

QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 410

RS232-TO-SMBUS/SPI INTERFACE BOARD AND SOFTWARE

DESCRIPTION

Demonstration circuit 410 is a PC-Serial-Port-to-SMBus/SPI adapter that uses a LabVIEW application program to simplify the evaluation of Linear Technology SMBus devices. The RS232 communicates between the PC and the DC410 at 19200 Baud.

The DC410 supports seven different SMBus command protocols: Quick Command, Send Byte, Receive Byte, Write Byte, Read Byte, Write Word, and Read Word. A Microchip microcontroller (PIC16C76) is used to convert the DC410 software-generated RS232 commands into SMBus commands.

The SMBus communication lines can be accessed through the 5-pin connector. The 5-pin connector accepts both 5V_{IN} and 3.3V_{IN} SMBus voltage levels.

The DC410 generates its own 5V supply when 8V-20V is applied to the VinEXT input and jumper JP2 is positioned

for VinEXT. The 15-pin connector P2 is an optional SMBus communications port that accepts two SMBus communication channels that are multiplexed on the DC410 to the DC410's microcontroller. These communication channels are 5V input SMBus voltage levels only.

DC410 comes with a CD that contains LabVIEW executables designed to communicate with specific Linear Technology demo boards. The DC410 CD also contains software that can be used to issue basic SMBus command protocols.

Among the LTC demo boards the DC410 supports are DC285 (LTC1695), DC182 (LT1786F), DC286 (LTC1960), DC486 (LTC1760), DC496 (LTC4008), and DC512 (LTC4100).

Design files for this circuit board are available. Call the LTC factory.

QUICK START PROCEDURE

Refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

1. Place JP2 in the VinExt position.
2. Place the JP1 and JP3 jumpers in their Res default positions.
3. Apply 8V-20V to the VinExt and Gnd terminals.
4. Connect the 9-pin serial port to a Serial Port on your computer (e.g. COM1, COM2).
5. Connect the SMBus device under test to the 5-pin connector (connect the system Vcc of the SMBus device (5V

or 3.3V) to pin 1 of the 5-pin connector).

6. Copy the device software from the DC410 CD onto the computer's hard drive.

For instance, to use the software for demonstration circuit 286, copy the DC286 directory to your computer's hard drive.

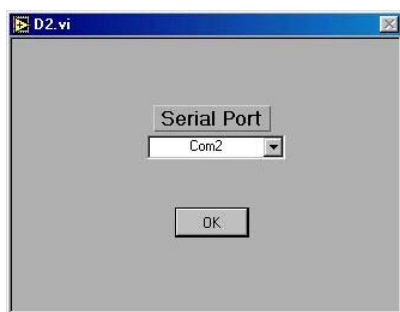
If there is no specific software for the device, copy the DC410 directory to your computer's hard drive. The DC410 application allows you to issue SMBus commands manually.

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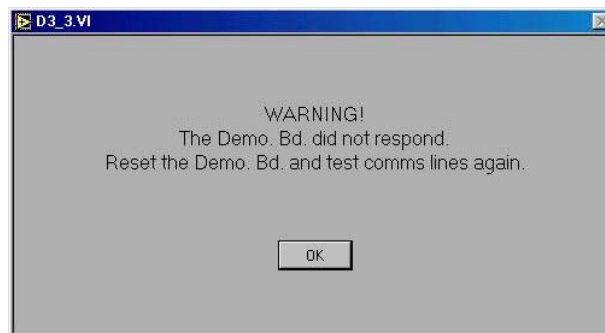
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NOTE: The serpdrv driver must be in the same folder as the LabVIEW executable program.

7. Run the executable for the demonstration board you wish to drive (e.g. DC286V9.exe) or run LVDC410.exe. The LabVIEW executable starts.
8. You are asked to choose a serial port. Select the appropriate computer serial port from the list and click OK. The LabVIEW user interface appears (described in the next section).



At this point you may be asked to reset the board if there is an RS232 communications problem. Press the RESET button (S1) of DC410, then click OK.



NOTE: If there continue to be communication problems make sure the serial port being used (COM1, COM2, COM3 etc.) has resources provided for it under Window's Start > Settings > Control Panels > System-Port Settings window and ensure the FIFO enabled option is selected under this window. Also, it is not a good idea to run a LabVIEW executable over COM3 if the PC mouse is running on COM1 because COM1 and COM3 share the same interrupt IRQ line and communication can be adversely effected (same applies for COM2 and COM4 because COM2 and COM4 share the same IRQ line).

