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2500 SERIES™

CTI 2562 EIGHT CHANNEL ANALOG OUTPUT MODULE INSTALLATION AND OPERATION GUIDE Version 2.0

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Version 1.0	4/10/01	Original Release
Version 1.1	5/30/01	Update to reflect addition of ‘last value’ in power cycling, module configuration updates, miscellaneous typos corrected.
Version 1.2	03/12/09	Added note about zero/last value jumper in 2.3.5, 2.9
Version 2.0	08/11/2020	Changed file format to word document. Updated pictures and diagrams. Corrected pcb layout.

PREFACE

This ***Installation and Operation Guide*** provides installation and operation instructions for the CTI 2562 8-Channel Analog Output Module for SIMATIC® 505 and CTI 2500 Series® programmable controllers. We assume you are familiar with the operation of SIMATIC® 505 and CTI 2500 Series® programmable controllers. Refer to the appropriate SIMATIC user documentation for specific information on the SIMATIC® 505 Series programmable controllers and I/O modules.

This ***Installation and Operation Guide*** is organized as follows:

Chapter 1 provides a description of the module.
Chapter 2 covers installation and wiring.
Chapter 3 is a guide to troubleshooting.
Appendix A details compatibility between the 2562 and the Siemens® 505-6208-A and 505-6208-B.

The 2562 8-Channel Analog Output Module



USAGE CONVENTIONS

NOTE:
Notes alert the user to special features or procedures.

CAUTION:
Cautions alert the user to procedures that could damage equipment.

WARNING:
Warnings alert the user to procedures that could damage equipment and endanger the user.

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CHAPTER 1. OVERVIEW

1.0. Product Summary

The CTI 2562 Eight Channel Analog Output Module is a member of Control Technology's family of I/O modules compatible with the SIMATIC® 505 and CTI 2500 Series® programmable controllers. The 2562 is designed to translate a digital word from the programmable controller (PLC) into an equivalent analog voltage and current signal.

1.1. Front Panel Description



Figure 1 CTI 2562 Front Panel

1.1.1. Active LED

The Active LED will be illuminated when the module is functioning normally. If the Active LED is not lit, the user 24V is not present or a serious problem exists with the module. If the LED is blinking the module requires calibration. Refer to Chapter 3 for troubleshooting.

1.1.2. Input Connector for Channels 1-8

This connector provides wiring terminals for channels 1-8 and for user supplied 24 VDC power supply. The wiring connector accepts 14-22 AWG wire.

1.2. Asynchronous Operation

The module operates asynchronously with respect to the PLC so that a scan of the PLC and a module output scan cycle do not occur at the same time. Note also that how an output signal changes is dependent on the update time of the module. The following figure illustrates this relationship:

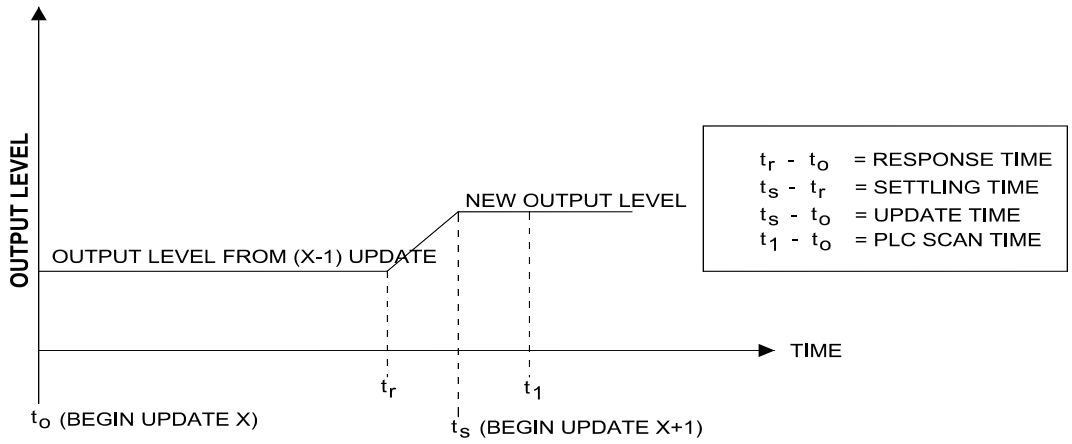


Figure 2 Relation of Update Time Change in Signal Output

1.3. Output Signal Description

Each of the eight channels independently provide output signals that are either Unipolar or Bipolar. Ranges supported include 0 to +5 VDC, 0 to +10 VDC, 0 to +20mA, -5 to +5 VDC, -10 to +10 VDC, and -20 to +20 mA. Both voltage and current outputs are available simultaneously so that either may be used for a particular channel.

