VERSATILE BASE SERIES

VBEX-TC EXPANDER
USER MANUAL

For Models:

VBEX-4K

Revision: 0

2012002.0

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Getting Started

This section explains how to read this manual and understand the symbols and information that it contains.

To begin using your VBEX-TC Expander, you will need to follow these steps:

- Install the VBEX-TC on the VB-1000 Controller
- Configure the VB-1000 Controller to use the VBEX-TC in the EZ LADDER Toolkit Project Settings.

Refer to the appropriate sections of this manual for details on the above items.

How to Use this Manual

In this manual, the following conventions are used to distinguish elements of text:

BOLD Denotes labeling, commands, and literal portions of syntax that must appear exactly as shown.

italic Used for variables and placeholders that represent the type of text to be entered by the user.

SMALL CAPS Used to show key sequences or actual buttons, such as OK, where the user clicks the OK button.

In addition, the following symbols appear periodically in the left margin to call the readers attention to specific details in the text:

Warns the reader of a potential danger or hazard associated with certain actions.

Appears when the text contains a tip that is especially useful.

Indicates the text contains information to which the reader should pay particularly close attention.

All Specifications and Information Subject to Change without Notice

Install the VBEX-TC Expander on the VB-1000 Controller

The VB-1000 and VBEX-TC are purchased separately. Before the VBEX-TC may be used, it must be installed as the expansion option on the VB-1000 controller. You will need full access to the VB-1000 top and bottom. It is recommended to disconnect and un-mount the VB-1000 prior to beginning this installation.

To Install the VBEX-TC

1. Un-mount and disconnect the VB-1000 Controller

2. Using the 3 metal spacers and 3 of the screws provided, install the spacers on the VB-1000 controller in the provided expansion holes as shown in Figure 1.1. The screws will enter from the back (solder) side of the VB-1000 and the spacers will be located on the top (component) side of the VB-1000.
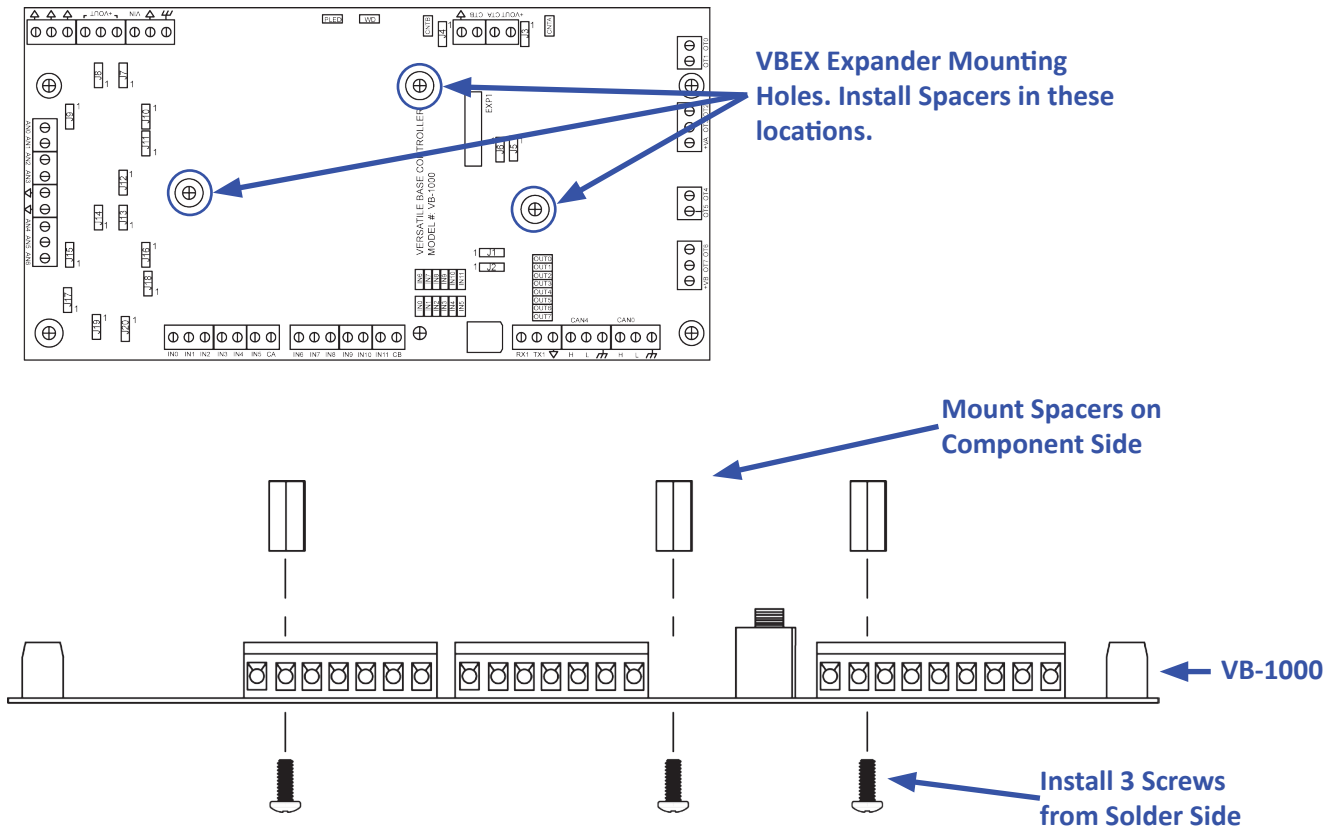
VBEX Expander Mounting Holes. Install Spacers in these locations.

