Using Watlow® Products with SpecView

Addendum to SpecView Manual

SCADA Software

WATLOW®

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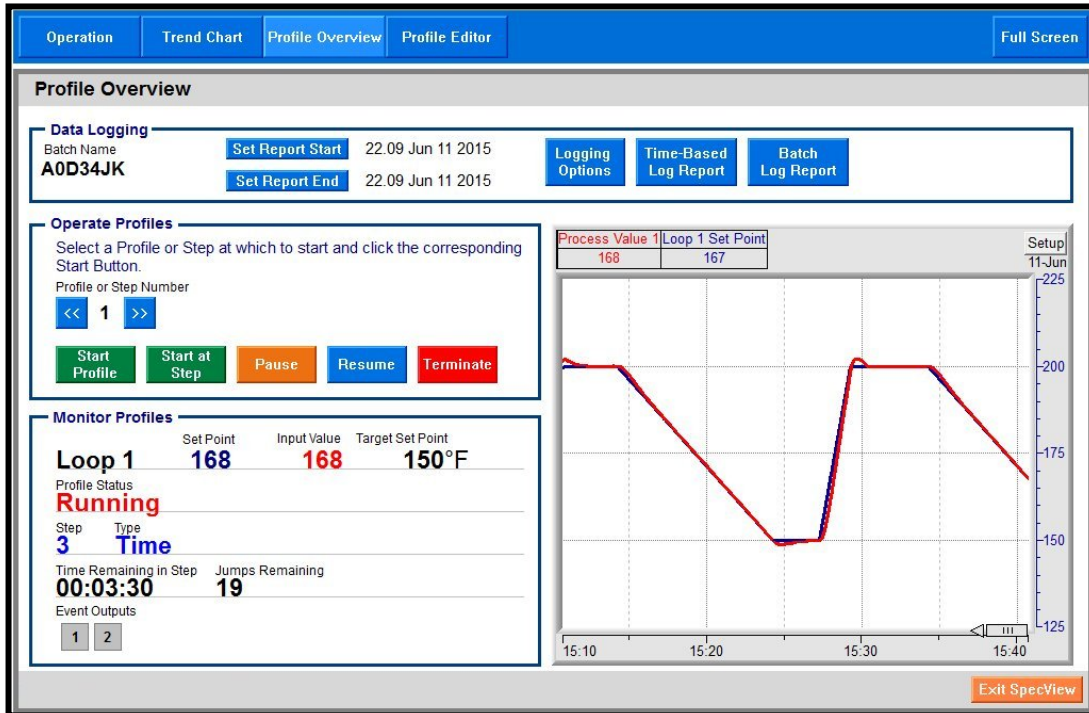
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TC Table of Contents

1 Chapter 1: Introduction

SpecView is a powerful and easy-to-use Supervisory Control and Data Acquisition (SCADA) software package. The purpose of this addendum is to quickly get you up and running using SpecView with Watlow controllers. Chapter 2 provides a brief explanation of concepts that may not be familiar to first time users of SpecView. Basic familiarity with these concepts is assumed in Chapter 3 which provides procedures for getting Watlow controllers communicating with SpecView. Chapter 4 provides detailed information regarding addressing and describes features specific to Watlow controllers.

This addendum supports SpecView version 3.

Additional Resources

In addition to this addendum the following resources are available for learning about SpecView and other products available from Watlow:

- *SpecView User Manual*—available on the SpecView installation disk and at Watlow.com navigate to Resources and Support, Technical Library: User Manuals and search on Keyword: SpecView.

- *SpecView Secrets Video Tutorials*—available at Watlow.com navigate to Resources and Support, Technical Library: Tutorials and Training and search on Keyword: SpecView.

- *SpecView Frequently Asked Questions*—available at Watlow.com navigate to Resources and Support, Technical Library: Tutorials and Training and search on Keyword: SpecView.

- *SpecView Software Download*—the latest version of SpecView is always available at Watlow.com navigate to Resources and Support, Technical Library: Software and Demos and search on Keyword: SpecView.

- *SpecView Software Field Upgrade Order Form*—guides you through the process of adding features to a copy of SpecView you already own. Get the form at Watlow.com navigate to Resources and Support, Technical Library: Software and Demos and search on Keyword: SpecView.

2 Chapter 2: About Setting up Communications

The following sections provide information to help you understand how to set up communications between SpecView and Watlow controllers.

Instrument Templates and Protocols

SpecView includes support for hundreds of different devices. The protocol drivers and instrument templates included with SpecView tell it how to communicate with specific devices. You will need to choose the appropriate templates whenever you want to automatically or manually set up communications between SpecView and a device.

There are many instrument templates grouped by communication protocol and product family that support Watlow products. The table below lists these template groups, protocols and the Watlow models supported by each.

Template Group	Protocol(s)	Supported Watlow Models	Notes
Watlow F4T & D4T	Modbus® RTU Modbus® TCP	F4T with INTUITION® D4T with INTUITION®	Support for F4T and D4T functions and inputs and outputs in the flex modules
Watlow Modbus		ASPYRE® Power Controllers EZ-ZONE® PM, EZ-ZONE RM, EZ-ZONE ST, SERIES 96, 97, SD MICRODIN, POWER SERIES, 986, 987, 988, 989 SERIES F4 Ramping	Support for basic operation parameters in EZ-ZONE products. See *EZ-ZONE Modbus® Instruments* on page 43. Limited support for programming SERIES F4 profiles.
Watlow Assembly		F4T with INTUITION D4T with INTUITION EZ-ZONE PM, EZ-ZONE RM	Supports reads and writes to 16 or 32 contiguous floating-point values. Intended to minimize update time for measurements when used with the user-configurable communication assemblies. See Watlow Assembly Instruments on page 46.
Watlow EZ-ZONE Standard Bus	Standard Bus	EZ-ZONE PM, EZ-ZONE RM, EZ-ZONE ST	Recommended for EZ-ZONE.
Watlow F4 Programmer	Modbus® RTU	SERIES F4 Ramping	Allows saving profiles as recipes. Requires Series F4 Programmer ordering option.
Anafaze 16 Loop		16CLS, CLS216, 16MLS, MLS316	Standard firmware option only
Anafaze 32 Loop		32MLS, MLS332	
Anafaze 8 Loop		4CLS, CLS204, 8CLS, CLS208	
Anafaze Ramp/Soak		CLS204, CLS208, CLS216, MLS316, MLS332	Ramp/Soak Profile programming and operation
Anafaze/AB	ANAFAZE	32MLS	Proprietary Anafaze protocol

Using Instruments from More than one Group or Protocol

The templates in the groups listed above that support Modbus® RTU on serial communications ports are compatible with each other. Similarly the templates that support Modbus® TCP used over Ethernet are compatible with each other. SpecView allows protocol-compatible templates to be used on the same port, but you will need to help SpecView by instructing it when to do so. When there are controllers connected to the same port that require instrument templates from different groups, you will scan once for each of those groups to automatically detect the various devices.

If your configuration requires communicating with controllers supported by different protocols via serial communications ports, each protocol must have its own network connected to SpecView via a separate communications port. Support for multiple communication ports is an ordering option for SpecView, and is field upgradeable.

Automatic and Manual Configuration

SpecView can automatically detect and set up communications with controllers. However, in some cases it may be necessary to manually configure SpecView. This method is particularly useful if you want to create screens and configure SpecView prior to receiving your controllers. Projects that were created automatically can be updated by testing the communications network for new controllers. It is also

possible to manually add or remove controllers from any configuration whether it was created automatically or manually. This addendum contains procedures for automatically and manually configuring communications for the various networking options supporting Watlow controllers.

SpecView can automatically detect F4T and D4T data loggers controllers using Modbus® TCP or Modbus® RTU and EZ-ZONE controllers using the Standard Bus protocol. When using Modbus® with EZ-ZONE controllers create the configuration manually.

Naming Instruments

It is useful to name instruments such that you can easily relate what you see on the screen in SpecView to your equipment and processes. You might want to use a name that:

- Indicates the controller's function in the process
- Indicates the controller's location in the panel
- Includes network information such as port and address

When you create a project or add instruments to one by automatically detecting controllers, SpecView prompts you to name the instruments as it adds them. You must name any instruments that you add manually. You can change an instrument's name whenever you like. However, changing an instrument's name makes logged data associated with the old name inaccessible going forward; it is best to name instruments up front.

Saving Settings in Non-Volatile Memory

Some Watlow controllers protect their non-volatile memory from being worn out prematurely due to excessive use that may occur when communicating with devices such as a PLC that send the same settings to a controller many times a second. In these controllers, the settings received via communications can be held in volatile memory that is cleared when the controller is turned off. Since SpecView will typically send parameter settings to a controller only when you edit a parameter on the screen, for your convenience you can set the controller to routinely save the parameter settings that come through communications in non-volatile memory. That way the values you set are saved even when the controller is powered down. Consult the controller manual for the appropriate parameter, typically called, "Non-Volatile Save".

Using F4T Controllers and D4T Data Loggers

The instruments in the *Watlow F4T & D4T* group support standard and optional features in in F4Ts and D4Ts as well as the flex modules those devices are set to expect. For details see *F4T Instruments* on page 29.

Automatic Detection of F4Ts and D4Ts
When automatically detecting a network with the Watlow F4T & D4T group, SpecView reads the part number of the F4T or D4T and adds the appropriate instruments for features including control loops, cascade loops, profiles and alarms. Additionally, an instrument is added for each flex module the F4T or D4T is configured to expect.

Additional Instruments Available with the Watlow F4T Driver
Because F4Ts and D3Ts offer many additional functions such as math, logic, timers and counters that may not all be used in the application, other instruments may be manually added to a configuration to gain access to the values and settings associated with these features.

Using EZ-ZONE Controllers with Standard Bus

When automatically detecting a Standard Bus network with the *Watlow EZ-ZONE Standard Bus* driver, SpecView reads each device's part number and adds the appropriate instruments. For the details see *EZ-ZONE Standard Bus Instruments* on page 30.

Note! Run the 32-bit version of SpecView for compatibility with the Watlow EZ-ZONE Standard Bus driver. This driver is not supported by the 64-bit version of SpecView.

Using EZ-ZONE Controllers with Modbus®

To configure SpecView to communicate with EZ-ZONE products via Modbus® you will select and add appropriate instruments manually. For each instrument you must determine the correct address string. The address string depends on the type of network and its configuration. You will add as many copies of the instrument as needed to allow access to the desired controller features. For example, to access all four analog inputs in an EZ-ZONE RM Control Module, you will add four *EZ-ZONE Analog Input* instruments.

SpecView Instruments Supporting EZ-ZONE Devices via Modbus®

The tables in this section list the instruments that may be used with each EZ-ZONE product. Additional tables in the *EZ-ZONE Modbus® Instruments* section on page 43 list each parameter included in these instruments. Review the supported parameters carefully and determine whether they allow you to develop a project that meets your requirements. Standard Bus communications provides access to many more EZ-ZONE controller parameters.

Simplified Address Strings in SpecView Version 3

In previous versions of SpecView the "address string" included the controller address, number of decimal places to display and the register offset. As of version 3 these are now entered in separate fields in SpecView which makes setting up instruments more straight forward.

Controller or Gateway Slave Address

For Modbus® TCP each controller or gateway is identified by its TCP/IP Address. EZ-ZONE controllers and gateways will respond to any valid setting (1 to 247) for the Slave Address. It is not necessary to set each device to a unique Modbus® address, but each must have a unique and appropriate IP address. See the figure below.

For Modbus® RTU specify the controller or gateway's Modbus® Slave Address (1 to 247). This is set in the controller or gateway's Setup Communications menu. Each controller or gateway on the network must have a unique Modbus® address. See the figure below.
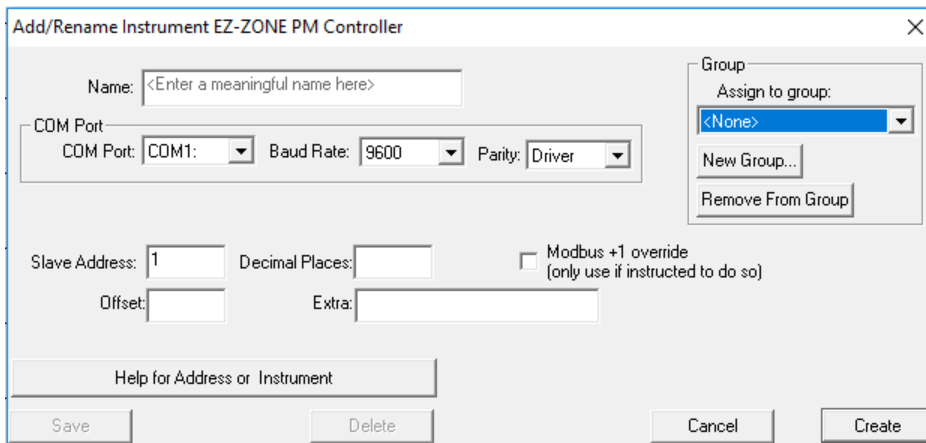
Decimal Places
Specify zero (0) to display whole numbers for parameters such as process variable and set point. Specify one (1) to display these parameters with tenths precision, two (2) to display hundredths and so on. Valid settings range from zero (0) to four (4).

Register Address Offset
The register address offset is the sum of the *First Instance Address* for the specific EZ-ZONE product, any applicable *Instance Offsets* and the *Gateway Offset*, if any. The Gateway Offset is set by the user when the RUI Gateway or RM Access Module gateway is configured. The First Instance Address and Instance Offsets depend on the controller's data map setting and are supplied in the tables below for each instrument and product.

Gateway Offset
Be careful not to set up instruments that attempt to read Modbus® registers that are mapped over by the configuration of the gateway.

Register Addresses and Offsets for EZ-ZONE ST

| Instrument | Instances | Data Map 1 via RUI Only[1] | | Data Map 2[2] | |
		First Instance Address	Instance Offset	First Instance Address	Instance Offset
EZ-ZONE Alarm	1 to 2	1480	50	1450	60
EZ-ZONE Analog Input	1 to 2	360	160	360	90
EZ-ZONE Control Loop	1	N/A	N/A	1750	N/A
EZ-ZONE Communications	1	2418	N/A	2060	20
EZ-ZONE Current	1	1120	N/A	1240	N/A
EZ-ZONE Digital I/O	1 to 6	880	30	940	30
EZ-ZONE Limit	1	680	N/A	720	N/A
EZ-ZONE Profile (Map 1)**	1 to 4	6070	500	N/A	N/A
EZ-ZONE Profile (Map 2)**	1 to 4	N/A	N/A	4000	1000
EZ-ZONE Profile (ST Map 1)	1 to 4	2870	800	N/A	N/A
EZ-ZONE Profile Operation	1	2720	N/A	3800	N/A
EZ-ZONE Set Points	1	2160	N/A	1890	N/A

[1] Supported only via EZ-ZONE RUI Gateway.
[2] Available with firmware version 4.0 or later.

Register Addresses and Offsets for EZ-ZONE PM

Instrument	Instances	Data Map 1		Data Map 2	
		First Instance Address	Instance Offset	First Instance Address	Instance Offset
EZ-ZONE Alarm	1 to 4	1480	50	1880	60
EZ-ZONE Analog Input	1 to 2	360	80	360	90
EZ-ZONE Communications	1 or 2	2490	20	2970	20
EZ-ZONE Control Loop	1 to 2	1880	70	2360	70
EZ-ZONE Current	1	1120	N/A	1360	N/A
EZ-ZONE Digital I/O	1 to 12	880	30	1000	30
EZ-ZONE Limit	1	680	N/A	720	N/A
EZ-ZONE Profile (Map 1)	1 to 4	2570	500	N/A	N/A
EZ-ZONE Profile (Map 2)	1 to 4	N/A	N/A	4500	1000
EZ-ZONE Profile Operation	1	2520	N/A	4340	N/A
EZ-ZONE Set Points	1 to 2	2160	80	2640	80

Register Addresses for EZ-ZONE Express Controller

Instrument	First Instance Address[1]
EZ-ZONE Alarm	1480
EZ-ZONE Analog Input	360
EZ-ZONE Control Loop	1880
EZ-ZONE Set Points	2160

[1] PM Express has only one instance each.

