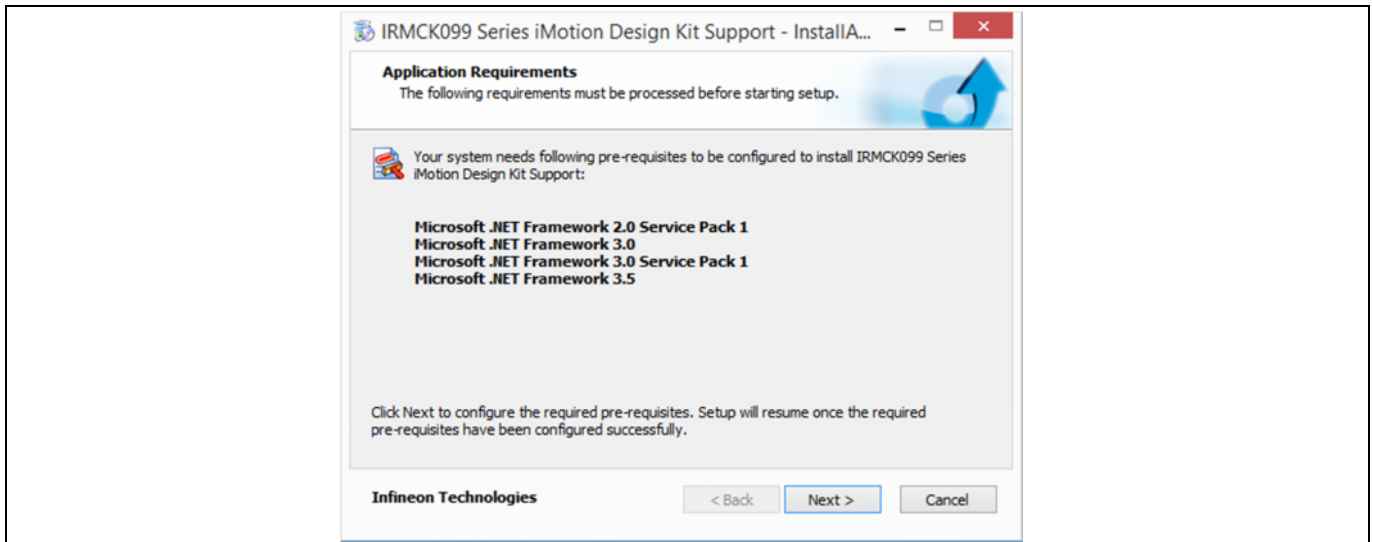
Figure 4   Pre-Requisites software installation

Step 2: After the pre-requisite software installs, it will install MCE Designer, MCE Programmer and other packaged application software.
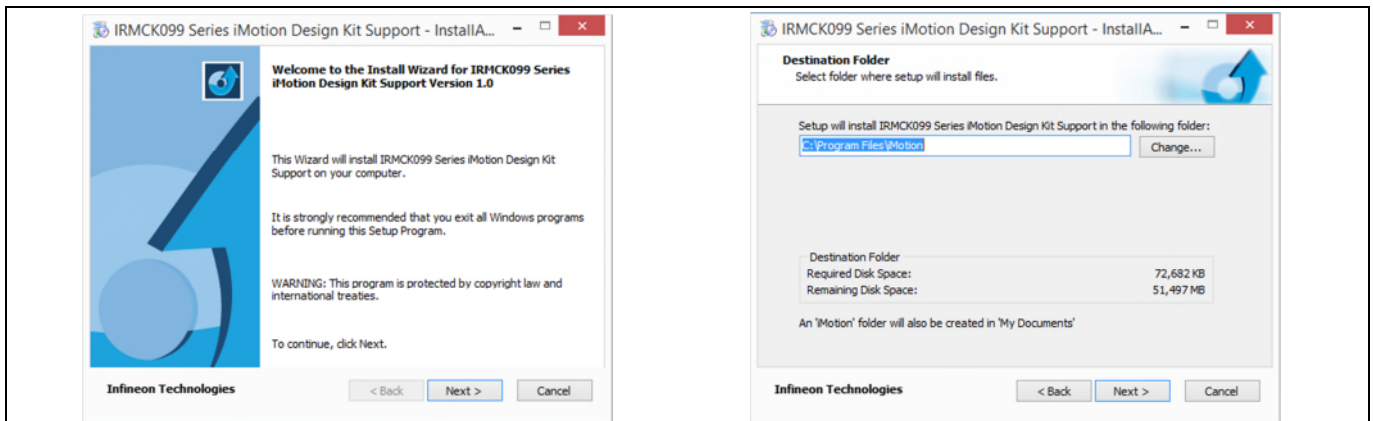
Figure 5   MCE Designer, MCE Programmer and other software installation

Press "Next" to select the install path, the default path is `C:\Program Files\iMotion`. This will overwrite previously installed files. The user can select a different path to preserve an earlier version of Infineon-99series-kit-mce-installer-SW-v02_02-EN. Then press "Next" and start the Infineon-99series-kit-mce-installer-SW-v02_02-EN software installation.