Mount Spacers on Component Side

Install 3 Screws from Solder Side

VB-1000

Figure 1.1 - Installation of Spacers

3. Carefully aligning the VBEX-TC with the installed spacers, gently plug the VBEX-TC into the EXP1 connector on the VB-1000. Ensure proper alignment on EXP1. When installed correctly, all the EXP1 pins will be plugged into the VBEX-TC and the VBEX-TC will be placed against the spacers and the mounting holes will align with the spacers correctly. Refer to Figure 1.2.

4. Install the remaining 3 screws provided to secure the VBEX-TC to the VB-1000 controller (installed spacers).
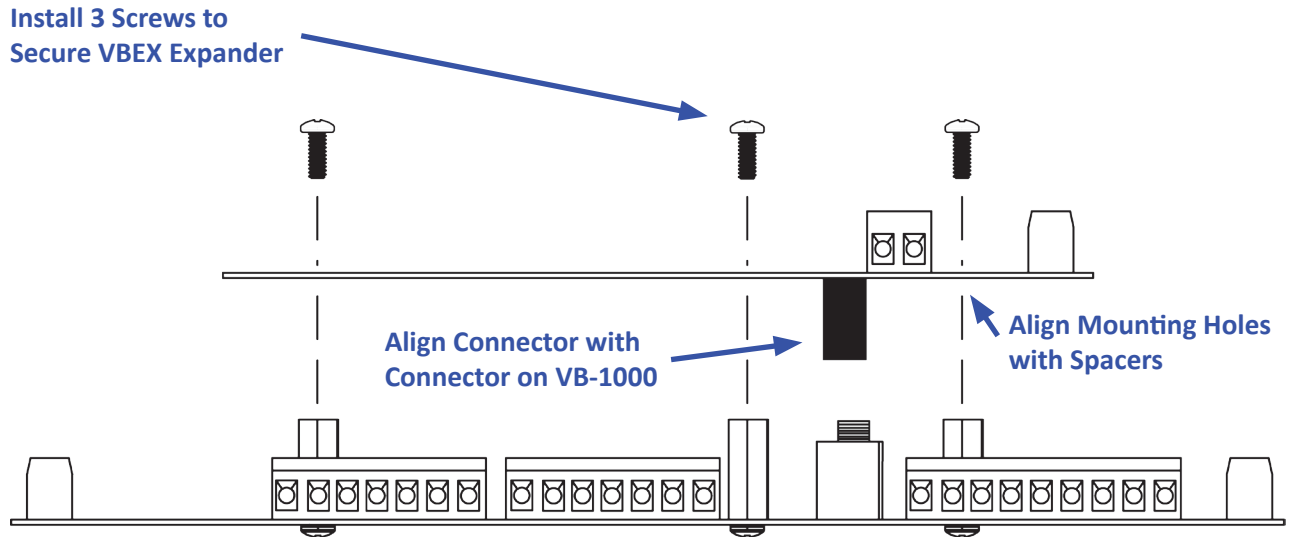
Install 3 Screws to
Secure VBEX Expander

Align Connector with
Connector on VB-1000

Align Mounting Holes
with Spacers

Figure 1.2 - Mounting the VBEX-TC

Configuring the VBEX-TC in EZ LADDER Toolkit

It is assumed that you are familiar with the VB-1000 before installing this expansion option. Please refer to the VB-1000 User Manual for details regarding the VB-1000.

