

ECER Technology
TiltCONTROL AND CONTROL-EMUL8R USER MANUAL



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1 Introduction

Welcome to the CONTROL-EMUL8R User Manual. The purpose of this manual will be to guide you through using the CONTROL-EMUL8R software for the first time, to using all of the advanced features of the software product. For a shorter introduction on how to use the CONTROL-EMUL8R, a Quick Start Guide is available from www.ECERTech.com, which covers the bare minimum needed to get started.

The TiltCONTROL and CONTROL-EMUL8R User Manual will cover the following sections in more detail.

- Getting Started
- How the CONTROL-EMUL8R Software operates
- Creating your own custom Plugins
- How to start emulating
- Managing Plugins
- Editing or creating a new Plugin
- Activating Program

2 Getting Started

By now you have probably purchased your new TiltCONTROL device and are ready to try it out with the CONTROL-EMUL8R software. If you haven't already purchased a TiltCONTROL device then I suggest that you do so, because this software is not nearly half as much fun without one.

Once you have read this guide you will be familiar with how the TiltCONTROL connects to your PDA, and the calibration process involved in getting set up for the first time. You will also be guided through the processes of Installing a Plugin, and Creating a Plugin for the CONTROL-EMUL8R with some examples.

2.1 Installing the TiltCONTROL Software Drivers

Now that you have unpacked your TiltCONTROL and are ready to get tilting, first you must install the TiltCONTROL software drivers on your PDA so it will recognize the TiltCONTROL. The software needed to use the TiltCONTROL can be downloaded from www.ECERTech.com/downloads.aspx. Once you have downloaded the latest version of the software, run the setup program and follow the installation steps provided.

2.2 Connecting the TiltCONTROL

Once you have installed the CONTROL-EMUL8R application software you will be ready to connect your TiltCONTROL device to your PDA and test out the software. Follow the steps below to test that your TiltCONTROL device is operational.

1. Turn your PDA on, and run the **EMUL8R Settings** application software by selecting **Programs** from the **START** menu, then select the **TiltCONTROL** folder then the **EMUL8R Settings** program icon.
2. Press the **TiltCONTROL Settings** button, then the **Manual Calibration** button.
3. Connect the TiltCONTROL device to the bottom of the PDA.
4. If your TiltCONTROL device is operational then you should be able to tilt the PDA and the values in the Sensor Readings section will change.

2.3 Calibrating the TiltCONTROL

Now that you know the TiltCONTROL is operational, you must calibrate it.

You can calibrate the TiltCONTROL device by using the Calibration Wizard or by using the Manual Calibration. It is recommended that you use the Calibration Wizard for the first time when calibrating, as it steps you through the calibration process. Once you know and understand the calibration process you can use the Manual Calibration process, because it is much faster and easier to perform.

2.4 The calibration process

The calibration process is a simple one and should only need to be performed once, when the TiltCONTROL device is first connected.

There are two ways to calibrate the TiltCONTROL, either via the Calibration Wizard or via the Manual Calibration.

The following sections will explain how to use both calibration methods.

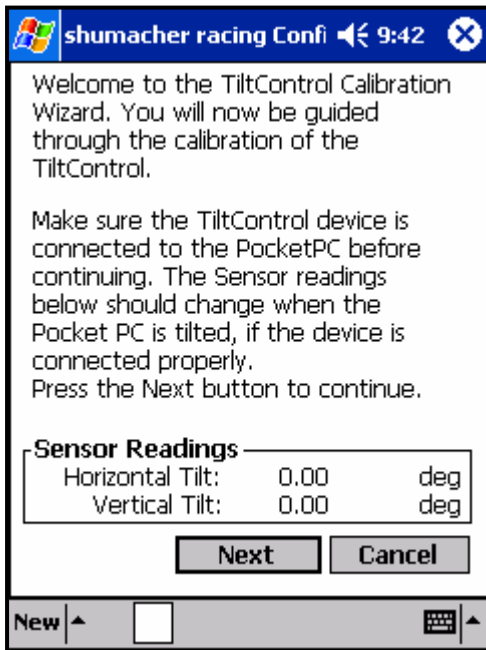
2.5 Using the Calibration Wizard

The Calibration Wizard will take you through the calibration process step by step. To start the Calibration Wizard press the **Calibration Wizard** button from within the **TiltCONTROL Settings** application. Each of the pages of the wizard is explained in detail in the following sections.

2.5.1 Welcome Screen

The Welcome screen as shown in **Error! Reference source not found.** will require you to verify that your TiltCONTROL device is actually connected to your PDA and that it is operating correctly. You will do this by tilting the device up and down and from side to side to verify that the **Sensor Readings** are changing with respect to the tilt of the device.

Figure 2-1 Welcome screen



Click the **Next** button once you have finished.

2.5.2 Zero G Calibrate Screen

The Zero G Calibrate screen as shown in Figure 2-2 is where you will calibrate the device for Zero G condition. Zero G condition is when the TiltCONTROL device is in the position where it should not experience any horizontal or vertical acceleration forces. This position is when the PDA and the TiltCONTROL device are placed on a flat surface so that the screen of the PDA is facing upwards and the axes of the Accelerometer in the TiltCONTROL are perpendicular to the earth's gravitational forces. The position that the PDA and TiltCONTROL should be positioned in for Zero G Calibration are shown in Figure 2-3.

Figure 2-2 Zero G Calibrate screen

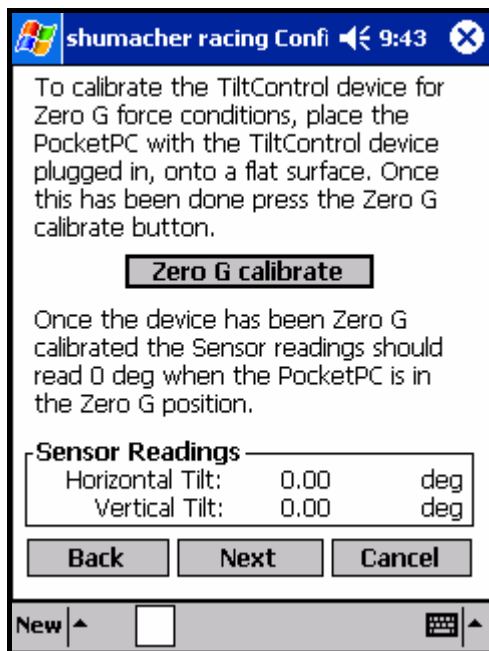


Figure 2-3 Zero G Position



Once you have placed the PDA and TiltCONTROL in the Zero G position, press the **Zero G Calibrate** button to calibrate the device.

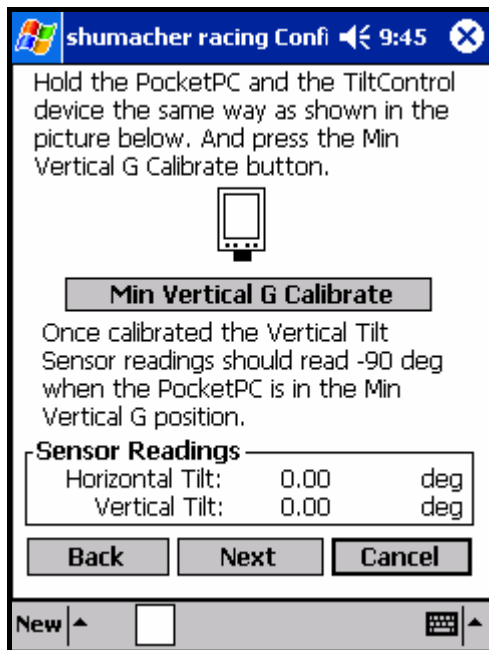
To test that the device has been correctly Zero G calibrated, place the PDA in the Zero G position and the **Sensor Readings** should read zero degrees. If they do not then repeat the process just described or contact ECER Technology for support.

Click the **Next** button once you have finished.

2.5.3 Minimum Vertical G Calibrate Screen

The Minimum Vertical G Calibrate screen as shown in Figure 2-4 is where you will calibrate the device for the Minimum Vertical G condition. The Minimum Vertical G condition is when the TiltCONTROL device is in the position where it should experience the greatest negative vertical acceleration force, which will be -1 G or -90 Degrees. This position is when the PDA and the TiltCONTROL device are held in the orientation shown in little picture above the **Minimum Vertical G Calibrate** button. Once you have placed the PDA and TiltCONTROL in the Minimum Vertical G position, press the **Minimum Vertical G Calibrate** button to calibrate the device.

Figure 2-4 Minimum Vertical G Calibrate screen



To test that the device has been correctly Minimum Vertical G calibrated, place the PDA in the Minimum Vertical G position and the sensor readings for the vertical tilt, should read -90 degrees. If it does not read the correct values then repeat the process just described.

Click the **Next** button once you have finished.

2.5.4 Maximum Horizontal G Calibrate Screen

Repeat the same process as explained for the Minimum Vertical G Calibrate screen, except hold the device in the same direction as shown in the little picture shown on the screen.

2.5.5 Maximum Vertical G Calibrate Screen

Repeat the same process as explained for the Minimum Vertical G Calibrate screen, except hold the device in the same direction as shown in the little picture shown on the screen.

2.5.6 Minimum Horizontal G Calibrate Screen

Repeat the same process as explained for the Minimum Vertical G Calibrate screen, except hold the device in the same direction as shown in the little picture shown on the screen-Test TiltCONTROL Screen

The Test TiltCONTROL screen as shown in Figure 2-5 is where you will test the calibration of the TiltCONTROL. If you press the Test TiltCONTROL button a screen will appear as shown in Figure 2-6. To test the operation of the TiltCONTROL an arrow will be displayed on the screen that will move around the screen when the device is tilted. The arrow should move in the direction that the device is tilted.

