

AnaWin3™ Quickstart Guide

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Overview

This guide describes how to install, set up, and operate *AnaWin* version 3 for the PPC-2000.

AnaWin3 is Windows[®]95, Windows[®]98, and NT software that allows you to program and monitor one or more PPC-2000 controllers from a single PC. *AnaWin3* allows you to log data to disk, graph data, schedule automatic recipe changes, manage alarms, manage recipes, configure control parameters, create custom overview screens, and use the advanced control features of your Watlow Anafaze PPC-2000 controller through a graphical user interface.

Using this Guide

This guide is intended for both experienced and inexperienced users. If you are an experienced user, you may want to skim parts of this guide. If you are an inexperienced user, you should read the entire guide carefully. We assume that *AnaWin3* users have a basic knowledge of Windows.

The information in this guide is organized into the following chapters.

- **Chapter 1, Overview:** Describes how to use this guide, *AnaWin3* on-line help, and Watlow Anafaze contact information.
- **Chapter 2, Installation:** Describes how to install *AnaWin3* and how to use the configuration program to connect to one or more controllers.
- **Chapter 3, OLE Reference:** Describes OLE (Object Linking and Embedding), which is used in the interchange of data with other Windows95 applications.

About On-line and Printed Help

AnaWin3 provides a comprehensive Help system which you can access from the *Help* menu, or by pressing F1. Pressing F1 provides context-sensitive help related to the part of the software that is displayed at the time.

Like most Windows applications, *AnaWin3* relies extensively on its on-line help system. Details of the PPC-2000 controller and its parameters are contained in the *PPC-2000 User's Guide*.

Watlow Anafaze Technical Support

We have made every effort to ensure that you will be able to install and run *AnaWin3* using the information in this guide and in the on-line help. Should you need further assistance, call Watlow Anafaze technical support at:

(831) 724-3800

email: AnafazeTechSupport@watlow.com

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Installation and Setup

This chapter describes how to install *AnaWin3* on your computer and how to use the configuration program to set up *AnaWin3* to communicate with your controller(s).

System Requirements

The following components are required to operate *AnaWin3*.

Minimum Hardware Requirements

- Pentium 200 MHz or greater with a minimum of 32 MB of RAM (Pentium 300 with 64 MB recommended for animation)
- Hard drive with 20 MB of free space (500 MB is recommended for logging and trending)
- 3.5 inch HD floppy drive
- SVGA display (800 x 600 resolution, 16-bit color)
- Communications port capable of 19.2 kbaud (with 16550 UART)
- Microsoft-compatible sound card (recommended for voice-annunciated and customized alarm sounds, but not required)
- Microsoft-compatible pointing device (mouse or trackball)

Software Requirements

- U.S. version of Windows95, Windows98 or WindowsNT 4.0
- Service Pack version 4 or later for WindowsNT.

Windows Setup

Windows must be configured properly for *AnaWin* to run correctly. Use the **Regional Settings** selections described below. To check or change these settings in Windows:

1. Click on **Start** then **Settings** then **Control Panel** on the Windows system taskbar.
2. Double-click on **Regional Settings**.

On the corresponding tab, select the following:

Table 2.1 Regional Settings

Tab	Setting	Option
Regional Settings	Language	English (United States)
Number	Decimal symbol	. [period]
	Digit grouping symbol	, [comma]
Time	Time separator	: [colon]
Date	Date separator	/ [slash]

Parts List

The following parts are included with *AnaWin3*:

- *AnaWin3* on 3.5 inch diskettes.
- *AnaWin3* Quickstart Guide
- *AnaWin3* Registration Form
- *AnaMator* on 3.5" diskettes (*AnaWin3* Developer edition only)

System Block Diagram

Figure 2.1 shows how a PC (using *AnaWin3*) interfaces with the PPC-2000 controller. Refer to the *PPC-2000 User's Guide* for specific wiring and configuration information.