Register Addresses for EZ-ZONE Express Limit

Instrument	First Instance Address[1]
EZ-ZONE Alarm	1480
EZ-ZONE Analog Input	360
EZ-ZONE Limit	680

[1] PM Express has only one instance each.

Register Addresses and Offsets for EZ-ZONE RMC Modules

Instrument	Instances	First Instance Address	Instance Offset
EZ-ZONE Alarm	1 to 8	1740	60
EZ-ZONE Analog Input	1 to 4	360	90
EZ-ZONE Communications	1	2830	N/A
EZ-ZONE Control Loop	1 to 4	2220	70
EZ-ZONE Current	1 to 4	1380	50
EZ-ZONE Digital I/O	1 to 12	1020	30
EZ-ZONE Limit	1 to 4	720	30
EZ-ZONE Profile (Map 2)	1 to 25	5440	1000
EZ-ZONE Profile Operation	1	5280	N/A
EZ-ZONE Set Points	1 to 4	2500	80
EZ-ZONE Sub Routine	1 to 15	30440	860

Register Addresses and Offsets for EZ-ZONE RME Modules

Instrument	Instances	First Instance Address	Instance Offset
EZ-ZONE Alarms	1 to 8	1440	60
EZ-ZONE Communications	1	2170	N/A
EZ-ZONE Digital I/O	1 to 24	360	30

Register Addresses and Offsets for EZ-ZONE RMH Modules

Instrument	Instances	First Instance Address	Instance Offset
EZ-ZONE Alarms	1 to 24	2660	60
EZ-ZONE Analog Input	1 to 16	380	90
EZ-ZONE Communications	1	6510	N/A
EZ-ZONE Control Loop	1 to 16	4100	70
EZ-ZONE Digital I/O	1 to 12	1820	30
EZ-ZONE Set Points	1 to 16	5220	80

Register Addresses and Offsets for EZ-ZONE RML Modules

Instrument	Instances	First Instance Address	Instance Offset
EZ-ZONE Alarms	1 to 16	2530	60
EZ-ZONE Analog Input	1 to 12	410	90
EZ-ZONE Communications	1	3500	N/A
EZ-ZONE Digital I/O	1 to 12	1850	30
EZ-ZONE Limit	1 to 12	1490	30

Register Addresses and Offsets for EZ-ZONE RMS Modules

Instrument	Instances	First Instance Address	Instance Offset
EZ-ZONE Alarms	1 to 16	2500	60
EZ-ZONE Analog Input	1 to 16	380	90
EZ-ZONE Communications	1	3470	N/A
EZ-ZONE Digital I/O	1 to 12	1820	30

Address Example 1: Analog Input 1 in an EZ-ZONE ST via Modbus® RTU

For an EZ-ZONE ST communicating with SpecView directly (no gateway) via Modbus® RTU, use the First Instance Address for the *EZ-ZONE Analog Input,* 360 to read analog input 1. If the controller's address on the 485 network is 2, set the following properties for the instrument:

- Slave Address: 2
- Offset: 360

Note that we must use data map 2 because data map 1 is not supported by SpecView for EZ-ZONE STs without a gateway.

Address Example 2: Analog Input 2 in an EZ-ZONE ST via Modbus® RTU

For an EZ-ZONE Analog Input instrument supporting analog input 2 in the ST controller from example 1, set the following properties for the instrument:

- Slave Address: 2
- Offset: 450

The offset is 450 because 360 is the address for the first analog input and you add the offset, 90, to reach the second input.

Address Example 3: EZ-ZONE PM Controllers via an EZ-ZONE RUI Gateway with Modbus® TCP

Consider three EZ-ZONE PM controllers configured for data map 2 and connected to an EZ-ZONE RUI Gateway with the local/remote gateway offsets set to 0, 4000 and 8000 respectively. To determine the register address offset for an *EZ-ZONE Set Points* instrument to support the second control loop in the third EZ-ZONE PM, locate the First Instance Address and the Instance Offset. These are 2640 and 80 respectively. Add these together for second control loop and add the gateway offset for the third controller: 2640 + 80 + 8000 = 10720. So the register address offset is 10720. Set the following properties for this instrument:

- TCP/IP Address or Hostname: 10.3.37.105
- Slave Address: 1
- Offset: 10720

Keep in mind that with Modbus® TCP the EZ-ZONE PM will respond to any slave address.

EZ-ZONE Modbus® Profile Instruments

The instruments supporting programming profiles include 10 steps each. Therefore, the instance offsets indicated above are ten times the instance offsets indicated for the steps in the controller manuals.

Old EZ-ZONE Modbus® Instruments

The following instruments are included in the Watlow Modbus® instrument group, but are no longer described in this document. They are not maintained or tested for use with later versions. They are provided for backwards compatibility only.

- EZ-ZONE PM Controller
- EZ-ZONE PM Limit
- EZ-ZONE PM Profiling
- EZ-ZONE ST Controller
- EZ-ZONE ST Profiling
- EZ-ZONE Gateway ST Controller
- EZ-ZONE Gateway ST Profiling

Note: These instruments support data map 1 only.

Using ASPYRE Power Controllers with Modbus®

Connect a 485 port on the PC to port 2 on the ASPYRE power controller via RS-485 Modbus RTU. To configure SpecView to communicate with ASPYRE products via Modbus® RTU from the Watlow Modbus group in the New Instruments list select and add one ASPYRE DT instrument manually per power controller. Configure communications with each instrument with the information listed below.

- COM Port: the serial port to on the PC which the ASPYRE power controller is connected
- Baud Rate: per the setting of the ASPYRE RS-485 port to which the PC is connected
- EZ-ZONE PM Profiling
- Parity: Driver
- Slave Address: the address of the ASPYRE power controller on the 485 network (also known as *station address*)
- Decimal Places: 0
- Modbus +1 override: not selected
- Offset: leave blank
- Extra: leave blank

3 Chapter 3: Setup Procedures

The following sections provide procedures for establishing communications between SpecView and Watlow controllers.

Automatically Detect an F4T or D4T

The following procedure guides you through the process of configuring SpecView to communicate with Watlow F4T controllers and D4T data loggers via Modbus® TCP or Modbus® RTU. It is assumed that the controllers are connected correctly via Ethernet or one or more of the computer's serial communications ports. To add a controller to an existing configuration, see *Manually Set up or Modify a Modbus® RTU, 485 or 232 Network* on page 20 or *Manually Set up or Modify a Modbus® TCP Network* on page 24.

To create a configuration automatically:

1) For each F4T / D4T:
   Modbus® RTU:
   - Set all controllers to the same baud rate

   - Set each controller to a unique Modbus Address

   - Set Parity to *None*.

   - Set Modbus Word Order to *Low High*

   - Modbus Data Map: 1

   Modbus® TCP:
   - Set each controller to a unique IP address.

   - Make sure Modbus TCP is enabled.

2) Launch SpecView and click through any informational dialogs.
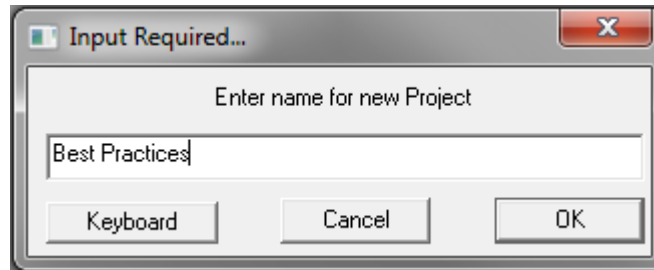
3) At the splash screen, click Select/Create Project…

4) In the **Projects** dialog click **Test Comms for New Project**.
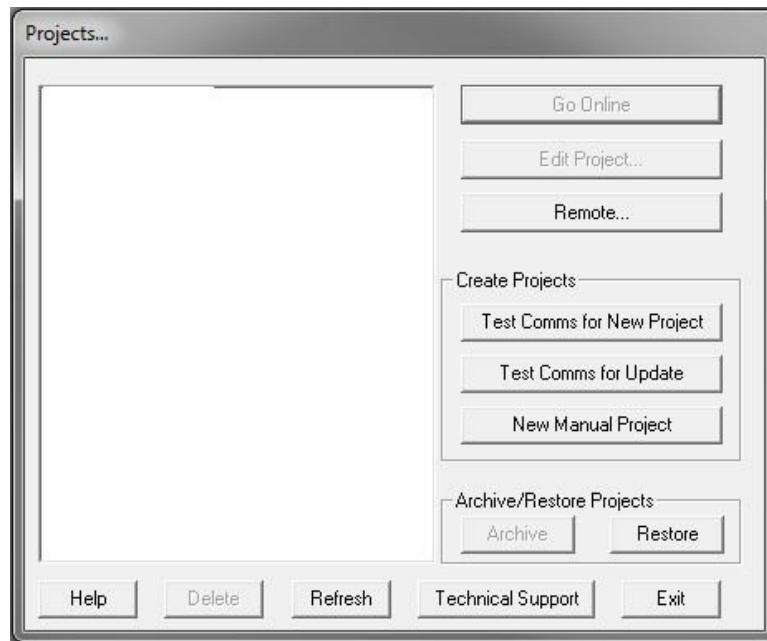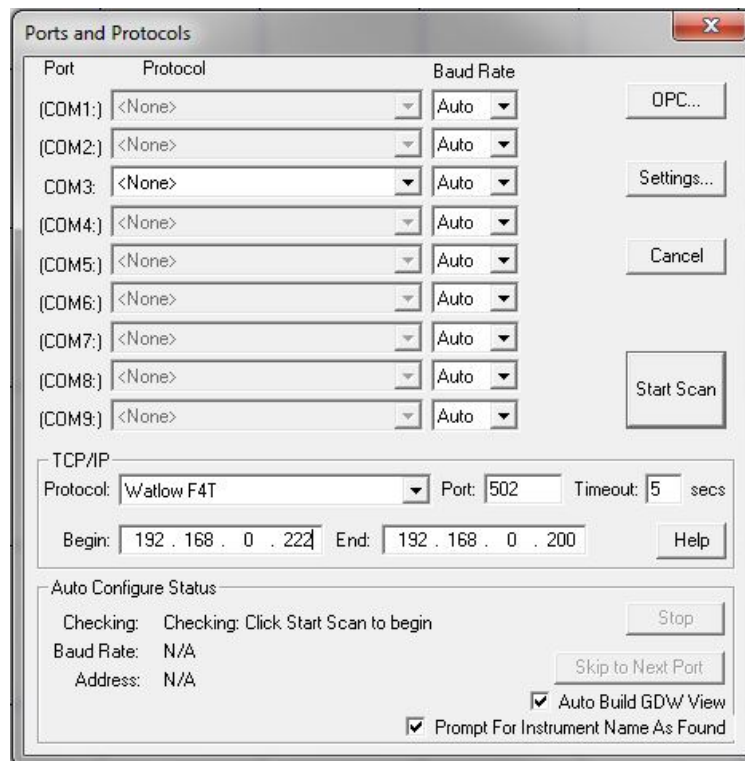

5) Enter a name for the project.

6) Click **OK**.

7) For the **Port** to which the controllers are attached, under **Protocol** choose the Watlow F4T & D4T template group.

8) For TCP/IP enter **Begin** and **End** addresses to limit the range of addresses scanned.

9) Click **Start Scan**.

10) For each instrument SpecView detects, enter a name and set **Decimal Places** or click **OK** to accept the default settings.
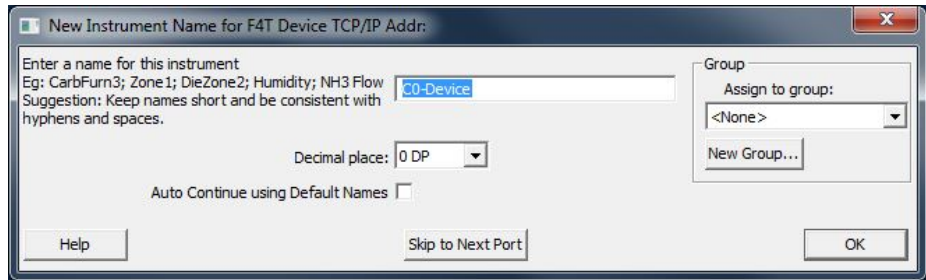
11) Once SpecView has scanned all the addresses with F4T controllers and D4T data loggers, click **Stop** or, if there are more ports to scan, click **Skip to Next Port** or **Skip to Next IP.**
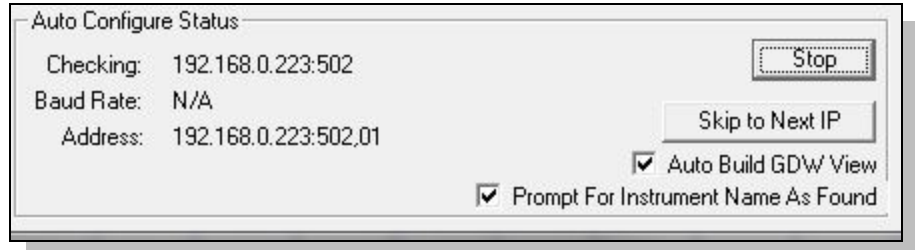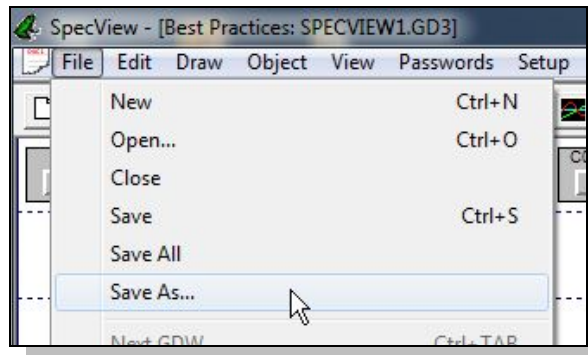
12) To scan another template group, click **Cancel** and repeat from step 7 above for the next template group.
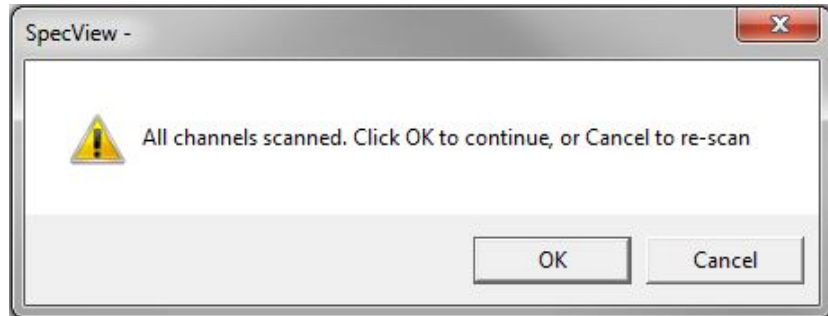
13) Click **OK**.

14) To save the GDW:
   - From the **File** menu, choose **Save As.**
   - Enter a **File name** for the GDW.
   - Click **Save**.

Automatically Detect a New Standard Bus, 485 or 232 Network

The following procedure guides you through the process of configuring SpecView to communicate with Watlow controllers via Standard Bus, 232 and 485 serial communications. It is assumed that the controllers are connected correctly to one or more of the computer's serial communications ports. To add a controller to an existing configuration, see *Manually Set up or Modify an EZ-ZONE Standard Bus Network* on page 17 or *Manually Set up or Modify a Modbus® RTU, 485 or 232 Network* on page 20.

**To create a project automatically:**

1) Set all controllers to the same baud rate. (Not necessary for Standard Bus.)

