TB047

Connecting The MCP2150 To The Windows® CE Operating System

Author: *Steve Schlanger*
Aegis Technologies LLC

INTRODUCTION

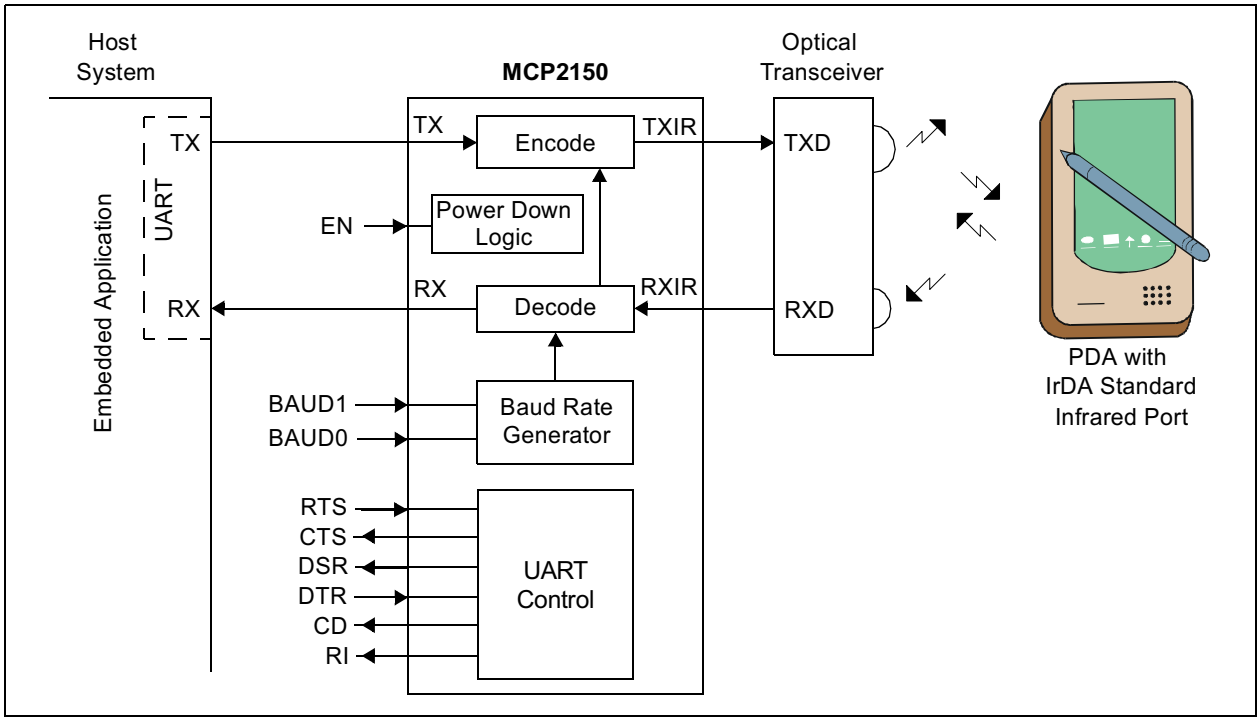
This technical brief demonstrates the operation of the MCP2150 with Microsoft® Windows® CE Operating System (OS). The MCP2150 is a protocol handler supporting IrDA® standards plus an encoder/decoder. This allows the MCP2150 to be used as a "Virtual Connector", a wireless link between an embedded application 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/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.