Before you can begin using features on the VBEX-TC, it must be configured as an option for the VB-1000 target within the EZ LADDER Toolkit. For help with installing or using EZ LADDER, please refer to the EZ LADDER User Manual.

   1. In EZ LADDER, from the File Menu at the top, click **PROJECT** then **SETTINGS**. This will open the Project Settings Window. Select **VB-1000** as the target from the choices. Refer to Figure 1.3.
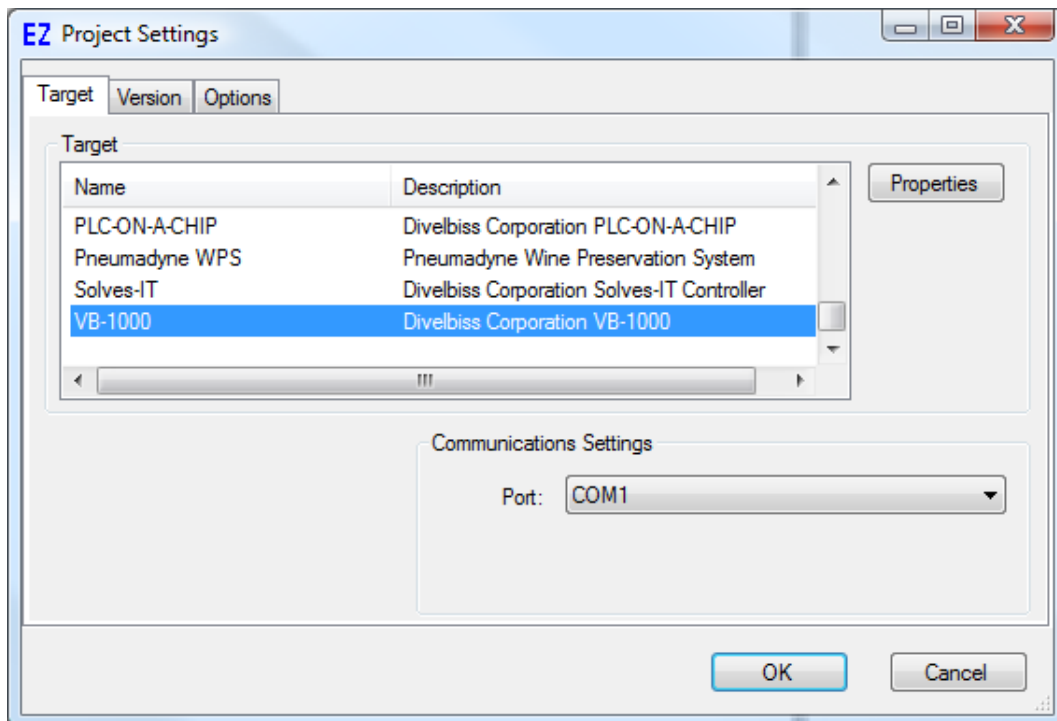
Figure 1.3 - Project Settings Window