2) Set each controller to a unique address or zone number.

3) Launch SpecView.

    Note! Use the 32-bit version of SpecView with the Watlow EZ-ZONE Standard Bus driver.

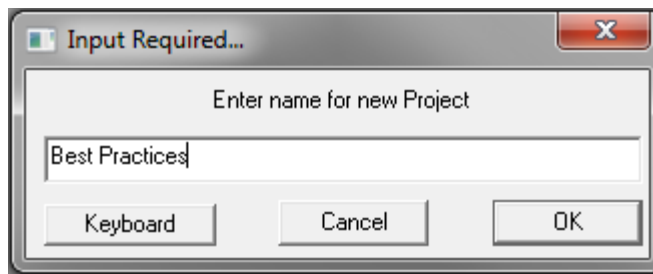4) At the splash screen, click **Select/Create Project…**

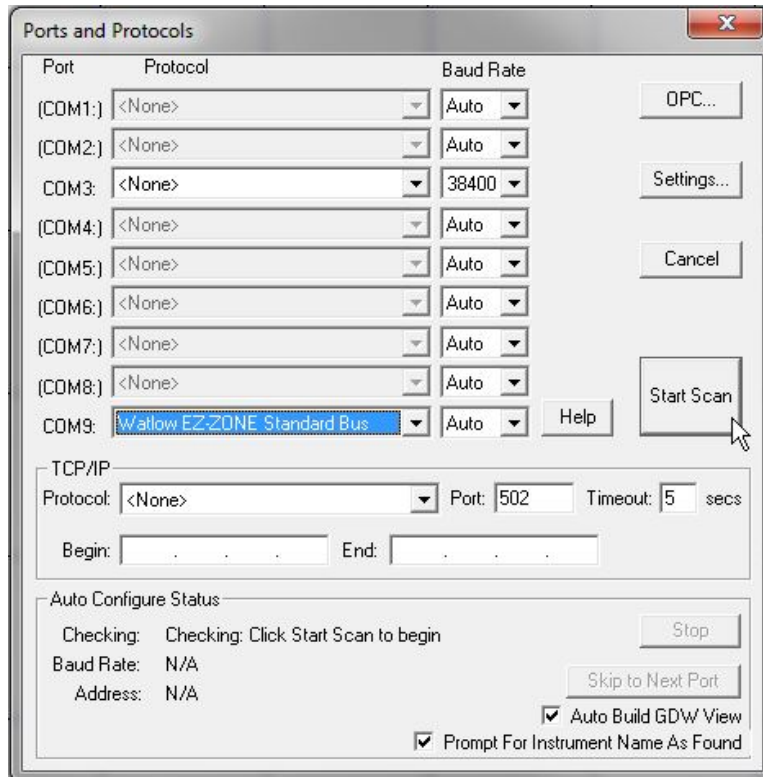5) In the **Projects** dialog click **Test Comms for New Project**.
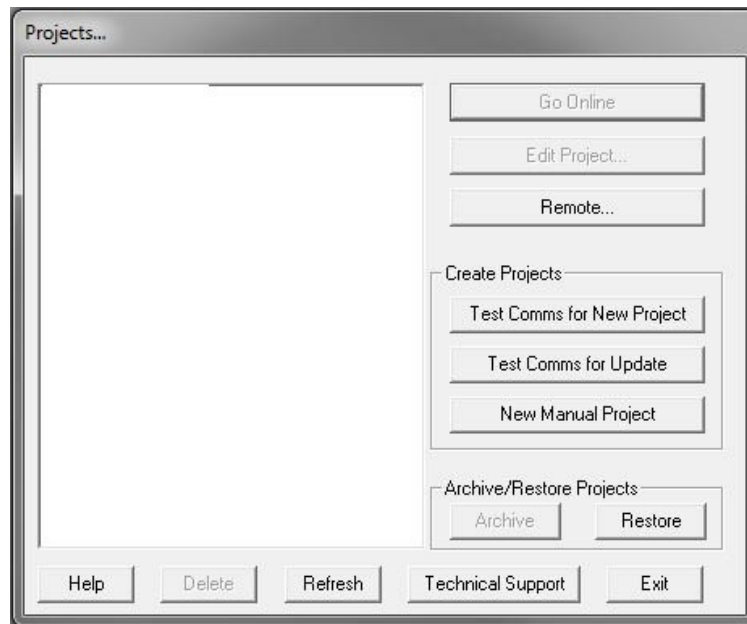
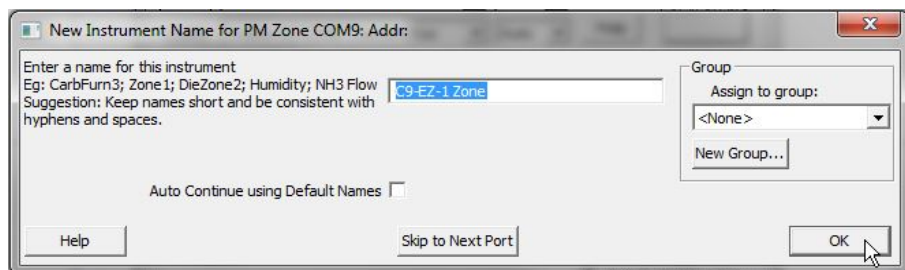6) Enter a name for the project.

7) Click **OK**.

8) For the **Port** to which the controllers are attached, choose the appropriate template group driver in **Protocol**. See the table below.

9) Click **Start Scan**.

10) For each instrument SpecView detects, enter a name and set **Decimal Places** or click **OK** to accept the default settings.

For this Controller…	Choose this Template Group for Protocol…	Notes
EZ-ZONE PM, RM or ST	Watlow EZ-ZONE Standard Bus	
SERIES 96, 97, SD MICRODIN, POWER SERIES, 986, 987, 988, 989	Watlow Modbus	
SERIES F4 Ramping	Watlow Modbus Watlow F4 Programmer[1]	For the SERIES F4 Profiling controller, scan twice, once with each template group. Add the F4 Cascade instrument manually if desired. See *Manually Set up or Modify a Modbus® RTU, 485 or 232 Network* on page 20.
16CLS, 16MLS, CLS216, MLS316	Anafaze 16 Loop	CLS200 and MLS300 Standard and Ramp/Soak firmware options. For controllers with Ramp/Soak to add the Anafaze Profile Status and the desired Anafaze Profile instruments. See *Manually Set up or Modify a Modbus® RTU, 485 or 232 Network* on page 20.
32MLS, MLS332	Anafaze 32 Loop	
8CLS, CLS208 4CLS, CLS204	Anafaze 8 Loop	
32MLS (Anafaze protocol)	Anafaze/AB	

[1]Scan with the Watlow F4 Programmer driver only if the F4 programmer option is enabled in the SpecView key.
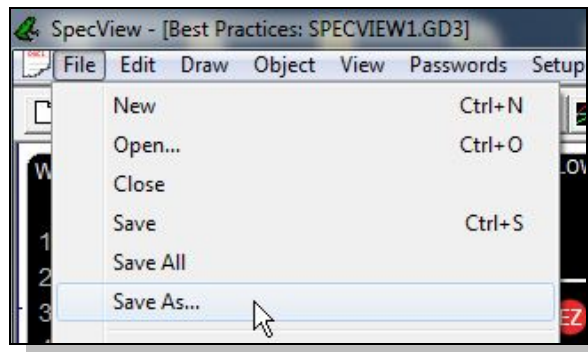
11) If another template group must be scanned, click **Cancel** and repeat this procedure from step 8 for the next template group.
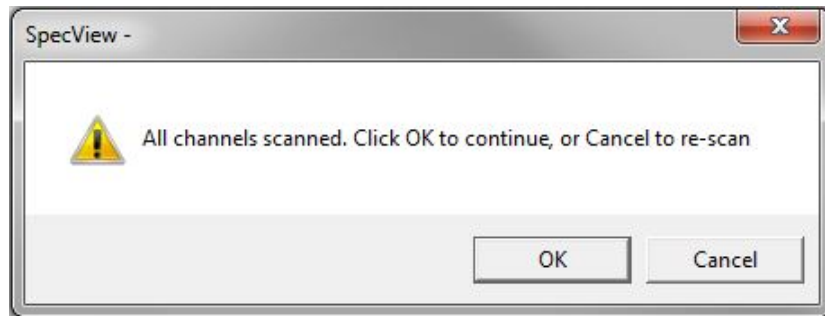
12) Click **OK**.

13) To save the GDW:
   - From the **File** menu, choose **Save As.**
   - Enter a **File name** for the GDW.
   - Click **Save**.

Manually Set up or Modify an EZ-ZONE Standard Bus Network

The following procedures guide you through the process of manually creating a configuration for a Standard Bus network and adding devices to this configuration. Use this procedure when the EZ-ZONE controllers are not available to detect automatically.

To create a manual project:

1) Launch SpecView.

   Note! Use the 32-bit version of SpecView with the Watlow EZ-ZONE Standard Bus driver.

2) At the splash screen, click **Select/Create Project…**

3) Click **New Manual Project**.
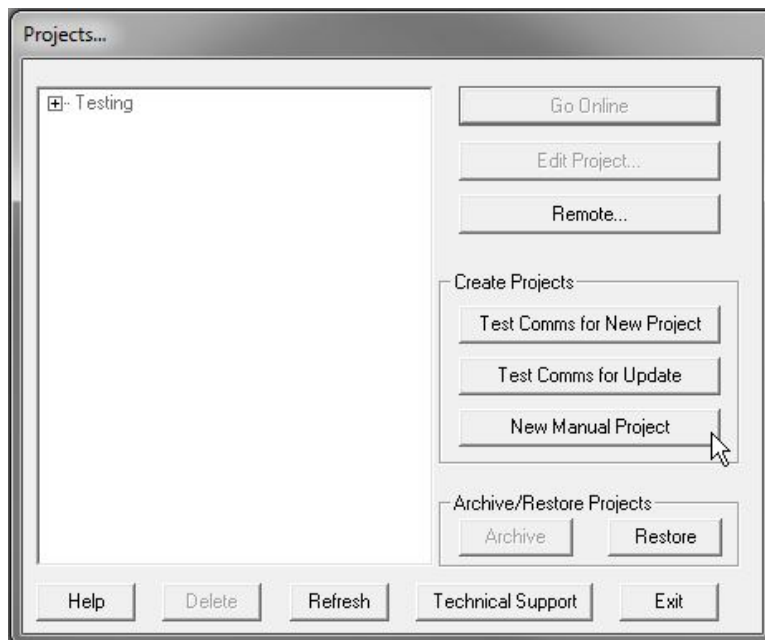
4) Enter a name for the project.

5) Click **OK**.

To add one or more instruments to a project:

1) Open the Graphical Display Window in the edit mode if it is not already open.

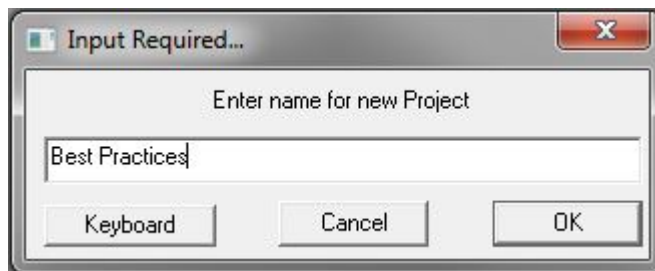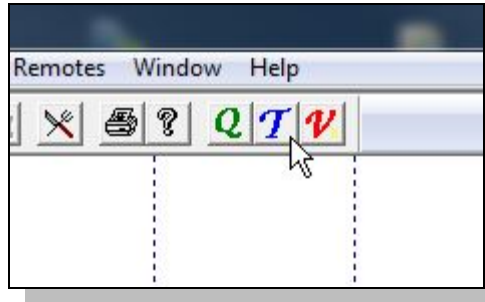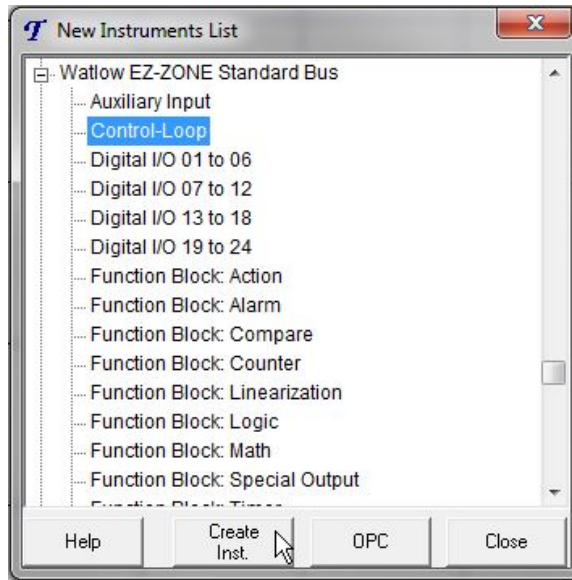2) Click the **Templates** button.

3) In **New Instruments List** click ⊞ to expand **Watlow EZ-ZONE Standard Bus**.

4) Select the instrument you want to add. (See the table below.)

5) Click **Create Inst.**

For This Controller…	From this Template Group…	Add These Instruments…	With Address...[1]
EZ-ZONE PM	Watlow EZ-ZONE Standard Bus	See the PM table on page 31.	
EZ-ZONE PM Express Controller[2]	Watlow EZ-ZONE Standard Bus	PM Express Controller	z
EZ-ZONE PM Express Limit[1]	Watlow EZ-ZONE Standard Bus	PM Express Limit_	z
EZ-ZONE RMA Access Module	Watlow EZ-ZONE Standard Bus	See the RMA table on page 31.	
EZ-ZONE RMC Control Module	Watlow EZ-ZONE Standard Bus	See the RMC table on page 32.	
EZ-ZONE RMH High-Density Control Module	Watlow EZ-ZONE Standard Bus	See the RMH on page 34.	
EZ-ZONE RML High-Density Limit Module	Watlow EZ-ZONE Standard Bus	See the RML table on page 35.	
EZ-ZONE RMS High-Density Scanner Module	Watlow EZ-ZONE Standard Bus	See the RMS table on page 36.	
EZ-ZONE RME Expansion Module	Watlow EZ-ZONE Standard Bus	See the RME table on page 37.	
EZ-ZONE RM Function Blocks	Watlow EZ-ZONE Standard Bus	See the Function Block table on page 38.	
EZ-ZONE ST	Watlow EZ-ZONE Standard Bus	ST Controller	z
		ST Profiling[3]	z

[1] Replace "z" in the address with the zone number (also known as the standard bus address).
[2] For PM model numbers of the form PMxxxxx-AAAABxx.
[3] Add these instruments for a controller that includes the ramp and soak or profiling option.

6) In the **Add/Rename Instrument** dialog type a **Name** for the instrument.

7) Select the COM **Port**.

8) Enter the **Address**. See the table above.

9) Click **Create**.

10) Repeat from step 4 for each instrument to be added.

