EZ Touchscreen CE Computer

User Manual

Using EZ Touchscreen CE Computer

The EZ Touchscreen CE Computer (or EZ-CE for short) can be used by any one who is familiar with using of Windows operating system on PCs.

The CE operating system presents a desktop that is similar to the desktop on a windows operating system, such as Windows 2000 or Windows XP. There are however some subtle differences.

The CE operating system has a much smaller memory foot-print compared to the desktop Windows (about 20 MB versus up to Giga bytes). To achieve small foot print, CE has retained only the essential features.

This manual describes how to use EZ-CE units.

Input Methods:

You can interact with the CE panels using mouse, keyboard and touch.

Mouse, Keypad and Input Panel

The CE panel comes with a one USB port. You can connect USB mouse or a USB keypad or both through a USB Hub.
You can also use Input Panel which is a on screen keypad. Click on the input panel icon in the bottom task bar to bring up the input panel. (CE may bring up the input panel automatically in most instance when it needs user input).

Touch

It is highly recommended that you use a stylus (such as used with palm devices) to touch the touch-screen.
EZ-CE panels come with a touch screen on the display. Touch allows you to mimic a mouse in the following manner:

Mouse action	**Equivalent Touch**	**Response**
Left Button single click	Single touch	Selects an item
Double-click	Double touch	Selects and Opens the selected item The speed of double touch/click can be adjusted through control panel>Mouse
Drag	Hold Stylus and drag	Moves selected item
Right-click	Touch for a bit longer time	A dotted circle would appear, and then the right-click menu appears

EZ-CE Desktop

The desktop of a typical EZ-CE unit is shown below. As you can see the desktop looks very similar to the regular windows Desktop with similar icons. (Your unit may have different number of icons based on the options ordered).

Icons

The CE desk top shows several familiar-looking icons. (Actual icons on your desktop may vary based on the components installed on the unit). Here is a brief description of the icons found on a typical factory shipped unit.

My Computer:

This icon is similar to the desktop windows My Computer icon. Clicking on this icon brings up a window that shows number of folders. You may notice that there are no drive letters shown here. CE operating system does not have drive letters (such as C:).

Recycle Bin:

Like the desktop Windows, this is the icon of recycle bin. Items deleted are sent to recycle bin.

Microsoft Wordpad and Media Player

The EZ-CE Panels come with Wordpad and Media player installed, and icons placed on the desktop.

Viewer Shortcuts:

In Enhanced units, several file viewers are installed and short cuts placed on desktop. These include Image Viewer, Word Viewer, pdf Viewer, Excel Viewer and PowerPoint viewer.

Task Bar and Start up Menu

Task Bar on the EZ CE panel is located at the bottom of the display. As a default the bar is visible all the time. However, like desktop Windows, it can be hidden automatically.
The Start Symbol is located on the left side of the bar. Several status icons are located on the right side of the task bar.

Start Menu

Clicking on the Start Symbol brings up the start-up menu.

Status Icons

The task bar displays a variable number of status icons, including Date/Time, Input Panel, Ethernet Connection, etc.

For a complete list of status icons and their meaning, please see help by clicking Start>Help and selecting the Task Bar.

Storage and File system

The CE panel has 3 storage areas for applications and data.

FLASH (On-board):

Flash memory provides non-volatile storage. The CE panel has 32 MB on-board flash. The flash stores the complete OS image that includes CE operating system, bundled user programs (such as Wordpad, file viewers), registry, etc. On power-up, the OS is copied in RAM. OS as well as Applications run from RAM. Approximately 26MB is reserved for the OS in On-board flash.

About 6MB of on-board flash is available for users that can be used for application/data storage. The on board Flash appears as FLASH folder in the "My Computer" window. You can add (paste)/delete application and data files in this folder. Files copied in FLASH folder are persistent, i.e. will not be lost during power cycling.

RAM (On Board):

The CE panel has 64MB on board RAM. Out of this 32 MB is reserved for the OS, and the remaining 32 MB is available for Program as well as Storage memory. User can adjust the division between the program and storage. Please "System" under control panel later on in this manual.

On power-up, the OS is copied from on-board flash to RAM, and executed from there. All folders, except FLASH and Storage Card, reside in RAM. All folders in RAM are dynamically created on Power-up. RAM is volatile, i.e. the contents of this area are not retained during power cycling.

Storage Card- Compact flash (optional)

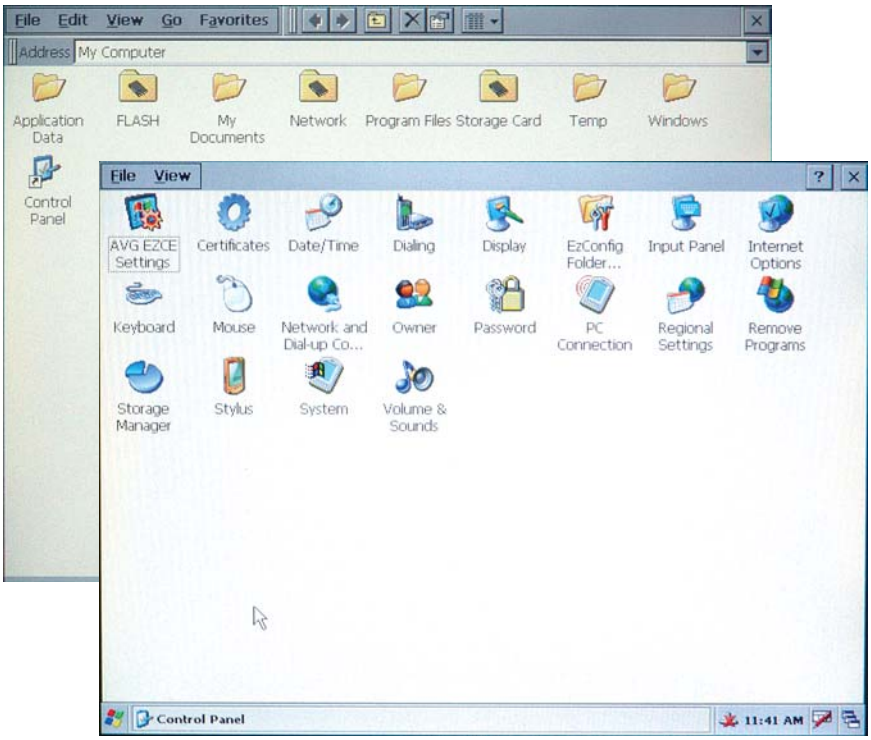
The CE Panel has a slot for optional compact flash card. You can use any off-the-shelf compact flash card in this slot. The compact flash card can be used to store user applications and data files. You can run an application stored on compact flash by double clicking it.
The compact flash module appears as "**Storage Card**" folder within "My Computer" window. If the card is not present, the **Storage Card** folder icon would also not be visible.