Software installation for MCETOOLV2

Step 3: The driver installation dialog will launch during Infineon-99series-kit-mce-installer-SW-v02_02-EN installation. If the PC has installed the CP210x chip driver before, press "Cancel" to cancel the operation, otherwise follow the prompt to finish unpacking and installing the driver.
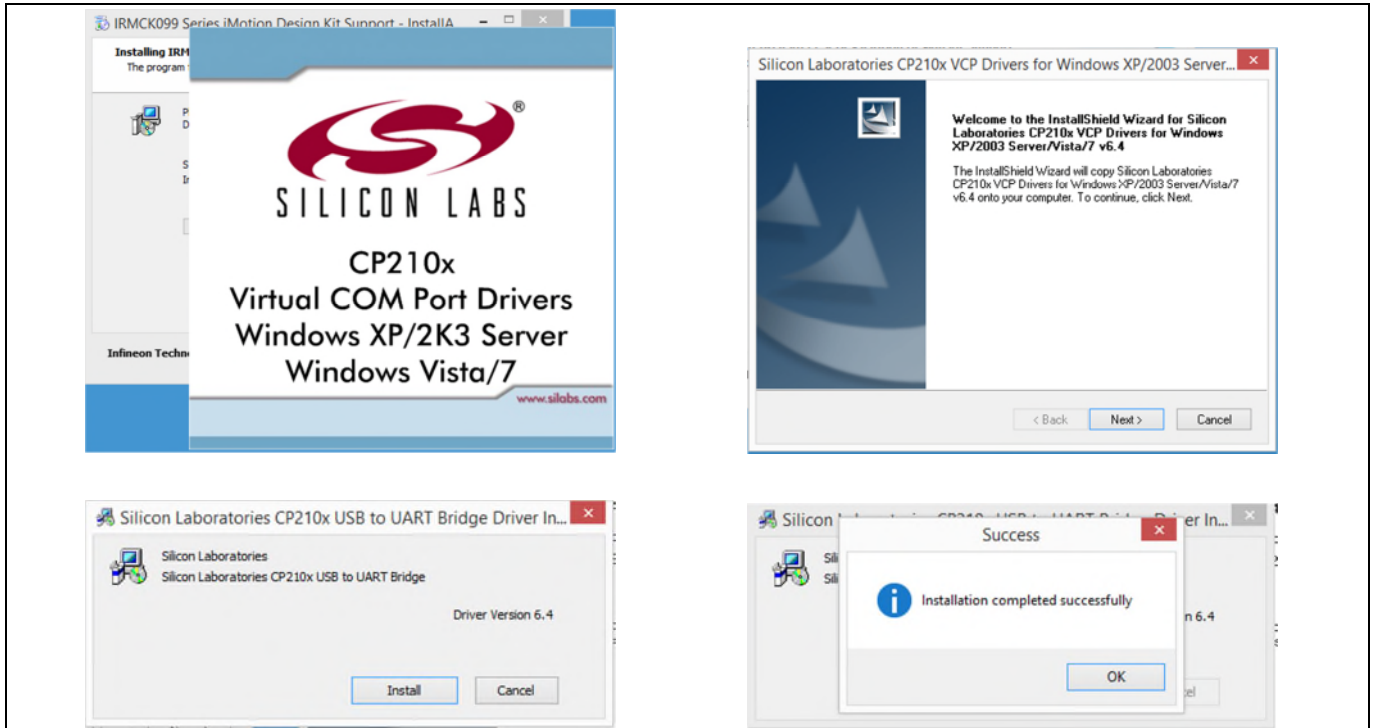
Figure 6   C210x chip driver installations