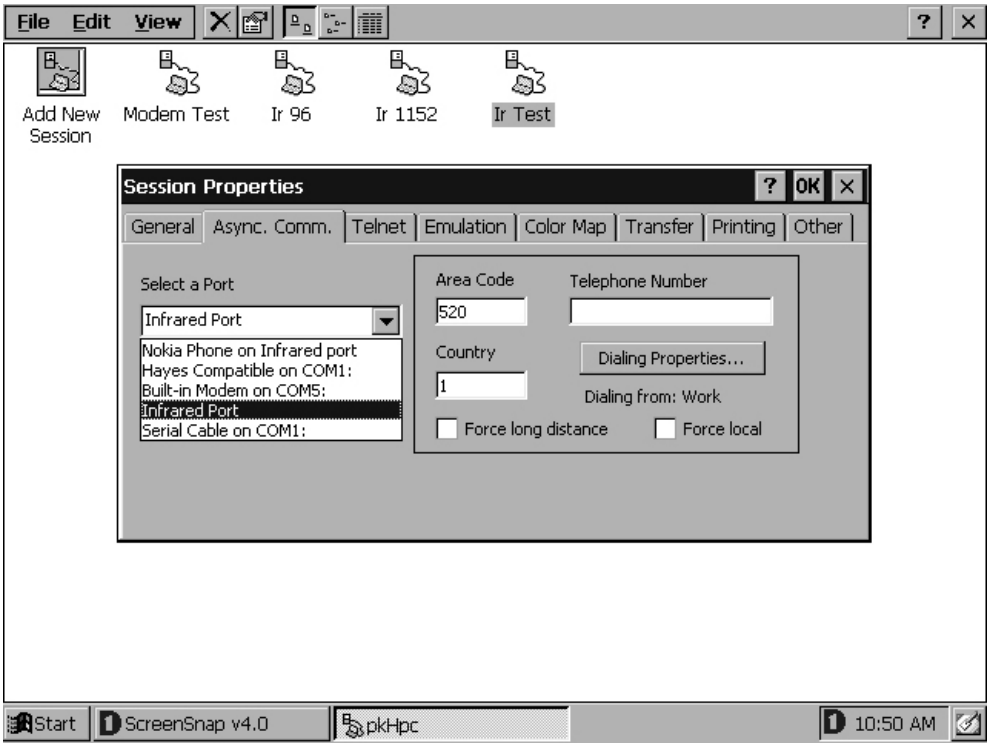
SETUP OF WINDOWS CE DEVICE

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.

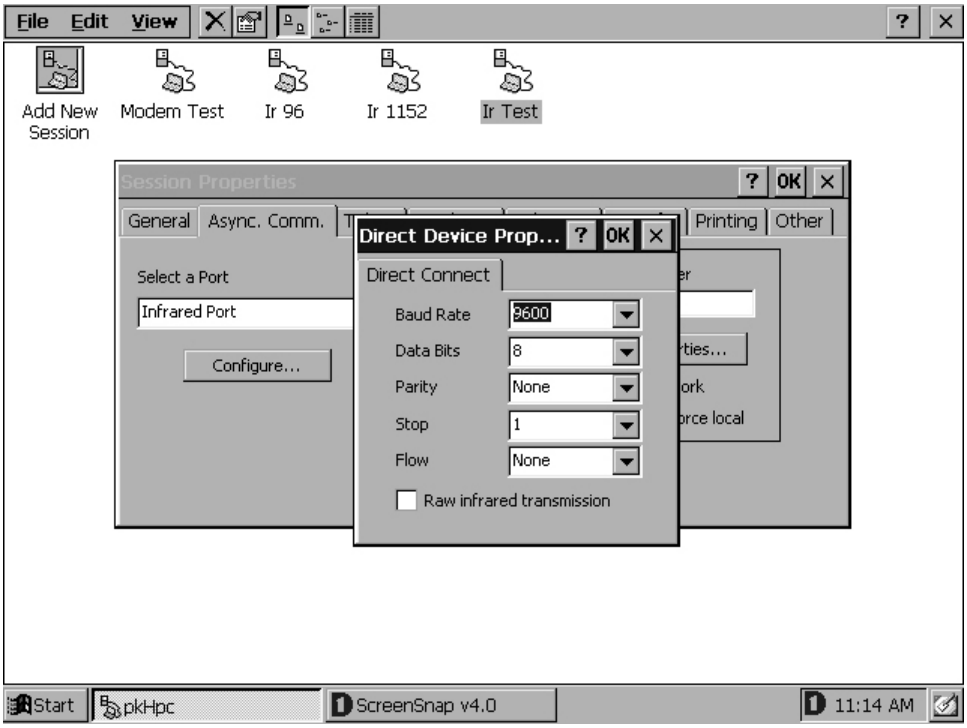
FIGURE 2: ASYNCHRONOUS COMMUNICATION SETUP SCREEN IN pkHpc



Activesync is a registered trademark of Microsoft Corporation in the United States and/or other countries.

