MMI6070 Quick Start Guide

Introduction

If at any time more information is required on HMI safety and protection ratings, HMI Power, and HMI communication, please refer to the MMI6070 Installation Guide provided at the following link: http://www.tri-plc.com/documents/MMI6070-Install-Instructions.pdf The following is only the minimum basic information required to get the MMI6070 set up with TRI PLCs in most situations.

1. Connect HMI to PC and PLC

Your MMI6070 comes with a USB cable to connect the HMI to your PC and a standard DB9 serial cable for RS232 connection to your TRi PLC (If the HMI is purchased as a bundle with the PLC, otherwise the DB9 cable can be purchased separately). An RS485 connection cable is not provided, but it is possible to make a 2-wire RS485 connection between the PLC and HMI by modifying the standard DB9 cable, or by building a custom cable.

Getting Connected:

1. Connect the mini-USB end of the USB cable to the MMI6070 and the standard USB end of the cable to one of your PCs USB ports.

   For RS232 connection.
2. Connect the female end of the standard 9-pin RS232 serial cable to the male DB9 connector on the MMI6070.
3. Connect the male end of the DB9 cable to the female connector on the PLC.

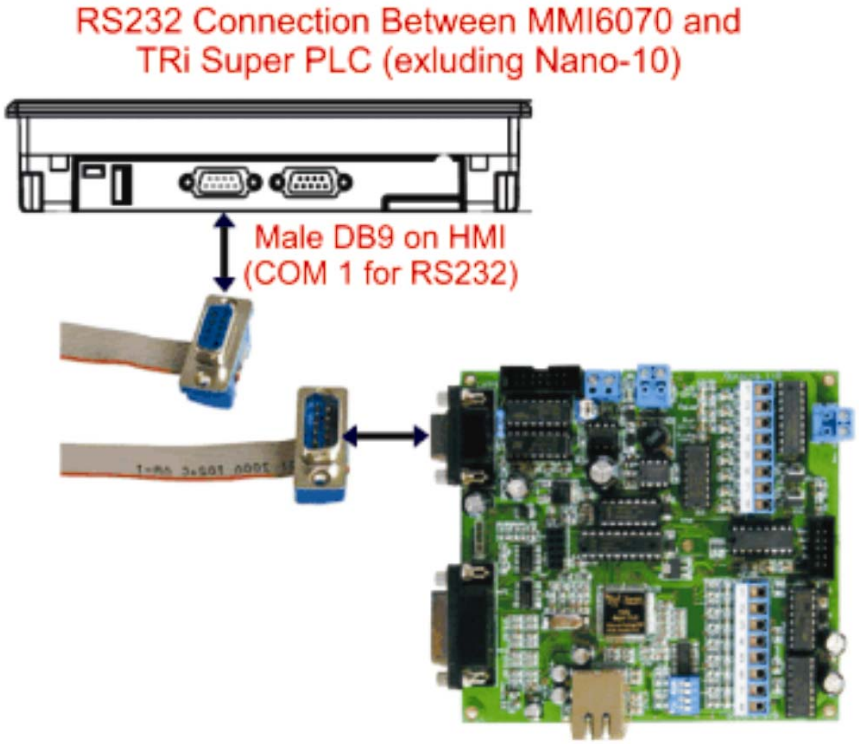


Figure 1: RS232 connection between MMI6070 and TRi PLC

For RS485 connection.

2. Connect the male end of the standard 9-pin RS232 serial cable to the female DB9 connector on the MMI6070.
3. The Nano-10 does not have an RS232 port, so the DB9 cable supplied with the MMI6070 must be modified or a custom cable must be built in order to interface the Nano-10 (or any TRi PLC RS485 port) to the HMI. Refer to Figure 2 below when creating/modifying the cable.