Step 4: After CP210x chip driver installation the following dialog "IRMCK099 Series iMotion Design Kit Support" successfully installed will appear. Check/Uncheck boxes to visit iMotion support site and view release notes and press "Finish" to exit the installation wizard.
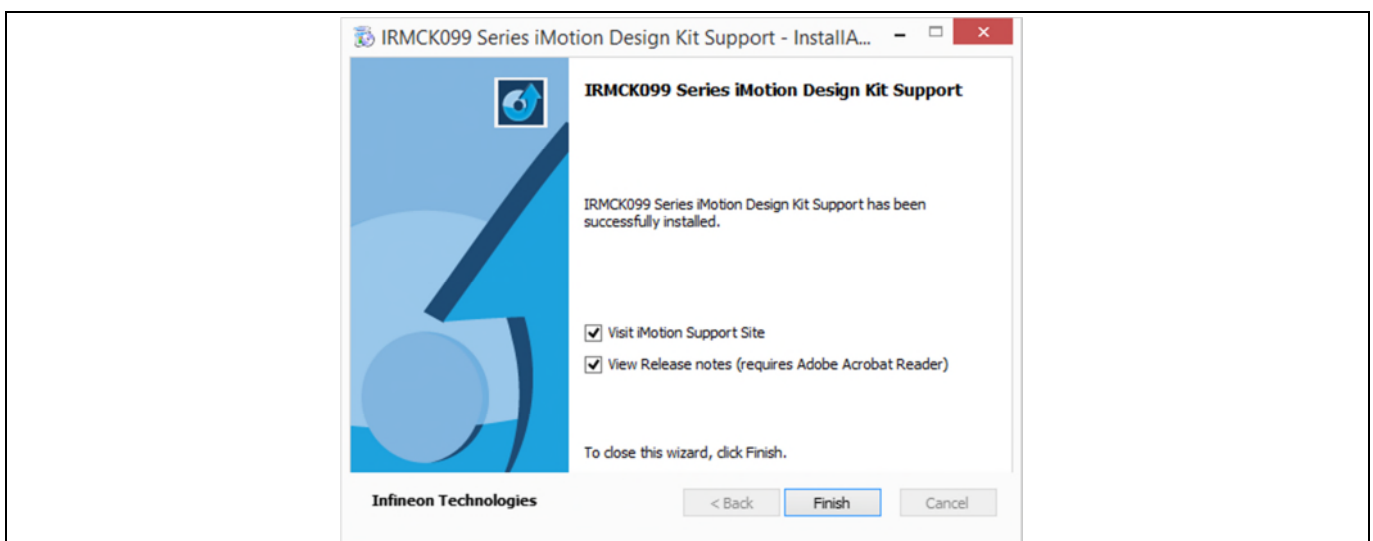
Figure 7   Installation completed dialog

3 Getting Started

3.1 Using MCETOOLV2 with MCE Programmer

3.1.1 PC port configuration

When MCETOOLV2 is used for the first time or the COM port number has changed, configure the connection port and the baud rate. If there is no connection or the configuration has problem, MCE Programmer will prompt warning information.

Launch MCE Programmer and select "Tools—>IR Cable V2 Serial Port Setup". Choose the right serial port and set the baud rate to "57600 bps (IRCable V2 default)".
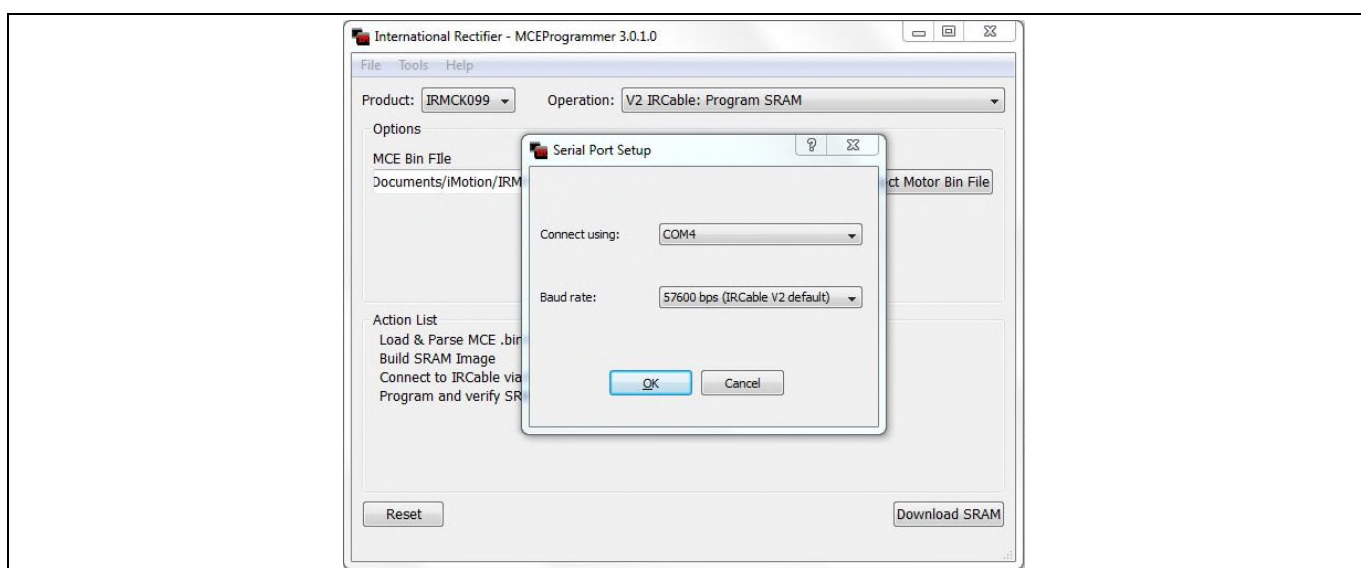
Figure 8   Configuring the connection port

