

Stellaris® Intelligent Display Module with 3.5” Landscape Display (IDM-L35) RDK

Stellaris reference design kits (RDKs) from Texas Instruments accelerate product development by providing ready-to-run hardware, example software, and comprehensive documentation including hardware design files. The Intelligent Display Module with 3.5” Landscape Display (IDM-L35) is a highly integrated QVGA touch-panel module for automation and instrumentation applications. The compact design is based on the LM3S1958 Stellaris microcontroller. The example applications include source code exercising the various peripherals provided on the module and illustrating use of the Stellaris® Peripheral Driver Library and Stellaris® Graphics Library. Development of software for the IDM-L35 is simplified by using StellarisWare® software and ARM development tools from our tools partners.

Installing and Using the IDM-L35 RDK

Kit Contents

The IDM-L35 RDK includes the following items:

- Intelligent 3.5” Landscape QVGA Touch Panel (MDL-IDM-L35) with metal standoffs
- JTAG debug adapter (20-pin to 10-pin)
- USB-to-TTL serial cable
- Reference Design Kit CD containing this Quickstart Guide, a User’s Manual, example source code, peripheral driver library, graphics library, and hardware design files



Quickstart Application

The IDM-L35 RDK comes preprogrammed with a quickstart application. Once you have powered the board, this application runs automatically. The application provides a security keypad to allow access to a door. A GPIO output is momentarily toggled upon entry of the access code to activate an electric door strike, unlocking the door. A demonstration of the Stellaris Graphics Library is also included within the application. To activate the graphics library demonstration, enter “***” on the numeric keypad.

Upon startup, the screen is blank and the hint at the bottom says to touch the screen. Press the screen to bring up the keypad, which is randomized as an added security measure. The current access code is provided in the hint at the bottom of the screen.

Enter the access code and then press the ‘#’ key to end the code entry. If the correct access code is entered, the GPIO output toggles momentarily, as indicated by the hint at the bottom of the screen, and the screen goes blank. Touch the screen again to repeat the process. If an incorrect access code is entered, the screen goes blank and waits for another access attempt.

A simple serial command line is provided to allow the access code to be changed, to view statistics related to the example, and to initiate a software update. To use the command line, connect a terminal emulator to the IDM-L35 module serial port with settings 115200/8/N/1 using the provided USB-to-serial cable.

If a microSD card is present, the access code is stored in a file called “key.txt” in the root directory. This file is written whenever the access code is changed, and is read at startup to initialize the access code. If a microSD card is not present or the “key.txt” file does not exist, the access code defaults to 6918.

Running the Quickstart Application

Follow these steps to start running the quickstart application preprogrammed into the IDM-L35.

Powering the IDM-L35

The IDM-L35 may be powered via the USB-to-serial cable supplied with the kit or an external 5 V power supply.

1. Connect the black 6-pin socket of the USB to TTL Serial Cable to serial header J8 on the underside of the IDM-L35, with the black wire on J8 pin 1. Header J8 pin 1 is indicated by a white triangle next to it.
2. Connect the USB connector of the USB to TTL Serial Cable to an available USB port on a PC.

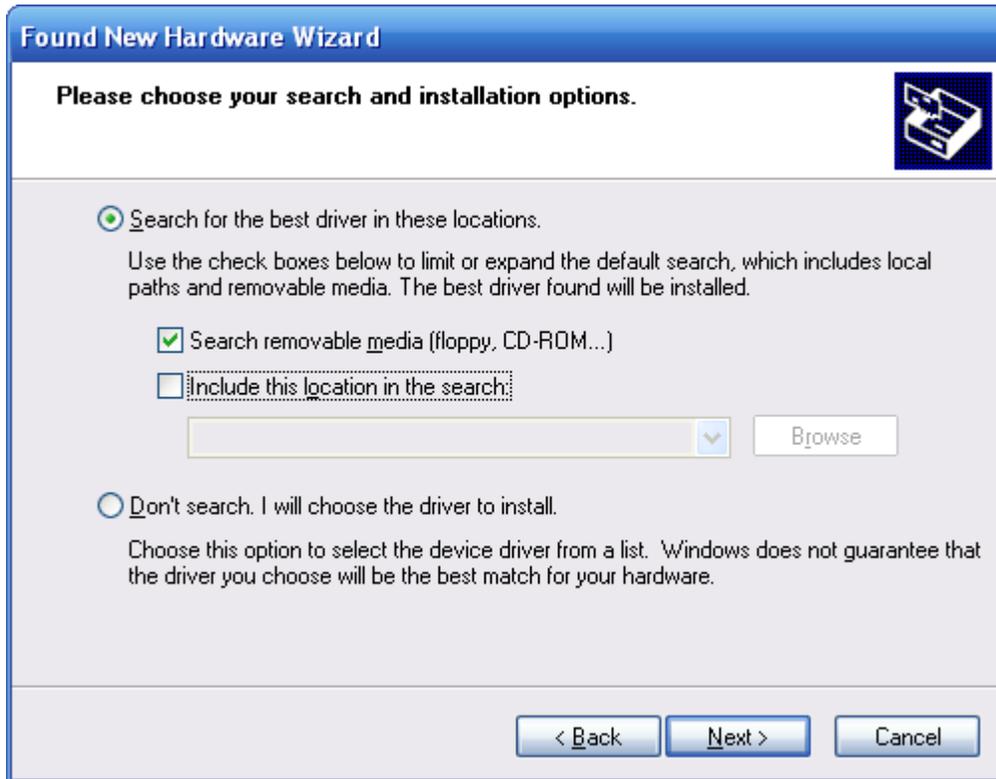
Installing the Virtual COM Port Driver

1. When you plug in the USB-to-serial cable for the first time, Windows starts the Found New Hardware Wizard and asks if it should attempt to install the software automatically or from a specified location. Chose “Install from a list or specified location (Advanced)” then click “Next.”