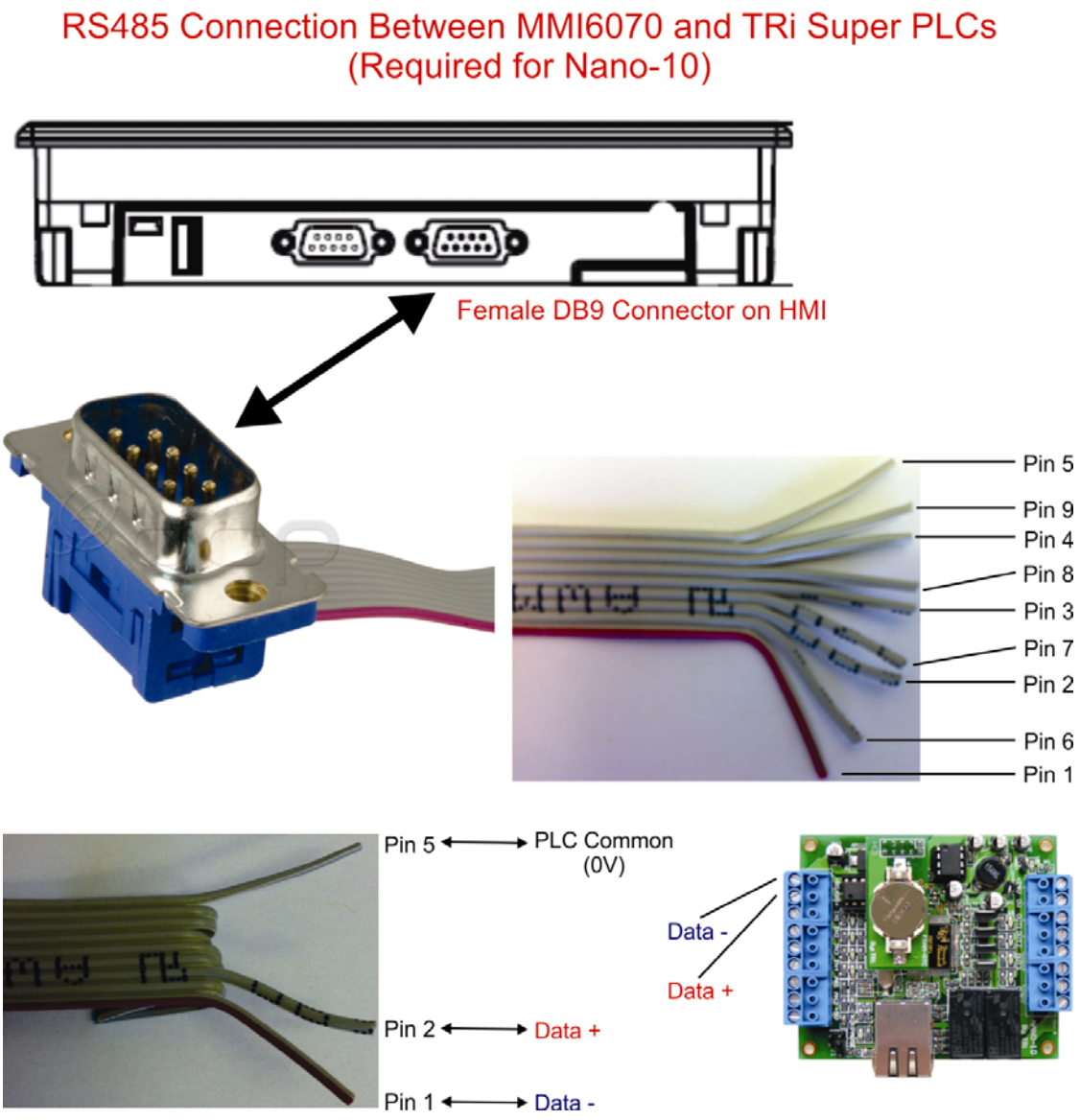


Figure 2: RS485 connection between MMI6070 and TRi PLC

a. Follow the pinout for the Female HMI connector table below to connect two wires (data + and data -) between the PLC and HMI.
b. The male end of the DB9 cable connects to the HMI and the female end is to be removed (cut the ribbon cable at the base of the connector) so that the ribbon cable can be stripped and the two signal wires can be connected to the RS485 terminal on the PLC.
c. We recommend terminating wires with ferrules for better connection to the RS485 screw terminal.
d. Alternatively, you can create a custom cable that is DB9 male terminated on one end and twisted pair (two wires) with terminal plugs on the other end.