11) Close the New Instruments List.
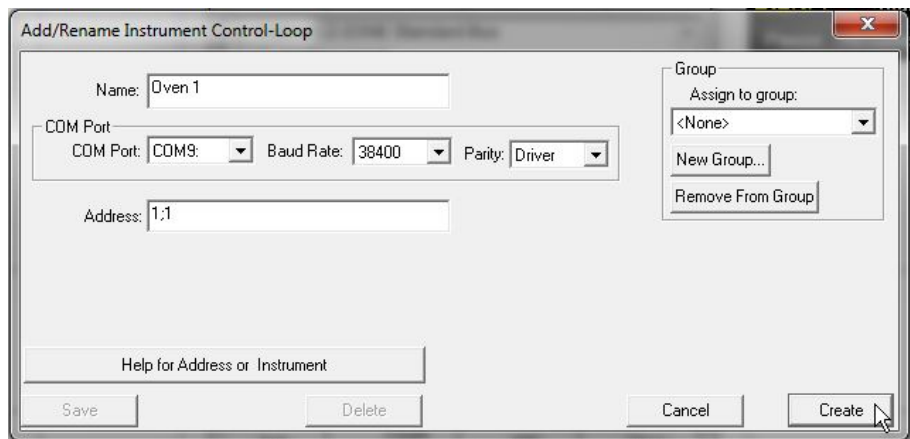
12) To add an instrument view to the GDW, drag the instrument from the list to the GDW.
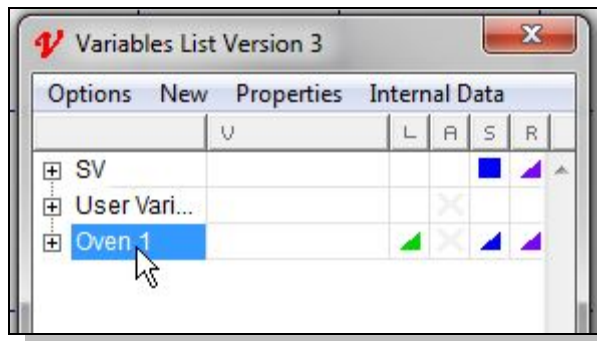
13) To add a variable to the GDW:
   - Open the Variables list
   - Expand the instrument by clicking ⊞.
   - Drag the parameter from the list to the GDW.
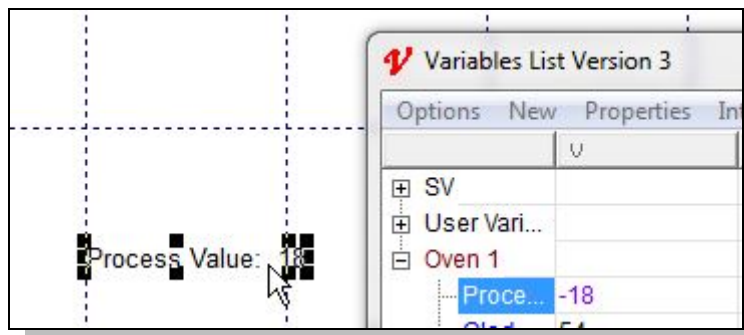
14) To save the GDW:
   - From the **File** menu, choose **Save.**
   - Enter a **File name** for the GDW.
   - Click **Save**.
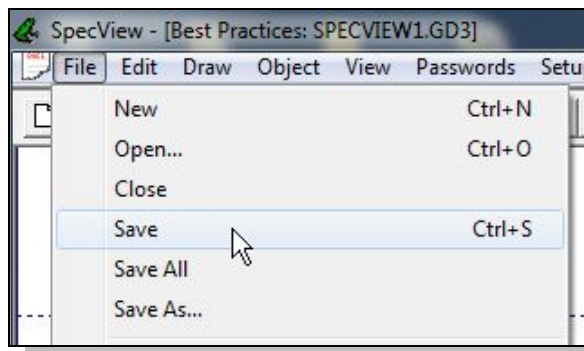
Manually Set up or Modify a Modbus® RTU, 485 or 232 Network

The following procedures guide you through the process of manually creating a configuration for a Modbus® RTU, 485 or 232 network and adding devices to this configuration. Use this procedure when the controllers are not available to detect automatically, when you want to add a new controller to an existing configuration and for creating configurations that communicate with EZ-ZONE controllers via Modbus® RTU.

To create a new project manually:

1) Launch SpecView.

2) At the splash screen, click **Select/Create Project…**

3) Click **New Manual Project**.
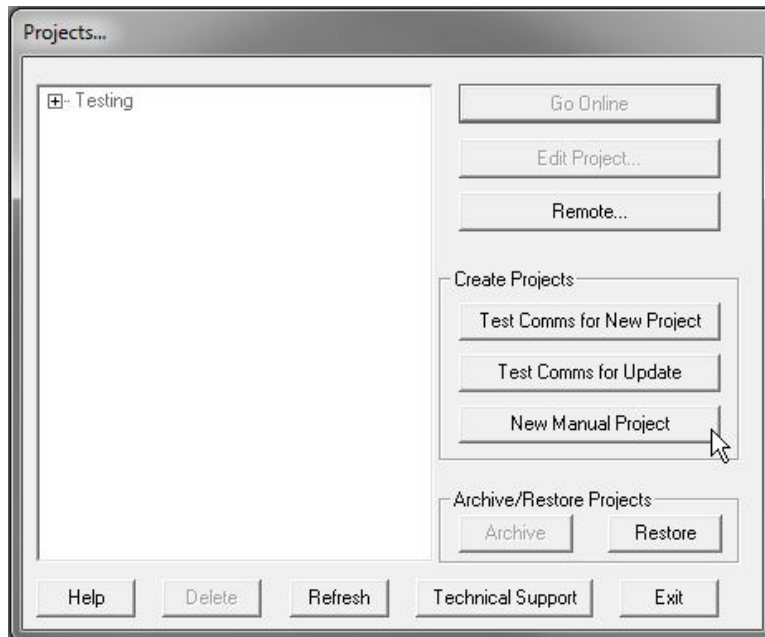
4) Enter a name for the project.

5) Click **OK**.
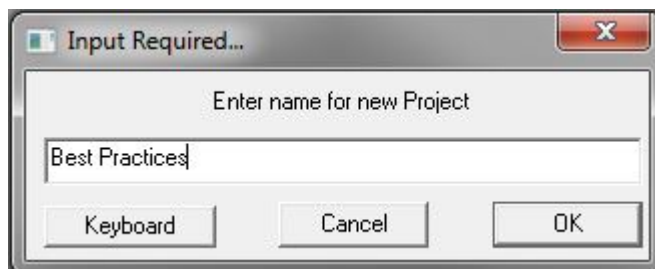
To add one or more instruments to a project:

1) Open the Project in the edit (on-line) mode if it is not already open.
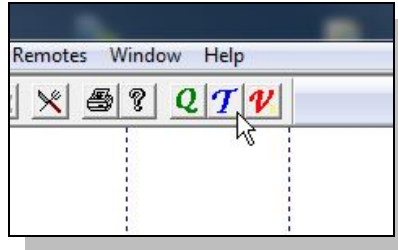
2) Click the **Templates** button.

3) In **New Instruments List** click ⊞ to expand the group that includes the instrument you want to add. See the table below.
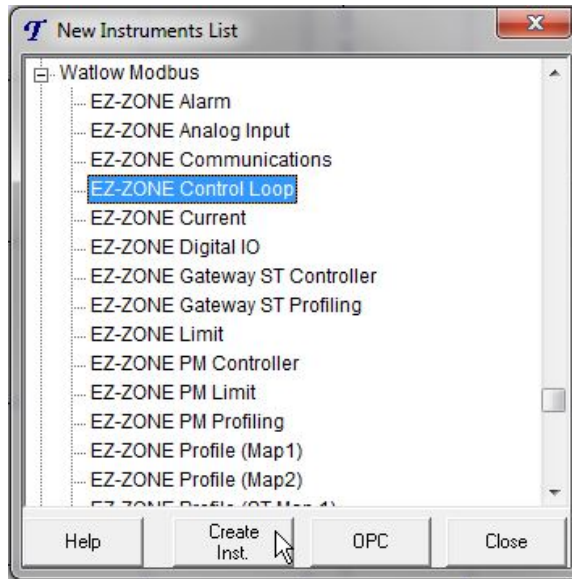
4) Select the instrument you want to add.

5) Click **Create Inst.**

6) In the **Add/Rename Instrument** dialog type a **Name** for the instrument.
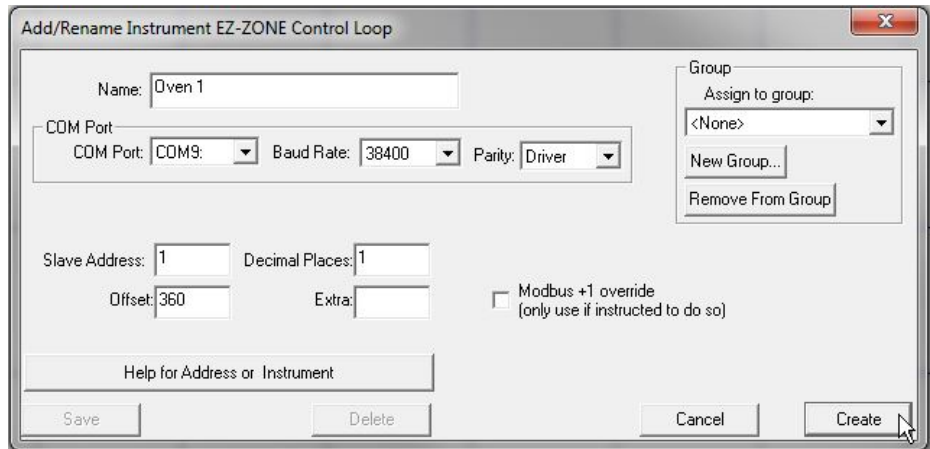
7) Select the **Port**.

8) Set the **Baud Rate**.

9) Enter the **Slave Address** set in the controller.

10) Enter the **Decimal Places**.

11) For EZ-ZONE controllers enter the **Offset**. See *Using EZ-ZONE Controllers with Modbus®* on page 6.

For This Controller…	From this Template Group…	Add These Instruments…
F4T or D4T	Watlow F4T & D4T	See *F4T Instruments* on page 29.
ASPYRE DT	Watlow Modbus	ASPYRE DT (See *Using ASPYRE Power Controllers with Modbus®* on page 10
EZ-ZONE PM	Watlow Modbus	See *SpecView Instruments Supporting EZ-ZONE Devices via Modbus®* on page 6.
EZ-ZONE PM Express Controller		
EZ-ZONE PM Express Limit		
EZ-ZONE RM	Watlow Assembly	See *Watlow Assembly Instruments* on page 46.
EZ-ZONE ST		
MICRODIN	Watlow Modbus	MicroDin
SERIES 96	Watlow Modbus	Series 96
SERIES 97	Watlow Modbus	SERIES 97 Limit
SERIES SD	Watlow Modbus	SERIES SD Controller
		SERIES SD Profiling[1]
SERIES SD Limit	Watlow Modbus	SERIES SD Limit
986, 987, 988, 989	Watlow Modbus	Watlow 988
POWER SERIES	Watlow Modbus	Watlow Power Series
SERIES F4 Ramping	Watlow Modbus	Watlow F4
		F4 Cascade
	Watlow F4 Programmer	Watlow F4 Program[2]
Any	Generic Modbus	See *Generic Modbus Instruments* on page 46.

[1] Add this instrument for a controller that includes the ramp and soak or profiling option.
[2] Add the Watlow F4 Program instrument only if the F4 programmer option is enabled in the SpecView key.

For This Controller…	From this Template Group…	Add These Instruments…	Modbus +1 Override option	With Offset…
16CLS, 16MLS, CLS216, MLS316	Anafaze 16 Loop	MLS CPU	Yes	
		MLS(16)Ch (1 per loop)	Yes	n (n = loop)
32MLS, MLS332	Anafaze 32 Loop	MLS CPU	Yes	
		MLS(32)Ch (1 per loop)	Yes	n (n = loop)
8CLS, CLS208 4CLS, CLS204	Anafaze 8 Loop	MLS CPU	Yes	
		CLS(8)Ch (1 per loop)	Yes	n (n = loop)
CLS204, CLS208, CLS216, MLS316, MLS332	Anafaze Ramp/Soak	Anafaze Profile Status[1]	Yes	
		Anafaze Profile A to Anafaze Profile Q (as many as desired to program)[1]	Yes	

[1] Add these instruments for a controller that includes the ramp and soak or profiling option.

12) For Anafaze instruments only:

- Check **Modbus +1**

- Enter the **Offset**, if required.

13) Click **Create**.

14) Repeat from step 3 as needed to add additional instruments.

15) Close the New
Instruments List.

16) To add an instrument
view to the GDW,
click-and-drag the
instrument from the
list to the GDW.
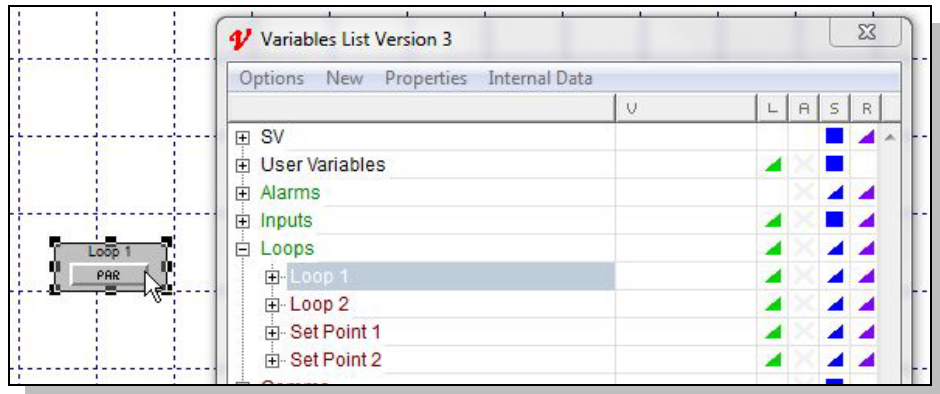
17) To add a variable to the
GDW:
- Open the Variables list
- Expand the instrument
by clicking ⊞.
- Click-and-drag the
parameter from the list
to the GDW.
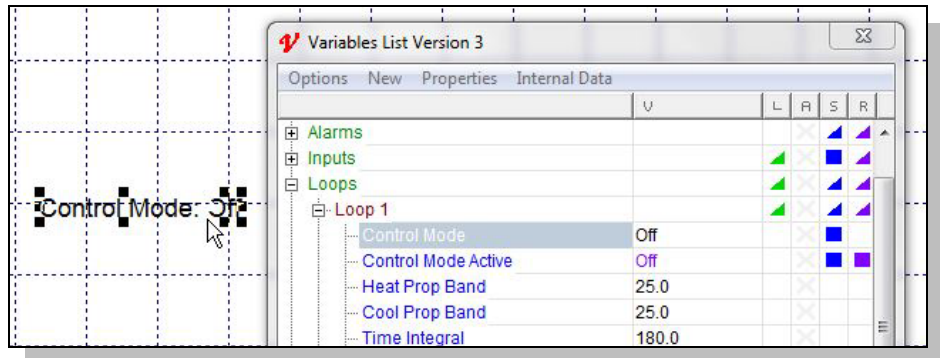
18) To save the GDW:
- From the **File** menu,
choose **Save.**
- Enter a **File name** for
the GDW.
- Click **Save**.
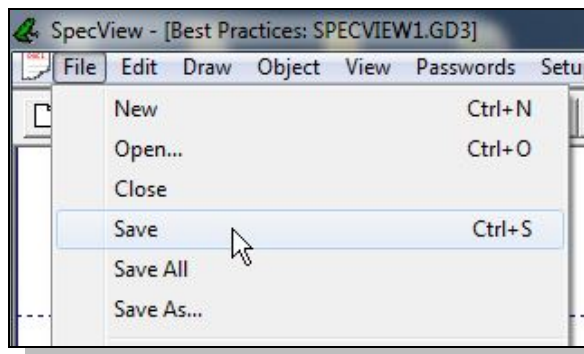
Manually Set up or Modify a Modbus® TCP Network

The following procedures guide you through the process of manually configuring SpecView to communicate with F4T and EZ-ZONE controllers via Modbus® TCP and adding instruments to the project.

To create a new project manually:

1) Launch SpecView.