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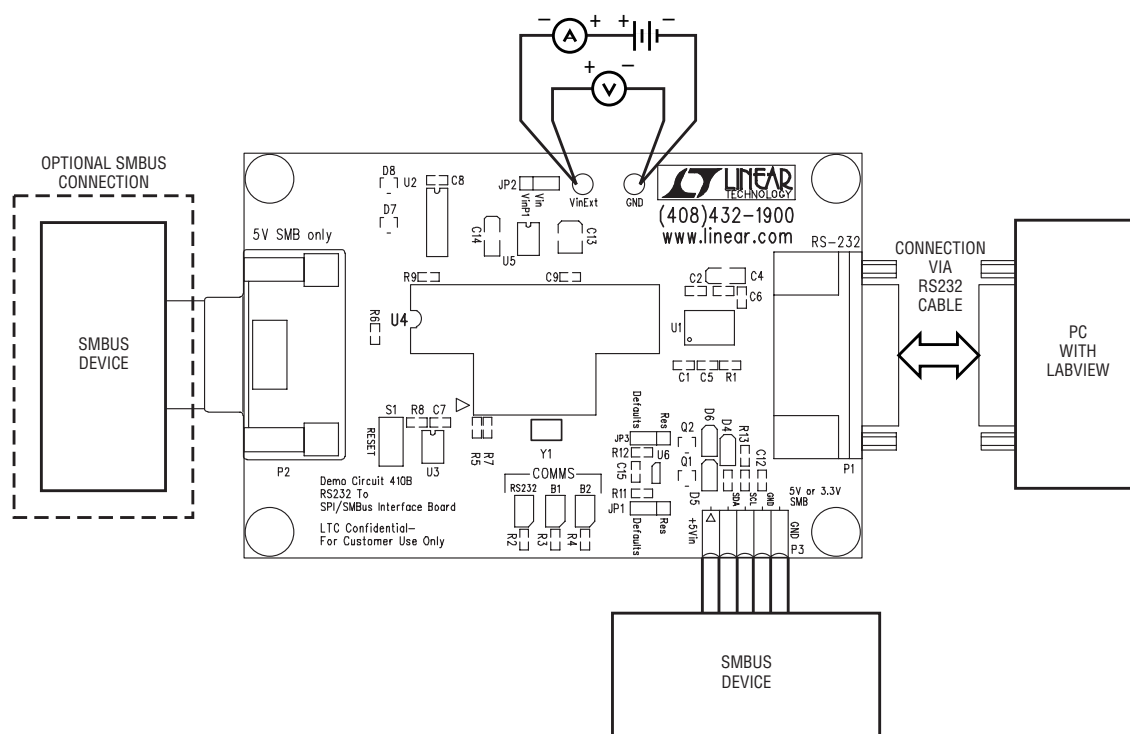


Figure 1. Proper Measurement Equipment Setup

USING THE DC410 SOFTWARE (LABVIEW USER INTERFACE)

Figure 2 shows the main window of the LVDC410.exe LabVIEW user interface program. LVDC410.exe allows a user to send seven SMBus Command Protocols from the SMB Command Protocol pop-down menu.

The seven command protocols are:

- Quick Command
- Send Byte
- Receive Byte
- Write Byte
- Read Byte
- Write Word
- Read Word.

These protocols are detailed in the System Management Bus Specification with a brief figurative description

given in the "System Management Bus Protocol Summary" section on page 4.

The Device Address byte is the first byte sent out on the SMBus; the Device Command byte is the second byte sent out if the protocol requires a second byte; and the Read\Write Data numeric box consists of the last byte(s) sent out on the SMBus, if the protocol requires the byte(s) to be sent out. In the case of Read Commands the Data returned is displayed in the Read\Write Data numeric box.

To issue a command:

1. Select the command from the SMB Command Protocol drop down list.
2. Click Send Cmd.

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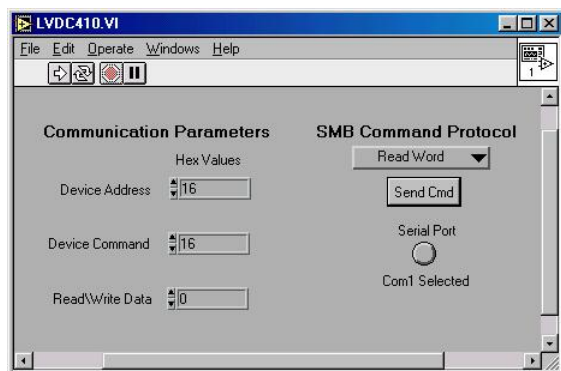


Figure 2. DC410 LabView User Interface

SYSTEM MANAGEMENT BUS PROTOCOL SUMMARY

The protocols described in this section use the following command building blocks:

- S: Start bit
- R/W: Read/Write Command bit
- W: Write
- R: Read
- A: Ack
- A: NOT Ack
- P: Stop bit

In the protocols below, regular text represents command syntax in the DC410-Data-to-SMBus-Device direction; **bold** text represents command syntax in the SMBus-Device-Data-to-DC410 direction.

Quick Command

S | Device Address | R/W | **A** | P

Send Byte

S | Device Address | W | **A** | Command Code | **A** | P

Receive Byte

S | Device Address | R | **A** | Command Code | A | P

Write Byte

S | Device Address | W | **A** | Command Code | **A** | Data Byte | **A** | P

Read Byte

S | Device Address | W | **A** | Command Code | **A** | S | Device Address | R | **A** | Data Byte | A | P

Write Word

S | Device Address | W | **A** | Command Code | **A** | Data Low Byte | **A** | Data High Byte | **A** | P

Read Word

S | Device Address | W | **A** | Command Code | **A** | S | Device Address | R | **A** | Data Low Byte | A | Data Byte High | A | P