Figure 2-5 Test TiltCONTROL

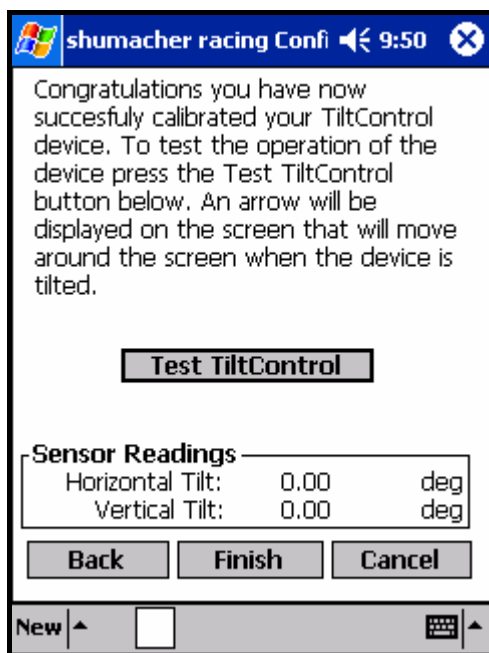
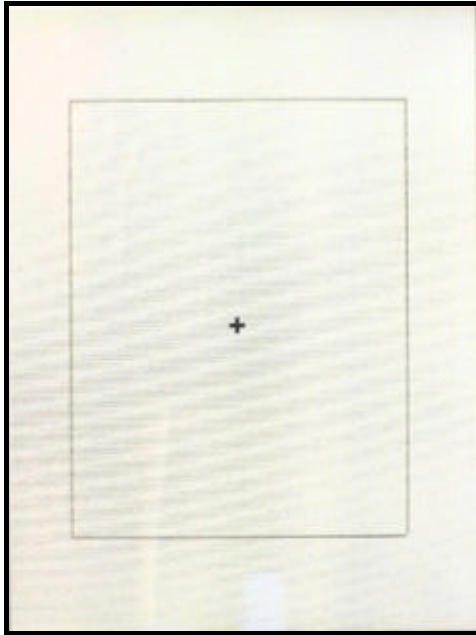


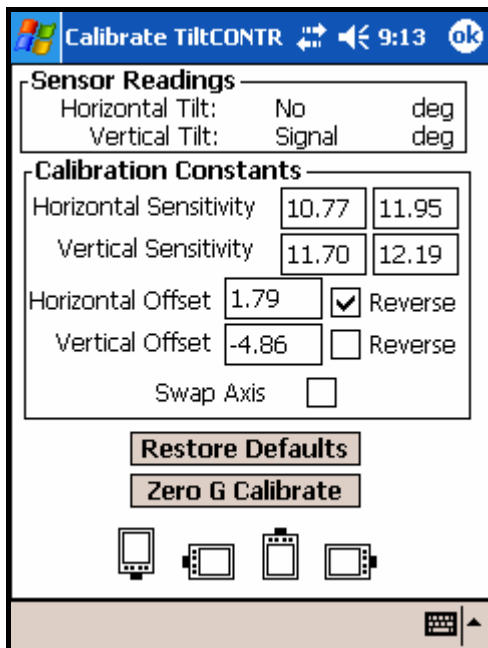
Figure 2-6 Test TiltCONTROL screen



2.6 Using the Manual Calibration

The Manual Calibration allows you to set the same values by pressing buttons as in the Calibration Wizard; however it also allows you to set the actual values for the calibration parameters that are used. To start the Manual Calibration press the **Manual Calibration** button from within the **TiltCONTROL Settings** application. The Manual Calibration screen will look like the screen shot shown in Figure 2-7. Each of the parameters of the Manual Calibration is explained in detail in the following section.

Figure 2-7 Manual Calibration screen



2.6.1 Horizontal and Vertical Sensitivity

The Horizontal and Vertical Sensitivity parameters are the parameters that are used to calibrate for maximum and vertical horizontal and vertical G positions.

The values on the left hand side of the two rows of parameters are used to set the minimum horizontal and maximum G positions respectively.

The values on the right hand side of the two rows are used to set the maximum horizontal and maximum G positions respectively.

You can either change these values manually or you can press the PDA position icons at the bottom of the screen to set the respective parameters. To use the PDA position icons to set the parameters simply place the PDA in the same orientation as shown in the icon, and press the icon. You should see a change in the parameter values when the icon is pressed.

2.6.2 Horizontal and Vertical Offset

The Horizontal and Vertical Offset parameters are the parameters that are used to calibrate for the Zero G position.

You can either change these values manually or you can place the PDA in the Zero G Calibrate position and press the Zero G Calibrate button.

3 How the CONTROL-EMUL8R Software operates

Now that you have calibrated the TiltCONTROL device it is time to get started with the fun stuff, setting up and using the CONTROL-EMUL8R software. The following sections of this manual will explain how the CONTROL-EMUL8R software operates, and how you can set it up to work with any application that uses the Stylus, D-PAD or Buttons.

CONTROL-EMUL8R is a program that runs all of the time, in the background on your PDA and monitors what program is currently being used. If you have a CONTROL-EMUL8R Plugin installed for a specific program, such as a game for example, and that game is running then the CONTROL-EMUL8R will load that Plugin and allow you to use the TiltCONTROL to control the program.

A CONTROL-EMUL8R Plugin specifies how the TiltCONTROL will control the PDA, for a specific application. It will specify whether the TiltCONTROL will emulate the arrow keys or the stylus to control the application, and what sensitivity levels and thresholds will be used for these controls. There are numerous Plugins already available for download from www.ECERTEch.com. And if you have an application that you want supported, please send an email to support@ecertech.com, and we will look into creating a Plugin for your application. Alternatively you can create your own Plugin using the Plugin Creator, which is installed with the CONTROL-EMUL8R. With the Plugin Creator you can start with an existing Plugin and modify it, or start with a completely blank framework. The following sections will explain in details how you can create your own Plugin.

When you first installed the CONTROL-EMUL8R you would have been asked if you would like to install the latest Plugins. If you selected YES, then the latest set of Plugins available from www.ECERTEch.com would have been installed on your PDA. If you selected NO then you will need to reinstall or go to www.ECERTEch.com and download and install one or more of the Plugins available.

- Once a Plugin has been installed, all that you need to do is start the application that the Plugin is setup for and insert the TiltCONTROL into your PDA. As soon as the program has been started the CONTROL-EMUL8R will detect the application is running and start controlling the PDA with the TiltCONTROL.

NOTE: You will still be able to control your PDA with normal controls swell.

- As a simple example, to test out the operation of the TiltCONTROL and the CONTROL-EMUL8R, try the Notes Plugin. The Notes Plugin can be downloaded from www.ECERTEch.com, or it would have been installed on your PDA if you selected to install the latest Plugins at install time.
- The Notes Plugin will start emulating the stylus when a new note is opened in Notes.
- To test the Notes Plugin, simply start up Notes, open a new note and insert the TiltCONTROL into the PDA. You should be able to move the PDA around and see the lines appear as if you were using the stylus.
- If the PDA is not responding to the TiltCONTROL's movements then it may be because of one of the following:
 - Check that the CONTROL-EMUL8R is not disabled, by launching **EMUL8R Settings**, which can be done by selecting **Start->Programs->TiltCONTROL->EMUL8R Settings**, and making sure that the **Disable CONTROL-EMUL8R** checkbox is not selected.
 - Check that the Plugin has been installed correctly by launching **EMUL8R Settings**, pressing the **Manage Plugins** button and making sure that the installed Plugin is listed.

- Check that the installed Plugin is not disabled, finding the Plugin in the list of **Installed Plugins** and making sure that the Disabled flag is set to **F**.

TIP: It is recommended to have the TiltCONTROL disconnected if the CONTROL-EMUL8R is emulating the stylus, and you also want to use the stylus yourself, or else it will conflict with you trying to use the stylus to select items.

3.1 How does the CONTROL-EMUL8R work

First of all it is a good idea to understand the theory behind how the CONTROL-EMUL8R Plugins work. Once you understand the basics of how and why the CONTROL-EMUL8R software emulates the controls the way it does, it will make it a lot simpler and easier for you to create and edit your own Plugins.

The CONTROL-EMUL8R software uses the sensor readings from the TiltCONTROL to emulate one of the several Human User Interface devices available on your PDA. These Human User Interface devices include the Stylus, the D-PAD (or the arrow keys on your virtual keyboard) and the hardware buttons or keys available on your PDA and virtual keyboard.

The CONTROL-EMUL8R software does this by sampling the sensor readings from the TiltCONTROL at a rate that can be specified by you within the calibration process, then converting the sensor readings into a control percentage, which is calculated based on different control parameters that you will specify during the setting up of the CONTROL-EMUL8R. This control percentage is then used to emulate the control type that you choose to emulate.

Q. So how is the control percentage calculated from the sensor readings, and how does the control percentage relate to the control of the emulated Human User Interface?

A. Lets take a look at the sensor readings first. If the device is tilted to the left, which is along the horizontal axis, then the Horizontal sensor reading will be a negative value, representing a degree of tilt in the negative direction. Conversely if the device is tilted to the right, which is also along the horizontal axis, then the horizontal sensor reading will be a positive value, representing a degree of tilt in the positive direction. This is also the same for tilting the device up and down, which is along the vertical axis where tilting the device up gives a positive vertical sensor reading and tilting the device down gives a negative vertical sensor reading.

Once the sensor readings are known, the control percentage can be calculated. The details of the how the control percentage is calculated will be explained a little later, however the basic relationship between the sensor readings and the control percentage will be explained now.

In the most simple case if the vertical or horizontal sensor reading is zero then the vertical or horizontal control percentage will also be zero respectively, and if the sensor reading is negative then the control percentage will be negative and vice versa for positive readings. In most other cases the control parameters, that you must specify when creating a CONTROL-EMUL8R Plugin, will introduce more complexity into the control percentage calculation, however the same principles will apply, that the control percentage will be proportional to the sensor readings.

3.1.1 Calculating the Control Percentage

Q. So how is the control percentage calculated?

A. First of all we need to look at the parameters that affect the calculation of the control percentage. Then we need to look at how the control percentage is used to emulate each different type of control type.

3.1.2 Parameters of each type of Control Emulation

Table 3-1 describes each of the parameters that are used when calculating the control percentage from the sensor readings. These parameters are set when you go through the emulation set up process.

Table 3-1 Control Percentage Parameters

Control Emulator Parameter	Description	Units
Horizontal Zero Control angle	This is the horizontal angle at which the PDA is held that results in zero horizontal control percentage.	Degrees
Vertical Zero Control angle	This is the vertical angle at which the PDA is held that results in zero vertical control percentage.	Degrees
Horizontal Control Sensitivity	This is the sensitivity of the horizontal control. It is measured in degrees per 100% control percentage. The greater the sensitivity the less of a tilt angle is required of the PDA to result in 100% control percentage.	Degrees / 100%
Vertical Control Sensitivity	This is the sensitivity of the vertical control. It is measured in degrees per 100% control percentage. The greater the sensitivity the less of a tilt angle is required of the PDA to result in 100% control percentage.	
Minimum Horizontal Threshold	This is the horizontal control percentage threshold at which the control percentage will read above zero. If the calculated control percentage is less than the minimum threshold then the control percentage will be set to zero else it will be equal to the calculated control percentage minus the minimum threshold.	%
Maximum Horizontal Threshold	This is the maximum horizontal control percentage threshold. If the calculated control percentage is greater than the maximum threshold then the control percentage will be set to the Maximum Horizontal Threshold.	%
Minimum Vertical Threshold	This is the vertical control percentage threshold at which the control percentage will read above zero. If the calculated control percentage is less than the minimum threshold then the control percentage will be set to zero else it will be equal to the calculated control percentage minus the minimum threshold.	
Maximum Vertical Threshold	This is the maximum vertical control percentage threshold. If the calculated control	

	percentage is greater than the maximum threshold then the control percentage will be set to the Maximum Horizontal Threshold.	
Horizontal Control Offset	This is the control percentage offset that will be applied to the calculated horizontal control percentage.	%
Vertical Control Offset	This is the control percentage offset that will be applied to the calculated vertical control percentage.	
Reverse Horizontal Control	If this is set to true then the horizontal control percentage will be reversed.	Boolean
Reverse Vertical Control	If this is set to true then the vertical control percentage will be reversed.	Boolean
Disable Horizontal Control	If this is set to true then the horizontal control percentage will be disabled and always set to zero.	Boolean
Disable Vertical Control	If this is set to true then the vertical control percentage will be disabled and always set to zero.	Boolean
Digital Filter Length	The Digital Filter Length will set the length of the digital filter that is used to filter the TiltCONTROL readings. The longer the digital filter length the more stable the control will be. The shorter the length the more responsive the TiltCONTROL will be.	

Now that the control emulation parameters have been introduced let us now look at the different types of control types and how the control percentage is used to emulate that type.

3.1.3 Different types of Control Emulation explained

There are two main types of control that can be emulated, and each type of control can also be broken up into a slightly different control again, these are shown in Table 3-2. Along with the different types of control type, each control type can be emulated in a different way which is referred to as the emulation method which is also listed in Table 3-2.