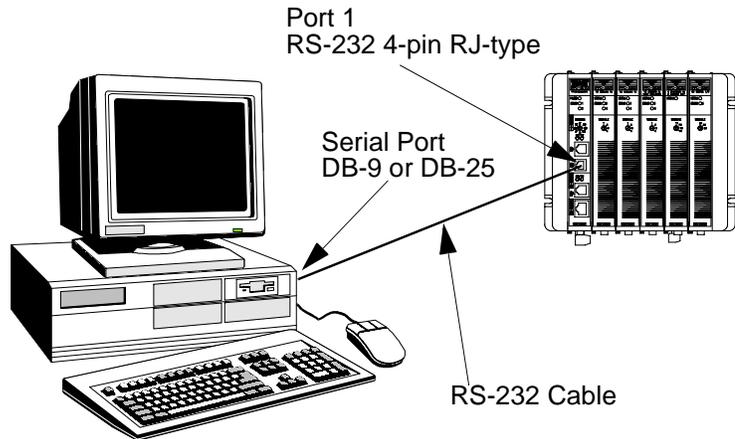


Figure 2.1 Connecting One PPC to a Computer Using RS-232

Communication with a single PPC-2000 controller can be made using an RS-232 connection to one of the PC's serial ports. RS-232 cables are available from Watlow Anafaze.

The serial communication link required to communicate with more than one Watlow Anafaze controller or with a communication cable longer than 50 feet is RS-485. We recommend using the standard serial interface of RS-232 with an external RS-485 converter.

We recommend using a B&B Electronics RS-232/RS-485 optically isolated converter P/N 485OIC. This converter has screw terminals for connecting the RS-485 wires and a DB-25 male connector for the RS-232 side. You can reach B&B Electronics at (815) 434-0846.

Contact the factory for other available converters.

Safety

Watlow Anafaze has made every effort to ensure the reliability and safety of its controllers and *AnaWin3*.

Good engineering practices, electrical codes, and insurance regulations require you to use independent external safety devices to prevent potentially dangerous or unsafe conditions.

Use of *AnaWin3* does not eliminate the need for appropriate external, independent safety devices.

For additional process safety, use *AnaWin3* to automatically reload your desired operating parameters after a power failure.

Please contact Watlow Anafaze immediately if you have questions about system safety.

Installation

In this section you will configure the PPC-2000 system(s) to communicate, install the AnaWin3 software and configure it, and then test communications. If you are installing more than four PPC-2000 systems to communicate with one PC you will need to install the software before setting up the communications parameters on the fifth controller and on. See *Setting Programmable Modbus Addresses on page 8* for more information on setting up more than four controllers.

Configuring your Controllers

For multiple PPC installations, each PPC must have a unique network address. As many as 32 PPC systems may communicate on a network. Network addresses 1 through 4 can be set using rotary switch position A through D on the processor module.

Communication parameter changes do not take affect until the controller is reset or its power is cycled, and only with the appropriate rotary switch settings on the Processor module.

Install the AnaWin3 software and use setting **D** and *PPCCom-Su* to program the remaining addresses (5-32). See *Setting Programmable Modbus Addresses on page 8*.



NOTE!

Do not cycle power with the rotary switch set in positions E-G unless specifically directed to do so. These positions are used for clearing memory and other functions. Parameter settings can be lost. See the PPC-2000 User's Guide for more on these switch settings.

Table 2.2 PPC-2010 Rotary Switch Configuration

Position	Controller Address
A	1
B	2
C	3
D	4
E-G	N/A
H	1

Switch positions **A-D** select the following settings:

- 19.2 kbaud (programmable)
- Even parity (fixed)
- 8 data bits (fixed)
- 1 stop bit (fixed)

Switch position **H** selects the following fixed settings:

- 19.2 kbaud
- Even parity
- 8 data bits
- 1 stop bit

Switch settings **E-G** are reserved.

Installing AnaWin3

To install *AnaWin3*, follow these steps:

1. Insert the disk labeled **AnaWin Disk 1** in to the floppy drive.
2. Click on **Start** then **Run** on the Windows system taskbar.
3. Type **a:\setup** or **b:\setup**.
4. The Setup program prompts you through the installation process. Follow the instructions on the screen.
5. After installation you will be asked to reboot your PC.
6. After your PC has rebooted, on the Windows system task bar, click **Start**, then **Programs**, then **Anafaze**, then **Anawin32**.
7. The first time you run *AnaWin3*, you are prompted to enter your serial number. You must enter the serial number printed on **AnaWin disk 1**. Enter capital letters in the first field. Do not enter the dash. Tab to or click on the second field and enter the numbers.

You will also need this serial number any time you request technical support.

8. Click **OK**
-or-
click **Exit** to abort the program.

A message box displaying **AnaWin for PPC** will appear. Click **OK** to view the **Setup** screen.

9. From the **Communications** menu on the **Setup** screen, select **Port**, then the Com Port used to communicate with the PPC-2000 controller.
10. For up to 4 controllers, click **Add** to select each controller address.
11. Click **OK**.

For more than 4 controllers, see the AnaWin Help file *Adding Controllers to a System* for more information on communicating with your PPC-2000.