Note: If there is no MCETOOLV2 connection to the PC or the configuration is mismatched, the following error messages will appear. Please reconfigure the port settings.
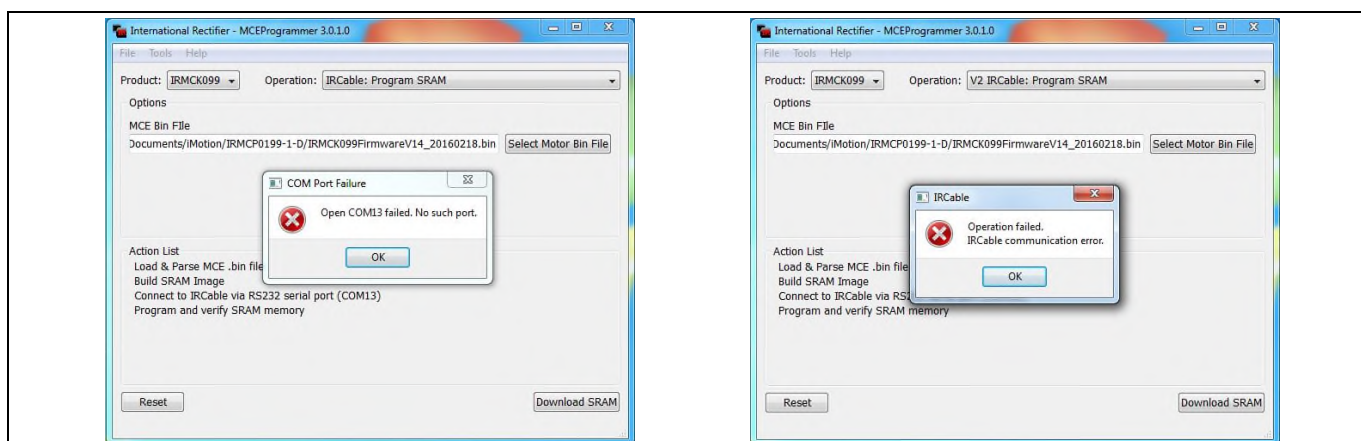
Figure 9   Open COM port failed / Port configured incorrectly

3.1.2 Target device programming

Select desired operation for MCETOOLV2 from drop-down list, select .bin file and click "Download" or "Program + Verify" button (depending upon desired operation)
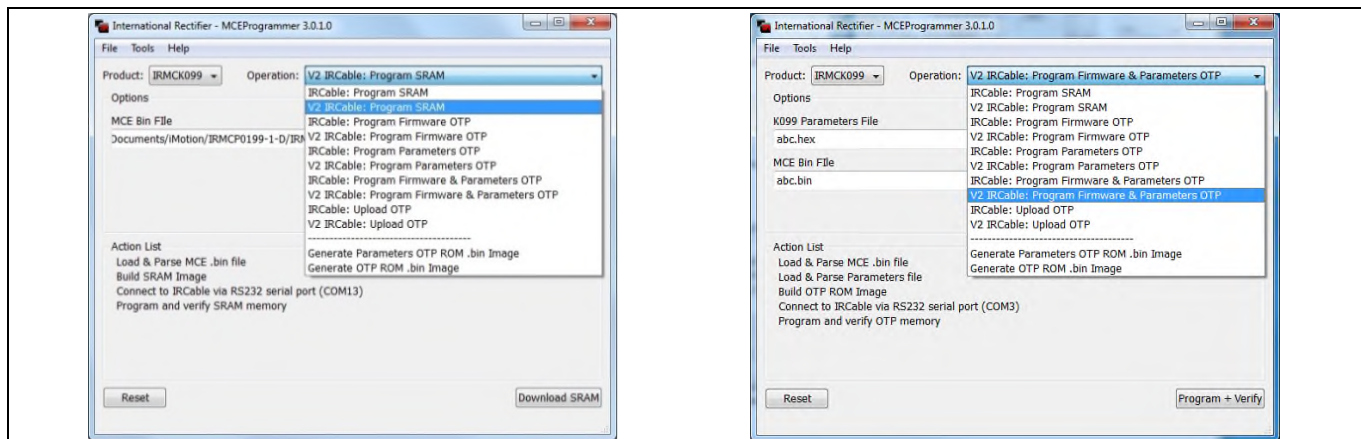
Figure 10   Select desired programming option