Table 3-2 Different Control types

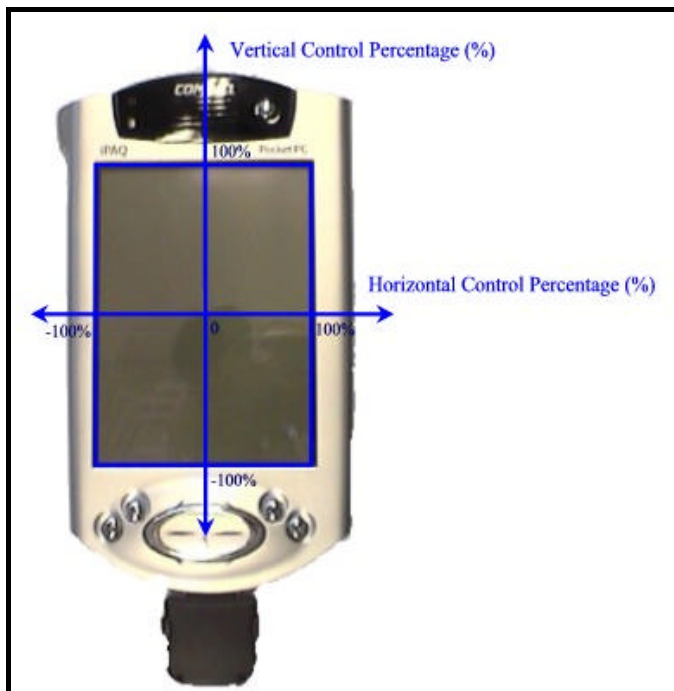
Control Type		Description	Emulation Methods	Description
Stylus		The stylus control type is the control type that emulates the use of the stylus on the PDA touch screen.	Continuous	Continuous stylus emulation is the method used to simulate the user pressing the stylus down once, and then dragging it around the screen.
			Discrete	Discrete stylus emulation is the method used to simulate the user tapping and releasing the stylus as it is moved around the screen.
Button	D-PAD or Arrow keys	The Button control type is the control type used to emulate any of the buttons or keys on the device. For example it can be used to emulate the arrow keys or the D-PAD on an IPAQ. It can also be used to emulate any of the other keys on the keyboard or any other hardware keys.	Frequency	Frequency modulation emulates the pressing of the button at a frequency, which increases as the control percentage increases.
			PWM	PWM (Pulse Width Modulation) emulates the pressing of the button at a Duty Cycle, which increases as the control percentage increases.
	Custom Button		On/Off	On/Off modulation emulates the button turning on when the control percentage reaches a threshold, and turning off when it is below the threshold.

Each type of control type and respective emulation method that is available for control emulation is explained in detail in the following sections.

3.1.3.1 Stylus Control types

The Stylus Control Type is probably the easiest to explain, setup and use of all of the control types, and provides for the most intuitive control of your PDA. If you take a look at Figure 3-1 you will see a picture of a PDA screen. You will notice that it is divided up into a two dimensional axis, where the X axis is named the Horizontal Control Percentage Axis and the Y Axis is named the Vertical Control Percentage Axis. Each axis is in units of percentage. The intersecting point of the axis is where zero Horizontal Control Percentage and zero Vertical Control Percentage is at, and this is called the Zero Control position.

Figure 3-1 Control Percentage Axis

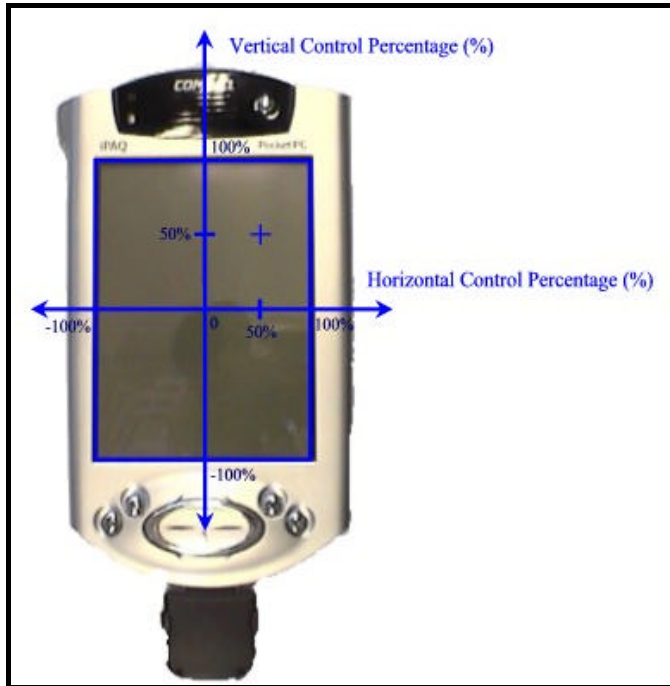


The way that the stylus control emulation works is that it takes the horizontal and vertical sensor readings and calculates the control percentage based on the configuration settings that you have entered, (which will be explained a little later) and converts that control percentage into screen coordinates and emulates a stylus tap at that screen position.

Q. So how does the control percentage relate to the calculated screen coordinate for the stylus tap?

A. Once the control percentage has been calculated it is converted into a screen coordinate which is directly related to the two dimensional axis overlaid onto the PDA screen as shown in Figure 3-1, where the screen coordinates are the same position as where the horizontal and vertical control percentage meet on the graph. Figure 3-2 shows an example for 50% Horizontal Control percentage and 50% Vertical Control percentage.

Figure 3-2 50% horizontal and vertical control percentage



3.1.3.1.1 Stylus Control Emulation methods

There are two types of emulation method for the stylus control. These are Continuous and Discrete.

The Continuous stylus emulation method emulates the user pressing the stylus against the PDA screen and holding it down while it is moved around the screen. There are no additional parameters that need to be set for the continuous stylus modulation method during the configuring of the control emulation software.

The Discrete stylus modulation method emulates the user tapping the stylus against the screen at the calculated screen coordinate at a set frequency. The parameters that must be set by the user when configuring the control emulation software are shown in Table 3-3.

Table 3-3 Discrete stylus control emulation parameters

Parameter	Description	Units
Stylus Hold Time	The total time that the emulated stylus is held down before it is released.	Seconds
Stylus Tap Frequency	The total number of times that the emulated stylus will tap the screen per second.	Taps per second

3.1.3.2 Button (D-PAD or Arrow keys, and Custom Button) Control types

The Button control type is a little more involved to set up and fine tune. The Button control type either emulates the D-PAD (which essentially is just the arrow keys on the virtual keyboard) or any of the custom buttons that you can specify such as any of the application launch buttons on your PDA. These control types can be emulated with a number of different methods. But basically there is always four buttons associated with the Button control type.

When using the D-PAD control type the pressing of the D-PAD in the left, right, up and down directions needs to be emulated.

When using the custom control buttons the pressing of each of the four assigned custom buttons needs to be emulated.

Q. So how does the TiltCONTROL emulate the buttons?

A. This depends on the emulation method chosen. The basic principle is that the button that is emulated being pressed is mapped to a direction of tilt of the device. Table 3-4 lists the button which is emulated based on the angle and direction of tilt.

Table 3-4 Emulated button based on direction of angle of tilt

Button	Direction of Tilt
Left	Negative horizontal tilt
Right	Positive horizontal tilt
Up	Positive vertical tilt
Down	Negative vertical tilt

The way the emulated button is emulated is based on the emulation method, but basically the greater the control percentage the more times per second the button will be pressed and or the longer it will be held down.

Let us now have a look at each of the emulation methods, and how each one uses the control percentage to emulate the button control.

3.1.3.2.1 D-PAD or Arrow keys, and Custom Button Emulation methods

There are three types of emulation method for the Button control. These are

- Frequency Modulation
- Pulse Width Modulation (PWM) and
- On / Off Modulation

Frequency modulation emulates the control by emulating the pressing of the button faster as the control percentage increases.

If you choose to use Frequency Modulation to emulate the Button control type, it is the same as when you use the buttons by pressing them faster to get more movement of the object that you are controlling.

The parameters that must be set when configuring for frequency modulation are shown in Table 3-5.

Table 3-5 Frequency emulation parameters

Parameter	Description	Units
Button Hold Time	The total time that the emulated button is held down before it is depressed.	Milliseconds
Max button Press Frequency	The maximum number of times that the pressing of the button will be emulated at maximum control percentage.	Taps per second

Pulse Width Modulation emulates the control by emulating the holding the button down for longer and releasing it for less time as the control percentage increases. This increases the duty cycle of the Pulse Width Modulation as the control percentage increases.

The parameters that must be set when configuring for Pulse Width Modulation are shown in Table 3-6.

Table 3-6 Pulse Width Modulation emulation parameters

Parameter	Description	Units
100% Duty Cycle	The 100% duty cycle time is the sum of the times that the button is held down and let go. The total time that the device is held down increases as the control percentage increases.	Milliseconds

On / Off Modulation emulates the control by emulating the holding the button down if the control percentage is not zero. So basically if the device is tilted past a certain threshold causing a control percentage other than zero to be calculated then the button in the direction of the control percentage will be held down until the control percentage is zero or changes direction.

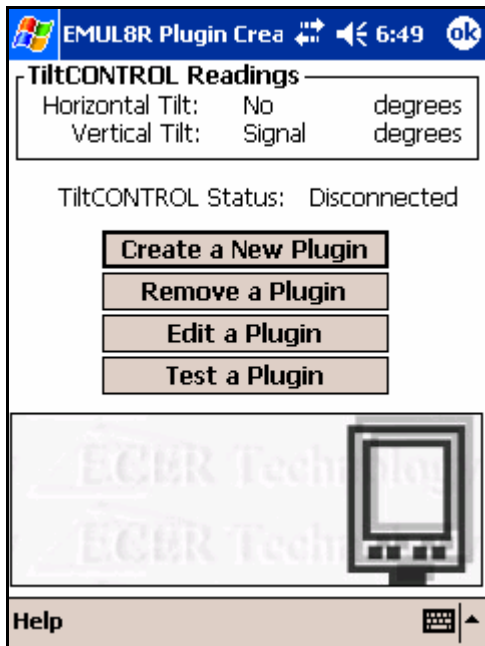
There are no extra parameters that must be set when configuring for On / Off.

4 Creating your own custom Plugins

To create or edit a Plugin you must start the **Plugin Creator** application on your PDA, which can be accessed from the **Programs\TiltCONTROL** folder.

Once the **Plugin Creator** application has been started you will be shown the screen in Figure 4-1 Plugin Creator.

Figure 4-1 Plugin Creator



Select the **Create a New Plugin** button.

You will be prompted whether you would like to start with a blank Plugin or an existing Plugin. Once you have selected one of these options you will be asked to enter the name and some comments about the Plugin that you are about to create. Once entered press the **OK** button.

There are two ways in which you can create a Plugin. The Advanced method or the Wizard method.

It is recommended that you use the Wizard method for the first time when configuring for control emulation, as it steps you through the process. Once you know and understand the process you can use the Advanced method, because it is much faster and easier to perform.

If you want to skip all of the boring stuff and get straight into using the TiltCONTROL, go to www.ECERTech.com and follow the links to the Plugin Library. The Plugin Library contains a collection of Plugins that can be installed directly onto your PDA.

