Connecting The MCP2150 To The Windows® CE Operating System

INTRODUCTION

This technical brief demonstrates the operation of the MCP2150 with Microsoft® Windows® CE Operating System (OS). The MCP2150 is a protocol handler supporting IrDA® standards plus an encoder/decoder. This allows the MCP2150 to be used as a “Virtual Connector”, a wireless link between an embedded application and an IrDA standard host. This host can be a handheld device using Microsoft Windows CE. Windows CE is an excellent host platform for use with the MCP2150 because of the light weight, low cost, ease of use, and portability of these devices. Microsoft Windows includes a terminal client that can easily be used to demonstrate this capability.

Windows CE devices are made by Compaq®, Casio, IBM®, LG, and many others. These devices are available with or without keyboards. Keyboard models are sometimes referred to as H/PC pro devices. The smaller models without keyboards are sometimes called P/I PC devices. Some have color screens, others have monochrome LCD displays. One common feature of all these models is that all have an IrDA standard infrared port.

Windows CE devices do not, however, include a terminal client. A terminal client called pkHpc is available from Cambridge Computer Corporation. A 30-day trial version of this utility can be downloaded from www.cam.com. Other terminal clients are available, but pkHpc has been used by the author and its use is documented in this technical brief.

This demonstration will use the MCP2150 Developer’s Board. Optionally, the MCP2120 Developer’s Board may be used. The MCP2120 is a simple encoder/decoder. The IrDA standard protocol handler would need to be implemented in the host system, such as a personal computer (PC) with IrDA standard drivers installed. These boards are available in the MCP2120/MCP2150 Developer’s Kit (DV163008).

FIGURE 1: SYSTEM BLOCK DIAGRAM

IrDA is a registered trademark of the Infrared Data Association.
SETUP OF WINDOWS CE DEVICE

The first step in using pkHpc is installing it in your Windows CE device. This must be done using Microsoft Activesync® and a Personal Computer (PC) using Microsoft Windows. The connection to a Windows CE device can be made using a cable or an IR port. The MCP2150 Developer’s Board can be used to add an IR port to a desktop PC. See the MCP2150 Developer’s Board User’s Guide for more information (DS51246).

Once the pkHpc utility is installed, a terminal session has to be set up. There are areas of the set up that need special attention for an IrDA standard infrared connection. The first is the “Async Comm.” tab of the Session Properties window. Figure 2 shows how this should be set up. The port selected should be “Infrared Port”.

Note: If an IrDA standard infrared port cellphone or other device is installed on your system, then other types of IR ports may also be listed. Make sure “Infrared Port” is selected.

FIGURE 2: ASYNCHRONOUS COMMUNICATION SETUP SCREEN IN pkHpc
Once the infrared port is selected, it must be configured. Click on the "Configure" button. Figure 3 shows the Configuration screen. The Direct Device Properties window will show the various parameters of the serial port. Please note these parameters do not affect the virtual port established by the IrDA standard protocol stack. The "Raw Infrared Transmission" box must not be selected. Selecting this box will bypass the IrDA standard protocol stack and send the serial data as raw Ir data without this protocol. Figure 3 shows how this window should appear.

FIGURE 3: DIRECT DEVICE PROPERTIES WINDOW OF pkHpc
SETUP OF MCP2150 DEVELOPER’S BOARD

To connect to the MCP2150, make sure the MCP2150 demo board is powered. Then open the pkHpc session. The indicator on the MCP2150 demo board will light when a valid connection is available. If IR data is sent to the MCP2150 and the embedded application prevents the MCP2150 from sending its data to the Host controller, the infrared link will be shut down by the MCP2150. This is due to the limited available buffer space. Make sure that the host device is able to receive data (i.e.: CTS/RTS signals in appropriate states) when the infrared communication begins.

PKHPC supports binary file transfers using Kermit, Xmodem, Xmodem 1K, Ymodem, Ymodem-G, and Zmodem. These file transfer protocols build packets, just like the IrDA standard specifies. The packet sizes are larger than the packet size used by the MCP2150. This difference in packet size creates delays as the host and the MCP2150 reconcile what has to be sent and when. Also, the file transfer protocols will send a packet and expect a response sooner than the minimum IrDA standard turnaround time. This will cause the file transfer protocol to abort. For example, pkHPC Zmodem will require a response to a packet considerably faster than the minimum IrDA standard turnaround time. Zmodem will therefore immediately abort if you attempt to use it. The use of file transfer protocols is not recommended with the virtual serial link provided by the MCP2150. These protocols are not needed because the IrDA standard packets already have CRC-16 protection. If the embedded application does require handling a data packet then care should be taken to align the IrComm packet boundaries with the data packet boundary to maximize throughput.

REFERENCES

Microchip Documents
Reference documents may be obtained by contacting your nearest Microchip sales office (listed in the back of this document) or by downloading via the Microchip website (www.microchip.com).

- MCP2150 Data Sheet, DS21655
- AN758, “Using the MCP2150 to Add IrDA® Standard Wireless Connectivity”, DS00758
- MCP2120/MCP2150 Developer’s Kit User’s Guide, DS51246

IrDA Standards References
The IrDA Standards download page can be found at:

http://www.irda.org/standards/specifications

Optical Transceiver Manufacturers
Manufacturers of common optical transceivers are shown in Table 1.

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<tr>
<th>Table 1: COMMON OPTICAL TRANSCEIVER MANUFACTURERS</th>
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<td>Company</td>
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<td>Vishay/Temic</td>
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SUMMARY

The MCP2150 is an easy to use, low cost link between embedded systems and any portable device equipped with an IrDA standard communications port. Third party tools and materials are available to help the developer add IrDA standard wireless connectivity with a minimum lead time and learning curve.
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