And wait for desired operation to finish.
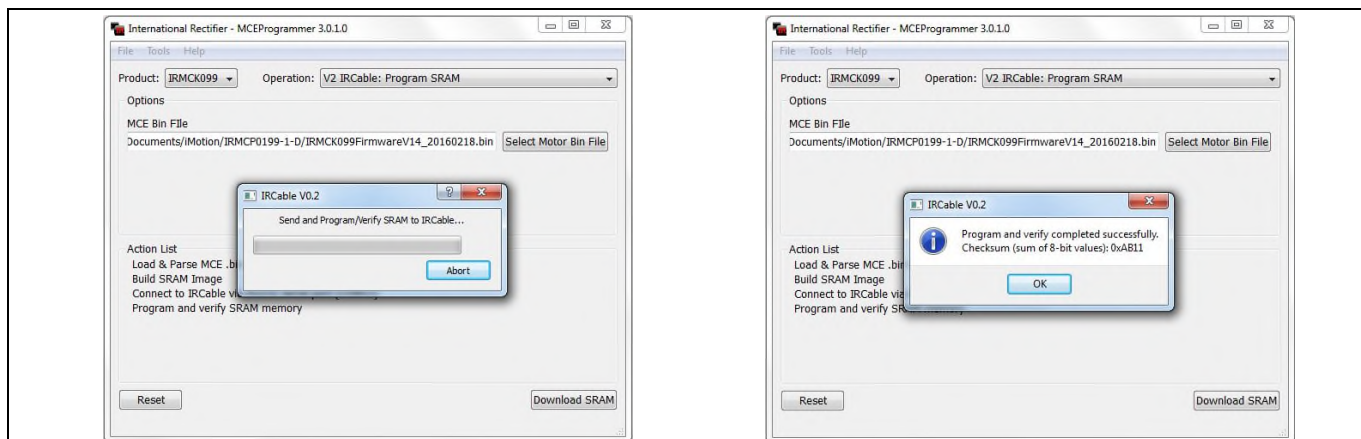
Figure 11   Programming complete

Switch SW1 is used to power target from isolated DC-DC converted on MCETOOLV2. If switch is in upward position, target is powered from MCETOOLV2 and if it's in downward position, target is powered from external source.

When Programmming OTP, switch in upward position is required.

3.2   Using MCETOOLV2 with MCE Designer

3.2.1   PC port configuration

Launch MCE Designer, open desired configuration file (with extension .irc)
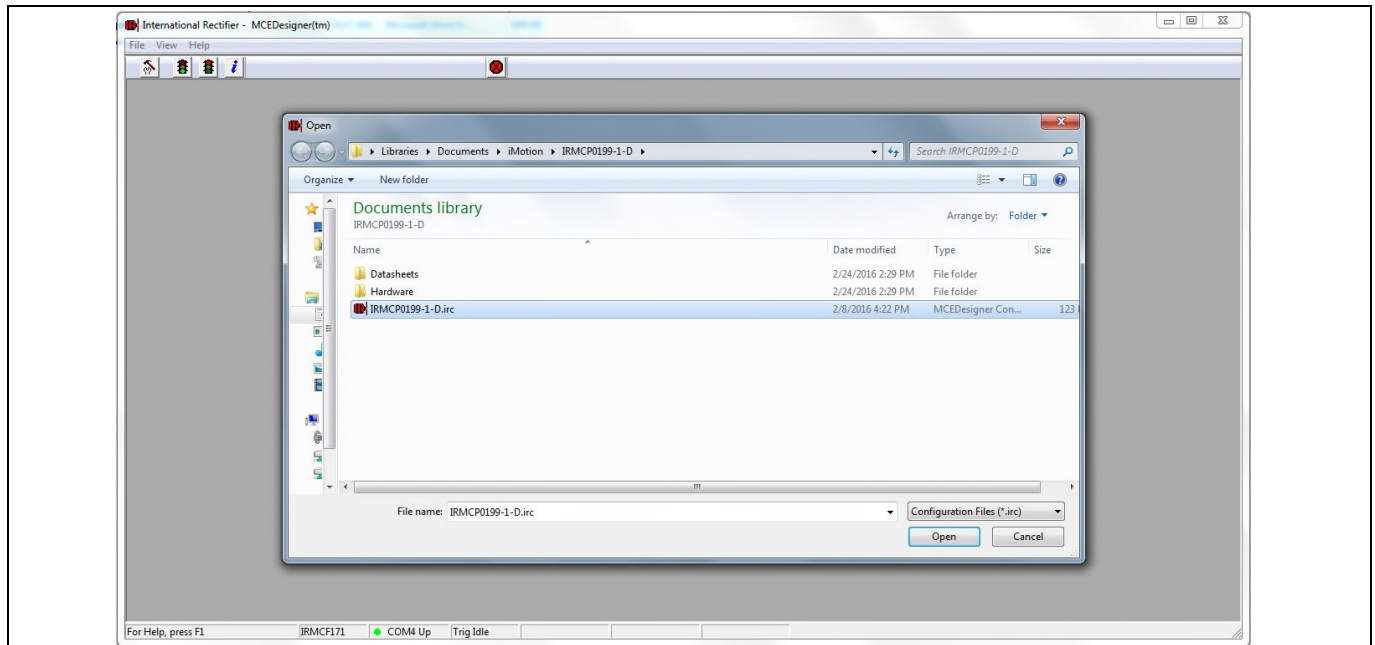
Figure 12   Configuration file selection