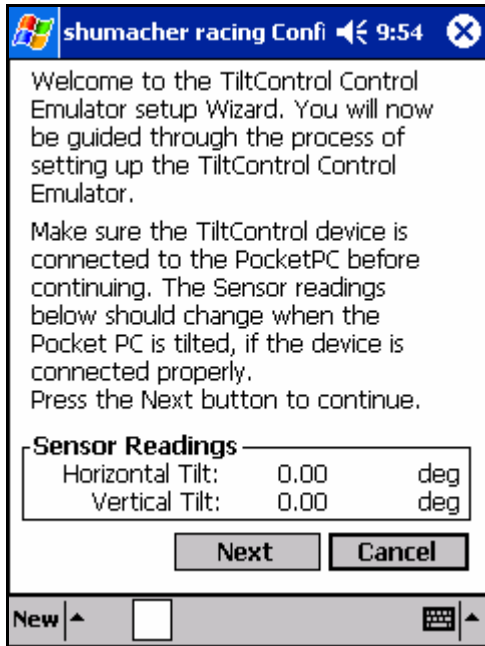
4.1 Using the Wizard method

The Wizard method will take you through the control emulation setup process step by step. Each of the pages of the Wizard is explained in detail in the following sections.

4.1.1 Welcome Screen

The Welcome screen as shown in Figure 4-2 will require you to verify that your TiltCONTROL device is actually connected to your PDA and that it is operating correctly. You will do this by tilting the device from side to side and up and down to verify that the **Sensor Readings** are changing with respect to the tilt of the device.

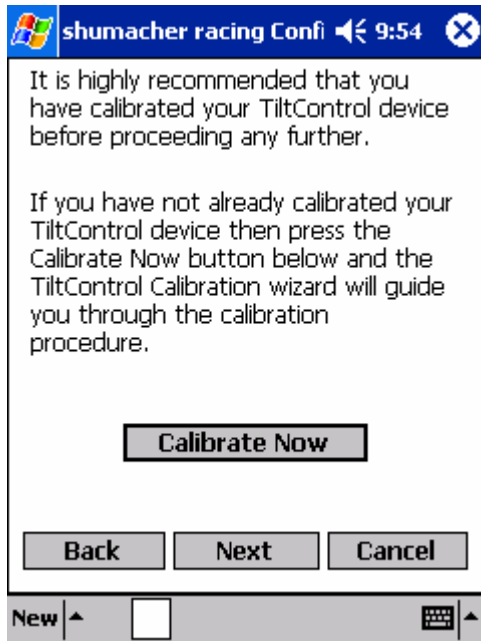
Figure 4-2 Control emulator wizard Welcome screen



Click the **Next** button once you have finished.

4.1.2 Calibrate Recommendation Screen

The Calibrate Recommended screen as shown in Figure 4-3 will give the option to calibrate your TiltCONTROL device if you have not already done so.

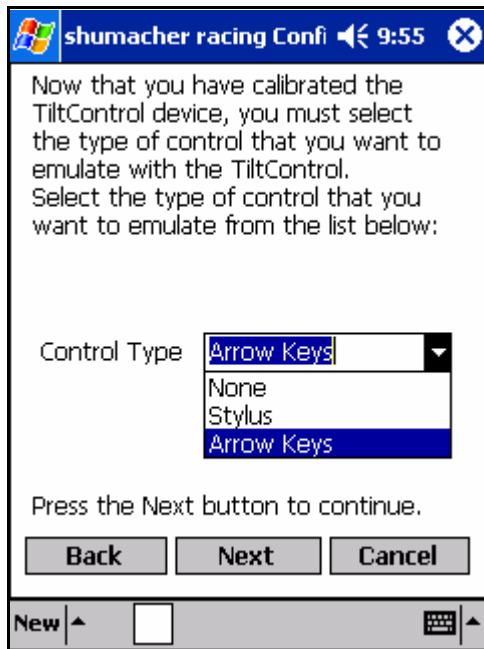
Figure 4-3 Calibrate recommended screen

Click the **Next** button once you have finished.

4.1.3 Control Type selection Screen

The Control Type selection screen as shown in Figure 4-4 is where you must select the Control type that you would like to emulate. You must choose either Arrow Keys or Stylus. From here on the set up process is different depending on whether you choose Stylus or Arrow Keys as your Control type. First the setting up of the Stylus Control Type will be explained followed by the Arrow Keys set up.

Figure 4-4 Control Type selection screen

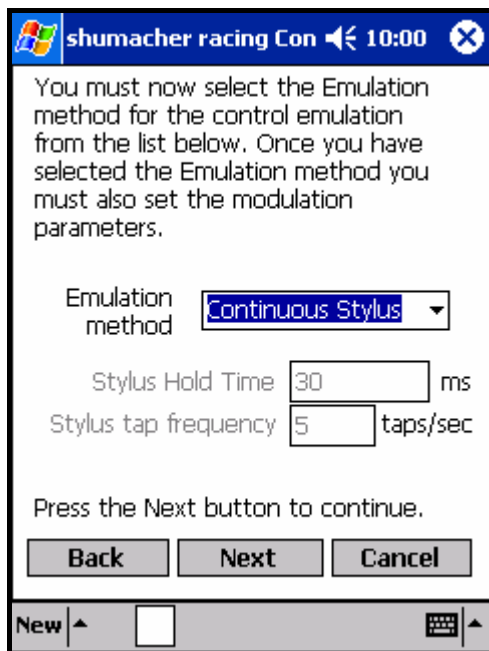


4.1.4 Emulation method and parameters screen (Stylus Control type)

The Emulation and parameters screen for the Stylus Control type is shown in Figure 4-5. You must select the Continuous Stylus or Discrete Stylus Emulation method. If you choose the Continuous emulation method then you will not need to set any additional parameters and you can proceed to the next screen.

If you choose the Discrete emulation method then you will need to set the Stylus Hold Time parameter before continuing.

Figure 4-5 Emulation Parameters screen



Press **Next** once you have finished.

4.1.5 Select Control Area screen (Stylus Control type)

The Select Control Area screen as shown in Figure 4-6 is where you select the area of the screen that you want the Stylus to be bound to. If you press the **Select Control Area Now** button you will be presented with a screen as shown in Figure 4-7.

Figure 4-6 Select Control area screen

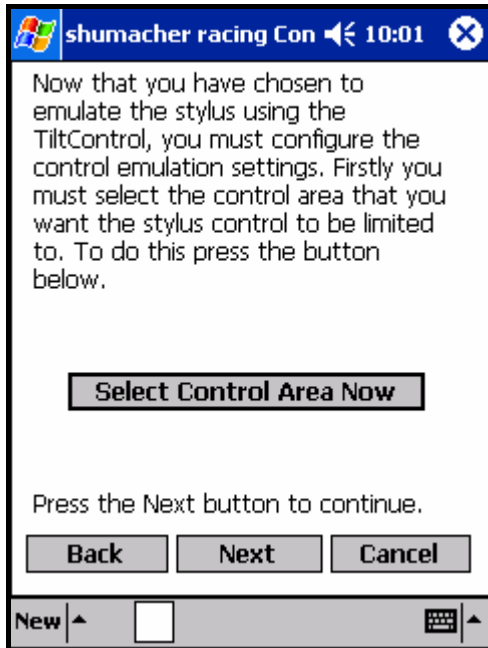
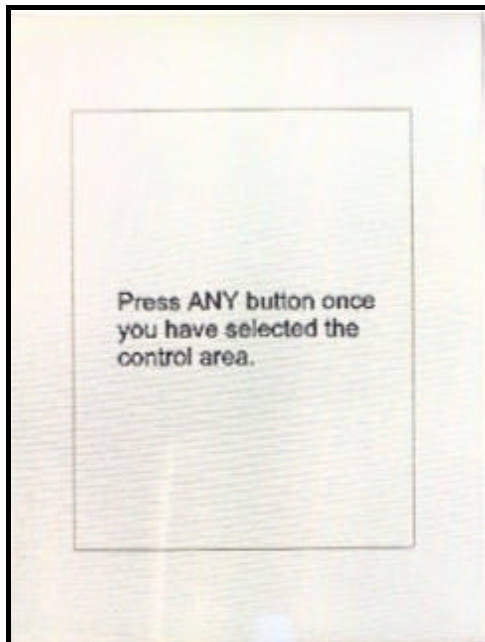


Figure 4-7 Select Control area

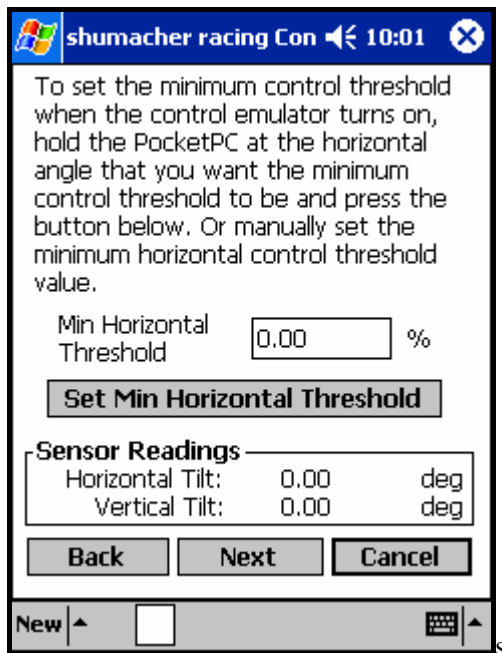


This screen is where you can graphically select the Control Area. Simply draw a box for the perimeter of where you would like the Stylus control to stay within. Press any button to exit. Press **Next** once you have finished.

4.1.6 Set Min Horizontal Threshold screen (Stylus Control type)

The Set Min Horizontal Threshold screen as shown in Figure 4-8 is where you select the threshold control percentage for when you would like the CONTROL-EMUL8R software to actually start emulating. To set the minimum horizontal threshold, hold the device at the angle that you would like it to be at and press the **Set Min Horizontal Threshold** button.

Figure 4-8 Set Min Horizontal Threshold

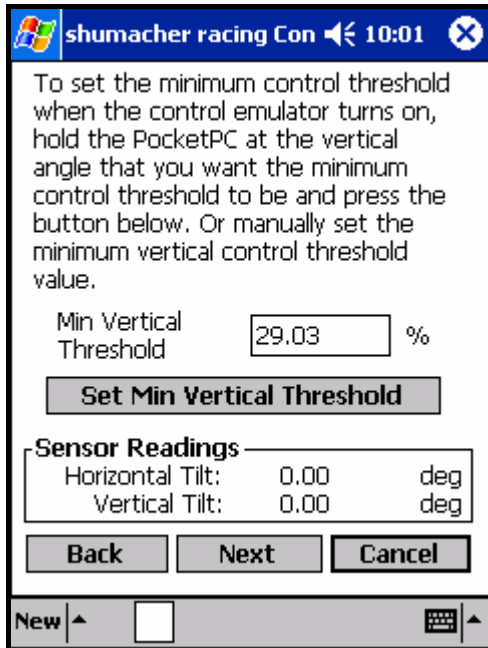


Press **Next** once you have finished.

4.1.7 Set Min Vertical Threshold screen (Stylus Control type)

The Set Min Vertical Threshold screen as shown Figure 4-9 is where you select the threshold control percentage for when you would like the CONTROL-EMUL8R software to actually start emulating. To set the minimum vertical threshold, hold the device at the angle that you would like it to be at and press the **Set Min Horizontal Threshold** button.

