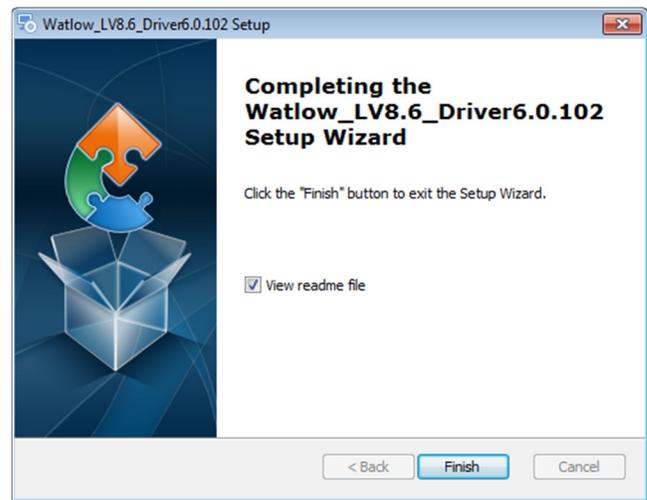


# Watlow Std Bus Driver Readme

You may use this software provided you agree to the terms of the license. READ THE LICENSE TERMS AND CONDITIONS CAREFULLY BEFORE PROCEEDING WITH THE INSTALLATION. INSTALLING THE PRODUCT INDICATES YOUR ACCEPTANCE OF THESE TERMS AND CONDITIONS. IF YOU DO NOT AGREE WITH THESE TERMS AND CONDITIONS, DELETE THE WATLOW STD BUS DRIVER FILES.

There are two methods to install the Watlow Standard Bus driver. Method 1 uses an exe file to install the required files and is the simplest to use. Method 2 uses a zip file that must be unzipped. The files must then be moved to the appropriate directories. This driver is being distributed as LabVIEW version 8.6 which allows for forward compatibility. When initially opening a VI in versions other than LabVIEW 8.6, an error may occur when trying to link to the Watlow Watbus.dll. This is normal, ignore this error and save the VI, this will re-link with the Watbus.dll.

**Method 1:** Double-click on the file called "Watlow\_LV8.6\_Driver6.x.xx" where x.xx is the current driver revision. Follow the displayed instructions. Although the driver is saved in LabVIEW 8.6 in a 32-bit version, the driver may be used with newer versions of LabVIEW



including the 64-bit versions. LabVIEW will make the necessary conversion when opened. Watlow recommends leaving the default location for the placement of the driver.

**Method 2:** Unzip the file "Watlow Std Bus.zip" to a folder. The default subfolder is C:\...\Watlow Std Bus. Move the newly created subfolder to the location on the hard drive for the LabVIEW containing the instrument drivers. On a typical PC, it is C:\Program Files (x86)\National Instruments\LabVIEW 8.6\instr.lib where the version of LabVIEW matches the installed version.

The LabVIEW Drivers utilize a .net assembly .dll called Watbus.dll. This .dll was built on .NET assembly 4.0. Included in the driver package is an executable to install .NET assembly 4.0 if needed. The location is instr.lib\Watlow Std

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Bus\Addons\dotNetFx40\_Full\_x86\_x64.exe. Failure to have the correct .net assembly will result in non-functional drivers (Broken Arrow).

The Common Language Runtime (CLR) version of LabVIEW is also critical. LabVIEW 2012 & earlier utilizes CLR 2.0, which by default allows it to use .NET assembly version 3.5. To ensure that LabVIEW runs off the correct .net assembly version copy the configuration file called "LabVIEW.exe.config" located in folder instr.lib\Watlow Std Bus\Addons\ and place in the root directory that the LabVIEW .exe is located. Failure to do so this will result in drivers not functioning (Broken Arrow).

**NOTE:** When creating executables, it is required that the following dll's are placed in the same location as the executable. These dlls are located in the same folder as the Driver VI's.

- SerialLink.dll
- SerialLink64.dll
- Usblink.dll (Future Expansion)
- Usblink64.dll (Future Expansion)
- Watbus.dll

## Directory Structure:

Using installation Method 1 will create a subdirectory called Watlow Std Bus in the LabVIEW instrument driver subdirectory called instr.lib. Using installation Method 2 will result with the same directory structure. Within the Watlow Std Bus directory will be three additional directories called Public, WatbusUsb64 and Watlow LabVIEW Project Readme Files. The directory called Public contains the Standard Bus VIs for Std\_Bus\_Initialize, Std\_Bus\_ReadValue, Std\_Bus\_Write and Std\_Bus\_Close as well as a Standard Bus LabView Example VI to demonstrate the complete process.

The directory called WatbusUsb64 is currently not used by any Watlow product and is included for future expansion of USB connected devices. Standard Bus communications packet formatting is handled automatically by the Watbus.dll file. That file content is not available for modification or operational detail.

## Standard Bus Protocol:

Standard Bus is a Watlow developed proprietary protocol that is supplied on a variety of products as standard equipment. The terminals are labeled CD, CE and CF for the EIA-485 serial port in most cases. In a few special-order models, the terminals may be labeled CA, CB, and CC. For the F4T/D4T family, the Ethernet port is labeled E1 through E8. This driver simplifies the communications to these devices by a user requesting a parameter identified with an ID number, instance and zone. The PC requires either a USB to EIA-485 converter or Ethernet port depending on the product application. See the user's guide for the wiring instructions.

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**Operational Description:** The user is required to identify the parameter within a controller that is to be read and/or written. The parameter is identified by the parameter ID. The user's guide and an Excel Spreadsheet both available from the Watlow web site contain the parameter IDs with descriptions. Example; a parameter such as analog input value will have a parameter ID 4001, an instance 1 to identify which input and a zone 1 to identify which address on a serial bus is being accessed. The user should open the communication channel using the Initialize.VI, the ReadValue.VI or Write.VI to gather or change data. Lastly the user should close the channel using the Close\_System.VI

This driver supports one port to be open at a time. The maximum number of standard bus devices (ZONES) on a single EIA-485 serial port is 16. ZONE 17 is reserved for the access module type called RMA in the EZ-ZONE RM family of products. For Ethernet devices supporting Standard Bus communication such as the F4T/D4T family, each Ethernet device is treated as ZONE 1 with an IP address. In the context of this driver, a ZONE is a physical standard bus address and not a thermal loop zone. In summary, open the port required and close as soon as complete so that another port may be opened. The data for temperature related values are sent by default in degrees Fahrenheit. The user may request the data to be sent in Celsius. Units of measure are independent from the displayed units on the face of the controller allowing different units to be utilized from each interface.

The available Excel spreadsheets list the parameter IDs for the F4T/ D4T and EZ-ZONE products. Refer to the appropriate user's guide for detail on parameter descriptions and identifications. Do not use the Modbus register addressing for parameter IDs. For the F4T/ D4T family, communications are via Standard Bus using the Ethernet port (not the serial port nor USB port). When using Ethernet on the F4T or D4T, enter the port as Ethernet in the driver and enter the IP address. For the EZ-ZONE products, use serial port 1 on the EZ-ZONE product set to Standard Bus (not the Ethernet port). For EZ-ZONE ST, DIP switch 4 sets the protocol when applicable.

This driver supports Standard Bus communications protocol over the Ethernet port and Standard Bus EIA-485 port. If you wish to communicate using the Serial port with Modbus RTU or with Modbus TCP (for units having that option), use a generic Modbus driver from National Instruments or third party.

Additional instructions are on right of screen in Example project.

In summary, use the appropriate port for the applicable product to use the supplied driver.