12. Click **Test**. If the communications test result is **Error Time Out**, verify the Com Port setting, controller address, and connections. If the communications test result displays the firmware version for each controller, communications are setup properly.
13. From the **File** menu, select **Save**, then **Exit**.
14. On the Windows system task bar, click **Start**, then **Programs**, then **Anafaze**, then **Anawin32**.
15. Select **ComDiags** from the **System** menu to verify that AnaWin is communicating with each of the controllers.

Setting Programmable Modbus Addresses

Modbus addresses one through four may be set using the rotary switch on the face of the PPC-2010 Processor Module. See *Setting Programmable Modbus Addresses on page 8* for information on setting the rotary switch. The following procedure describes how to set other addresses:



WARNING! *Power is shut off to the PPC during the following procedure. Power cycling will interfere with process control. Do not perform this procedure if interrupting process control is not acceptable.*

1. Close *AnaWin* and *LogicPro* if either is running.
2. Connect only the PPC to be configured to the computer on which *AnaWin* is installed.
3. Set the rotary switch on the Processor Module to position **H**.
4. Turn off power to the PPC system.
5. Turn power on to the PPC system.
6. Launch *PPCComSu*.
7. Select the desired **Baud Rate** for each port.
8. Select the desired Modbus address for the PPC system.
9. Click the **Send** button.
10. Close *PPCComSu*.
11. Set the rotary switch on the Processor Module to position **D**.
12. Turn off power to the PPC system.
13. Turn on power to the PPC system.

Once configured with unique addresses, as many as 32 PPC controllers may be connected to the PC on a 485 communications network.

ActiveX (OLE) Reference

Watlow Anafaze provides a built-in ActiveX Server. An ActiveX (formerly OLE) client may do any of the following:

- Read the value for any channel, global, analog input, digital, output or logical (logic program shared memory) based parameter for all controllers on the bus
- Set the value of control mode (manual, auto, tune or idle), setpoint, and control output for all controllers on the bus
- Get a list of available recipes
- Download a recipe from the list

Each exposed method returns an integer value indicating the outcome of the method. The possible return values are enumerated as `DataServerReturnValue` for ease of use in Visual Basic projects.

ActiveX Server Exposed Methods

The following are declarations for all exposed methods.

Server Method

ServerStatus()

Returns the status of *AnaWin3*. Possible return values are:

AWOK (0)

AWShutDown (1)

AWNotCommunicating (2)

AWStartingUp (16)

Methods for Getting Data

GetChannelDataValues(Address As Integer, ParmNum As Integer, StartIndex As Integer, NumValues As integer, Values As Variant)

GetAnalogInputDataValues(Address As Integer, ParmNum As Integer, StartIndex As Integer, NumValues As integer, Values As Variant)

GetDigitalDataValues(Address As Integer, ParmNum As Integer, StartIndex As Integer, NumValues As integer, Values As Variant)

GetAnalogOutputDataValues(Address As Integer, ParmNum As Integer, StartIndex As Integer, NumValues As integer, Values As Variant)

GetLogicalIntegerValues(Address As Integer, ParmNum As Integer, StartIndex As Integer, NumValues As integer, Values As Variant)

GetLogicalBooleanValues(Address As Integer, ParmNum As Integer, StartIndex As Integer, NumValues As integer, Values As Variant)

GetGlobalDataValues(Address As Integer, ParmNum As Integer, Values As Variant)

Used to obtain data values for 1 or more items from a single controller on the bus. Global data items have variable numbers of items. GetGlobalDataValues returns all the values for the given global parameter and thus has no StartIndex or NumValues argument.

Address - The modbus address of the desired controller.

ParmNum - The parameter number of the requested data.

StartIndex - The first Item (e.g. Channel) for which data is requested.

NumValues - The number of items for which data is requested

Values - An array of values containing the requested data is returned in this variant. The data type of the value is dependent on the ParmNum passed

The list of valid parameter numbers for each parameter type is given later in this document.

Methods for Setting Data

SetChannelDataValues(Address As Integer, ParmNum As Integer, StartChan As Integer, numValues As integer, values As Variant, DownloadID As integer)

Used to set channel data values on a single controller. Note that only Setpoint, Control Mode, Heat (Primary) Output and Cool (Secondary) Output are accepted for ParmNum. All parameters are as above except that the caller fills Values with an array of values prior to calling the method. If the arguments and data passed in are valid, AWOK(0) is returned and

the download request is assigned an unique ID which is passed back in the DownloadID argument. This DownloadID can be used to assess the status of the download attempt using the RecipeLoadStatus method.