2. Click **PROPERTIES.** This opens the VB-1000 Properties dialog.

3. Using the **OPTION BOARD** drop-down menu, select the VBEX-TC as shown in Figure 1.4.

4. Click **OK** to close the VB-1000 Properties dialog and click **OK** to close and save the Project Settings. The VBEX-TC is now installed as an option for the VB-1000 controller.
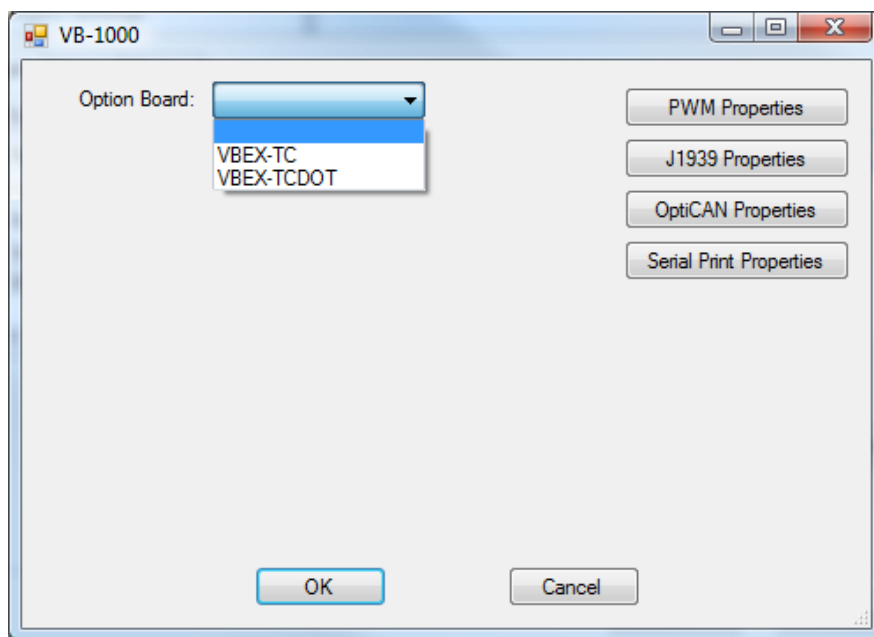

Figure 1.4 - VB-1000 Properties

Getting to Know the VBEX-TC

The VBEX-TC is an expander for the VB-1000 controller. The VBEX-TC provides up to 4 Thermocouple inputs. The following models are supported as VBEX-TC expanders. See Figure 1.5.

Model #	Description
VBEX-4K:	VBEX-TC expander with 4 Type K Thermocouples

Additional Thermocouple Types

Other thermocouple types, (J, N, R, S) are available upon request. Please consult the factory for availability of VBEX expansion with these thermocouple types.

Thermocouple Input
Terminals (+-)

TC4 +
‚

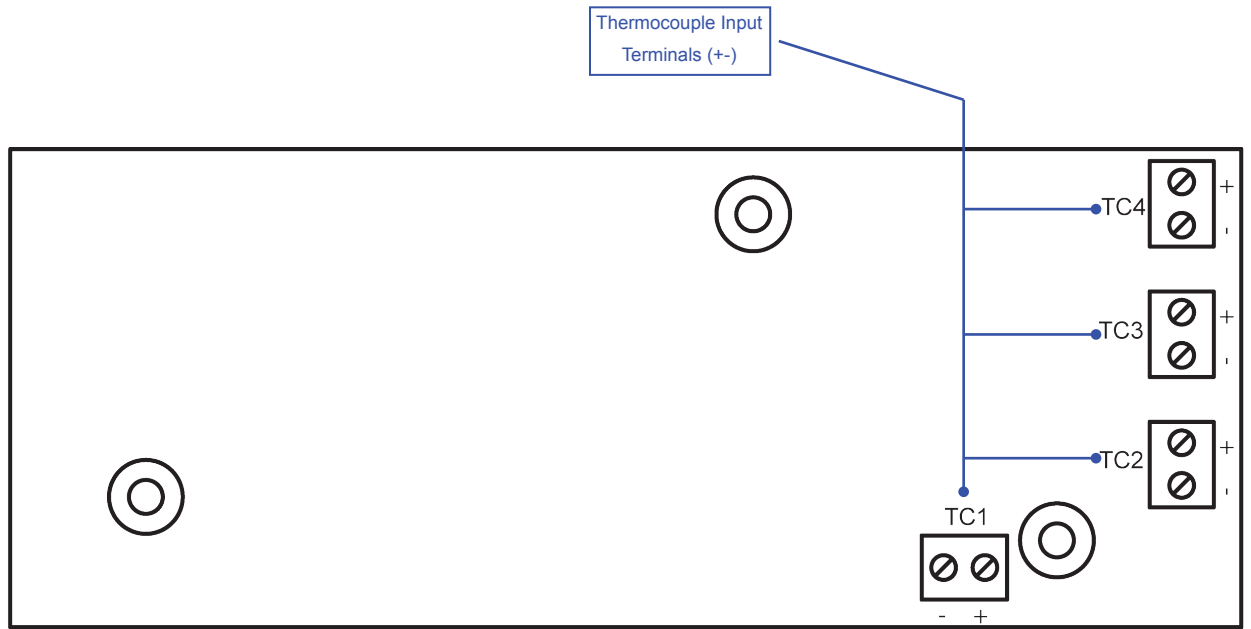TC3 +
‚

TC2 +
‚

TC1
- +

Figure 1.5 - VBEX-TC Features

VBEX-TC Features

This section explains the VBEX-TC Expander hardware features, options and information regarding EZ LADDER Toolkit for basic operation.