Path Names

CE does not support relative path or file names. Therefore an absolute path must be specified to access a file. For example if there is file called abc.txt on compact flash card's root folder, you must use **\Storage Card\abc.txt** as the file name. As another example if file hello.exe is in FLASH folder, use **\flash\hello.exe** to access this file.

Control Panel

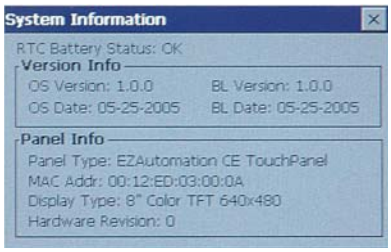
Control Panel like in desktop Windows provides many utilities to maintain the system. Control Panel is accessed through the “My Computer” icon or from Start>Settings>Control Panel.



Most of these icons are also found in the desktop windows, and work very similarly. Below is the description for *some* of the icons:

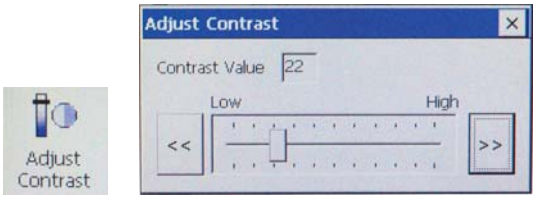
AVG EZCE Settings:

AVG EZCE Setting icon is the AVG specific icon that allows you to view information about the panel as shown below. The information include the Battery Status (Battery is used for real time clock only), OS version, and Panel Information including MAC-ID.



Contrast Adjustment

This is available only if the display is STN type. It allows you to change the contrast of the display.

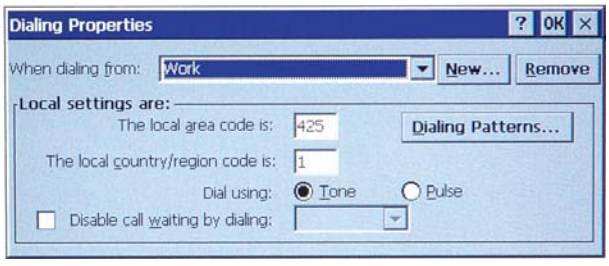


Date/Time:

This icon is used to set system date and time. The time is maintained by a real-time clock IC, which is battery backed. If the unit does not retain the date and time, please check the battery.

Dialing

Dialing icon allows you to define settings for Dialing, such as area code, tone or pulse dialing, etc.

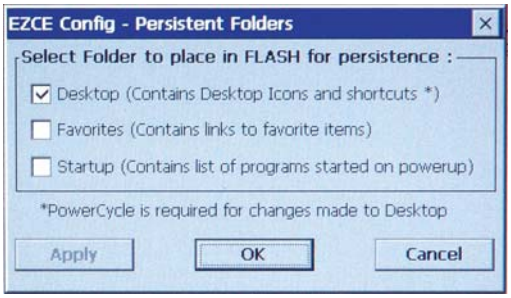


Display

The display icon allows you to manage several display related properties, such as background, appearance and backlight.

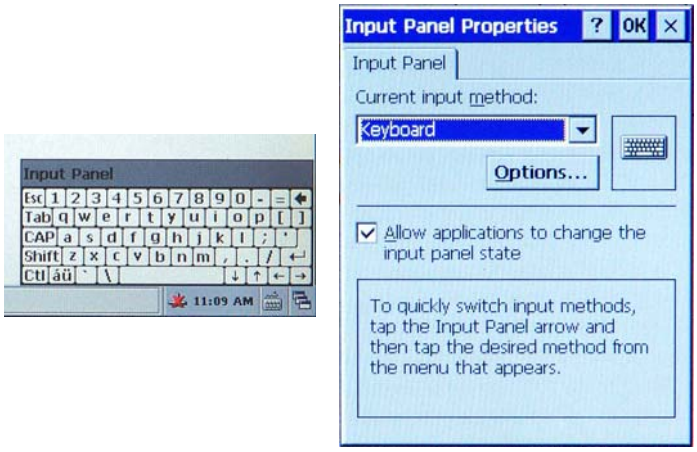
EZConfig Folder Setting

Windows CE normally creates Desktop, Startup and Favorites folders (amongst others) dynamically on power up and stores these in RAM. This utility allows users to determine the location of these three folders: FLASH or RAM. If you choose to store these folders in FLASH, then anything added to these folders would be retained through power cycle. For example if you create a short cut to an application stored in FLASH folder on Desktop, and the Desktop folder resides in FLASH, the application shortcut would be retained through power cycle.
(To create shortcut: Copy the application, and then right click on the desktop. Select create short cut from the right click menu.)



Input Panel

The CE panel provides a soft keypad (onscreen keypad) for entry. This icon allows you to edit certain properties of the keypad.