Figure 4-9 Set Min Vertical Threshold

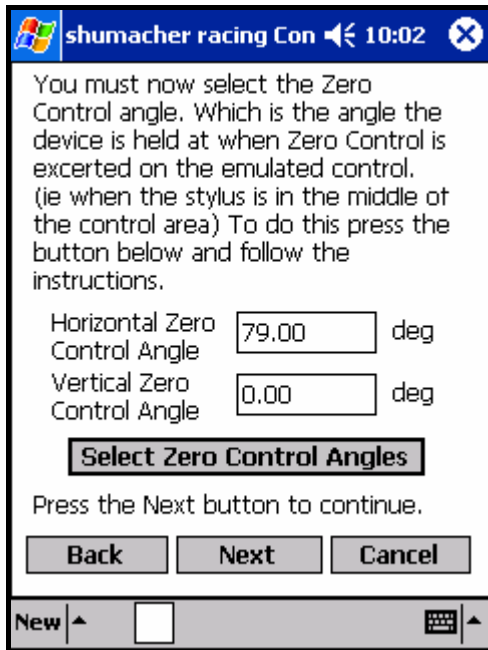


Press **Next** once you have finished.

4.1.8 Select Zero Control Angles screen (Stylus Control type)

The Select Zero Control Angles screen as shown in Figure 4-10 is where you can set the Zero Control Angles. The Zero Control Angles are the horizontal and vertical angles that you hold the device at to get Zero Control Percentage. To set the Zero Control Angles, hold the device at the position that you would like the Zero Control Angles to be at and press the **Select Zero Control Angles** button. Alternatively you can set the parameters manually by entering them in the fields provided.

Figure 4-10 Zero Control Angles screen



Press **Next** once you have finished.

4.1.9 Select Control Sensitivity screen (Stylus Control type)

The Select Control Sensitivity screen as shown in Figure 4-11 is where you can set the sensitivity of the emulated control. If you press the **Select Control Sensitivity** button you will be shown with the screen shown in Figure 4-12. This is where you can graphically set the Control Sensitivity. To set the Control Sensitivity of each axis simply slide the sliders to increase or decrease the sensitivity. You can test the sensitivity as you go by tilting the device to get a feel for how sensitive it is becoming. Once finished press any button.

Figure 4-11 Select Control Sensitivity screen

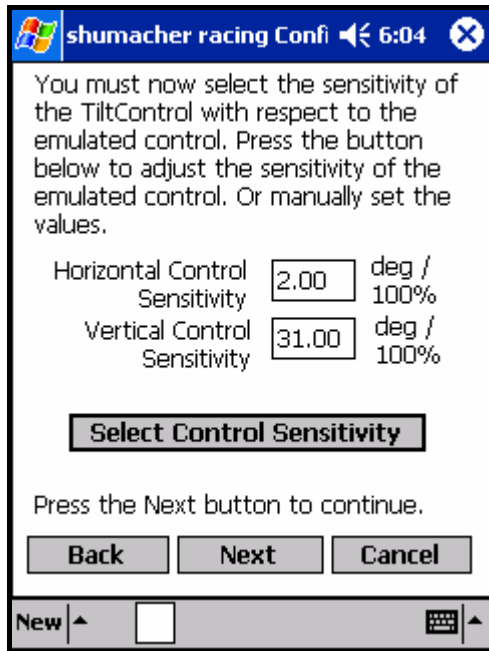
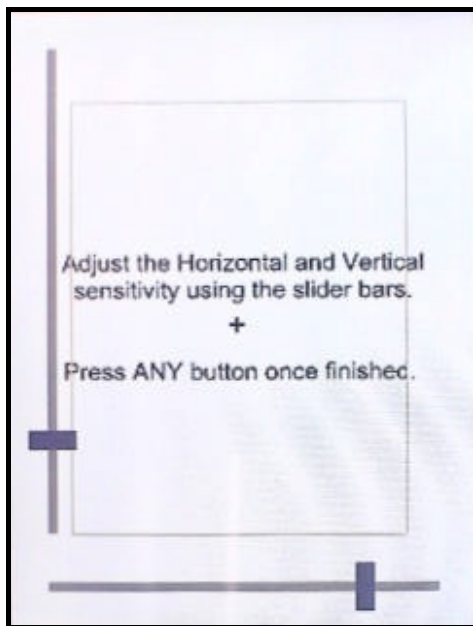


Figure 4-12 Set Control sensitivity

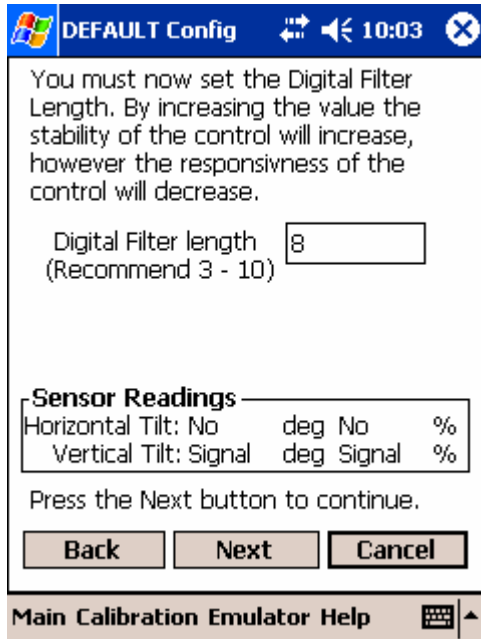


Alternatively you can set the Control Sensitivity manually by entering the values in the fields provided. Press **Next** once you have finished.

4.1.10 Digital Filter Length screen (Stylus Control type)

The Digital Filter Length will set the length of the digital filter that is used to filter the TiltCONTROL readings. The longer the digital filter length the more stable the control will be. The shorter the length the more responsive the TiltCONTROL will be.

Figure 4-13 Digital Filter Length parameters screen

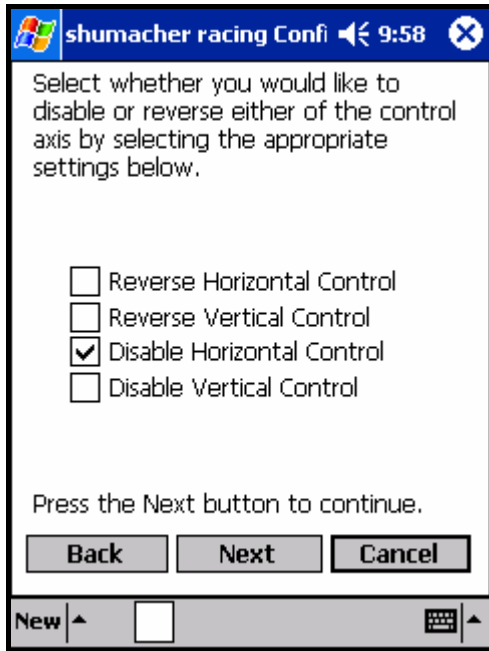


Press **Next** once you have finished.

4.1.11 Reverse and Disable parameters screen (Stylus Control type)

The Reverse and Disable parameters screen as shown in Figure 4-14 is where you can reverse or disable the vertical and or horizontal controls. Simply select the parameters that you would like and continue on.

Figure 4-14 Reverse and disable parameters screen



Press **Next** once you have finished.

4.1.12 Test TiltCONTROL screen (Stylus Control type)

The Test TiltCONTROL screen as shown in Figure 4-15 is where you will test the configuration settings that you just set. If you press the **Test TiltCONTROL** button a screen will appear as shown in Figure 4-16. To test the operation of the TiltCONTROL an arrow will be displayed on the screen that will move around the screen when the device is tilted. The arrow should move in the direction that the device is tilted.

Figure 4-15 Test TiltCONTROL screen

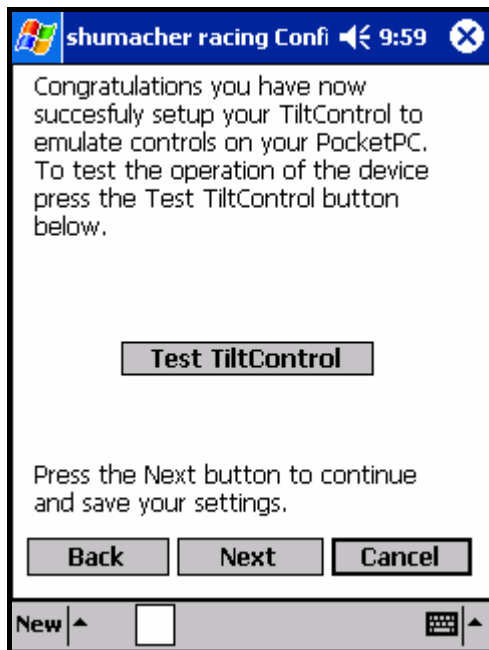
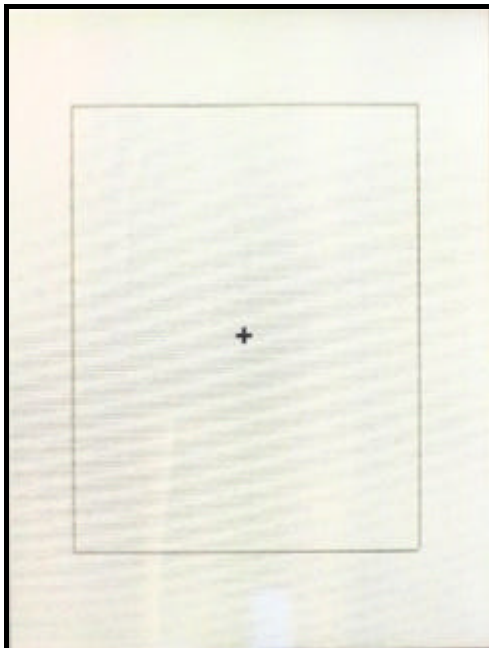


Figure 4-16 Test TiltCONTROL



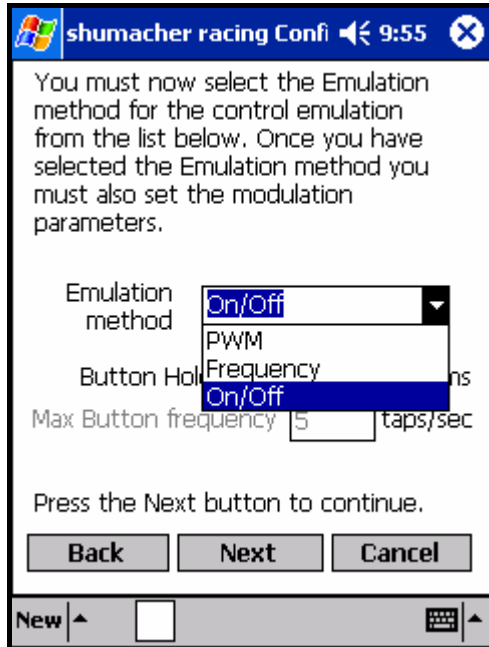
You have now successfully set up the CONTROL-EMUL8R software to emulate the Stylus.

Press **Next** to continue to the Save Configuration screen.

4.1.13 Emulation method and parameters screen (Arrow Keys Control type)

The Emulation and parameters screen for the Arrow Control type is shown in Figure 4-17. You must select either the PWM, Frequency or On/Off emulation method.