2) At the splash screen, click **Select/Create Project…**

3) Click **New Manual Project**.
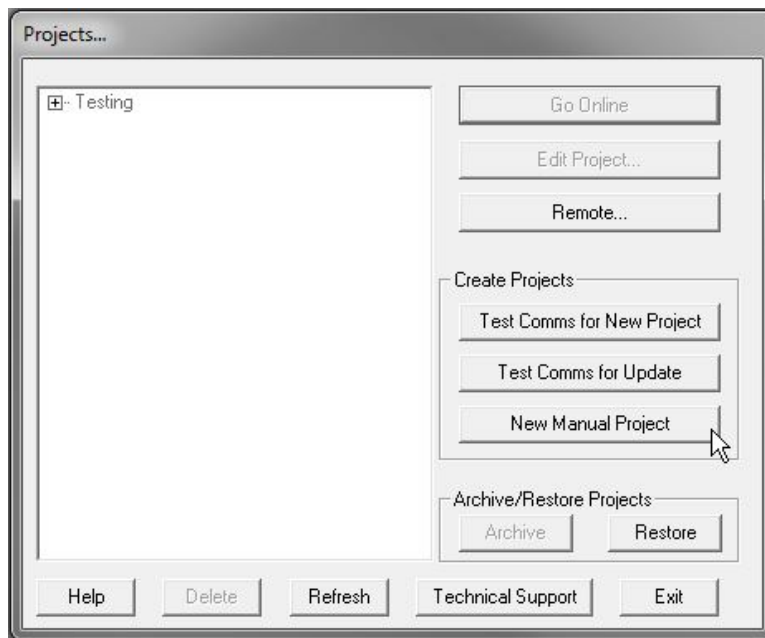
4) Enter a name for the configuration

5) Click **OK**.
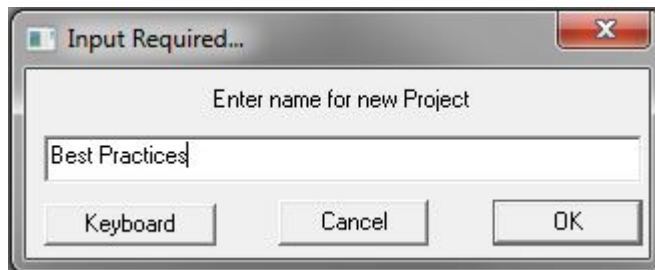
To add one or more instruments to a project:

1) Open the Project in the edit (on-line) mode if it is not already open.

2) Click the **Templates** button.

3) In **New Instruments List** click ⊞ to expand the group that includes the instrument you want to add. See the table below.

4) Select the instrument you want to add. Locate them in the sections referenced below.

5) Click **Create Inst.**
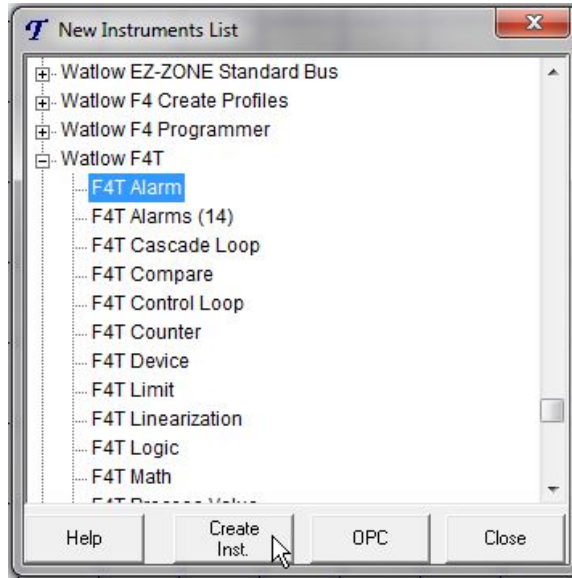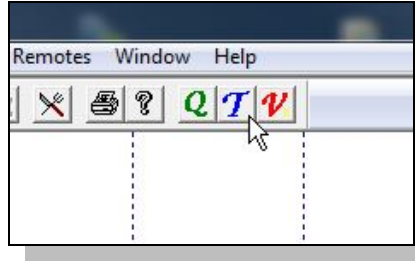
For This Controller…	From this Template Group…	Add These Instruments…	With Address and Offset…
F4T	Watlow F4T	See *F4T Instruments* on page 29.	
EZ-ZONE PM			
EZ-ZONE PM Express Controller		See *Using EZ-ZONE Controllers with Modbus* on page 6.	
EZ-ZONE PM Express Limit	Watlow Modbus		
EZ-ZONE RM			
EZ-ZONE ST			
Any	Generic Modbus	See *Generic Modbus Instruments* on page 46.	

6) In the **Add/Rename Instrument** dialog for **COM Port** select *TCP/IP*.

7) In the **TCP/IP Address** field enter the IP Address.

8) In **Decimal Places** enter the number of decimals to show.
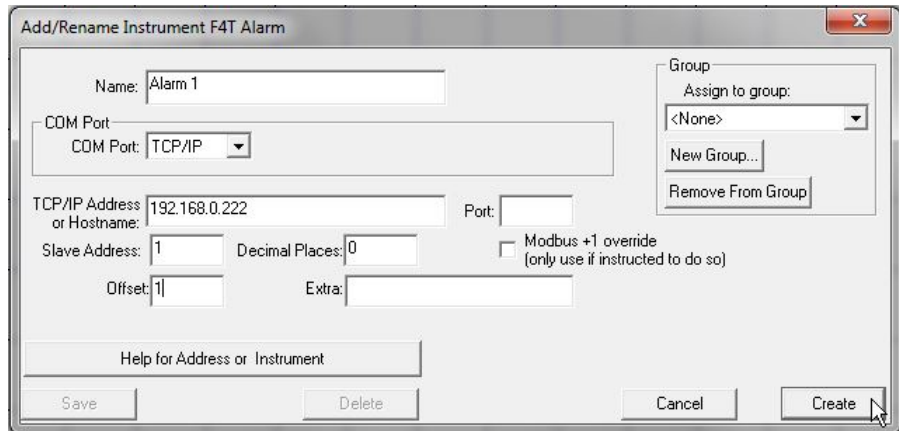
9) In **Offset** enter the necessary address offset, if any. See the section referenced in the table above.

10) Click **Create**.

11) Repeat from step 3 as needed to add additional instruments.

12) Close the New Instruments List.

13) To add instrument views to the GDW, for each:
    - In the **Variables** list select the instrument**.**
    - Click **Add Item**.
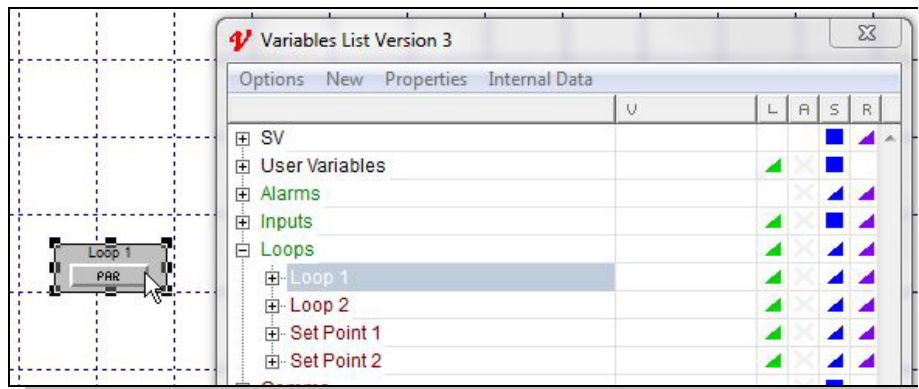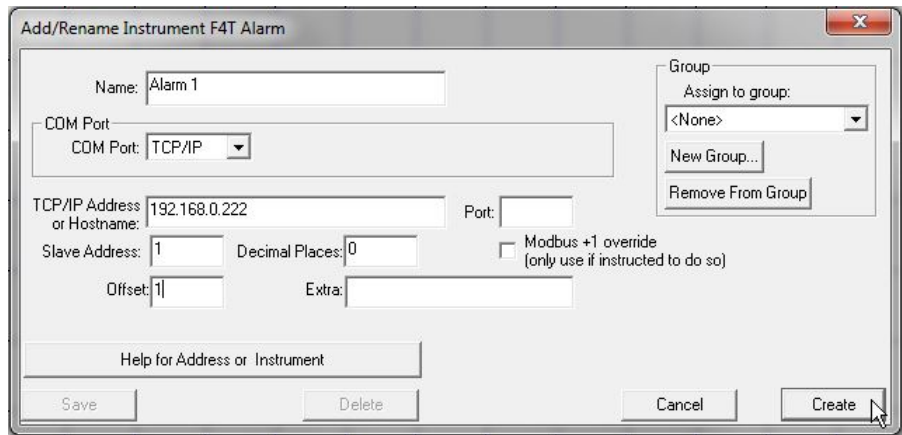
14) To add a variable to the GDW:
    - Expand the instrument by clicking ⊞.
    - Click-and-drag the parameter from the list to the GDW.
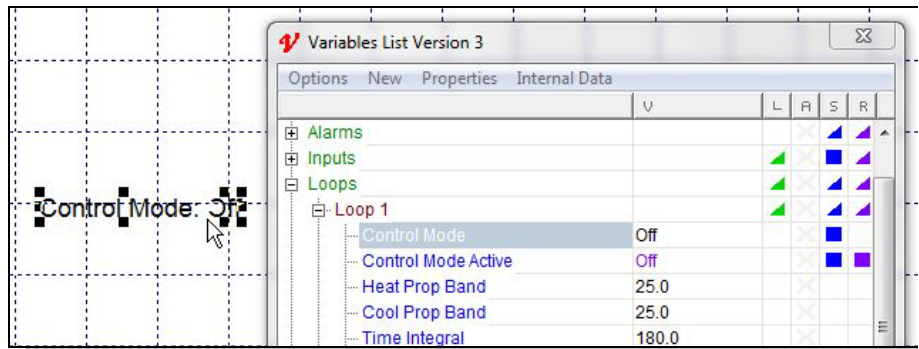
15) To save the GDW:
    - From the **File** menu, choose **Save As**.
    - Enter a **File name** for the GDW.
    - Click **Save**.
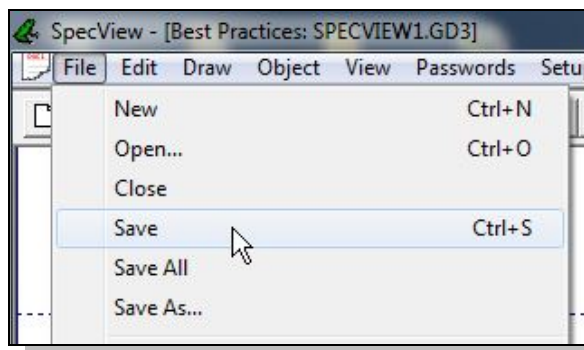
Adjust the Displayed Decimals

The following procedure describes how to adjust the number of decimal places displayed in SpecView.

Note this procedure does not apply to EZ-ZONE controllers communicating with SpecView by Watlow EZ-ZONE Standard Bus because with that protocol the decimal places are automatically displayed according to the controller setting.

When communicating with F4T or EZ-ZONE controllers via Modbus® the Decimal Places setting in SpecView determines the precision with which numbers are displayed; it does not shift the decimal placement relative to the digits. For older Watlow controllers it is necessary to set the Decimal Places setting according to the controller setting so that numbers are scaled correctly and not off by orders of magnitude.

To make the number of decimal places displayed in SpecView match the controller display:

1) Set the decimal setting in the controller as desired. (See the table for details about each controller.

For This Controller…	For Sensor Type…	Parameter in SpecView…	Parameter in Controller…	Available Decimals
EZ-ZONE ST, PM, RM	Any	N/A	dEC	0 to 3
MICRODIN	Any	Decimal Point	(No Display)	0 or 1
SERIES 96	Thermocouple, RTD	Decimal Pt 1	dEC1	0 or 1
	Process	Decimal Pt 1	dEC1	0 to 3
SERIES 97	Any	Decimal 1	dEC1	0 or 1
SERIES SD Controller	Thermocouple, RTD	See Note (1)	dEC	0 or 1
SERIES SD Limit	Process (mA, mV, V)	See Note (2)	dEC	0 to 3
POWER SERIES	Not available			
986, 987, 988, 989	Any	Decimal 1 Decimal 2	dEC1	0 to 3
SERIES F4 Ramping	Thermocouple, RTD, Wet Bulb-Dry Bulb	Input 1 DecPlaces Input 2 DecPlaces Input 3 DecPlaces	Choose Decimal	0 or 1
	Process	Input 1 DecPlaces Input 2 DecPlaces Input 3 DecPlaces	Choose Decimal	0 to 3
CLS, MLS,	Thermocouple, RTD	Precision	Disp Format	1
CLS200, MLS300	Linear	Precision	Disp Format	0 to 4

Notes:
(1) For a SERIES SD with a thermocouple or RTD set the *Decimals (Ctlr Temp Display Only)* parameter, the *Decimals (SpecView and Ctlr Prcs Display)* parameter and SpecView for the same number of decimals.
(2) For a SERIES SD with a process input (mA, mV or V) set the *Decimals (SpecView and Ctlr Prcs Display)* parameter and SpecView for the same number of decimals.

2) Open the project and from the **File** menu choose **Edit Mode (go offline)**.

3) Click to open the Variables list.

4) Select the instrument.

5) Click **Properties**.
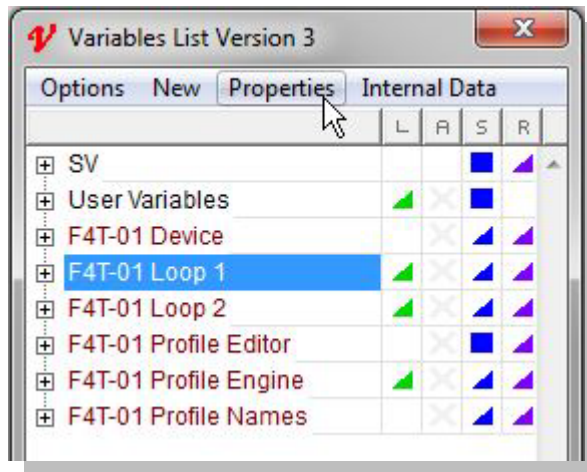
6) Set the **Decimal Places** as desired:

Set…	For…
0	Whole Numbers
1	Tenths
2	Hundredths
3	Thousandths
4	Ten-thousandths

7) Click **Save**.
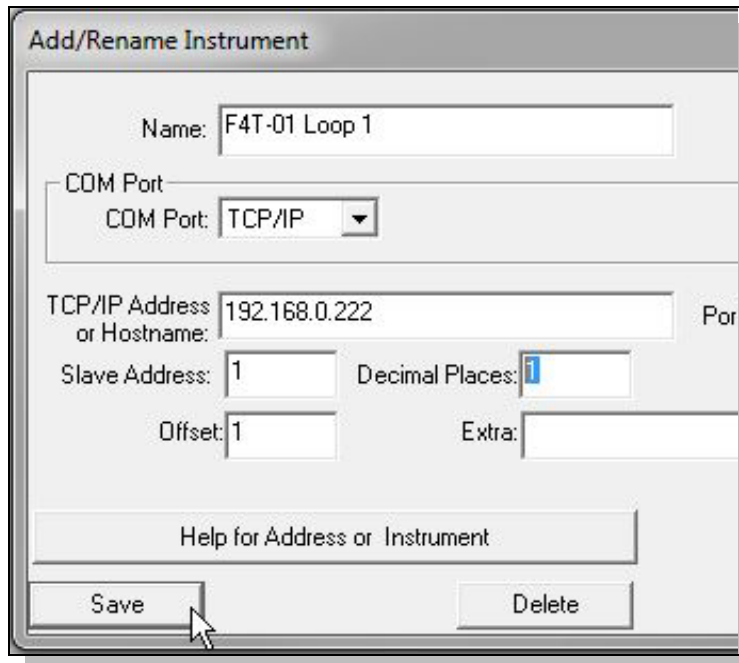
8) To save the GDW:
   - From the **File** menu, choose **Save.**
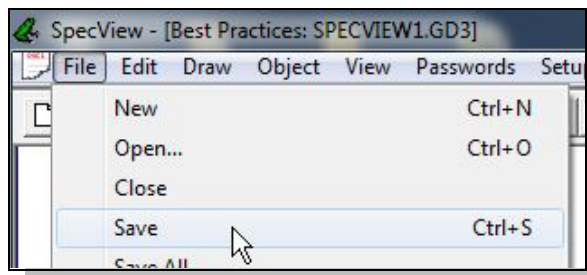
Note: The possible decimal settings may depend on other controller settings such as the sensor type. Not all parameters are affected by the decimal places setting.