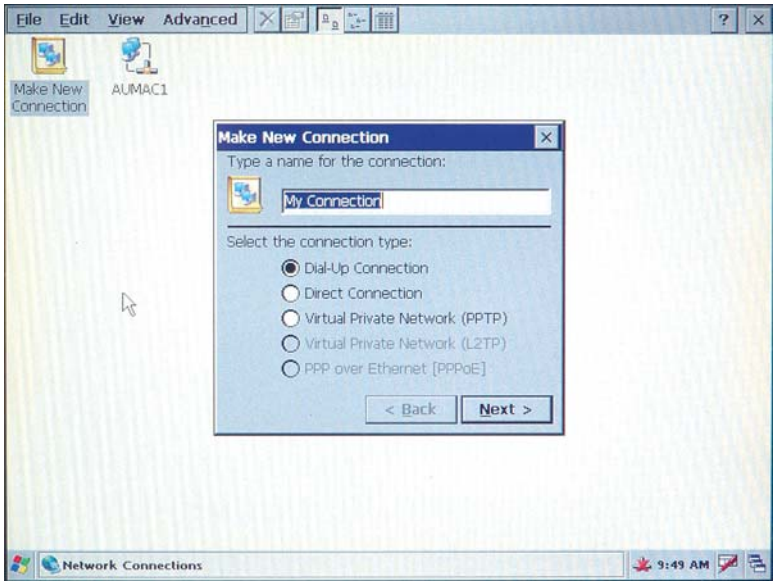
Internet Options

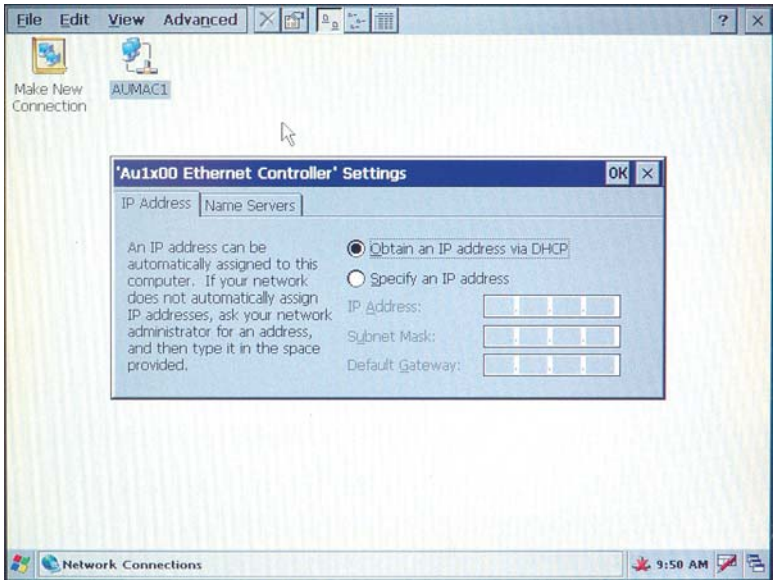
Internet Option icon allows you to define some internet related settings, such as Start page, Search page, Connection and Security.

Network and Dial-up Connection

This icon lets you define network connections, including TCP/IP, Static IP address or DHCP, name servers, etc.

For Ethernet connections settings, please click on the AUMAC1 icon to set IP addresses (DHCP or Static) as well as name servers.





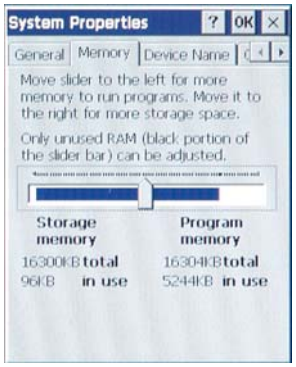
Stylus- Touch Screen Calibration

This icon is used to calibrate the Touch Screen. Click on the icon and follow the instructions on the screen. The touch screens are factory calibrated and you should not require calibrating it. However, if the touch screen appears to be off, please use this utility to calibrate the same.

System

This displays a variety of system information.

The memory tab shows how the available 32 MB Ram (32MB is reserved for OS out of total 64MB) is divided between Program and Storage. User can adjust this allocation by using the slider in the tab.



Registry

Registry data base in CE, like in desktop Windows, stores a variety of system and program related information. The CE panel supports persistent registry, i.e. the registry information is not lost when power is turned off. The registry information is stored in the on-board flash memory. Registry is recreated on power-up in RAM.

Ports

Com1

Com1 Port is a 9 pin RS 232 port. The Port has only RX, TX and GND wired. The other pins are not used, as shown below:

COM1 Port	
Pin #	RS-232C Connection
1	Do Not Use
2	TXD (RS-232C)
3	RXD (RS-232C)
4	Do Not Use
5	Logic GND
6	Do Not Use
7	Do Not Use
8	Do Not Use
9	Do Not Use

Com3

The COM3 port is a 15 pin port, which support RS232 and RS422. The Pins for the port are described below:

COM 3 Port	
Pin #	Connection
1	Chassis GND
2	PLC TXD (RS-232C)
3	PLC RXD (RS-232C)
4	+5V (100Ω)
5	Logic GND
6	LE
7	PLC CTS (RS-232C)
8	PLC RTS (RS-232C)
9	RXD+ (RS-422A)
10	RXD- (RS-422A)
11	TXD+ (RS-422A)
12	TXD- (RS-422A)
13	Terminating Resistor (connect to pin 9)
14	NC

USB Port

The EZCE Panel provides an USB port. The port supports only USB mouse and keyboards.

Ethernet Port

The panel provides one RJ45 connector for a 10/100MB Ethernet connection.

How to transfer files

User can transfer their files (data or application) to the CE panel in a variety of ways. Please note that only FLASH folder (and Storage Card) is non-volatile or persistent. Any thing copied to a folder in other than on FLASH (or Storage Card) will be lost on power-up.

Compact flash card

You can copy your files on a Compact Flash card from a PC using a compact flash card reader/writer. Then, plug in the compact flash card in the unit. The compact flash appears as “Storage Card” Folder within “My Computer” folder. You can copy files from the Storage Card folder and paste to the desired location on the CE panel (or vice verse).

Network

You can connect the CE panel to your local area network, and transfer the files from Network to the CE Panel.