Highlight or click child window with title "System – XXX.irc" and select "Preferences —> Connection". Select proper com port from drop down list and press "OK" button.
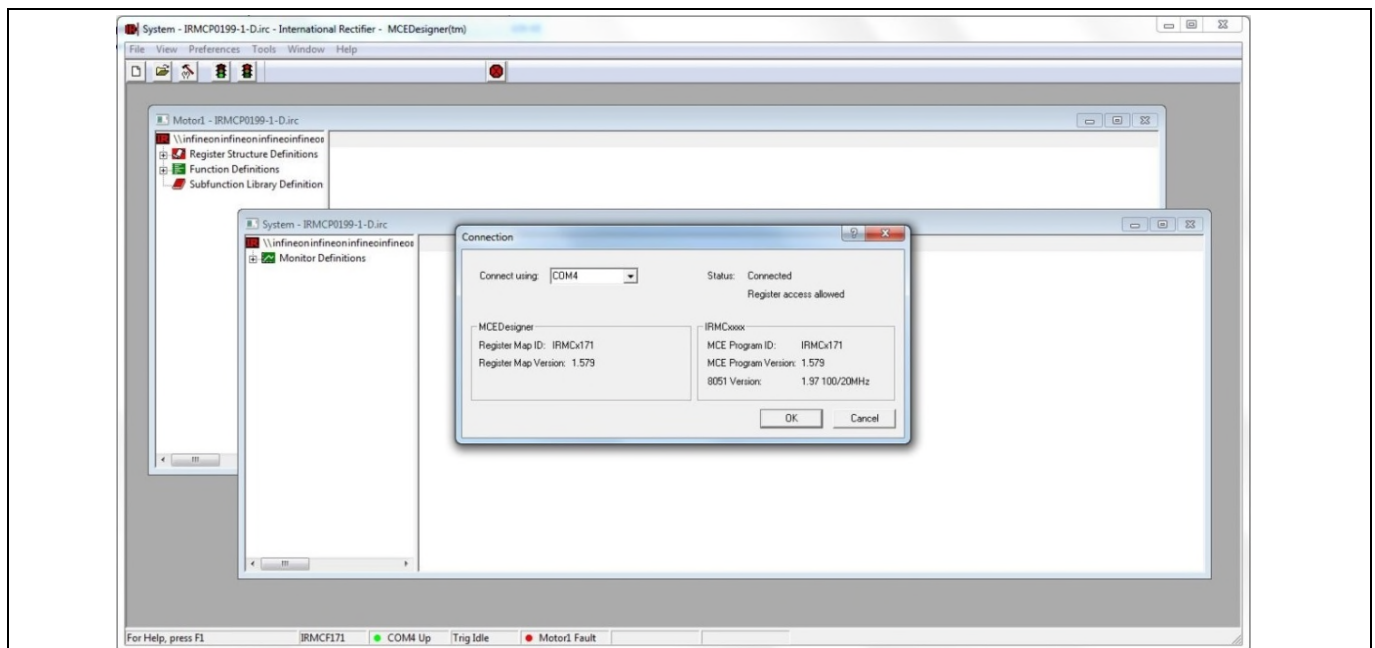
Figure 13   Com port selection