Figure 4-17 Control Type selection



If you choose the **PWM** method you will be required to set the **100% Duty Cycle time** parameter before you go any further.

If you choose the **Frequency** method you will be required to set the **Button Hold time** and the **Max Button frequency** parameters.

If you choose the **On/Off** method you will not be required to set any additional parameters.

Press **Next** once you have finished.

4.1.14 Set Zero Control Position screen (Arrow Keys Control type)

The Set Zero Control Position screen as shown in Figure 4-18 is where you will set the Zero Control Position, which is the position at which you hold the device at when zero control percentage is calculated.

Figure 4-18 Set Zero Control position

shumacher racing Conf 9:56

Hold the PocketPC at the angle that you want Zero Control to be emulated and press the button below. Or manually set the zero control angle values.

Horizontal Zero Control Angle deg

Vertical Zero Control Angle deg

Set Zero Control Position

Sensor Readings

Horizontal Tilt:	0.00	deg
Vertical Tilt:	0.00	deg

Back Next Cancel

New

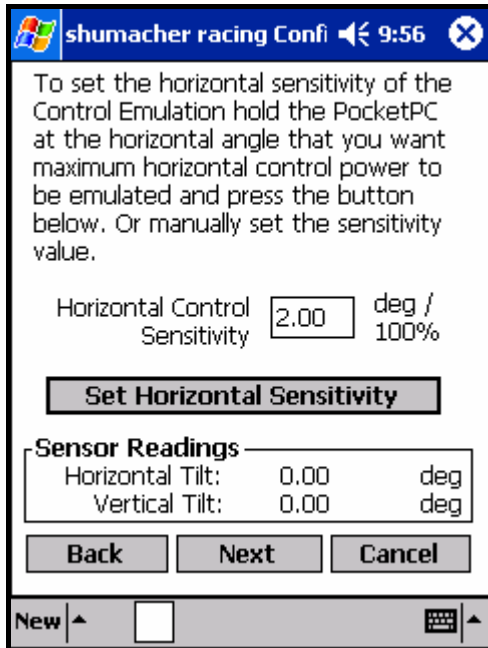
To set the Set Zero Control Position, hold the device in the position that you would like zero control and press the **Set Zero Control Position** button. Alternatively you can set the parameters manually by entering them in the fields provided.

Press **Next** once you have finished.

4.1.15 Set Horizontal Sensitivity screen (Arrow Keys Control type)

The Set Horizontal Sensitivity screen as shown in Figure 4-19 is where you will set the Horizontal Sensitivity. To set the Horizontal Sensitivity hold the device at the horizontal angle that you would like maximum horizontal control percentage to be emulated and press the Set Horizontal Sensitivity button. Alternatively you can set the parameter manually by entering them in the field provided.

Figure 4-19 Set Horizontal Sensitivity

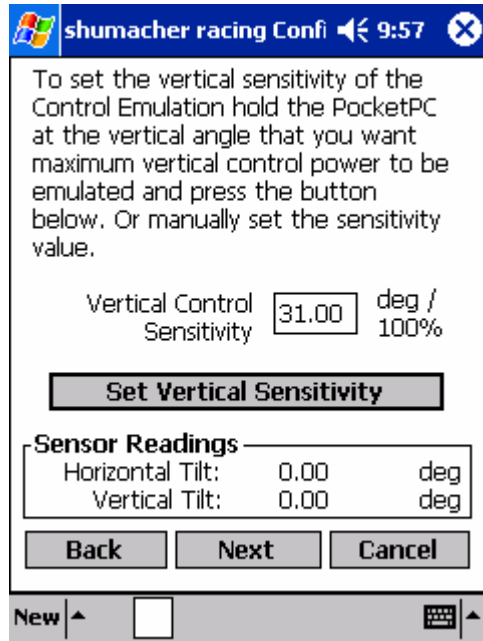


Press **Next** once you have finished.

4.1.16 Set Vertical Sensitivity screen (Arrow Keys Control type)

The Set Vertical Sensitivity screen as shown in Figure 4-20 is where you will set the Vertical Sensitivity. To set the Horizontal Sensitivity hold, the device at the horizontal angle that you would like maximum horizontal control percentage to be emulated and press the Set Horizontal Sensitivity button. Alternatively you can set the parameter manually by entering them in the field provided.

Figure 4-20 Set Vertical Sensitivity

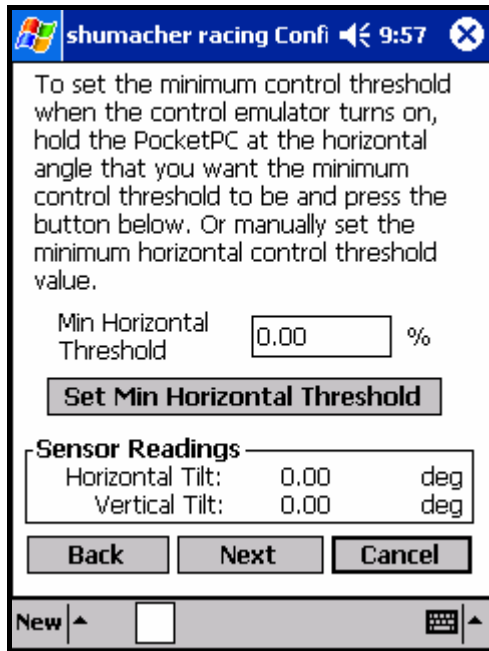


Press **Next** once you have finished.

4.1.17 Set Min Horizontal Threshold screen (Arrow Keys Control type)

The Set Min Horizontal Threshold screen as shown in Figure 4-21 is where you select the threshold control percentage for when you would like the CONTROL-EMUL8R software to actually start emulating. To set the minimum horizontal threshold, hold the device at the angle that you would like it to be at and press the **Set Min Horizontal Threshold** button.

Figure 4-21 Set Min Horizontal Threshold screen

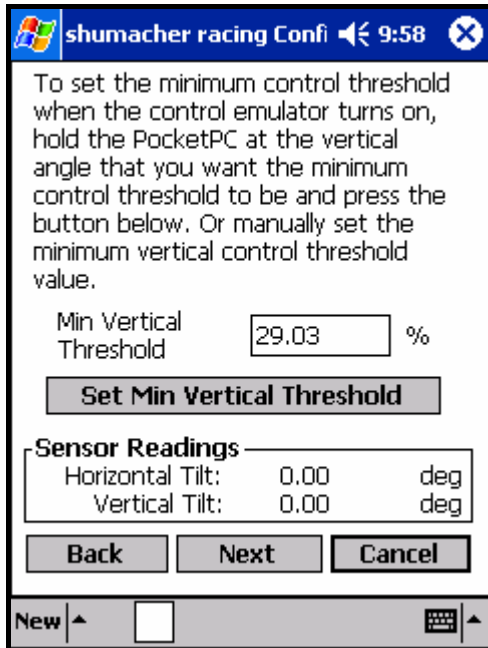


Press **Next** once you have finished.

4.1.18 Set Min Vertical Threshold screen (Arrow Keys Control type)

The Set Min Vertical Threshold screen as shown in Figure 4-22 is where you select the threshold control percentage for when you would like the CONTROL-EMUL8R software to actually start emulating. To set the minimum vertical threshold, hold the device at the angle that you would like it to be at and press the **Set Min Vertical Threshold** button.

Figure 4-22 Set Min Vertical Threshold screen

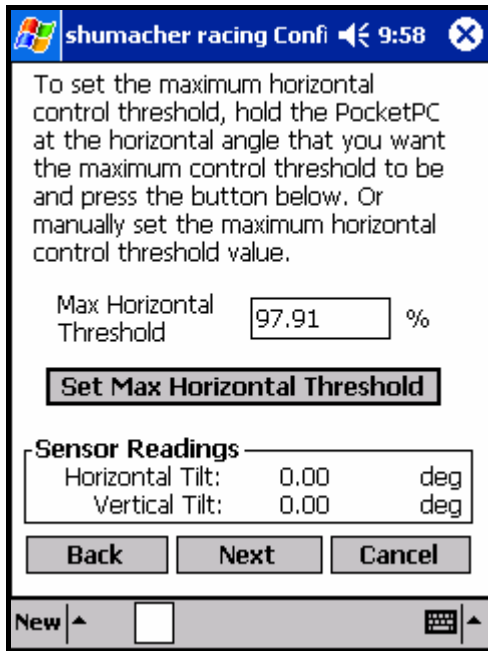


Press **Next** once you have finished.

4.1.19 Set Max Horizontal Threshold screen (Arrow Keys Control type)

The Set Max Horizontal Threshold screen as shown in Figure 4-23 is where you select the maximum control percentage that the CONTROL-EMUL8R software will actually emulate. To set the maximum horizontal threshold, hold the device at the angle that you would like it to be at and press the **Set Max Horizontal Threshold** button.

Figure 4-23 Set Max Horizontal Threshold screen

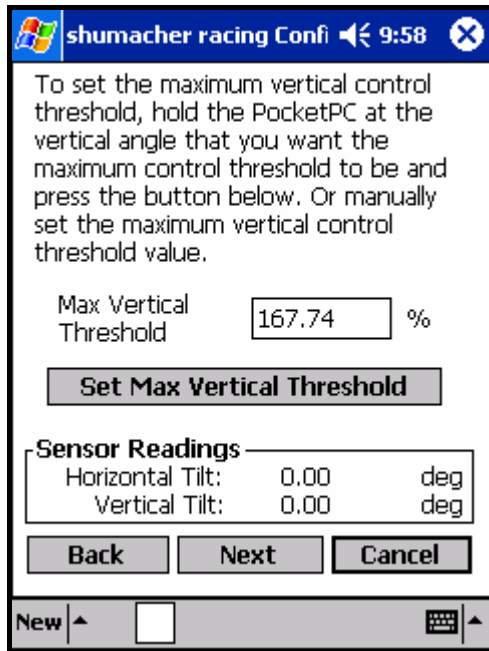


Press **Next** once you have finished.

4.1.20 Set Max Vertical Threshold screen (Arrow Keys Control type)

The Set Max Vertical Threshold screen as shown in Figure 4-24 is where you select the maximum control percentage that the CONTROL-EMUL8R software will actually emulate. To set the maximum vertical threshold, hold the device at the angle that you would like it to be at and press the **Set Max Vertical Threshold** button.

Figure 4-24 Set Max Vertical Threshold screen

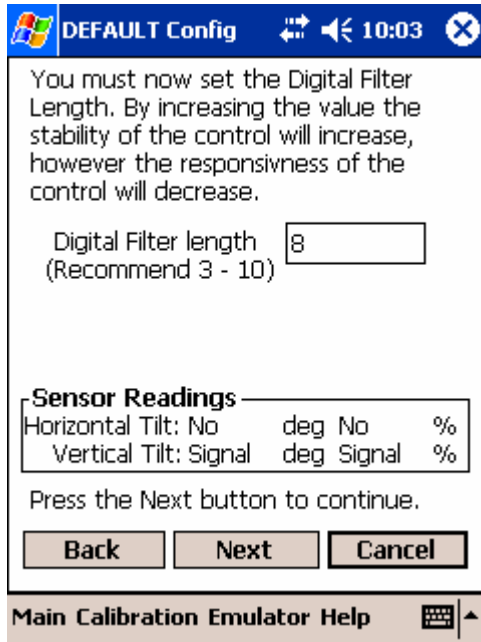


Press **Next** once you have finished.