As a default the EZCE Panel is setup as a DHCP client. So, if the CE panel is connected to a LAN with DHCP server, the panel would get its IP address and name servers from the DHCP server. If DHCP server is not available on the LAN, you can setup the CE panel for a static IP. Please see “Network and Dial-up Connection” under Control Panel section. You may click the Network Connection icon on task bar to view information about the network connection.

Once the CE panel is on your network, copy and paste the files between the network drives and CE panel.

How to run applications

Running an application in CE is similar to that of in Desktop Windows. You can run an application by any one of the following methods:

Desktop Icons:

Double click on a desk top icon to run application corresponding to the icon.

Start > Programs

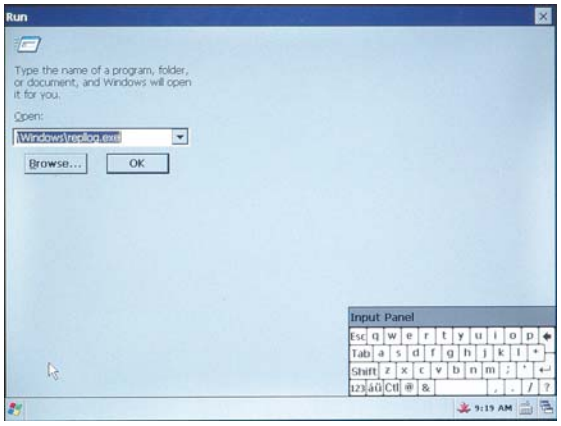
Click Start Symbol (Lower-Left corner of the display), then choose Programs and select the application to run from the list of Programs.

Browse

You can browse to the application through the My Computer folder and sub folders, and double click the application file to run it.

Run command

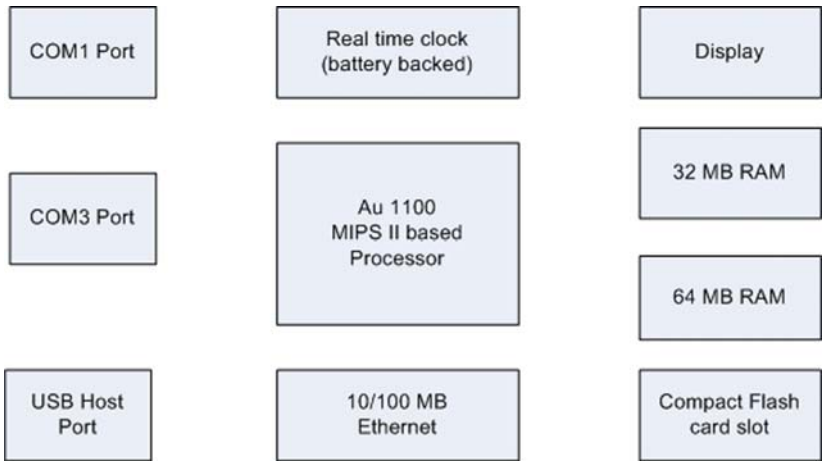
Click the Start symbol (Lower-Left corner of the display) and then select Run from the choices. Then Browse-to or type-in the application to run. Click OK to run it.



Windows CE Panel Information for Developers

Hardware Block diagram

The EZ-CE panel uses Alchemy Au1100 processor, which is based on MIPS II architecture. A block diagram of the panel is shown below:



As shown in the block diagram, the panel has 32 MB on-board NOR-Flash, 64 MB of on board RAM.

Application Development

You can develop applications for the EZCE panel using one of the following development environments:

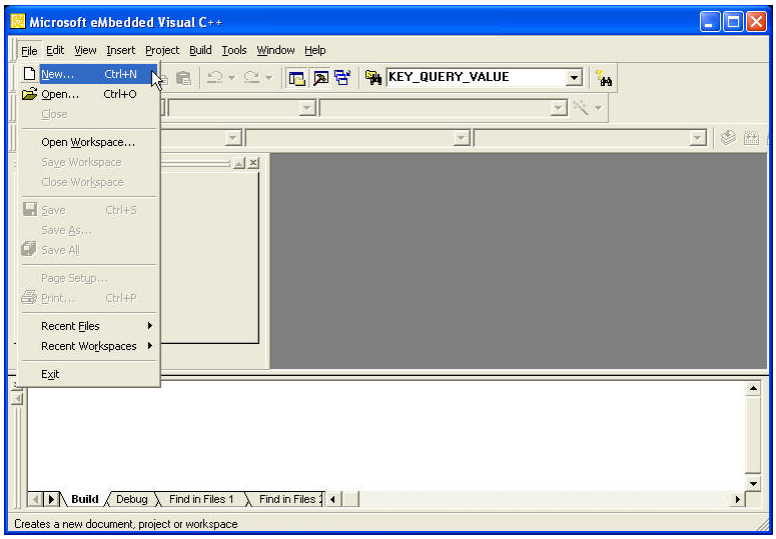
- **Embedded Visual C++ (eVC++)**
- **Visual Studio.net**

Developing applications using Embedded Visual C++

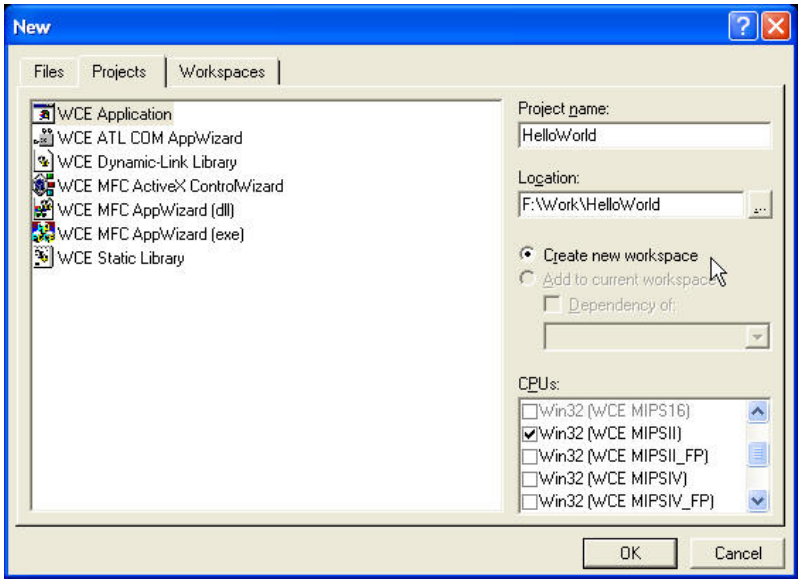
To use Embedded Visual C++, the EZCE SDK must be installed. AVG distributes the SDK file as EZCE_SDK.msi installer package file. To install the SDK within eVC++ environment, double click the file, and follow the instructions.