4 Chapter 4: Instrument Reference

This chapter describes the instruments and instrument views supporting Watlow products.

F4T and D4T Instruments

The following sections list the instruments that support F4T controllers and D4T data loggers.

Automatic Detection with the Watlow F4T & D4T Instrument Group

When automatically detecting a network with the Watlow F4T & D4T instrument group, SpecView reads each controller's part number and adds the appropriate instruments. When adding instruments manually, refer to the table below which correlates F4T and D4T configuration codes with the instruments that support the corresponding features. The table also lists the Offset setting, if required, for each instrument.

For part numbers matching…	Add… *Instrument Name* (Description)	Offset
F4Txxxxxxxxxxxx	*F4T Device* (real time clock, global and diagnostic settings)	
	F4T Alarms (14) (alarm settings for alarms 1 to 14)	
F4Txxx(D, E or F)xxxxxxxx	*F4T Profile Editor*	
	F4T Profile Engine (monitor and operate ramp-soak profiles)	
	F4T Profile List (name and start command for each profile)	
F4Txxx(B, C, E or F)xxxxxxxx	*F4T Special OP Function* (used for compressor control)	1
F4TxxxxxxxxUxxx U = (1, 2, 3, 4, 7, 8, 9, B or C)	*F4T Control Loop* (setup and monitor control loop 1)	1
F4TxxxxxxxxUxxx U = (2, 3, 4, 8, 9 or C)	*F4T Control Loop* (setup and monitor control loop 2)	2
F4Txxxxxxxx(3, 4 or 9)xxx	*F4T Control Loop* (setup and monitor control loop 3)	3
F4Txxxxxxxx4xxx	*F4T Control Loop* (setup and monitor control loop 4)	4
F4TxxxxxxxxUxxx U = (6, 7, 8, 9, A. B or C)	*F4T Cascade Loop* (setup and monitor cascade loop 1)	1
F4Txxxxxxxx(A, B or C)xxx	*F4T Cascade Loop* (setup and monitor cascade loop 2)	2
D4Txxxxxxxxxxxx	*D4T Device* (real time clock, global and diagnostic settings)	
	D4T Alarms (14) (alarm settings for alarms 1 to 14)	
Flex modules which the F4T or D4T is configured to expect	*FMxx-xxxx-xxxx...* (corresponding to the module configuration code)	*

*The offset for a flex module instrument is simply the slot number in which the module is expected.

Additional Instruments Available in the Watlow F4T & D4T Instrument Group

The table below lists the other instruments that may be manually added to a configuration to gain access to additional values and settings in F4T controllers and D4T data loggers.

Instrument Names	Description	Offset[1]
F4T Alarm / D4T Alarm	One alarm function block	1 to 14
F4T Alarms (14) / D4T Alarms (14)	14 alarm function blocks	1
F4T Compare / D4T Compare	One compare function block	1 to 16
F4T Counter / D4T Counter	One counter function block	1 to 16
F4T Limit	One limit function block	1 to 6
F4T Linearization / D4T Linearization	One linearization function block	1 to 8
F4T Logic / D4T Logic	One logic function block	1 to 24
F4T Math / D4T Math	One math function block	1 to 24
F4T Process Value / D4T Process Value	One process value function block	1 to 8
F4T Special OP Functions/ D4T Special OP Functions	One special output function block	1 to 4
F4T Timer / D4T Timer	One timer function block	1 to 16
F4T Variable / D4T Variable	One variable function block	1 to 24
F4T Variables (24)/ D4T Variables (24)	24 variable function blocks	

Notes
[1] With the exception of *Variables (24)* and *Alarms (14)* instruments which support variables 1 to 24 and alarms 1 to 14 respectively, each of these instruments supports a single function block. Set the address offset in the instrument properties to the function block number you want. For example, for Counter 2, set the offset to 2.

EZ-ZONE Standard Bus Instruments

The tables in this section list the part number options for EZ-ZONE controllers correlating them with the instruments that support the corresponding features. The tables also list the format of the addresses for each instrument which are entered when configuring SpecView manually.

Addresses for Standard Bus EZ-ZONE Instruments

The addresses entered into SpecView for each instrument are the zone number (also known as standard bus address) and, for some instruments, an offset. The tables indicate which instruments require the offset.

Standard Bus instrument addresses consist of:
- "z" the Zone number or Standard Bus address (1 to 9, A, B, C, D, E, F, H or J)
- ; a semicolon when an offset is required
- the offset or instance number required for some instruments

Note: For the individual Function Block instruments the offset is shown as "o" in the Address column. In place of the "o" enter the instance number of the function block. For example, for Alarm 7 in an RM at zone 5 the Address is, "5;7".

EZ-ZONE PM Standard Bus Instruments

This table describes the instruments supporting the EZ-ZONE PM controllers and limits including the PM Express models.

Model	For part numbers matching…	Add… *Instrument Name* (Description)	Address[1]	Named[2]
PM	PMxxxxx-xxxxVxx (V = A, C, D or F)	*PM Zone* (alarm, digital input, output, global and diagnostic)	z	Cn-EZ-z Zone
	PMxUxxx-xxxxVxx (U = C, R, B, J, N, E or S) (V = A, C, D or F)	*Control-Loop* (setup and monitor loop 1)	z;1	Cn-EZ-z Ctlr-1
	PMxxxxx-x(C or J)xxVxx (V = A, C, D or F)	*Control-Loop* (setup and monitor loop 2)	z;2	Cn-EZ-z Ctlr-2
	PMxxxxx-x(L or M)xxVxx (V = A, C, D or F)	*Integrated Limit*	z	Cn-EZ-z Limit
	PMxxxxx-x(R or P)xxVxx (V = A, C, D or F)	*Auxiliary Input*	z;2	Cn-EZ-z AI-2
	PMxxxxx-xTxxVxx (V = A, C, D or F)	*Single Current Input*	z;1	Cn-EZ-z CT-1
	PMxxxxx-xxxx(C or F)xx	*PM Function Blocks*	z	Cn-EZ-z FB
	PMxUxxx-xxxxVxx (U = L, M or D) (V = A, C, D or F)	*Stand Alone and RM Limit* (not in PM with a control loop)	z;1	Cn-EZ-z Limit-1
	PMxUxxx-xxxxxxx (U = R, B, N or E)	*PM Profiling* (program and operate ramp-soak profiles)	z	Cn-EZ-z Prof
	PMxCxxx-xxxx(B or E)xx	*PM Express Controller*	z	Cn-EZ-z Ctlr
	PMxLxxx-xxxx(B or E)xx	*PM Express Limit_*	z	Cn-EZ-z Limit
	PMxTxxx-xxxxxxx	*PM Timer*	z	Cn-EZ-z Timer

Notes
[1] Replace "z" in the address with the zone number (also known as Standard Bus address).
[2] Instrument names are shown as automatically detected by SpecView where "n" is replaced by the port number and "z" is replaced by the zone number (also known as Standard Bus address).

EZ-ZONE RMA Standard Bus Instruments

This table describes the instruments supporting EZ-ZONE RM Access Modules.

Model	For part numbers matching…	Add… *Instrument Name* (Description)	Address[1]	Named[2]
RMA	RMAx-xxxx-xxxx	*RMA Zone* (global and diagnostic)	z	Cn-EZ-z Zone
	RMAx-xYxx-xxxx (Y = 2, 3, 5, or 6)	*RMA Gateway*	z	Cn-EZ-z GW
	RMAx-xxxD-xxxx	*RM Data Logging*	z	Cn-EZ-z Log

Notes
[1] Replace "z" in the address with the zone number (also known as Standard Bus address).
[2] Instrument names are shown as automatically detected by SpecView where "n" is replaced by the port number and "z" is replaced by the zone number (also known as Standard Bus address).

EZ-ZONE RMC Standard Bus Instruments

This table describes the instruments supporting EZ-ZONE RM Control Modules.

Model	For part numbers matching…	Add… *Instrument Name* (Description)	Address[1]	Named[2]
RMC	RMCxxxxxxxxxxxx	*RM Zone* (alarms, actions globals and diagnostics)[3]	z	Cn-EZ-z Zone
	RMCxxxxxxxxxxxx	*RMC Outputs 1 to 8*	z	Cn-EZ-z Out
	RMCxxxxxxxxxxxx	*RM Function Blocks*[4]	z	Cn-EZ-z FB
	RMCYxxxxxxxxxxx (Y = 1, 2, 3 or 4)	*Control-Loop* (setup and monitor control loop 1)	z;1	Cn-EZ-z Ctlr-1
	RMCxx(1 or 2)xxxxxxxxx	*Control-Loop* (setup and monitor control loop 2)	z;2	Cn-EZ-z Ctlr-2
	RMCxxxx(1 or 2)xxxxxxx	*Control-Loop* (setup and monitor control loop 3)	z;3	Cn-EZ-z Ctlr-3
	RMCxxxxxx(1 or 2)xxxxx	*Control-Loop* (setup and monitor control loop 4)	z;4	Cn-EZ-z Ctlr-4
	RMC(5 or 6)xxxxxxxxxxx	*Stand Alone and RM Limit* (set up and monitor limit 1)	z;1	Cn-EZ-z Lim-1
	RMCxx(5 or 6)xxxxxxxxx	*Stand Alone and RM Limit* (set up and monitor limit 2)	z;2	Cn-EZ-z Lim-2
	RMCxxxx(5 or 6)xxxxxxx	*Stand Alone and RM Limit* (set up and monitor limit 3)	z;3	Cn-EZ-z Lim-3
	RMCxxxxxx(5 or 6)xxxxx	*Stand Alone and RM Limit* (set up and monitor limit 4)	z;4	Cn-EZ-z Lim-4
	RMC7xxxxxxxxxxx	*Single Current Input* (set up and monitor current input 1)	z;1	Cn-EZ-z CT-1
	RMCxx7xxxxxxxxx	*Single Current Input* (set up and monitor current input 2)	z;2	Cn-EZ-z CT-2
	RMCxxxx7xxxxxxx	*Single Current Input* (set up and monitor current input 3)	z;3	Cn-EZ-z CT-3
	RMCxxxxxx7xxxxx	*Single Current Input* (set up and monitor current input 4)	z;4	Cn-EZ-z CT-4
	RMCxx(R or P)xxxxxxxxx	*Auxiliary Input* (set up and monitor analog input 2)	z;2	Cn-EZ-z AI-2
	RMCxxxx(R or P)xxxxxxx	*Auxiliary Input* (set up and monitor analog input 3)	z;3	Cn-EZ-z AI-3
	RMCxxxxxx(R or P)xxxxx	*Auxiliary Input* (set up and monitor analog input 4)	z;4	Cn-EZ-z AI-4
	RMCxxxxxxxCxxxx	*Digital I/O 07 to 12*	z	Cn-EZ-z DIO 07-12
	RMC(3 or 4)xxxxxxxxxxx	*RMC Profile Operation* (setup and operate ramp and soak)	z	Cn-EZ-z Prof Ops
	RMC(3 or 4)xxxxxxxxxxx	*RMC Profiles 1 to 5* (program profiles steps 1 to 50)	z	Cn-EZ-z Prof 1-5
	RMC(3 or 4)xxxxxxxxxxx	*RMC Profiles 6 to 10* (program steps 51 to 100)	z	Cn-EZ-z Prof 6-10

Model	For part numbers matching…	Add… *Instrument Name* (Description)	Address[1]	Named[2]
RMC (cont.)	RMC(3 or 4)xxxxxxxxxxx	*RMC Profiles 11 to 15* (program steps 101 to 150)	z	Cn-EZ-z Prof 11-15
	RMC(3 or 4)xxxxxxxxxxx	*RMC Profiles 16 to 20* (program steps 151 to 200)	z	Cn-EZ-z Prof 16-20
	RMC(3 or 4)xxxxxxxxxxx	*RMC Profiles 21 to 25* (program steps 201 to 250)	z	Cn-EZ-z Prof 21-25
	RMC(3 or 4)xxxxxxxxxxx	*RMC Sub Routines 1 to 5* (sub routine steps 1 to 50)	z	Cn-EZ-z SR-1-5
	RMC(3 or 4)xxxxxxxxxxx	*RMC Sub Routines 6 to 10* (sub routine steps 51 to 100)	z	Cn-EZ-z SR-6-10
	RMC(3 or 4)xxxxxxxxxxx	*RMC Sub Routines 11 to 15* (sub routine steps 101 to 150)	z	Cn-EZ-z SR-11-15

Notes

[1] Replace "z" in the address with the zone number (also known as Standard Bus address).

[2] Instrument names are shown as automatically detected by SpecView where "n" is replaced by the port number and "z" is replaced by the zone number (also known as Standard Bus address).

[3] The RM Zone instrument includes eight instances of alarms. Several types of EZ-ZONE RM modules support more alarm instances. Add a Function Block: Alarm instrument manually for each addtional instance you want to access.

[4] The RM Function Block instrument includes four or eight instances of each type of function block. Several types of EZ-ZONE RM modules support more function block instances than that. To access these additional instances, add an individual function block instrument for each block you want to access.

EZ-ZONE RMH Standard Bus Instruments

This table describes the instruments supporting EZ-ZONE RM High-Density Control Modules.

Model	For part numbers matching…	Add… *Instrument Name* (Description)	Address[1]	Named[2]
RMH	RMHx-xxxx-xxxx	*RM Zone* (alarms, actions globals and diagnostics)[3]	z	Cn-EZ-z Zone
		RM Function Blocks[4]	z	Cn-EZ-z FB
	RMHx-(1 or 2)xxx-xxxx	*Control-Loop* (setup and monitor control loop 1)	z;1	Cn-EZ-z Ctlr-1
		Control-Loop (loop 2)	z;2	Cn-EZ-z Ctlr-2
		Control-Loop (loop 3)	z;3	Cn-EZ-z Ctlr-3
		Control-Loop (loop 4)	z;4	Cn-EZ-z Ctlr-4
	RMHx-x(1 or 2)xx-xxxx	*Control-Loop* (loop 5)	z;5	Cn-EZ-z Ctlr-5
		Control-Loop (loop 6)	z;6	Cn-EZ-z Ctlr-6
		Control-Loop (loop 7)	z;7	Cn-EZ-z Ctlr-7
		Control-Loop (loop 8)	z;8	Cn-EZ-z Ctlr-8
	RMHx-xx(1 or 2)x-xxxx	*Control-Loop* (loop 9)	z;9	Cn-EZ-z Ctlr-9
		Control-Loop (loop 10)	z;10	Cn-EZ-z Ctlr-10
		Control-Loop (loop 11)	z;11	Cn-EZ-z Ctlr-11
		Control-Loop (loop 12)	z;12	Cn-EZ-z Ctlr-12
	RMHx-xxx(1 or 2)-xxxx	*Control-Loop* (loop 13)	z;13	Cn-EZ-z Ctlr-13
		Control-Loop (loop 14)	z;14	Cn-EZ-z Ctlr-14
		Control-Loop (loop 15)	z;15	Cn-EZ-z Ctlr-15
		Control-Loop (loop 16)	z;16	Cn-EZ-z Ctlr-16
	RMHx-xxCx-xxxx	*Digital I/O 01 to 06*	z	Cn-EZ-z DIO 01-06
	RMHx-xx(J, F or L)x-xxxx	*RM Outputs 1 to 4*	z	Cn-EZ-z Out 01-04
	RMHx-xxxC-xxxx	*Digital I/O 07 to 12*	z	Cn-EZ-z DIO 07-12
	RMHx-xxx(J, F or L)-xxxx	RM Outputs 7 to 10	*z*	Cn-EZ-z Out 07-10

Notes

[1] Replace "z" in the address with the zone number (also known as Standard Bus address).