Here are tables showing the RS232 and RS485 pin connections between the MMI6070 and all TRI PLCs (excluding the H-series and E-series PLCs) in case a custom cable is being built:

		HMI Male DB9 Connector	
Pin #	**Symbol**	**HMI COM 1 [RS232]**	**PLC Female DB9 Connector [RS232]**
2	RxD	Received Data	Transmitted Data
3	TxD	Transmitted Data	Received Data
5	GND	Signal Ground	Signal Ground

Note: If you are using the Nano-10, there is no RS232 port and the RS485 port is actually considered COM1 in the PLC. See step 4 in Getting Connected for connection instructions.

		HMI Female DB9 Connector	
Pin #	**Symbol**	**HMI COM 1 [RS485]**	**PLC 2-Wire Screw Terminal [RS485]**
1	Rx-	Data-	Data-
2	Rx+	Data+	Data+
5	GND	Signal Ground	Signal Ground

2. Connect Power to HMI and PLC

The MMI6070 has 3 connections for power: +, -, and ⏚. A 24VDC power supply should be used, which can be the same supply used for the PLC.

Power should be connected to the MMI6070 as follows :

1. Connect the +24VDC terminal from the power supply to the + terminal on the HMI.
2. Connect the 0VDC (-) terminal from the power supply to the - terminal on the HMI.
3. The ⏚ can generally be left unused, but the installation guide should be referenced if you are unsure.

Power should be connected to the PLC as follows :

1. Connect the +24VDC terminal from the power supply to the +24V terminal on the PLC.
2. Connect the 0VDC (-) terminal from the power supply to the 0V terminal on the PLC.
3. Reference the PLC documentation for more information on this.

3. Install and Run EB8000 HMI Software

You will have received a small CD labelled: Easy Builder 8000 Installation CD. You should install the EB8000 software from the CD on your PC, which will include the necessary drivers for compatible TRI PLCs. If the software does not install right away, you can execute the “EB8000_V4.51.msi” file that is located in the main folder of the CD. Then follow the steps to install the software.

Once the software has installed you can start EB8000 from the start menu or desktop icon on your PC. You should then see something similar to the following picture:

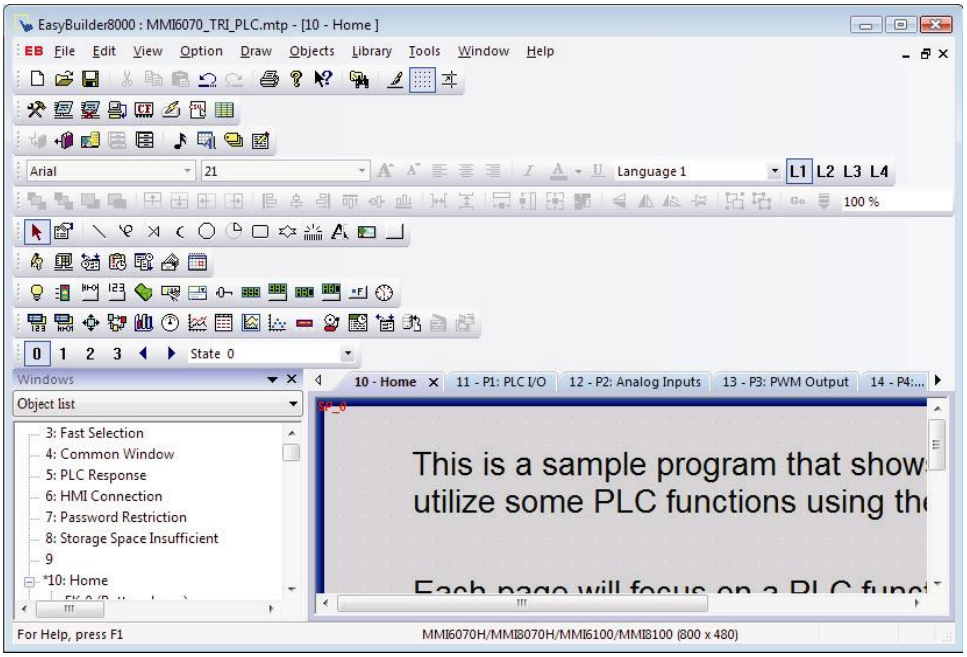


Figure 3: EB8000 Screen

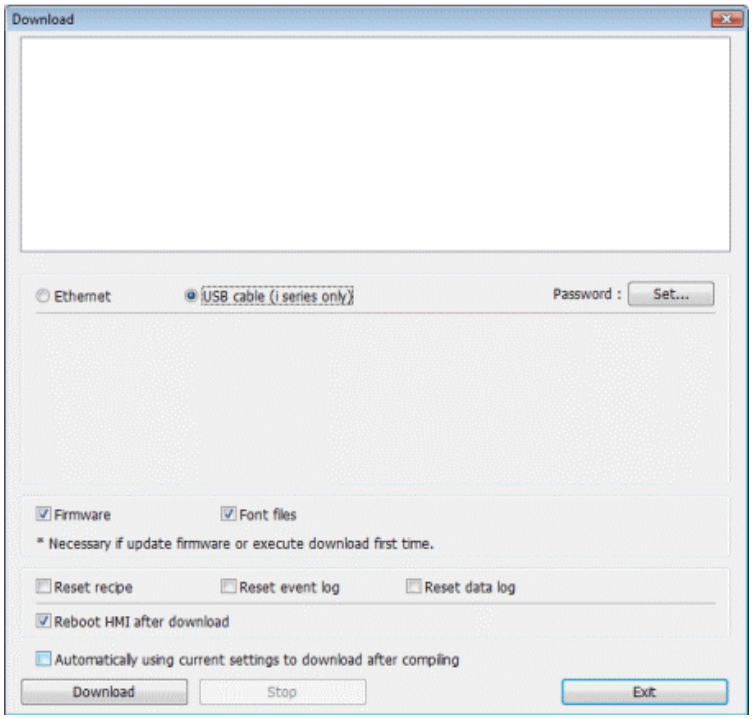
4. Load and Transfer HMI Sample Program

The sample program included with this quick start guide is called “triplcdemo.mtp”. You can open this file from Easy Builder 8000 using File – Open and selecting the location that triplcdemo.mtp is saved to.

This sample program is already pre-configured for communication with a TRI PLC via RS485, since all of the compatible TRI PLCs have one or more RS485 ports.

Once you have opened the sample program, you can transfer it to the HMI as follows :

1. Go to the “Tools” menu and select “Compile”.
2. A new window should appear, click on Compile.
3. You should see “Succeeded” highlighted if it worked. You can close the window.
4. Go to the “Tools” menu and select “Download”. A new window should appear.
5. Make sure that “USB Cable”, “Firmware”, and “Reboot HMI after Download” are all selected as shown in Figure 2.
6. Click download and wait for the message that the download has finished.



NOTE:
The “Firmware” box typically only needs to be checked the first time a program is being transferred to the HMI or if any COM settings have changed or if there is a firmware update being installed to the HMI.

Figure 4: Download Window

5. Load and Transfer PLC Sample Program

A Trilogi PLC sample program, called MMI6070.PC6, is also included in the “MMI6070doc.zip” file. This should be opened with Trilogi and transferred as normally done with Trilogi (and TLServer for serial connections). You can find more information on communicating with a PLC using Trilogi from the TL6 Programmers Reference Manual.

The MMI6070.PC6 sample program is only required for the LCD and PWM functions included in the “MMI6070_TRI_PLC.mtp” sample program. It could be modified to do more such as update the LCD periodically instead of only once.