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.

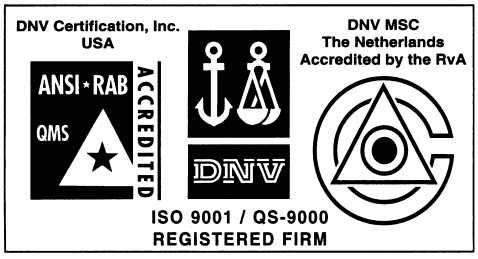
TABLE 1: COMMON OPTICAL TRANSCEIVER MANUFACTURERS

Company	Company Web Site Address
Infineon	www.infineon.com
Agilent	www.agilent.com
Vishay/Temic	www.vishay.com
Rohm	www.rohm.com

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.

Trademarks



Microchip received QS-9000 quality system certification for its worldwide headquarters, design and wafer fabrication facilities in Chandler and Tempe, Arizona in July 1999. The Company's quality system processes and procedures are QS-9000 compliant for its PICmicro® 8-bit MCUs, KEELOQ® code hopping devices, Serial EEPROMs and microperipheral products. In addition, Microchip's quality system for the design and manufacture of development systems is ISO 9001 certified.

WORLDWIDE SALES AND SERVICE

AMERICAS

Corporate Office
2355 West Chandler Blvd.
Chandler, AZ 85224-6199
Tel: 480-792-7200 Fax: 480-792-7277
Technical Support: 480-792-7627
Web Address: http://www.microchip.com

Rocky Mountain
2355 West Chandler Blvd.
Chandler, AZ 85224-6199
Tel: 480-792-7966 Fax: 480-792-7456

Atlanta
500 Sugar Mill Road, Suite 200B
Atlanta, GA 30350
Tel: 770-640-0034 Fax: 770-640-0307

Austin - Analog
8303 MoPac Expressway North
Suite A-201
Austin, TX 78759
Tel: 512-345-2030 Fax: 512-345-6085

Boston
2 Lan Drive, Suite 120
Westford, MA 01886
Tel: 978-692-3848 Fax: 978-692-3821

Boston - Analog
Unit A-8-1 Millbrook Tarry Condominium
97 Lowell Road
Concord, MA 01742
Tel: 978-371-6400 Fax: 978-371-0050

Chicago
333 Pierce Road, Suite 180
Itasca, IL 60143
Tel: 630-285-0071 Fax: 630-285-0075

Dallas
4570 Westgrove Drive, Suite 160
Addison, TX 75001
Tel: 972-818-7423 Fax: 972-818-2924

Dayton
Two Prestige Place, Suite 130
Miamisburg, OH 45342
Tel: 937-291-1654 Fax: 937-291-9175

Detroit
Tri-Atria Office Building
32255 Northwestern Highway, Suite 190
Farmington Hills, MI 48334
Tel: 248-538-2250 Fax: 248-538-2260

Los Angeles
18201 Von Karman, Suite 1090
Irvine, CA 92612
Tel: 949-263-1888 Fax: 949-263-1338

New York
150 Motor Parkway, Suite 202
Hauppauge, NY 11788
Tel: 631-273-5305 Fax: 631-273-5335

San Jose
Microchip Technology Inc.
2107 North First Street, Suite 590
San Jose, CA 95131
Tel: 408-436-7950 Fax: 408-436-7955

Toronto
6285 Northam Drive, Suite 108
Mississauga, Ontario L4V 1X5, Canada
Tel: 905-673-0699 Fax: 905-673-6509

ASIA/PACIFIC

Australia
Microchip Technology Australia Pty Ltd
Suite 22, 41 Rawson Street
Epping 2121, NSW
Australia
Tel: 61-2-9868-6733 Fax: 61-2-9868-6755

China - Beijing
Microchip Technology Consulting (Shanghai) Co., Ltd., Beijing Liaison Office
Unit 915
New China Hong Kong Manhattan Bldg.
No. 6 Chaoyangmen Beidajie
Beijing, 100027, No. China
Tel: 86-10-85282100 Fax: 86-10-85282104