[2] Instrument names are shown as automatically detected by SpecView where "n" is replaced by the port number and "z" is replaced by the zone number (also known as Standard Bus address).

[3] The RM Zone instrument includes eight instances of alarms. Several types of EZ-ZONE RM modules support more alarm instances. Add a Function Block: Alarm instrument manually for each additional instance you want to access.

[4] The RM Function Block instrument includes four or eight instances of each type of function block. Several types of EZ-ZONE RM modules support more function block instances than that. To access these additional instances, add an individual function block instrument for each block you want to access.

EZ-ZONE RML Standard Bus Instruments

This table describes the instruments supporting EZ-ZONE RM High-Density Limit Modules.

Model	For part numbers matching…	Add… *Instrument Name* (Description)	Address[1]	Named[2]
RML	RMLx-xxxx-xxxx	*RM Zone* (alarms, actions globals and diagnostics)[3]	Z	Cn-EZ-z Zone
		RM Function Blocks[4]	Z	Cn-EZ-z FB
		Stand Alone and RM Limit (set up and monitor limit 1)	z;1	Cn-EZ-z Lim-1
		Stand Alone and RM Limit (set up and monitor limit 2)	z;2	Cn-EZ-z Lim-2
		Stand Alone and RM Limit (set up and monitor limit 3)	z;3	Cn-EZ-z Lim-3
		Stand Alone and RM Limit (set up and monitor limit 4)	z;4	Cn-EZ-z Lim-4
	RMLx-x(5 or 6)xx-xxxx	*Stand Alone and RM Limit* (set up and monitor limit 1)	z;5	Cn-EZ-z Lim-5
		Stand Alone and RM Limit (set up and monitor limit 2)	z;6	Cn-EZ-z Lim-6
		Stand Alone and RM Limit (set up and monitor limit 3)	z;7	Cn-EZ-z Lim-7
		Stand Alone and RM Limit (set up and monitor limit 4)	z;8	Cn-EZ-z Lim-8
	RMLx-xx(5 or 6)x-xxxx	*Stand Alone and RM Limit* (set up and monitor limit 1)	z;9	Cn-EZ-z Lim-9
		Stand Alone and RM Limit (set up and monitor limit 2)	z;10	Cn-EZ-z Lim-10
		Stand Alone and RM Limit (set up and monitor limit 3)	z;11	Cn-EZ-z Lim-11
		Stand Alone and RM Limit (set up and monitor limit 4)	z;12	Cn-EZ-z Lim-12
	RMLx-xxCx-xxxx	*Digital I/O 01 to 06*	z	Cn-EZ-z DIO 01-06
	RMLx-xxJx-xxxx	*RM Outputs 1 to 4*	z	Cn-EZ-z Out 01-04
	RMLx-xxxx-xxxx	*Digital I/O 07 to 12*	z	Cn-EZ-z DIO 07-12

Notes

[1] Replace "z" in the address with the zone number (also known as Standard Bus address).

[2] Instrument names are shown as automatically detected by SpecView where "n" is replaced by the port number and "z" is replaced by the zone number (also known as Standard Bus address).

[3] The RM Zone instrument includes eight instances of alarms. Several types of EZ-ZONE RM modules support more alarm instances. Add a Function Block: Alarm instrument manually for each additional instance you want to access.

[4] The RM Function Block instrument includes four or eight instances of each type of function block. Several types of EZ-ZONE RM modules support more function block instances than that. To access these additional instances, add an individual function block instrument for each block you want to access.

EZ-ZONE RMS Standard Bus Instruments

This table describes the instruments supporting EZ-ZONE RM High-Density Scanner Modules.

Model	For part numbers matching…	Add… *Instrument Name* (Description)	Address[1]	Named[2]
RMS	RMSx-xxxx-xxxx	*RM Zone* (alarms, actions globals and diagnostics)[2]	z	Cn-EZ-z Zone
		RM Function Blocks[3]	z	Cn-EZ-z FB
		Auxiliary Input (input 1)	z;1	Cn-EZ-z AI-1
		Auxiliary Input (input 2)	z;2	Cn-EZ-z AI-2
		Auxiliary Input (input 3)	z;3	Cn-EZ-z AI-3
		Auxiliary Input (input 4)	z;4	Cn-EZ-z AI-4
	RMSx-x(R or P)xx-xxxx	*Auxiliary Input (input 5)*	z;5	Cn-EZ-z AI-5
		Auxiliary Input (input 6)	z;6	Cn-EZ-z AI-6
		Auxiliary Input (input 7)	z;7	Cn-EZ-z AI-7
		Auxiliary Input (input 8)	z;8	Cn-EZ-z AI-8
	RMSx-xx(R or P)x-xxxx	*Auxiliary Input (input 9)*	z;9	Cn-EZ-z AI-9
		Auxiliary Input (input 10)	z;10	Cn-EZ-z AI-10
		Auxiliary Input (input 11)	z;11	Cn-EZ-z AI-11
		Auxiliary Input (input 12)	z;12	Cn-EZ-z AI-12
	RMSx-xxx(R or P)-xxxx	*Auxiliary Input (input 13)*	z;13	Cn-EZ-z AI-13
		Auxiliary Input (input 14)	z;14	Cn-EZ-z AI-14
		Auxiliary Input (input 15)	z;15	Cn-EZ-z AI-15
		Auxiliary Input (input 16)	z;16	Cn-EZ-z AI-16
	RMSx-xxCx-xxxx	*Digital I/O 01 to 06*	z	Cn-EZ-z DIO 01-06
	RMSx-xx(J, F or L)x-xxxx	*RM Outputs 1 to 4*	z	Cn-EZ-z Out 01-04
	RMSx-xxx(C or B)-xxxx	*Digital I/O 07 to 12*	z	Cn-EZ-z DIO 07-12
	RMSx-xxx(J, F or L)-xxxx	*RM Outputs 7 to 10*	z	Cn-EZ-z Out 07-10

Notes

[1] Replace "z" in the address with the zone number (also known as Standard Bus address).

[2] Instrument names are shown as automatically detected by SpecView where "n" is replaced by the port number and "z" is replaced by the zone number (also known as Standard Bus address).

[3] The RM Zone instrument includes eight instances of alarms. Several types of EZ-ZONE RM modules support more alarm instances. Add a Function Block: Alarm instrument manually for each additional instance you want to access.

[4] The RM Function Block instrument includes four or eight instances of each type of function block. Several types of EZ-ZONE RM modules support more function block instances than that. To access these additional instances, add an individual function block instrument for each block you want to access.

EZ-ZONE RME Standard Bus Instruments

This table describes the instruments supporting EZ-ZONE RM Expansion Modules.

Model	For part numbers matching…	Add… *Instrument Name* (Description)	Address[1]	Named[2]
RME	RMEx-xxxx-xxxx	*RM Zone* (alarms, actions globals and diagnostics)[2]	z	Cn-EZ-z Zone
	RMEx-xxxx-xxxx	*RM Function Blocks*[3]	z	Cn-EZ-z FB
	RMEx-Cxxx-xxxx	*Digital I/O 01 to 06*	z	Cn-EZ-z DIO 01-06
	RMEx-Txxx-xxxx	*Single Current Input* (set up and monitor current input 1)	z;1	Cn-EZ-z CT-1
		Single Current Input (set up and monitor current input 2)	z;2	Cn-EZ-z CT-2
		Single Current Input (set up and monitor current input 3)	z;3	Cn-EZ-z CT-3
		Single Current Input (set up and monitor current input 4)	z;4	Cn-EZ-z CT-4
	RMEx-Vxxx-xxxx (V = J, K, F or L)	*RM Outputs 1 to 4*	z	Cn-EZ-z Out 01-04
	RMEx-xCxx-xxxx	*Digital I/O 07 to 12*	z	Cn-EZ-z DIO 07-12
	RMEx-xTxx-xxxx	*Single Current Input* (set up and monitor current input 5)	z;5	Cn-EZ-z CT-5
		Single Current Input (set up and monitor current input 6)	z;6	Cn-EZ-z CT-6
		Single Current Input (set up and monitor current input 7)	z;7	Cn-EZ-z CT-7
		Single Current Input (set up and monitor current input 8)	z;8	Cn-EZ-z CT-8
	RMEx-xVxx-xxxx (V = J, K, F or L)	*RM Outputs 7 to 10*	z	Cn-EZ-z Out 07-10
	RMEx-xxCx-xxxx	*Digital I/O 13 to 18*	z	Cn-EZ-z DIO 13-18
	RMEx-xxTx-xxxx	*Single Current Input* (set up and monitor current input 9)	z;9	Cn-EZ-z CT-9
		Single Current Input (set up and monitor current input 10)	z;10	Cn-EZ-z CT-10
		Single Current Input (set up and monitor current input 11)	z;11	Cn-EZ-z CT-11
		Single Current Input (set up and monitor current input 12)	z;12	Cn-EZ-z CT-12
	RMEx-xxVx-xxxx (V = J, K, F or L)	*RM Outputs 13 to 16*	Z	Cn-EZ-z Out 13-16
	RMEx-xxxC-xxxx	*Digital I/O 19 to 24*	z	Cn-EZ-z DIO 19-24

Model	For part numbers matching…	Add… *Instrument Name* (Description)	Address[1]	Named[2]
RME	RMEx-xxxT-xxxx	*Single Current Input* (set up and monitor current input 13)	z;13	Cn-EZ-z CT-13
		Single Current Input (set up and monitor current input 14)	z;14	Cn-EZ-z CT-14
		Single Current Input (set up and monitor current input 15)	z;15	Cn-EZ-z CT-15
		Single Current Input (set up and monitor current input 16)	z;16	Cn-EZ-z CT-16
	RMEx-xxx(F or L)-xxxx	*RM Outputs 19 to 22*	z	Cn-EZ-z Out 19-22

Notes

[1] Replace "z" in the address with the zone number (also known as Standard Bus address).

[2] Instrument names are shown as automatically detected by SpecView where "n" is replaced by the port number and "z" is replaced by the zone number (also known as Standard Bus address).

[3] The RM Zone instrument includes eight instances of alarms. Several types of EZ-ZONE RM modules support more alarm instances. Add a Function Block: Alarm instrument manually for each additional instance you want to access.

[4] The RM Function Block instrument includes four or eight instances of each type of function block. Several types of EZ-ZONE RM modules support more function block instances than that. To access these additional instances, add an individual function block instrument for each block you want to access.

EZ-ZONE RM Standard Bus Individual Function Block Instruments

This table describes the instruments supporting function blocks in EZ-ZONE RM Modules. These instruments are not automatically added to configurations. The *RM Function Block* instrument includes four or eight instances of each type of function block. Several types of EZ-ZONE RM modules support more function block instances than that. To access these additional instances, add the appropriate function block specific instrument for each instance you want to access.

Model	For part numbers matching…	Add… *Instrument Name*	Address[1]	Named
RM	RMYx-xxxx-xxxx (Y = E, H, L or S) or RMCxxxxxxxxxxxx	*Function Block: Action*	z;o	EZ Act-
		Function Block: Alarm	z;o	EZ Alm-
		Function Block: Compare	z;o	EZ Cmp-
		Function Block: Counter	z;o	EZ Ctr-
		Function Block: Linearization	z;o	EZ Lnr-
		Function Block: Logic	z;o	EZ Lgc-
		Function Block: Math	z;o	EZ Math-
		Function Block: Special Output	z;o	EZ SOF-
		Function Block: Timer	z;o	EZ Tmr-
		Function Block: Variable	z;o	EZ Var-

Notes

[1] An address for an individual function block instrument consists of the zone number (shown as "z") and the instance number separated by a semicolon. For example, the address string for Logic block number 8 in an RM module with address 5 is *5;8*.

EZ-ZONE ST Standard Bus Instruments

This table describes the instruments supporting EZ-ZONE ST Controllers.

Model	For part numbers matching…	Add… *Instrument Name* (Description)	Address[1]	Named[2]
ST	STxx-xxxx-xxxx	*ST Controller* (setup and monitor control loop and limit)	z	Cn-EZ-z Ctlr
	STxx-xxxx-xPxx	*ST Profiling* (program and operate ramp-soak profiles)	z	Cn-EZ-z Prof

Notes

[1] Replace "z" in the address with the zone number (also known as Standard Bus address).

[2] Instrument names are shown as automatically detected by SpecView where "n" is replaced by the port number and "z" is replaced by the zone number (also known as Standard Bus address).

EZ-ZONE Standard Bus Instrument Views

The following sections describe the instrument views that are available for use when EZ-ZONE controllers are connected to SpecView via a Standard Bus network.

Failed Sensor Indication

When the area that normally displays a process value on an instrument view is covered by a red rectangle, the instrument is indicating that the sensor has failed.
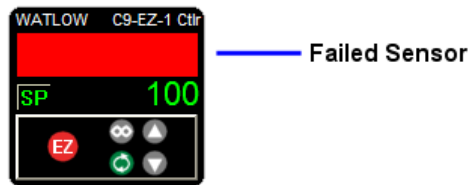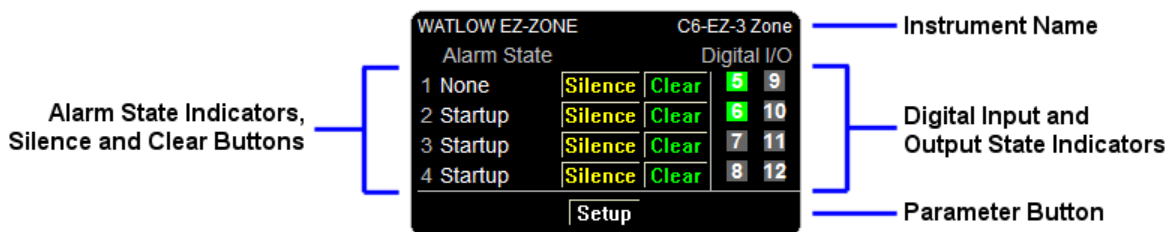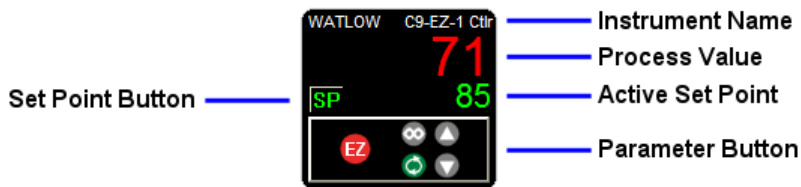

Failed sensor indication

CAUTION: This feature may not be available for all instruments, so take the appropriate precautions to insure fail-safe system operation.
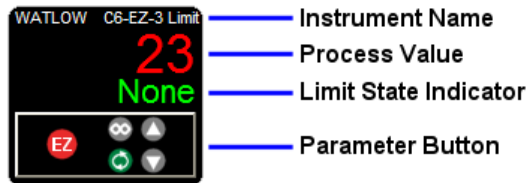

EZ-ZONE PM Standard Bus Instruments

EZ-ZONE PM controllers, limit controller and integrated controller are supported by the *PM Zone*, *Control Loop*, *Integrated Limit, Stand Alone and RM Limit*, *Auxiliary Input*, *Single Current Input*, *PM Function Blocks*, *PM Profiling*, *PM Express Controller* and *PM Express Limit_* instruments. The corresponding instrument views are illustrated below.
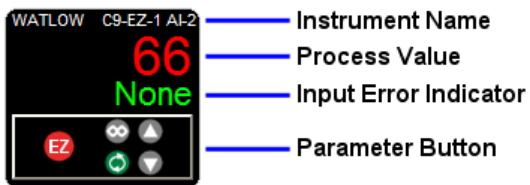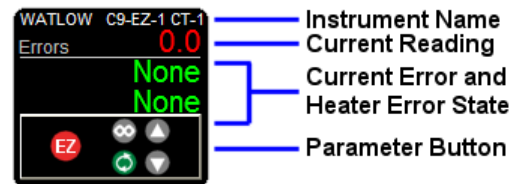