6. Using the MMI6070 Sample Program

Now that the MMI6070_TRI_PLC.mtp sample program has been loaded in the HMI, you should see the Home screen for this program :

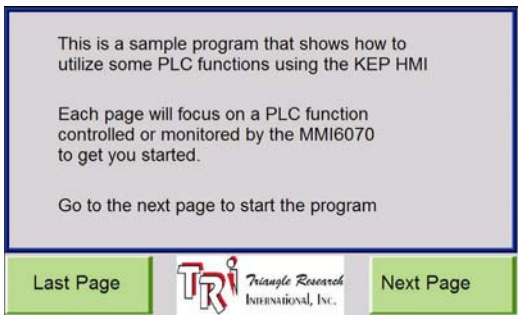


Figure 5: Home Screen

You can traverse through the different screens in the sample program by clicking on “Next Page” to go forward one page or “Last Page” to go backward one page. You can also access Help for each page by clicking on the “?” button, which will open up a new screen with some information and tips. There are 4 screens total as shown in Figures 4-7 below.

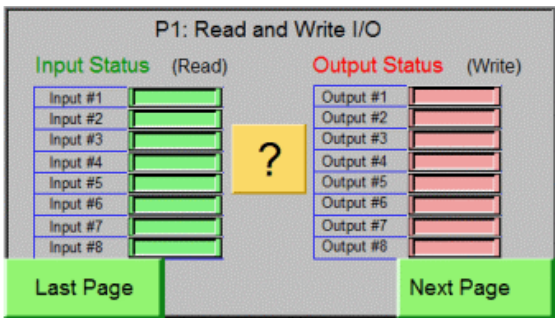


Figure 6: I/O Screen

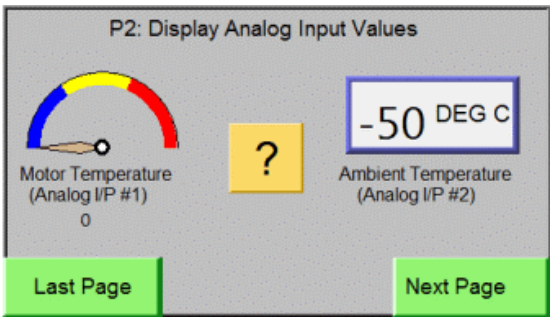


Figure 7: Analog Screen

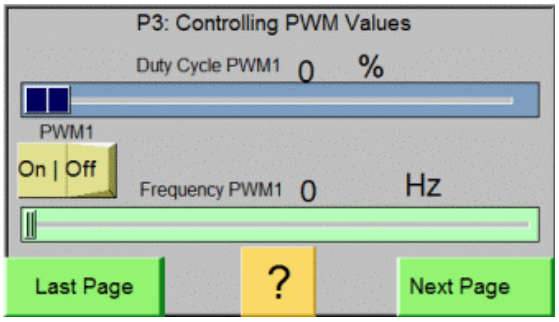


Figure 8: PWM Screen

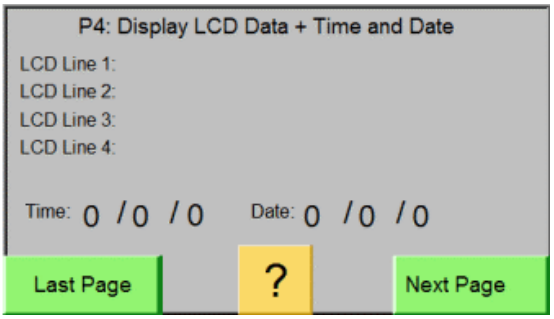


Figure 9: LCD Screen

7. Start a New Program and Configure for a TRI PLC

When you start a new program you will be asked to select your HMI model and screen orientation. You should select the MMI6070 (800 x 480) model and Landscape as per the following screenshot :