SetChannelDataValues returns immediately. If the return value is AWOK(0), the success or failure of loading the data to the controller can be determined by calling RecipeLoadStatus passing in the value returned in DownloadID. Otherwise some error occurred (indicated by the return value) and the data download was aborted.

Methods for Getting Parameter Names

GetChannelParameterName(Address As Integer, ParmNum As Integer, Value As Variant)

GetGlobalParameterName(Address As Integer, ParmNum As Integer, Value As Variant)

GetDigitalParameterName(Address As Integer, ParmNum As Integer, Value As Variant)

GetAnalogInputParameterName(Address As Integer, ParmNum As Integer, Value As Variant)

GetOutputParameterName(Address As Integer, ParmNum As Integer, Value As Variant)

GetLogicalIntegerParameterName(Address As Integer, ParmNum As Integer, Value As Variant)

GetLogicalBooleanParameterName(Address As Integer, ParmNum As Integer, Value As Variant)

Used to get the strings displayed in *AnaWin3* for the specified controller and parameter. Value is filled by the Server and will contain a string of 20 characters or less.

Methods for Handling Recipes

GetRecipeList(RecipeList As Variant)

Used to obtain a list of stored recipes. The server fills rcpList with an array of strings. If there are no recipes stored, the return value is AWNoRecipes(8).

LoadRecipe(RecipeName As String, DownloadID As Integer)

Used to load a recipe to the controller(s). Note that a recipe may span controllers. If the RecipeName passed in is valid, AWOK(0) is returned and the download request is assigned an unique ID which is passed back in the DownloadID argument. This DownloadID can be used to assess the status of the download attempt using the RecipeLoadStatus method.

LoadRecipe returns as soon as the recipe has been queued for download. If the return value is AWOK(0), the success or fail-

ure of loading the recipe to the controller can be determined by calling `RecipeLoadStatus` passing in the value returned in `DownloadID`. Otherwise some error occurred (indicated by the return value) and the recipe download was aborted.

RecipeLoadStatus(DownloadID As Integer)

Returns the status of the recipe download or `SetChannelData-Values` assigned to the `DownloadID` passed in. Possible return values are:

AWDownloadInProgress (9) - Download not yet complete

AWNoDownloadRequested (11) - No download has been assigned the passed in `DownloadID` or the status of this download has already been read.

AWDownloadSuccessful (12)

AWDownloadFailed (13)

Once the status of a download has been obtained, subsequent calls to `RecipeLoadStatus` will return `AWNoDownloadInProgress`(11).

LastRecipeDownloaded(RecipeName As Variant)

Fills the `RecipeName` argument with the name of the last recipe downloaded to the controller(s).

Client Registration Methods

RegisterAsClient(clientObj As Object)

UnRegisterAsClient(clientKey As Long)

The *AnaWin3* ACTIVEX Server allows (and encourages) clients to register themselves so that *AnaWin3* can keep track of them. This allows *AnaWin3* to notify clients when a local user shuts it down. Once the local user has shut *AnaWin3* down, it will no longer respond to client requests with meaningful data. All queries will be responded to with the value `AWShutDown` (1). However, *AnaWin3* can not completely shut down until all references to it are relinquished.

The `RegisterAsClient` and `UnRegisterAsClient` methods allow *AnaWin3* to notify all clients when a user has shut it down, so they can relinquish their references to the server and it can shutdown. It should be noted that if a user shuts down *AnaWin3*, it can not be restarted until all clients have closed their references to it.

To use the registration facility, the client must pass an object to the `RegisterAsClient` function that exposes a `Shutdown` method that *AnaWin3* may call when it is shut down. `RegisterAsClient` returns a long integer value that the client can save as it's client ID. If the client wishes to shutdown before

AnaWin3 shuts down, it should call the `UnRegisterAsClient` method, passing the client ID

value, then close its reference to the server.

The client's shutdown method should immediately close its reference to the server.

**NOTE!**

The client should not call `UnRegisterAsClient` from its `ShutDown` method as this will cause an **ACTIVEX** deadlock situation where each process is waiting for the other to return from its message call.

ActiveX Server Constant Values

AWOK (0)

Returned by all functions if they are successful

AWShutDown (1)

Returned by all functions if a local user has shut *AnaWin3* down

AWNotCommunicating (2)

Returned by all functions if *AnaWin3* is not able to communicate to the controller(s) on the bus.

AWInvalidParameter (3)

Returned by the Get and Set data values and the get parameter names functions if an invalid parameter number is passed to them.