3.2.2 Programming target device

Highlight or click child window with title "System – XXX.irc" and select "Tools —> Load Target". Select desired firmware file (with .bin extension) using "Browse.." button, press "Open" button in file selection dialog and then "OK" button in "Load Target" dialog.
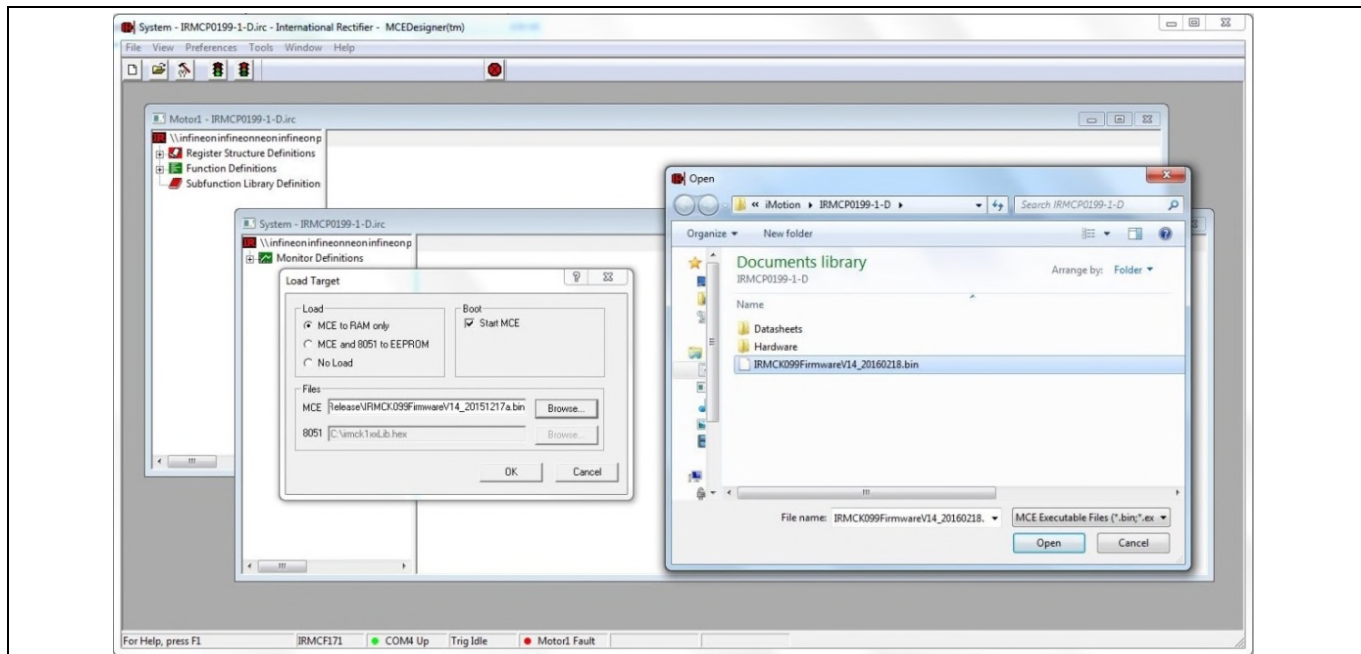
Figure 14   Firmware file selection