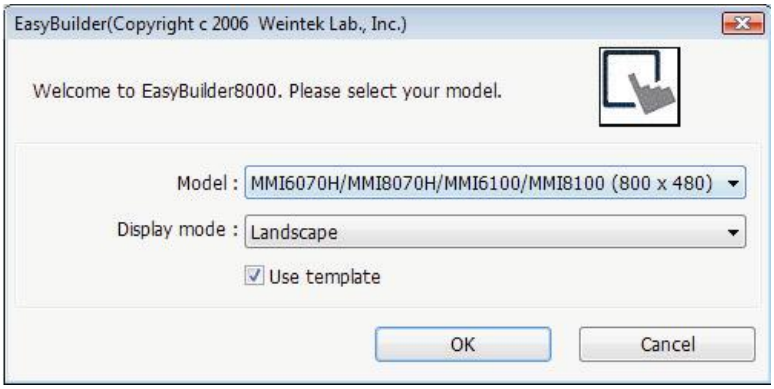
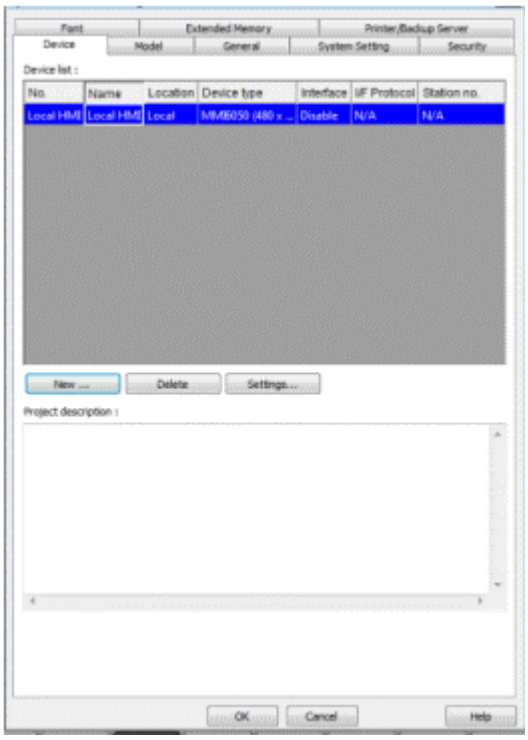


Figure 10: Select Model

Once you select OK, you will see a screen like Figure 9 below that allows you to configure the MMI settings for your current project. As shown below, the MMI6070 should be in the device list. Next you will need to add a PLC to the device list by selecting “New”, which will open up a new window called “Device Properties” as shown in Figure 10. The following settings should be selected, as shown in Figure 10 :

- Name: Anything (TRI_PLC was assigned automatically after selecting PLC type)
- PLC should be selected, not HMI
- Location: Local – because it is a serial connection
- PLC type: TRI_PLC – this is the communication driver for TRI PLCs.
- PLC I/F: RS-232 or RS-485 depending on how you want to connect to the PLC.
- PLC default station no.: 1 – this is the default PLC ID
- COM: COM1 (38400, N, 8, 1) – these are the default com settings in the PLC
- Everything else can be left as the default.



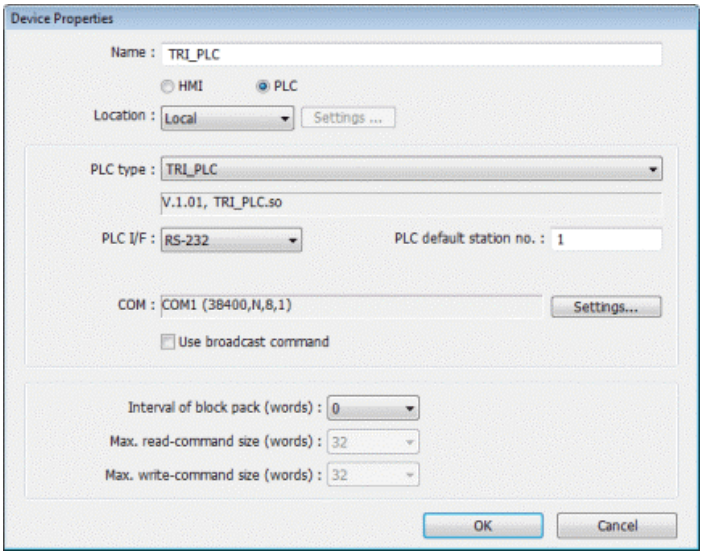


Figure 12: Add/Configure PLC

Figure 11: Configure HMI

Once you click OK, you should see the PLC in the device list below the MMI6070. There are other tabs you can select to modify additional parameters in the HMI for this project, but nothing that is required. The “General” and “System Setting” tabs contain settings that are most likely to be useful.