1.3.1. Unipolar Operation

In the Unipolar mode the PLC sends a 16-bit word to the module for translation to an analog signal. Data to be translated occupies 12 bits. The four remaining bits are unused. The following figure illustrates a 16-bit word sent from the PLC to the module.

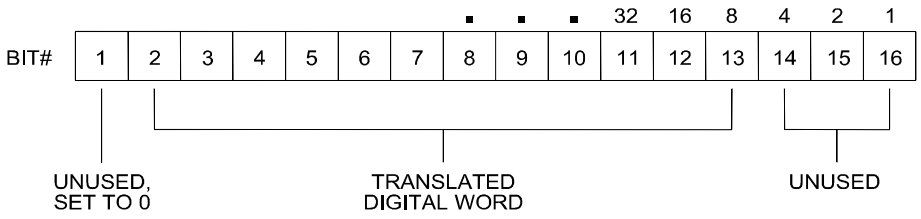


Figure 3 Word Output from the PLC to the Module

1.3.2. Bipolar Operation

In the Bipolar mode data to be translated occupies 11 bits plus a sign bit. The four remaining bits are unused.

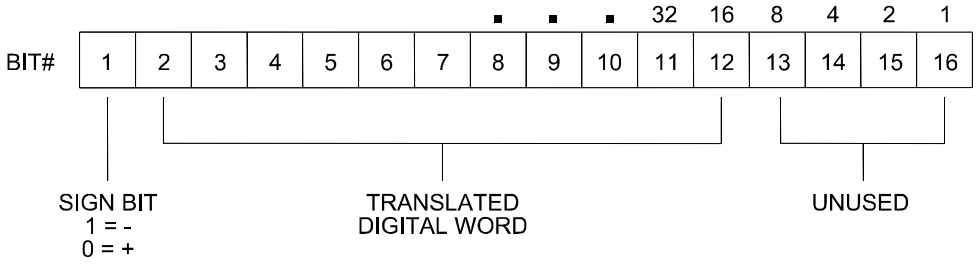


Figure 4 Bipolar Word Output from the PLC to the module

1.4. Immediate I/O

The 2562 Analog Output Module is fully compatible with the Immediate output instructions for the SIMATIC® 545 and 555 PLCs.

1.5. Unipolar or Bipolar Mode

Each output channel may be configured to provide either a bipolar or unipolar output signal.

1.6. Voltage or Current Output

Voltage and current output signals are both available simultaneously. For Unipolar output signals the ranges supported are 0 to +5 VDC, 0 to +10 VDC, and 0 to 20mA. For Bipolar outputs the ranges supported are -5 to +5 VDC, -10 to +10 VDC, and -20 to +20 mA. Selection of voltage ranges and Unipolar and Bipolar operation are made via internal jumpers and DIP switches. (See Figure 8 **Configuring the Module**.)

1.7. Digital to Analog Conversion

1.7.1. Unipolar Mode Conversion

The following equations are used to calculate the digital word used to generate a Unipolar output signal:

0 to +5 VDC range	Digital WY = (Output voltage x 32000) ÷ 5 volts WY = (Desired Output Voltage x 32000) ÷ 5 for example, to generate an output voltage of 2.5 VDC the WY value output from the PLC is calculated as follows: WY= (2.5x32000) ÷ 5 = 16000
0 to +10 VDC range	Digital WY = (Output voltage x 32000) ÷ 10 volts
0 to +20 mA range	Digital WY = (Output current x 32000) ÷ 20 mA

1.7.2. Bipolar Mode Conversion

The following equations are used to calculate the digital word used to generate a Bipolar output signal.

-5 to +5 VDC range	WY = (Desired output voltage x 32000) ÷ 5 volts Example: -5 volts output WY = (-5 x 32000) ÷ 5 = -32000
-10 to +10 VDC range	WY = (Desired output voltage x 32000) ÷ 10 volts Example: -5 volts output WY = (-5 x 32000) ÷ 10 = -16000
-20 to +20 mA range	WY = (Desired output current x 32000) ÷ 20 mA Example: 4 mA output WY = (4 x 32000) ÷ 20 = 6400

1.8. Output Resolution

1.8.1. Unipolar Mode

In Unipolar mode the module has a resolution of 8 counts out of 32000, or 1 part out of 4000. For the voltage range 0 to +5 VDC the minimum step is 1.25 mV. For the range 0 to +10 VDC the minimum step is 2.5 mV and for 0 to 20 mA output the minimum step is 5 microamps.