After installation, the SDK will add EZCE panel related options to the available platforms in eVC++.
To create a new project for the EZCE panel, use following steps:

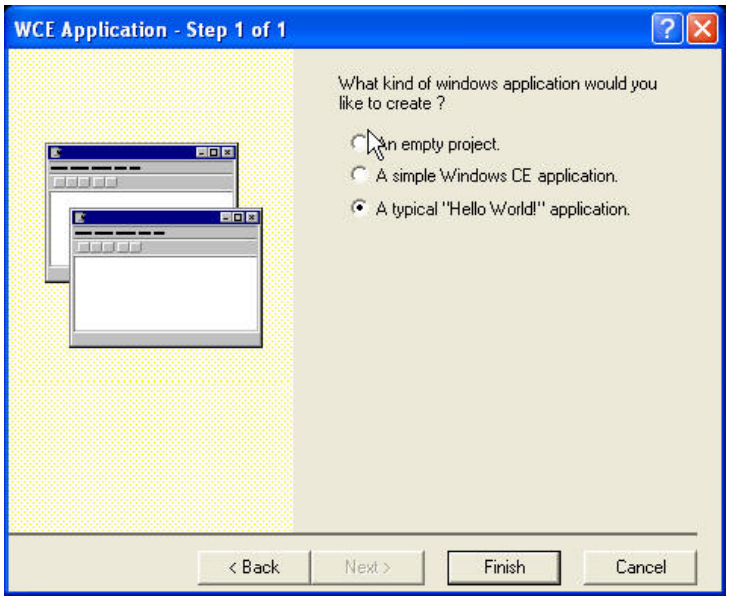
1. From the File Menu, select New:



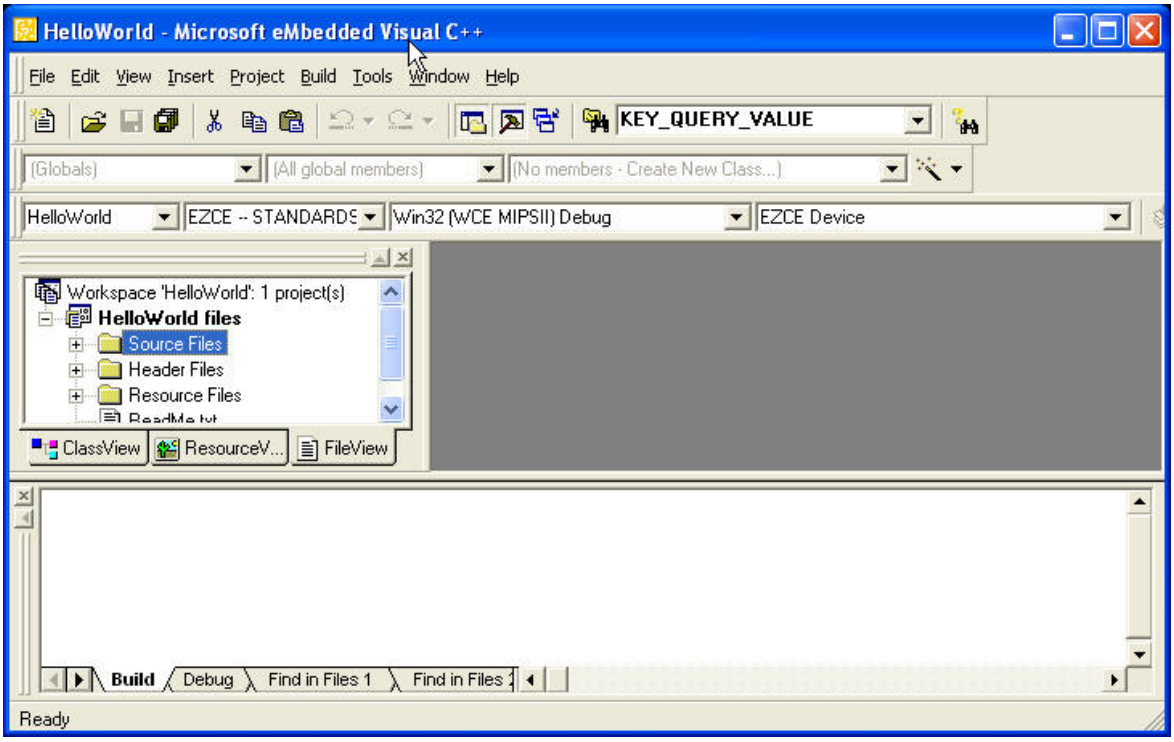
2. You will get the following dialog box. Select **Win32 (WCE MIPSII)** for CPU type, and appropriate Project type.



3. Make the desired selection here:



4. Select EZCE Platform as well as EZCE device.

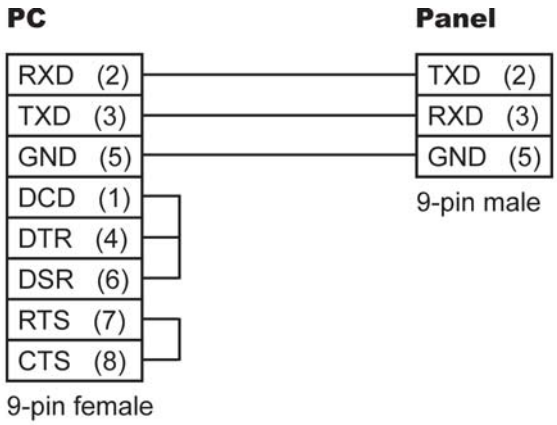


You are now ready to develop the application.