4.1.21 Digital Filter Length screen (Arrow Keys Control type)

The Digital Filter Length will set the length of the digital filter that is used to filter the TiltCONTROL readings. The longer the digital filter length the more stable the control will be. The shorter the length the more responsive the TiltCONTROL will be.

Figure 4-25 Digital Filter Length parameters screen

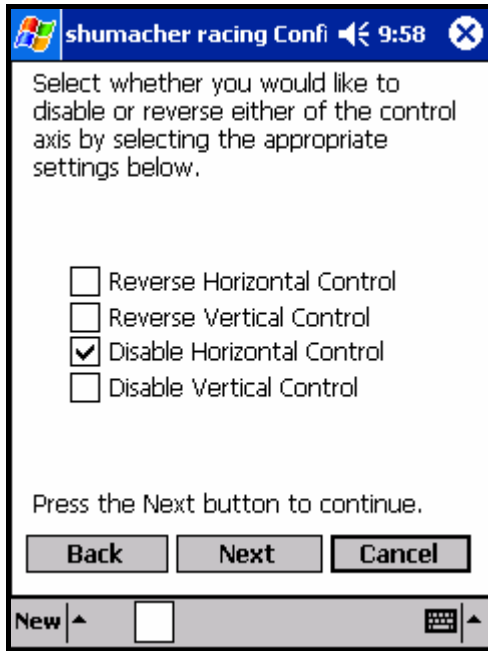


Press **Next** once you have finished.

4.1.22 Reverse and Disable parameters screen (Arrow Keys Control type)

The Reverse and Disable parameters screen as shown in Figure 4-26 is where you can reverse or disable the vertical and or horizontal controls. Simply select the parameters that you would like and continue on.

Figure 4-26 Reverse and Disable parameters screen



Press **Next** once you have finished.

4.1.23 Test TiltCONTROL screen (Arrow Keys Control type)

The Test TiltCONTROL screen as shown in Figure 4-27 is where you will test the configuration settings that you just set. If you press the **Test TiltCONTROL** button a screen will appear as shown in Figure 4-28. To test the operation of the TiltCONTROL there will be four white squares shown on a black background. Each square represents an arrow or a button. When the device is tilted the square will flash to simulate the pressing of the button.

Figure 4-27 Test TiltCONTROL screen

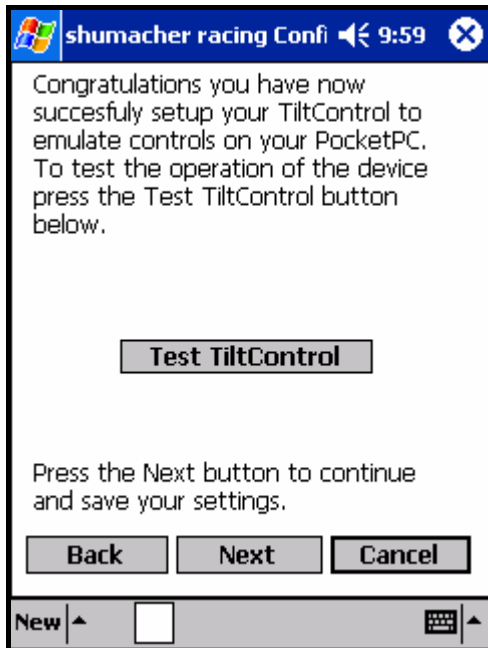
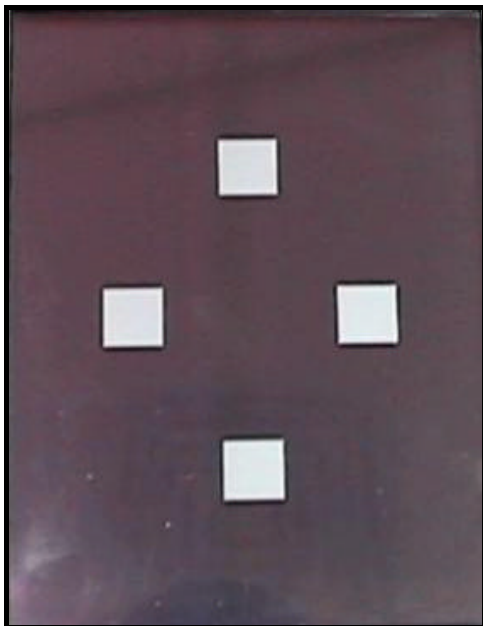


Figure 4-28 Test TiltCONTROL button screen



You have now successfully set up the CONTROL-EMUL8R software to emulate the Arrow Control type. Press **Next** to continue to the save configuration screen.

4.1.24 Target Application

The Target Application screen as shown in Figure 4-29 Target application screen is where you can set the attributes of the target application for the Plugin. Simply follow the steps shown in the Target Application tab. These steps are:

STEP 1: Disconnect the TiltCONTROL and press the button below (The **Start Monitor** button).

STEP 2: Launch the application that the Plugin is targeted at.

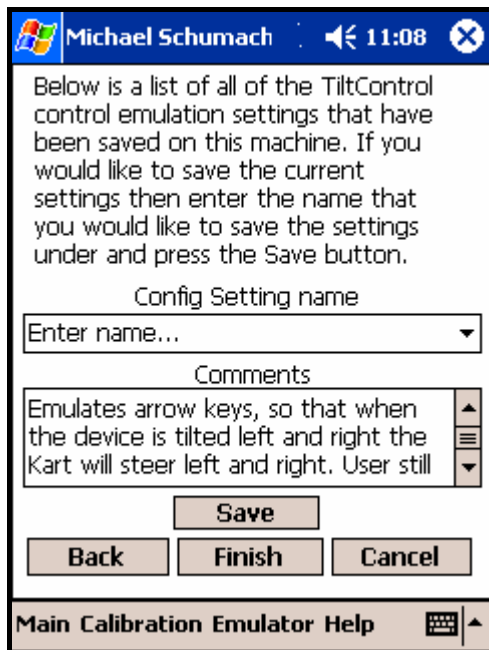
STEP 3: Once the application is at the stage that you want to be controlling it with the TiltCONTROL, insert the TiltCONTROL and wait for a beep to sound, then return to this screen.

Figure 4-29 Target application screen



4.1.25 Save Configuration setting screen

The Save Configuration setting screen as shown in Figure 4-30 is where you can save the settings that you just set up. Simply enter the name of the configuration that you would like to save the settings under and press the Save button.

Figure 4-30 Save Configuration setting screen

Press the **Finish** button to finish.

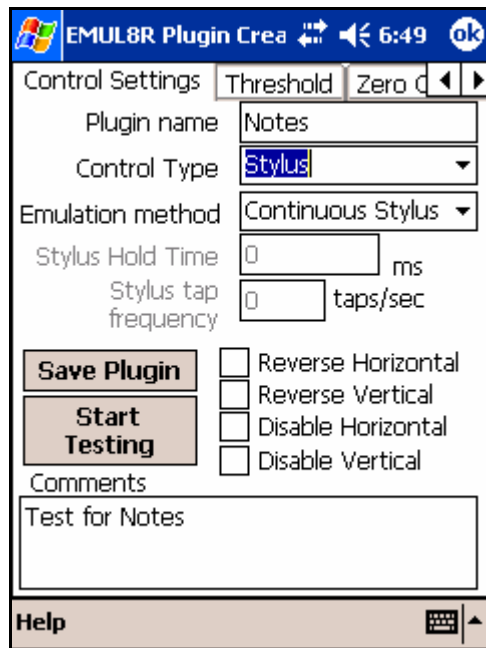
4.2 Using the Manual method for creating a Plugin

The Manual method for creating a Plugin, allows you to set the same values by pressing buttons as in the Wizard method; however it also allows you to set the actual parameters for the Plugin parameters that are used. The Manual setup is broken up into several tabs, each of the tabs and parameters of the Manual setup is explained in detail in the following sections.

4.2.1 Control Settings

The Control Settings tab as shown in Figure 4-31 is where you can set up the Control Type and the Emulation method, along with a few other settings. It is also where you can manually turn on the Plugin and start testing the Plugin, without having to wait for the application to launch. Once you have made any changes that you wanted to make you can press the **Start Testing** button and the CONTROL-EMUL8R will start emulating the control as soon as you open another program. The following sections briefly explain each of the settings on the Control Emulator Settings tab.

Figure 4-31 Control Emulator Settings tab



Plugin name

The **Plugin name** is the unique name that will be used to save the Plugin.

Control Type

The **Control Type** drop down box is where you can set the Control Type that you would like to emulate.

Custom Button Assignment

The **Custom Button Assignment** is currently unsupported.

Emulation Method

The **Emulation Method** drop down box is where you can set the Emulation Method that you would like to use. When you change the Emulation Method it may also alter the labels of the two parameters below it, depending on which settings are required.

Button Hold Time / 100% Duty Cycle Time / Stylus Hold Time

The label of this setting will change when the Emulation Method is changed. It will either set the **Button Hold Time**, **100% Duty Cycle Time** or **Stylus Hold Time** parameter depending on the **Control Type** and **Emulation Method** selected.

Max Button Frequency / Stylus Tap frequency

The label of this setting will change when the Emulation Method is changed. It will either be set to **Max Button Frequency** or **Stylus Tap frequency** depending on the Control Type and Emulation Method selected.

Reverse Horizontal Control

If the **Reverse Horizontal Control** checkbox is checked then the Horizontal Control percentage will be reversed.

Reverse Vertical Control

If the **Reverse Vertical Control** checkbox is checked then the Vertical Control percentage will be reversed.

Disable Horizontal Control

If the **Disable Horizontal Control** checkbox is checked then the Horizontal percentage will be disabled.

Disable Vertical Control

If the **Disable Vertical Control** checkbox is checked then the Vertical percentage will be disabled.

Start Testing Button

You can press the **Start Testing** button and the CONTROL-EMUL8R will start emulating the control as soon as you open another program. While you are still within the Manual setup pages the control emulation will be disabled. Only when you press the **Start menu** or open another program will the control emulation start.

Save Plugin

Pressing the **Save Plugin** will save the current settings of the Plugin.

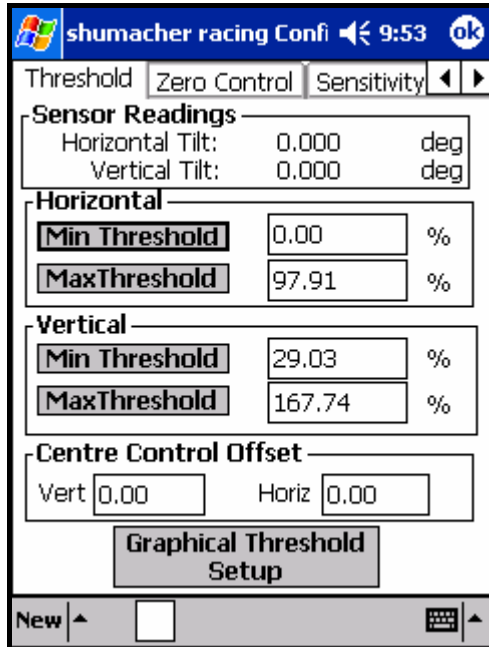
Comments

The **Comments** is where you can enter some comments to describe the Plugin.

4.2.2 Threshold

The Threshold tab as shown in Figure 4-32 is where you can setup the maximum and minimum control thresholds along with the Centre Control Offset parameter. Each of the settings is explained below.