AWInvalidAddress (4)

Returned by any function that accepts a modbus address, when an address that has no controller assigned to it is passed.

AWInvalidIndex (5)

Returned by any function that deals with array data when an index is passed to it that is less than zero or greater than the number of items that array has for the controller at the passed address has.

AWOutOfRange (6)

Returned by `SetChannelDataValues` when a value is passed in the values array that is invalid for the passed `ParmNum`

AWNoRecipes (8)

Returned by GetRecipeList if there are no recipes stored for the specified GroupNum.

AWDownloadInProgress (9)**AWNonExistentRecipe** (10)**AWNoDownloadRequested** (11)**AWDownLoadSuccessful** (12)**AWDownloadFailed** (13)

These are the possible return values for RecipeLoadStatus.

AWInconsistentArguments (14)

Returned by SetChannelDataValues if NumVals does not equal the size of the values array.

AWServerBusy (15)

Returned by SetChannelDataValues or LoadRecipe if downloading data has been disabled by the local user.

AWStartingUp (16)

When *AnaWin3* starts up, it reads up the data tables for all attached controllers. This can take several minutes depending on how many controllers are on the bus. *AnaWin3* will respond with AWStartingUp to all data queries and download requests during the startup process. The client should wait until the startup process is complete before sending or requesting data.

Table 3.1 PPC Channel Parameters

Parameter Number	Parameter Description
1	Heat Prop Band
2	Heat Integral
3	Heat Derivative
4	Heat Output Type
5	Control Mode
8	Setpoint
9	Process Variable
10	Heat Output Filter
11	Heat Output %
12	HP Limit

Parameter Number	Parameter Description
13	LP Limit
14	Control Type
15	Alarm Deadband
16	Setpoint Source
20	Heat Cycle Time
21	Units
24	Spread
25	HP Output Dest
26	LP Output Dest
27	HD Output Dest
28	LD Output Dest
29	Auto Heat Limit
30	Heat Limit Time
31	Sensor Fail Heat%
32	Sensor Fail Cool%
33	Heat Curve
38	Alarm Delay
39	Cool Prop Band
40	Cool Derivative
41	Cool Integral
42	Cool Output Type
43	Cool Cycle Time
46	Cool Output Filter
47	Cool Output %
48	Auto Cool Limit
49	Cool Limit Time
50	Cool Curve
54	Alarm Control
55	LD Enable
56	HD Enable
57	LP Enable

Parameter Number	Parameter Description
58	Alarm Status
60	Alarm Mask
61	Alarm Ack
70	Setpoint Ratio
71	Setpoint Offset
72	Heat Man Reset
73	Cool Man Reset
74	Heat Scale Lo
75	Cool Scale Lo
76	Heat Scale Hi
77	Cool Scale Hi
78	Heat Output Dest
79	Cool Output Dest
82	HD Offset
84	LD Offset
87	PV Source
88	HP Enable
89	LD Type
90	HD Type
91	LP Type
92	HP Type
93	Max Setpoint
94	Min Setpoint

Table 3.2 Global Parameters

Parameter Number	Parameter Description
0	Ambient Temps
2	Modules Present
4	Program Version
5	Error Log

Parameter Number	Parameter Description
15	Reload Defaults
18	RAM Clear Reset
19	Watchdog Test
21	Loop Startup
22	Ambient Status
23	Memory Status
24	Loop Checksum
25	H/W Cfg Status
26	Ctlr Has Reset
27	Defaults Loaded
28	Logic Run Status
29	Logic Load Status
30	Battery Status
31	Sys Cmd Flags
32	Sys Stat Flags
33	AC Frequency
34	Logic Startup
35	Start Logic
36	Stop Logic
37	Restart Ctlr

Table 3.3 *PPC Analog Input Parameters*

Parameter Number	Parameter Description
1	Input Value (PV)
2	Input Status
3	Input Type
4	Input Filter
5	Units
6	Input Signal Lo
7	Input Signal Hi

Parameter Number	Parameter Description
8	PV Lo
9	PV Hi
10	Decimal Places
11	PV Offset

Table 3.4 PPC Digital Parameters

Parameter Number	Parameter Description
0	State
1	Direction
2	Logic
3	Function

Table 3.5 PPC Analog Output Parameters

Parameter Number	Parameter Description
1	Value

Table 3.6 PPC Logical Integer Parameters

Parameter Number	Parameter Description
1	Value

Table 3.7 PPC Logical Boolean Parameters

Parameter Number	Parameter Description
1	Value