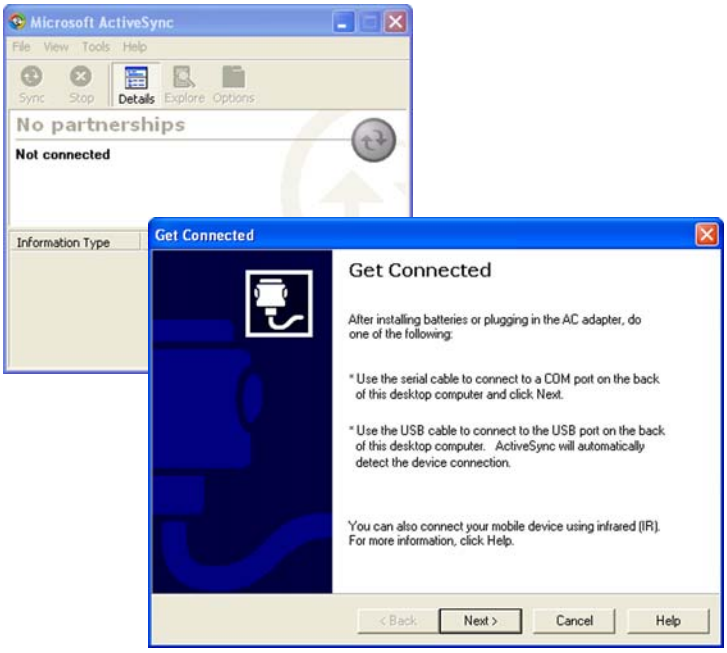
Debugging Applications using Embedded VC++

You can use Microsoft ActiveSync to debug eVC++ applications. Please follow these steps:

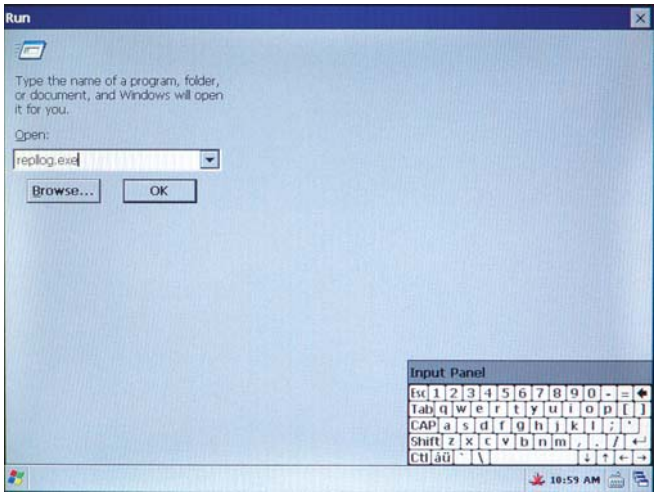
1. ActiveSync 3.5 or higher, and Embedded VC++ Version 4.0 or higher must be installed on the development PC.
2. Connect a RS232 debug cable between PC and CE panel. The debug panel must be wired as shown below:



3. Connecting:
   a. **On PC**, open ActiveSync, and select File>Get Connected from File menu. "Get Connected" dialog box appears.



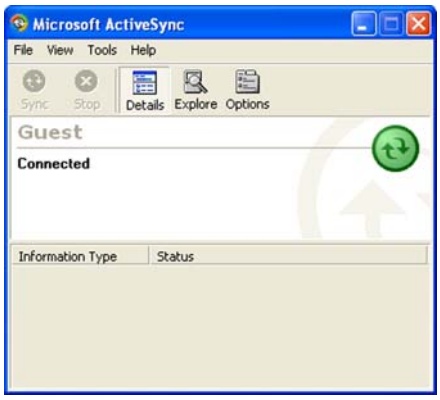
b. **On the CE Panel**, select Run from Start menu, and enter “repllog.exe” (without quotes).



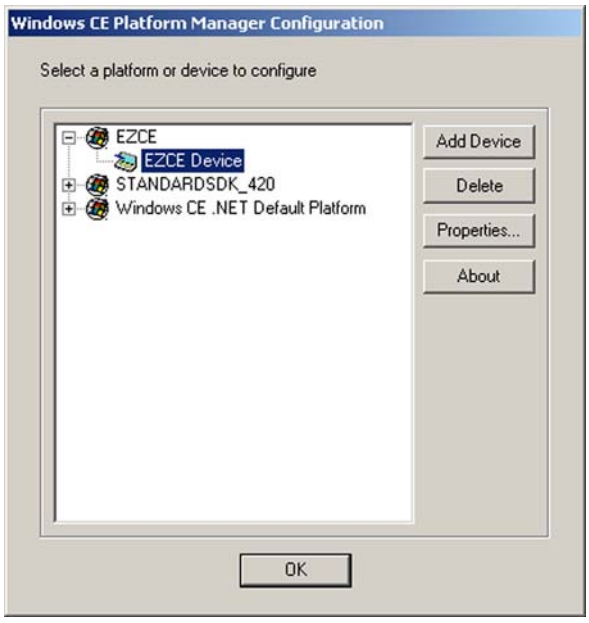
c. **On PC and CE Panel**, almost simultaneously click Next in the Getting connected dialog box on PC, and click OK in the run dialog box on CE Panel. (The two events must occur within 1-3 seconds of each other; otherwise one or the other side may timeout).

d. **On the PC**, you should see the “Setup a Partnership” dialog box. Select “No, I don’t want to synchronize information” option and click next.