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2. Make sure the IDM-L35 Documentation and Software CD that came with the Reference Design Kit is in your CD-ROM drive. Select “Search for the best driver in these locations,” and check the “Search removable media (floppy, CD-ROM...)” option. Click Next.



3. Windows finishes installing the drivers for the “USB Serial Converter” device then shows the following dialog. Click Finish to close the dialog box.



4. The Found New Hardware Wizard appears one more time. This is to install the drivers for the “USB Serial Port.” Again, follow the same instructions to install the drivers for this device.

Now all of the hardware drivers for the USB-to-serial converter have been installed

Using the Touch Panel

1. Touch the screen and the keypad appears.
2. Enter the access code provided in the hint at the bottom of the screen followed by the ‘#’ key.
3. The hint at the bottom of the screen indicates that the GPIO output has been toggled unlocking the door.

Using the Serial Command Line

1. Start a serial terminal (for example, Hyperterminal on Windows) on your PC and set the communication parameters to 115200bps, 8/N/1 with no flow control.
2. Power cycle the board by removing and reinserting the USB to TTL serial cable from the USB port. Once the introduction animation is complete, a welcome message will be seen on the terminal.

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3. On your terminal program, type `help` followed by “Enter” to see a list of commands supported via the serial command line.
4. Type `set` followed by a new four-digit access code, then press “Enter”.
5. The access code has now been changed. The new access code can be tested by touching the screen to bring up the keypad and entering the new code followed by the ‘#’ key.

Accessing the Graphics Demonstration

1. Touch the screen and the keypad appears.
2. Press the “*” key twice. The display changes to show an introduction to the demonstration.
3. Navigate through the various panels in the demonstration by pressing the “+” and “_” buttons at the bottom of the screen.
4. Exit back to the numeric keypad by pressing the “X” button found on the first and last demonstration panels.

RDK-IDM-L35 Firmware Development Package

A full set of C-based peripheral drivers is provided, covering all peripherals and functionality of the Stellaris devices. The Firmware Development Package includes various example applications with project files for all major tool vendors that support Stellaris.

Installing the RDK-IDM-L35 Firmware Development Package

1. Insert the RDK Documentation and Software CD into the CD-ROM drive of your computer. If Autoplay is enabled on your PC, the `index.htm` file automatically opens in your default web browser. If not, use Windows Explorer or other browser to open the `index.htm` file manually.
2. From the CD menu, select the Software button. Click the ‘Install’ link for the Driver Library. If you prefer to manually install DriverLib from a zip file, the zip file is located in the “\Software\DriverLib” directory.
3. To view the Firmware Development Package documentation, navigate to the installation directory and click the *Driver Library User’s Manual* PDF file.

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IDM-L35 Example Applications

The RDK-IDM-L35 Firmware Development Package includes several example applications for the IDM-L35. If you installed the software to the default installation path of C:\StellarisWare, you can find the example applications for the IDM-L35 in “C:\StellarisWare\boards\rdk-idm-l35”.

Peripheral Driver Library

The Firmware Development Package includes DriverLib, a library of low-level drivers for each of the peripheral devices on the IDM-L35’s LM3S1958 microcontroller. If you installed the software to the default installation path C:\StellarisWare you can find DriverLib in C:\StellarisWare\driverlib.

Graphics Library

The Firmware Development Package includes a graphics library which can be used for the IDM-L35. If you installed the software to the default installation path C:\StellarisWare, you can find the graphics library in “C:\StellarisWare\gplib”.

LM Flash Programmer Utility

This Windows application may be used to flash application or boot loader images to the IDM-L35 board either via serial port with the USB to TTL serial cable or using another Stellaris evaluation kit board as a USB-to-JTAG/SWD adapter. It can be installed from the IDM-L35 RDK CD and launched from the shortcut found in Start/All Programs/Luminary Micro/LM Flash Programmer.

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Conclusion

You have now successfully operated the Intelligent Display Module with 3.5" Landscape Display (IDM-L35) using the touch panel and web server. From here we recommend reading the *Stellaris Intelligent Display Module with 3.5" Display Reference Design Kit User's Manual*, which explains how to use the IDM-L35 in more detail. Once you have completed that step, you will be prepared to start adapting the software and hardware for a specific application.

References

The following references are included on the IDM-L35 RDK documentation CD and are also available for download at www.luminarymicro.com:

- *Stellaris Intelligent Display Module with 3.5" Display Reference Design Kit User's Manual*, publication number RDK-IDM-L35-UM
- *RDK-IDM-L35 Firmware Development Package User's Manual*, publication number SW-RDK-IDM-L35-UG
- *Stellaris Peripheral Driver Library User's Guide*, publication number SW-DRL-UG
- *Stellaris Graphics Library User's Guide*, publication number SW-GRL-UG

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