Wait for programming to finish.
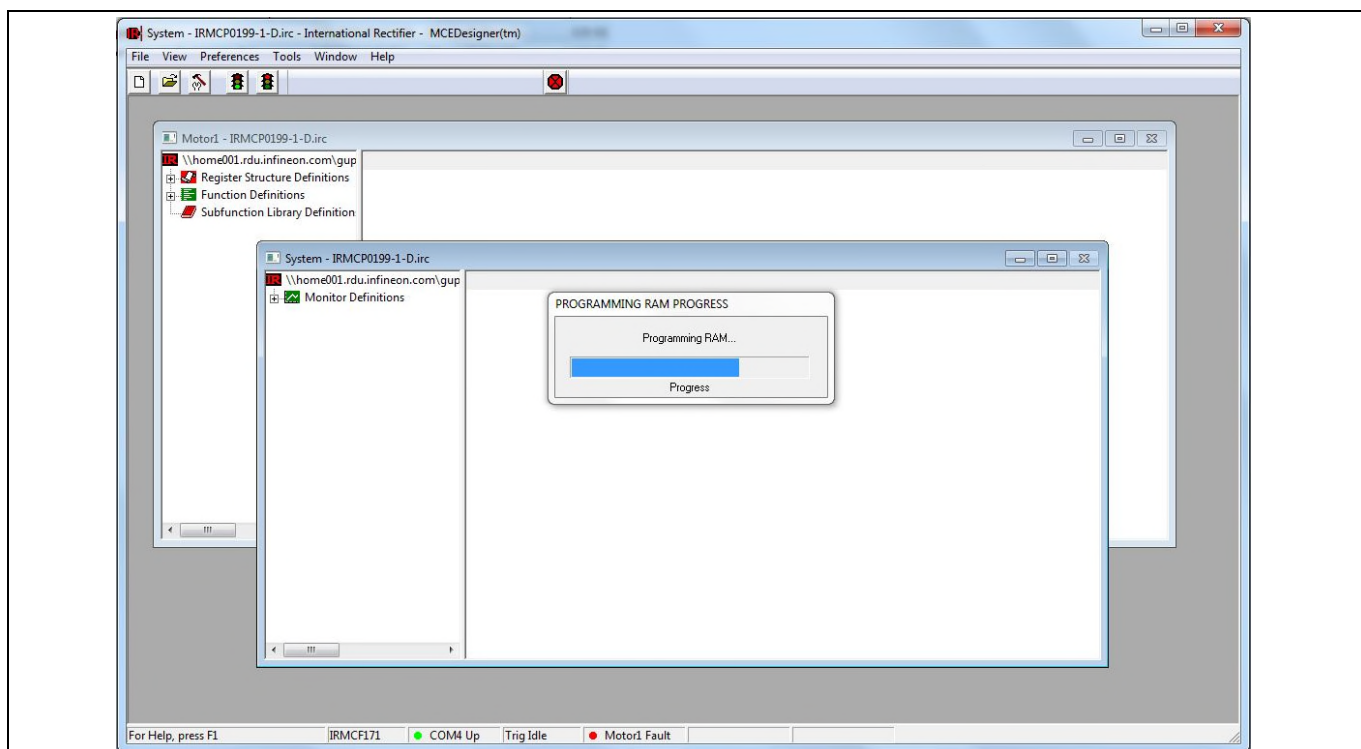
Figure 15   Programming in progress
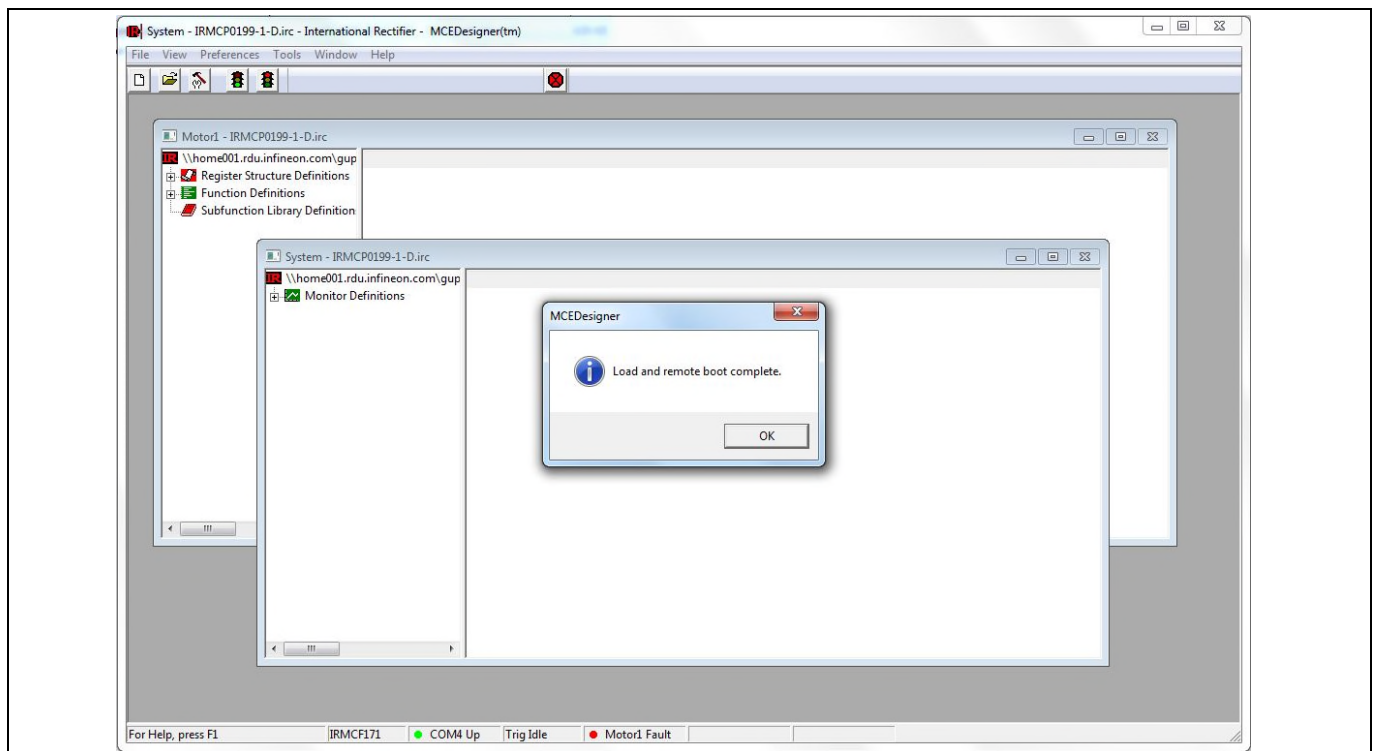
Figure 16   Programming complete

When configuration file is loaded or MCETOOLV2 is used for the first time or the COM port number has changed, configure the connection port. If there is no connection or the configuration has problem, MCE Designer will prompt warning information.

In this case, highlight or click child window with title "System – XXX.irc" and select "Preferences —> Connection". Select proper com port from drop down list and press "OK".

Revision history

Major changes since the last revision

Version number	Revision date	Revision description
1.3	2017-03-01	First Release
1.4	2017-07-27	1. Box figure updated 2. Document title updated 3. Software download link updated 4. Interface illustration updated

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