Thermocouple Inputs

The VBEX-TC provides up to 4 Thermocouple. The type and quantity of each thermocouple input is based on the actual Model Number of the Expander ordered.

Model #   Description
VBEX-4K: VBEX-TC expander with 4 Type K Thermocouples

Each analog input is represented in the EZ LADDER Toolkit ladder diagram using (Real) variables labeled TC1 - TC4. These variables were created automatically when the VBEX-TC expander was configured as the expansion option for the VB-1000 target.

Each variable (TC1- TC4) will represent the actual temperature read by the connected thermocouple in degrees Celsius. If you wish to have temperatures in degrees Fahrenheit, you must convert the values using mathematical function blocks in your ladder diagram program. Each thermocouple channel internally has all the required cold-junction compensation and linearization required.

Thermocouple Input Connections

For each of the thermocouple inputs (TC1-TC4), a + and - terminal are provided. Refer to Figure 1.5 for locations of the thermocouple input terminals and their polarity. Figure 2.2 illustrates a typical thermocouple connection.

When connecting thermocouples, connect the thermocouple wire directly to the terminals provided. When mounted in an enclosure, ensure that only thermocouple wire of the appropriate type is used for the connections between the VBEX-TC thermocouple terminals and the actual enclosure entry. Failure to use the proper thermocouple wire will result in incorrect temperature readings.
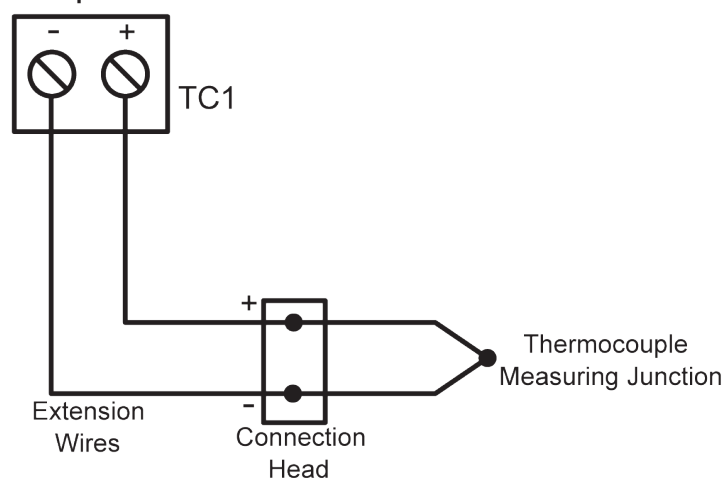

Figure 2.2 - Typical Thermocouple Input Connection

The operating temperature range of the expander may vary based on model number. The VB-1000 is rated for -40°C to +80°C, but some expanders may not operate under this full range. The controller and expander should only be installed where the temperature range of the narrowest window between the controller and the expander is sufficient.

VBEX-TC Specifications

Type K Thermocouple Inputs:	Qty up to 4
	Measurement Range: 0°C to 1023°C SEE NOTE 2
	Resolution: 12 Bit, 0.25°C per bit
	Accuracy 0°C to +700°C: +/-5.5°C SEE NOTE 1, SEE NOTE 2
	Accuracy +700°C to +1023°C: +/-7.75°C SEE NOTE 1, SEE NOTE 2
Operating Temp:	-20°C to 80°C SEE NOTE 2
Dimensions:	2.2" Wide x 5.7" Length x .6" Tall.
Mounting:	Installs on VB-1000 Controller, Stack Mount using #6 spacers and screws
Type:	Open Board
Storage Temperature:	-40-85°C

NOTE 1:   Temperature Accuracy based on 25°C ambient temperature.

NOTE 2:   Specifications will be changing in the near future, including better accuracy, better range and wider operating temperature. Consult factory for estimated availability.