China - Chengdu
Microchip Technology Consulting (Shanghai) Co., Ltd., Chengdu Liaison Office
Rm. 2401, Ming Xing Financial Tower
No. 88 TIDU Street
Chengdu 610016, China
Tel: 86-28-6766200 Fax: 86-28-6766599

China - Fuzhou
Microchip Technology Consulting (Shanghai) Co., Ltd., Fuzhou Liaison Office
Rm. 531, North Building
Fujian Foreign Trade Center Hotel
73 Wusi Road
Fuzhou 350001, China
Tel: 86-591-7557563 Fax: 86-591-7557572

China - Shanghai
Microchip Technology Consulting (Shanghai) Co., Ltd.
Room 701, Bldg. B
Far East International Plaza
No. 317 Xian Xia Road
Shanghai, 200051
Tel: 86-21-6275-5700 Fax: 86-21-6275-5060

China - Shenzhen
Microchip Technology Consulting (Shanghai) Co., Ltd., Shenzhen Liaison Office
Rm. 1315, 13/F, Shenzhen Kerry Centre,
Renminnan Lu
Shenzhen 518001, China
Tel: 86-755-2350361 Fax: 86-755-2366086

Hong Kong
Microchip Technology Hongkong Ltd.
Unit 901, Tower 2, Metroplaza
223 Hing Fong Road
Kwai Fong, N.T., Hong Kong
Tel: 852-2401-1200 Fax: 852-2401-3431

India
Microchip Technology Inc.
India Liaison Office
Divyasree Chambers
1 Floor, Wing A (A3/A4)
No. 11, O'Shaugnessey Road
Bangalore, 560 025, India
Tel: 91-80-2290061 Fax: 91-80-2290062

Japan
Microchip Technology Japan K.K.
Benex S-1 6F
3-18-20, Shinyokohama
Kohoku-Ku, Yokohama-shi
Kanagawa, 222-0033, Japan
Tel: 81-45-471- 6166 Fax: 81-45-471-6122

Korea
Microchip Technology Korea
168-1, Youngbo Bldg. 3 Floor
Samsung-Dong, Kangnam-Ku
Seoul, Korea 135-882
Tel: 82-2-554-7200 Fax: 82-2-558-5934

Singapore
Microchip Technology Singapore Pte Ltd.
200 Middle Road
#07-02 Prime Centre
Singapore, 188980
Tel: 65-334-8870 Fax: 65-334-8850

Taiwan
Microchip Technology Taiwan
11F-3, No. 207
Tung Hua North Road
Taipei, 105, Taiwan
Tel: 886-2-2717-7175 Fax: 886-2-2545-0139

EUROPE

Denmark
Microchip Technology Denmark ApS
Regus Business Centre
Lautrup hoj 1-3
Ballerup DK-2750 Denmark
Tel: 45 4420 9895 Fax: 45 4420 9910

France
Arizona Microchip Technology SARL
Parc d'Activite du Moulin de Massy
43 Rue du Saule Trapu
Batiment A - ler Etage
91300 Massy, France
Tel: 33-1-69-53-63-20 Fax: 33-1-69-30-90-79

Germany
Arizona Microchip Technology GmbH
Gustav-Heinemann Ring 125
D-81739 Munich, Germany
Tel: 49-89-627-144 0 Fax: 49-89-627-144-44

Germany - Analog
Lochhamer Strasse 13
D-82152 Martinsried, Germany
Tel: 49-89-895650-0 Fax: 49-89-895650-22

Italy
Arizona Microchip Technology SRL
Centro Direzionale Colleoni
Palazzo Taurus 1 V. Le Colleoni 1
20041 Agrate Brianza
Milan, Italy
Tel: 39-039-65791-1 Fax: 39-039-6899883

United Kingdom
Arizona Microchip Technology Ltd.
505 Eskdale Road
Winnersh Triangle
Wokingham
Berkshire, England RG41 5TU
Tel: 44 118 921 5869 Fax: 44-118 921-5820

06/01/01