Figure 4-32 Threshold tab



Horizontal Tilt

The **Horizontal Tilt** displays the current horizontal tilt angle being read from the TiltCONTROL.

Vertical Tilt

The **Vertical Tilt** displays the current vertical tilt angle being read from the TiltCONTROL.

Horizontal Min Threshold

The **Horizontal Min Threshold** parameter can be set by either holding the device at the horizontal angle that you would like minimum threshold to be and pressing the **Horizontal Min Threshold** button, or simply entering the value into the field provided. The Horizontal Min Threshold is the threshold at which the control emulator will start emulating.

Horizontal Max Threshold

The **Horizontal Max Threshold** parameter can be set by either holding the device at the horizontal angle that you would like maximum threshold to be and pressing the **Horizontal Max Threshold** button, or simply entering the value into the field provided. The Horizontal Max Threshold is the maximum threshold at which the control percentage will ever be, no matter how large the tilt angle.

Vertical Min Threshold

The **Vertical Min Threshold** parameter can be set by either holding the device at the vertical angle that you would like minimum threshold to be and pressing the **Vertical Min Threshold** button, or simply entering the value into the field provided. The Vertical Min Threshold is the threshold at which the control emulator will start emulating.

Vertical Max Threshold

The **Vertical Max Threshold** parameter can be set by either holding the device at the vertical angle that you would like maximum threshold to be and pressing the **Vertical Max Threshold** button, or simply entering the value into the field provided. The Vertical Max Threshold is the maximum threshold at which the control percentage will ever be, no matter how large the tilt angle.

Centre Control Offset

The **Horiz and Vert Centre Control Offset** is the amount that the horizontal and vertical control percentages are offset by. This parameter is only used for the Stylus Control Type. It is used so that the Control Area can be offset from the centre of the screen.

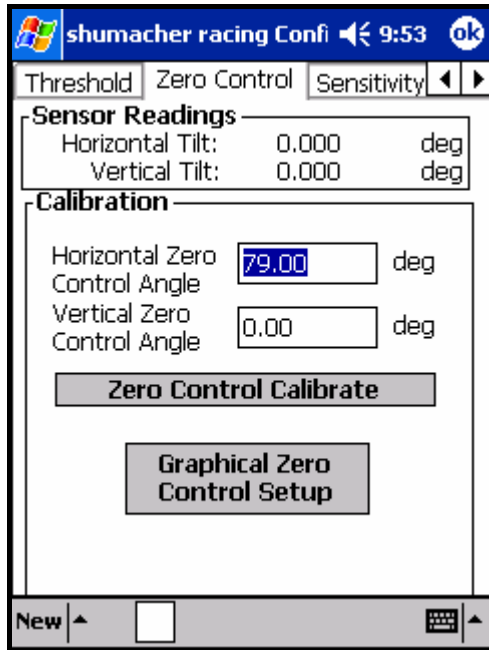
Graphical Threshold Setup

By pressing the **Graphical Threshold Setup** button you will be able to set the Control Area graphically. This is the same process as described in 4.1.5

4.2.3 Zero Control

The Zero Control tab as shown in Figure 4-33 is where you can set the Zero Control angle.

Figure 4-33 Zero Control tab



Horizontal Zero Control Angle

The **Horizontal Zero Control Angle** is the angle that you hold the device at to get a zero horizontal control percentage calculated.

Vertical Zero Control Angle

The **Vertical Zero Control Angle** is the angle that you hold the device at to get a zero vertical control percentage calculated.

Zero Control Calibrate Button

You can also set the **Zero Control angles** by holding the device in the position that you would like Zero Control to be, and pressing the **Zero Control Calibrate** Button.

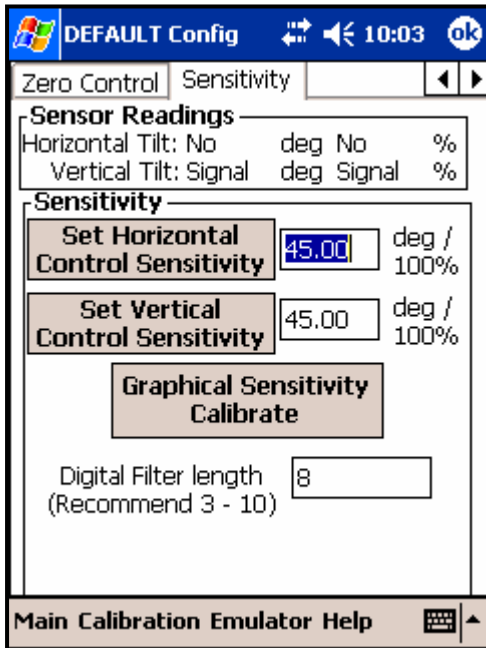
Graphical Zero Control Calibrate

You can also set the Zero Control angles by pressing the **Graphical Zero Control Calibrate** button then holding the device in the position that you would like Zero Control to be and tapping the screen.

4.2.4 Sensitivity

The Sensitivity screen as shown in Figure 4-34 is where you can set the sensitivity of the control. The parameters are described below.

Figure 4-34 Sensitivity screen



Set Horizontal Control Sensitivity

You can set the horizontal control sensitivity by holding the device at the angle that you would like 100% control percentage and pressing the **Set Horizontal Control Sensitivity** button. Or you can set the value manually by entering it into the field provided.

Set Vertical Control Sensitivity

You can set the vertical control sensitivity by holding the device at the angle that you would like 100% control percentage and pressing **the Set Vertical Control Sensitivity** button. Or you can set the value manually by entering it into the field provided.

Graphical Sensitivity Calibrate

You can also set the sensitivity by pressing the **Graphical Sensitivity Calibrate** button which will display a graphical means of setting the sensitivity. Refer to 4.1.9

Select Control Sensitivity screen (Stylus Control type) for further details.

Digital Filter Length

You can also set the Digital Filter Length by manually entering a value. Refer to 4.1.9

Select Control Sensitivity screen (Stylus Control type) for further details.

4.2.5 Target Application

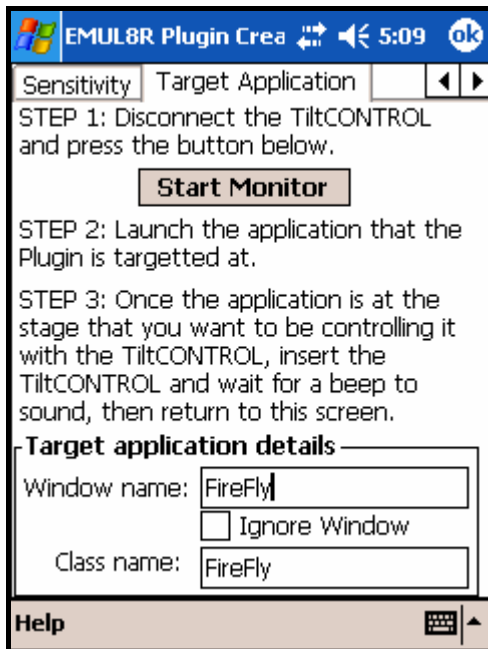
The Target Application tab is where you can set the attributes of the target application for the Plugin. Simply follow the steps shown in the Target Application tab. These steps are:

STEP 1: Disconnect the TiltCONTROL and press the button below (The **Start Monitor** button).

STEP 2: Launch the application that the Plugin is targeted at.

STEP 3: Once the application is at the stage that you want to be controlling it with the TiltCONTROL, insert the TiltCONTROL and wait for a beep to sound, then return to this screen.

Figure 4-35 Target application tab



5 How to start emulating

The CONTROL-EMUL8R will always be turned on if the CONTROL-EMUL8R is enabled. So if you have a Plugin installed for the application that you are targeting, and it is also enabled then the CONTROL-EMUL8R will start emulating the controls using the TiltCONTROL once that application is started.

NOTE: While in demo mode you will only be able to emulate for *90 seconds* at a time. After the 90 second time limit the emulator will turn itself off.

6 Managing Plugins

The installed CONTROL-EMUL8R Plugins can be managed by launching the **EMUL8R Settings** program, which can be found in the **Programs\TiltCONTROL** Folder.

6.1 Disabling and enabling a Plugin

To disable a Plugin, launch **EMUL8R Settings** and press the **Manage Plugins** button. Select the Plugin from the list of Installed Plugins that you want disabled and press the **Disable Plugin** button.

6.2 Uninstalling a Plugin

To uninstall a Plugin, launch **EMUL8R Settings** and press the **Manage Plugins** button. Select the Plugin from the list of Installed Plugins that you want disabled and press the **Uninstall Plugin** button.

7 Editing or creating a new Plugin

To edit or create a new Plugin you will need to launch the **Plugin Creator** program, which can be found in the **Programs\TiltCONTROL** Folder.

To create a New Plugin press the **Create a New Plugin** button. You will be able to start with a blank Plugin or an existing installed Plugin.

To edit a Plugin press the **Edit a Plugin** button. You will be prompted to select one of the installed Plugins to edit.

For more information about creating your own Plugins, please refer to the full CONTROL-EMUL8R User Manual, available for download from www.ECERTEch.com.

8 Activating Program

When the CONTROL-EMUL8R software is first installed it will run in Demo mode. When operating in Demo mode you will only be able to turn the CONTROL-EMUL8R on for 90 seconds at a time, at which time it will turn off automatically.

To activate the CONTROL-EMUL8R software you will first need to purchase the software from ECER Technology, at which time you will be supplied with an Activation key that is derived from the email address that you supplied when you purchased the software. Once you have this Activation key you will need to launch either the **EMUL8R Settings** or the **Plugin Creator** applications, and select the **Activate Program** item from the **Help** menu. Once you have done this the Activate Program screen will be displayed as shown in When the CONTROL-EMUL8R software is first installed it will run in Demo mode. When operating in Demo mode you will only be able to turn the CONTROL-EMUL8R on for 90 seconds at a time, at which time it will turn off automatically.

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Figure 9-1. Simply enter your email address and the activation key that you were provided with and press the Activate Now button. You will either be shown a successful activation message or given a reason why the activation was not successful. Once activated next time you start the CONTROL-EMUL8R software it will run in full mode.

Figure 8-1 Activate program

The screenshot shows a dialog box titled "shumacher racing Confi" with a volume icon and a clock showing 5:59. The dialog contains the following text:

To activate your version of the CONTROL-EMUL8R software you will be required to enter your email address that you used when you purchased the software, along with the activation key that you received when you purchased the software.

Email address:

Activation key:

At the bottom of the dialog, there is a "New" button and a small icon.

9 Activating Program

When the CONTROL-EMUL8R software is first installed it will run in Demo mode. When operating in Demo mode you will only be able to turn the CONTROL-EMUL8R on for 90 seconds at a time, at which time it will turn off automatically.

To activate the CONTROL-EMUL8R software you will first need to purchase the software from ECER Technology, at which time you will be supplied with an Activation key that is derived from the email address that you supplied when you purchased the software. Once you have this Activation key you will need to launch either the **EMUL8R Settings** or the **Plugin Creator** applications, and select the **Activate Program** item from the **Help** menu. Once you have done this the Activate Program screen will be displayed as shown in **Error! Not a valid bookmark self-reference..** Simply enter your email address and the activation key that you were provided with and press the Activate Now button. You will either be shown a successful activation message or given a reason why the activation was not successful. Once activated next time you start the CONTROL-EMUL8R software it will run in full mode.

Figure 9-1 Activate program



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