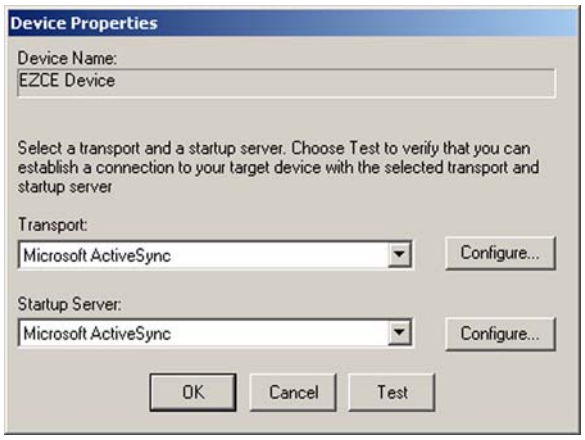
e. **On the PC**, the ActiveSync should now say “Guest connected”. You can minimize the ActiveSync now.



4. In Embedded Visual C++, go to Tools menu, and select “Configure Platform Manager.” Under the EZCE-Standard Platform, highlight “EZCE Device”, and click Properties.



5. You should now see the device properties dialog box. Verify that Microsoft ActiveSync is selected for Transport as well as for Startup Server.



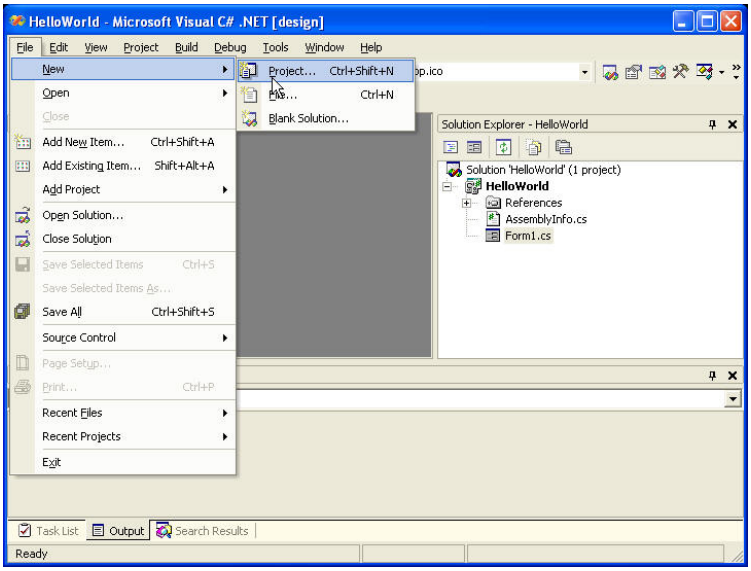
6. Click the Test button. "Testing Device Connection" dialog box will appear and would state that "Connection to device established." Click OK on all open dialog boxes.

7. You are now ready to debug with the embedded Visual C++. For more information or for help on how to debug using embedded VC++, please see the help in eVC++.

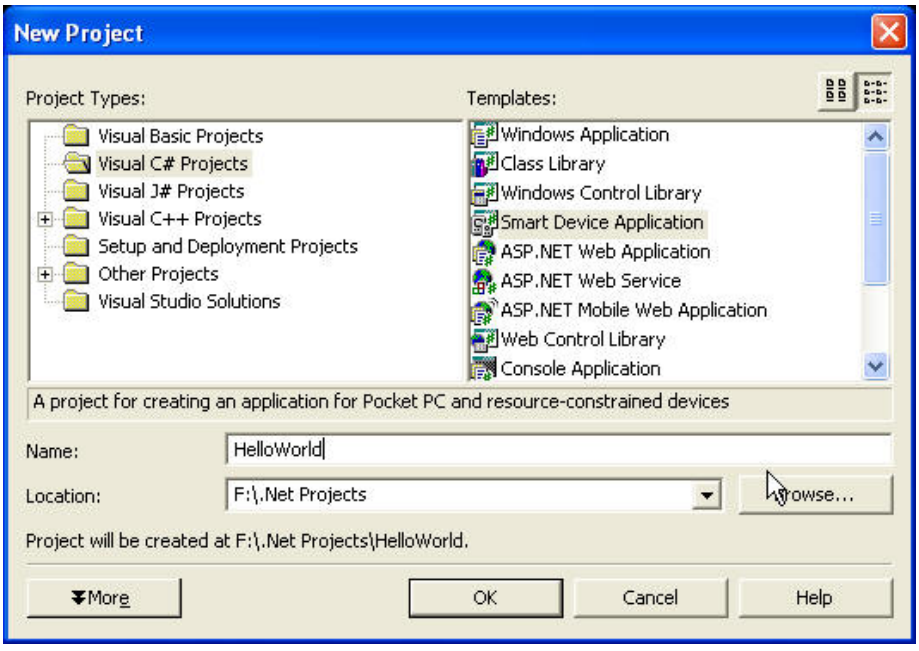
Developing Applications using Visual Studio.net 2003

To develop application in Visual Studio.net, please follow these steps:

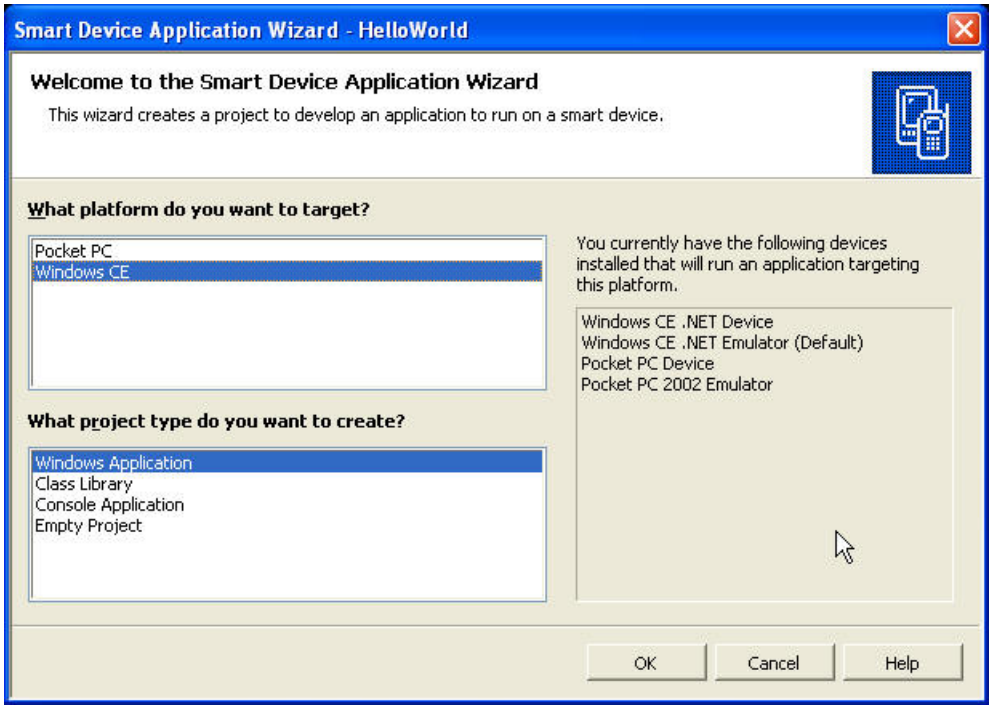
1. Select New in Visual Studio.net:



2. Select “Smart Device Application” template (available only for C# and AB).



3. Select Windows CE from the available choices. Make other choices as necessary.



You are now ready to start your application development.

AVG APIs

EZ Panel exposes certain APIs for developer's use. To use these API's please include AVG_API.h file in your code. The header file describes the prototypes of the API functions. Following are the contents of the header file:

```
// AVG_API.h

// The following ifdef block is the standard way of creating macros which make exporting
// from a DLL simpler. All files within this DLL are compiled with the AVG_API_EXPORTS
// symbol defined on the command line. this symbol should not be defined on any project
// that uses this DLL. This way any other project whose source files include this file see
// AVG_API_API functions as being imported from a DLL, wheras this DLL sees symbols
// defined with this macro as being exported.

#ifdef AVG_API_EXPORTS
#define AVG_API_API __declspec(dllexport)
#else
#define AVG_API_API __declspec(dllimport)
#endif


/*
// This class is exported from the AVG_API.dll
class AVG_API_API CAVG_API {
public:
      CAVG_API(void);
      // TODO: add your methods here.
};

extern AVG_API_API int nAVG_API;
*/

/*****************************************************************************
 * AVG_IncreaseContrast
 *
 * PARAMETERS
 *  amount    the amount the contrast will be increased by (1-99)
 *
 * FUNCTION
 *    Increase the current percent contrast by "amount" Note contrast can not
 *    be above 99. If the application tries to set contrast at a level higher
 *    than 99, the OS will set it to 99.
 *
 * RETURNS
 *    The percent contrast after being increased by "amount" (1-99)
 *****************************************************************************/
AVG_API_API unsigned int AVG_IncreaseContrast(unsigned int amount);




/*****************************************************************************
 * AVG_DecreaseContrast
 *
 * PARAMETERS
 *  amount    the amount the contrast will be decreased by (1-99)
 *
 * FUNCTION
 *    Decrease the current percent contrast by "amount" Note contrast can not
 *    be below 1. If the application tries to set contrast at a level below
```

```
 *    1, the OS will set it to 1.
 *
 * RETURNS
 *    The percent contrast after being decreased by "amount" (1-99)
 ****************************************************************************/
AVG_API_API unsigned int AVG_DecreaseContrast(unsigned int amount);



/****************************************************************************
 * AVG_GetContrast
 *
 * PARAMETERS
 *  none
 *
 * FUNCTION
 *    Gets the current percent contrast, 99 being the physical maximum, and 1
 *    being the physical minimum of the display
 *
 * RETURNS
 *    The percent contrast of the display (1-99)
 ****************************************************************************/
AVG_API_API unsigned int AVG_GetContrast(void);



/****************************************************************************
 * AVG_Enable485reciever
 *
 * PARAMETERS
 *  none
 *
 * FUNCTION
 *    turn on RS485 recieve durring transmit
 *
 * RETURNS
 *    none
 ****************************************************************************/
AVG_API_API void AVG_Enable485reciever(void);



/****************************************************************************
 * AVG_Disable485reciever
 *
 * PARAMETERS
 *  none
 *
 * FUNCTION
 *    turn off RS485 recieve durring transmit
 *
 * RETURNS
 *    none
 ****************************************************************************/
AVG_API_API void AVG_Disable485reciever(void);



/****************************************************************************
 * AVG_EnableBeeper
 *
 * PARAMETERS
```

```
 *  none
 *
 * FUNCTION
 *    turn on On-Board beeper
 *
 * RETURNS
 *    none
 ******************************************************************************/
AVG_API_API void AVG_EnableBeeper(void);


/******************************************************************************
 * AVG_DisableBeeper
 *
 * PARAMETERS
 *  none
 *
 * FUNCTION
 *    turn off On-Board beeper
 *
 * RETURNS
 *    none
 ******************************************************************************/
AVG_API_API void AVG_DisableBeeper(void);



/******************************************************************************
 * AVG_EnableCom1Debug
 *
 * PARAMETERS
 *  none
 *
 * FUNCTION
 *    enable com1 to be used for debug messages from OS.
 *
 * RETURNS
 *    none
 ******************************************************************************/
AVG_API_API void AVG_EnableCom1Debug(void);



/******************************************************************************
 * AVG_DisableCom1Debug
 *
 * PARAMETERS
 *  none
 *
 * FUNCTION
 *    disable com1 for debug messages from the OS.
 *
 * RETURNS
 *    none
 ******************************************************************************/
AVG_API_API void AVG_DisableCom1Debug(void);
```

```
/*****************************************************************************
 * AVG_Is_RTC_battery_OK
 *
 * PARAMETERS
 *  none
 *
 * FUNCTION
 *    test if the Real Time Cloack battery is OK or is at a low voltage state
 *
 * RETURNS
 *    1 - if RTC batery is OK
 *    0 - if RTC batery is low
 *****************************************************************************/
AVG_API_API unsigned int AVG_Is_RTC_battery_OK(void);
```