Then you can click OK on the Device Properties window and you should see a starting screen similar to Figure 11.

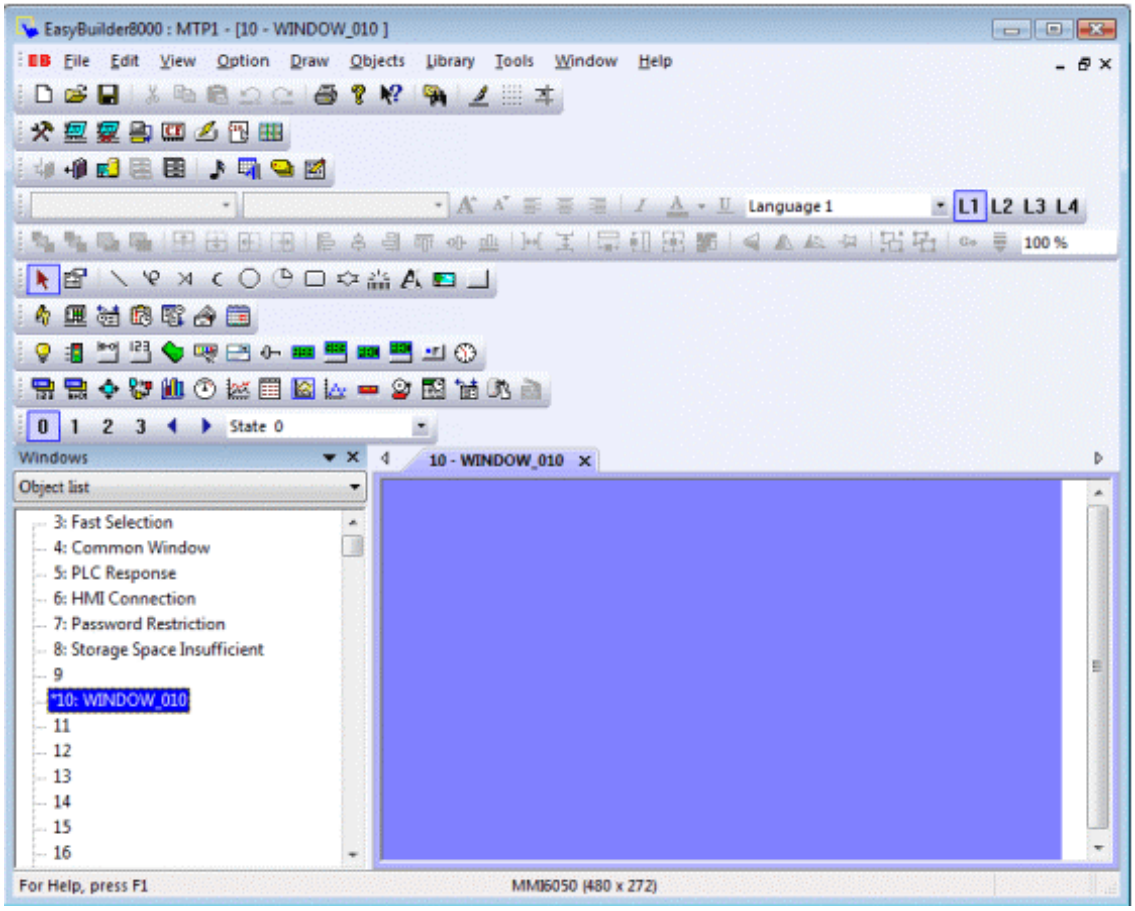


Figure 13: New Program Window

Now you can add windows and fill them with data input and display objects as well general text and pictures.

You can find more information on configuring the program for an MMI6070 with a TRI PLC as well as information on PLC data mapping between the PLC and HMI in the TRI_Setup pdf document included in the “MMI6070doc.zip” package. The Help menu in EB8000 also has a lot of information on the available components that will help to design your touch screen program.