PM Zone

Set Point Button

Instrument Name
Process Value
Active Set Point
Parameter Button

WATLOW   C9-EZ-1 Ctlr
71
SP   85
EZ

Control Loop and *PM Express Controller*

Instrument Name
Process Value
Limit State Indicator
Parameter Button

WATLOW   C6-EZ-3 Limit
23
None
EZ

Integrated Limit, Stand Alone and RM Limit and *PM Express Limit_*

Instrument Name
Process Value
Input Error Indicator
Parameter Button

WATLOW   C9-EZ-1 AI-2
66
None
EZ

Auxiliary Input

Instrument Name
Current Reading
Current Error and
Heater Error State
Parameter Button

WATLOW   C9-EZ-1 CT-1
Errors   0.0
None
None
EZ

Single Current Input

Parameter Button
Instrument Name

WATLOW
Setup
Instrument Name

PM Function Blocks

Profile Monitor Parameters

Start at this Profile or Step

Instrument Name

Process Values, Active Set Points and Target Set Points

Event Output Indicators

Profile Control Buttons

WATLOW EZ-ZONE   C6-EZ-3 Prof
        Input   Active SP   Target SP
1   20   18   25
2   23   XXX   -18
State: Running
Current Step: 1   Events
Step Type: Time   1 OUT
Step Time Remaining: 00:00:07 2 OUT
Jumps Remaining: 0
Start: 1   Start Profile | Start Step
Pause | Resume | Terminate | Program

PM Profiling

EZ-ZONE RM Standard Bus Instruments

EZ-ZONE RM control systems are supported by a wide variety of instruments. The *PM Timer, RMA Zone, RMA Gateway, RM Data Logging, RMC Outputs 1 to 8*, *RM Function Blocks*, as well as eight instruments for programming profiles and sub routines in RM control modules and four instruments for configuring outputs are supported with the simple parameter button instrument view.
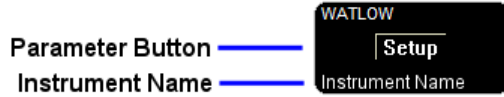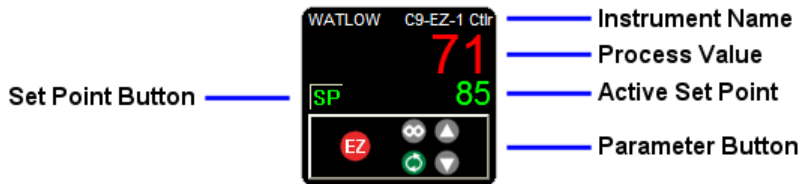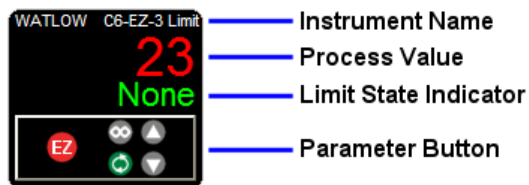

Parameter Button instrument View.

The *RM Zone*, *Control Loop*, *Stand Alone and RM Limit*, *Auxiliary Input*, *Single Current Input* and *RMC Profile Operation* instruments and a sample of the four *Digital I/O* instruments are illustrated below.
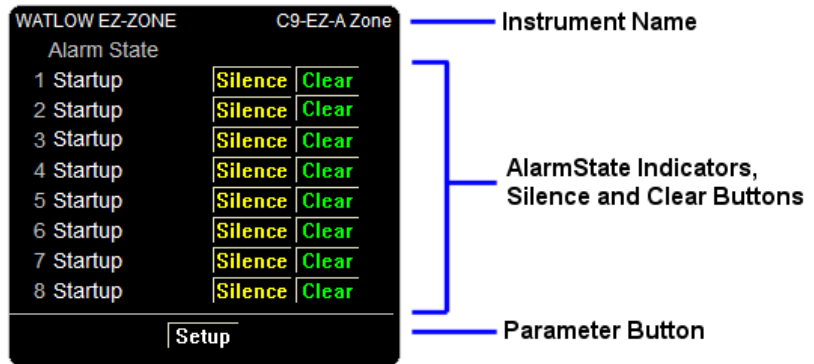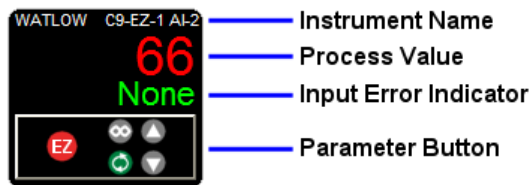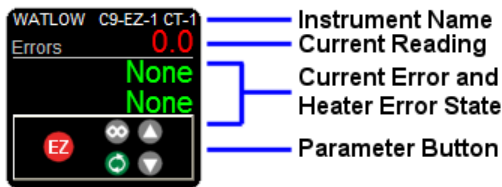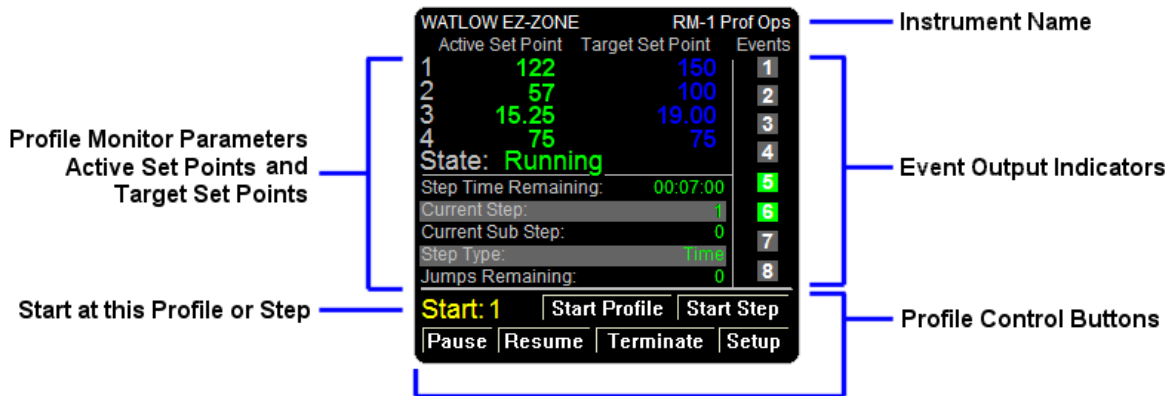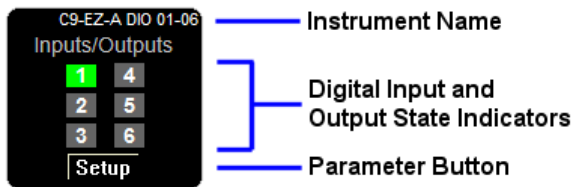

RM Zone

Control Loop

Stand Alone and RM Limit

Auxiliary Input

Single Current Input

Instrument Name
Current Reading
Current Error and Heater Error State
Parameter Button

RMC Profile Operation

Profile Monitor Parameters Active Set Points and Target Set Points
Start at this Profile or Step
Instrument Name
Event Output Indicators
Profile Control Buttons

Digital I/O

Instrument Name
Digital Input and Output State Indicators
Parameter Button

EZ-ZONE ST Standard Bus Instruments

The EZ-ZONE ST is supported by the *ST Controller* and *ST Profiling* instruments. The corresponding instrument views are illustrated below.

ST Controller

Set Point Button
Instrument Name
Process Value
Active Set Point
Parameter Button

ST Profiling

Profile Monitor Parameters
Start at this Profile or Step
Instrument Name
Process Value
Active Set Point
Event Output Indicators
Profile Control Buttons
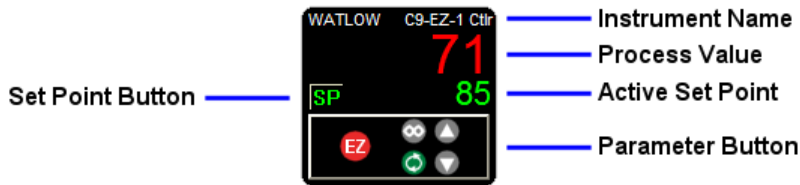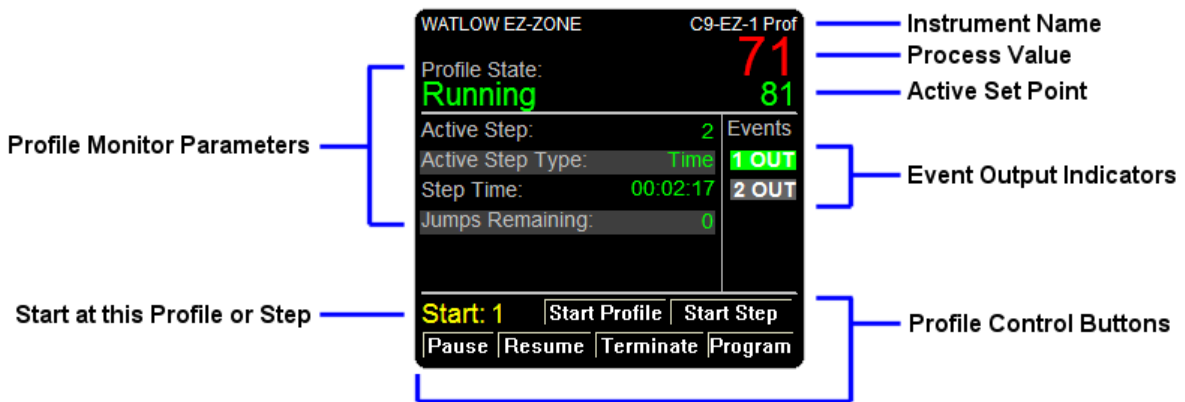
EZ-ZONE Modbus® Instruments

Watlow recommends using Standard Bus communications between SpecView and EZ-ZONE products because there are many advantages including automatic detection. However, there are situations where it may be preferable to use Modbus® RTU or Modbus® TCP. For these cases the following instruments are offered. The tables below list the parameters supported by these instruments.

EZ-ZONE Alarm
- State
- High Set Point
- Low Set Point
- Clear Request
- Silence Request

EZ-ZONE Analog Input
- Input Value
- Error Status
- Cal Offset
- Clear Latch

EZ-ZONE Communications
- Display Units
- Non-volatile Save

EZ-ZONE Control Loop
- Control Mode
- Control Mode Active
- Heat Prop Band
- Cool Prop Band
- Time Integral
- Time Derivative
- Dead Band
- Heat Hysteresis
- Cool Hysteresis
- Heat Power
- Cool Power
- Output Power
- TRU-TUNE+ Enable
- Autotune Request
- Autotune Status

EZ-ZONE Current
- Read
- Reading RMS
- Error
- Heater Error
- High Set Point
- Low Set Point

EZ-ZONE Digital I/O
- Input State
- Output State
- Direction

EZ-ZONE Limit
- State
- Status
- Low Set Point
- High Set Point
- Clear Request

EZ-ZONE Set Points
- Clsd-Loop Set Point
- Open Loop Set Point
- Clsd-Loop Working SP
- Open Loop Working SP
- Idle Set Point
- Ramp Working SP
- Ramp Target SP

EZ-ZONE Profile Operation

Profile State
Profile Start
Profile Action Request
Active Step
Current File
Active Step Type
Target SP Loop 1
Target SP Loop 2
Target SP Loop 3
Target SP Loop 4
Produced SP Loop 1
Produced SP Loop 2
Produced SP Loop 3
Produced SP Loop 4
Step Time Remaining
Event 1
Event 2
Event 3
Event 4
Event 5
Event 6
Event 7
Event 8
Jump Count Remaining

EZ-ZONE Profile (Map 1)

This instrument includes the following parameters for each of the ten steps in a profile.

Type
Target Set Point 1
Hours
Minutes
Seconds
Rate
Wait For Process 1
Wait for Process Instance
Wait Event 1
Wait Event 2
Jump Step
Jump Count
End Type
Event 1
Event 2

EZ-ZONE Profile (Map 2)

This instrument includes the following parameters for each of the ten steps in a profile.

Type
Control Mode 1
Control Mode 2
Control Mode 3
Control Mode 4
Target Set Point 1
Target Set Point 2
Target Set Point 3
Target Set Point 4
Hours
Minutes
Seconds
Rate
Wait For Process Enable 1
Wait For Process 1
Wait For Process Enable 2
Wait For Process 2
Wait For Process Enable 3
Wait For Process 3
Wait For Process Enable 4
Wait For Process 4
Wait for Process Instance
Wait Event 1
Wait Event 2
Wait Event 3
Wait Event 4
Day of Week
Guaranteed Soak Enable 1
Guaranteed Soak Enable 2
Guaranteed Soak Enable 3
Guaranteed Soak Enable 4
Subroutine Step
Subroutine Count
Jump Step
Jump Count
End Type
Event 1
Event 2
Event 3
Event 4
Event 5
Event 6
Event 7
Event 8

EZ-ZONE Profile (ST Map 1)

This instrument includes the listed parameters for each of the ten steps in a profile.

Type
Target Set Point 1
Hours
Minutes
Seconds
Rate
Wait For Process 1
Wait Event 1
Wait Event 2
Jump Step
Jump Count
End Type
Event 1
Event 2

EZ-ZONE Sub Routine

This instrument includes the following parameters for each of the ten steps in a sub routine.

Type
Control Mode 1
Control Mode 2
Control Mode 3
Control Mode 4
Target Set Point 1
Target Set Point 2
Target Set Point 3
Target Set Point 4
Hours
Minutes
Seconds
Rate
Wait For Process Enable 1
Wait For Process 1
Wait For Process Enable 2
Wait For Process 2
Wait For Process Enable 3
Wait For Process 3
Wait For Process Enable 4
Wait For Process 4
Wait Event 1
Wait Event 2
Wait Event 3
Wait Event 4
Day of Week
Guaranteed Soak Enable 1
Guaranteed Soak Enable 2
Guaranteed Soak Enable 3
Guaranteed Soak Enable 4
Event 1
Event 2
Event 3
Event 4
Event 5
Event 6
Event 7
Event 8

Watlow Assembly Instruments

These instruments support reading and setting floating point parameters with the minimum refresh time by utilizing the communication assembly feature of the Watlow controllers. Each instrument has either 16 or 32 parameters named Value 1, Value 2, Value 3 on up to either Value 16 or Value 32. An instrument is provided for either supported Modbus Word order (Low/High and High/Low.)

       Floats - Block16 (High/Low)

       Floats - Block16 (Low/High)

       Floats - Block32 (High/Low)

       Floats - Block32 (Low/High)

You will need to configure the communication assembly with the floating-point parameters in contiguous address ranges of up to 16 or 32 values in the Watlow controller.

The first address you want to access with SpecView is the address Offset setting for the SpecView instrument. The base address for the assembly is listed for each product in the table below. When using a gateway be sure to account for the gateway offset when setting the address for the instrument.

Device	Base Address
F4T / D4T	1080
EZ-ZONE	200

Generic Modbus Instruments

For parameters accessible via Modbus® that are not supported by the instruments in the Watlow instrument groups use these instruments from the Generic Modbus instrument group.

Access	Data Type	Instrument
Read/Write	Floating-Point	Generic Modbus IEEE FC4 Float register
Read-Only	Floating-Point	Generic Modbus IEEE FC4 Float register R/O
Read/Write	UINT	Generic Modbus 4X Holding Unsigned regs
Read-Only	UINT	Generic Modbus 4X Holding Regs R/O