1.8.2. Bipolar Mode

In Bipolar mode the module has a resolution of 16 counts out of 32000 or 1 part out of 2000. For the voltage range -5 to +5 VDC the minimum step is 2.5 mV. For the range -10 to +10 VDC the minimum step is 5.0 mV and for -20 to +20 mA output the minimum step is 10 microamps.

	RANGE CONFIGURATION	DIGITAL COUNTS / STEP	INPUT RESOLUTION PER STEP
UNIPOLAR	0 - 5 VDC	8	1.25 mV
	0 - 10 VDC	8	2.5 mV
	0 - 20 mA	8	5 µA
BIPOLAR	-5 TO +5 VDC	16	2.5 mV
	-10 TO +10 VDC	16	5 mV
	-20 TO +20 mA	16	10 µA

Figure 5 Output Resolution

1.9. Using the Module with a Built-In 20% Offset Calculation

If all 8 outputs are used in Offset Mode, i.e., 4 to 20 mA or 1 to 5 VDC operation, the 2562 may be configured to automatically scale the digital word from the PLC. This is to be used in Unipolar mode only. Jumper JP40, when enabled, will configure all eight outputs for offset operation. No relay ladder logic is required for output processing.

1 to 5 VDC range

Digital WY = ((Output voltage-1) x 32000) ÷ 4 volts
WY = ((Desired Output Voltage-1) x 32000) ÷ 4
for example, to generate an output voltage of 3.0 VDC the WY value output from the PLC is calculated as follows: WY= ((3-1)x32000) ÷ 4 = 16000

4 to 20 mA range

Digital WY = ((Output current - 4) x 32000) ÷ 16 mA
WY = ((Desired Output Current - 4) x 32000) ÷ 16
for example, to generate an output voltage of 12 mA the WY value output from the PLC is calculated as follows: WY= ((12-4)x32000) ÷ 16 = 16000

NOTE:
Jumper JP40 is labeled on the printed circuit board as Offset (EN(able)/DIS(able)).

CHAPTER 2. INSTALLATION

The installation of the Eight Channel Analog Output Module involves the following steps:

1. Planning the installation
2. Configuring the module
3. Inserting the module into the I/O base
4. Wiring the module output screw terminal connector
5. Connecting the 24 VDC user power supply
6. Checking module operation

The steps listed above are explained in detail in the following pages.

2.1. Planning the Installation

Planning is the first step in the installation of the module. This involves:

1. Calculating the I/O base power budget
2. Selecting a proper user power supply and wiring
3. Routing the wiring to minimize noise
4. Selecting the proper wiring method for the type of output you will use.

The following sections discuss these important considerations of the installation.

2.1.1. Calculating the I/O Base Power Budget

The 2562 requires 2.0 watts of +5 VDC power from the I/O base. Before inserting the module into the I/O base, ensure that the base power supply capacity is not exceeded.

2.1.2. Choosing a Power Supply

The power supply should be a single voltage, 20-28 VDC nominal 2.0 amp, UL Class 2 device. The compliance of the output circuits is directly related to the output voltage. The drive voltage and current are specified at 24 VDC.

2.1.3. Wiring Consideration

The module requires separate wiring for the power supply and for the output signals. Power and signal wiring must be separated to prevent noise in the signal wiring. Output signal wiring must be shielded, twisted-pair cable, with 14 to 22 gauge stranded conductors. The cable shield should always be terminated to earth ground at the I/O base. It should not be terminated at the output connector. Use the following guidelines when wiring the module:

- Always use the shortest possible cables
- Avoid placing power supply wires and signal wires near sources of high energy
- Avoid placing low voltage wire parallel to high energy wire (if the two wires must meet, cross them at a right angle)
- Avoid bending the wires into sharp angles
- Use wireways for wire routing
- Be sure to provide a proper earth ground for the cable shield at the I/O base
- Avoid placing wires on any vibrating surfaces

2.1.4. Requirements for Signal Wire Carrying Current

You must calculate the loop wiring resistance for any current output circuits. The loop resistance is determined by the length and type of wire, as well as the field device series resistance.

The circuit resistance must not exceed 1000 ohms. If a separate 20 volt power supply is used in the loop, the minimum resistance increases 1000 ohms, and the maximum resistance becomes 2000 ohms. Any value over 1000 ohms prevents the module from operating accurately. The following figure provides a schematic for wiring a loop with a resistance of less than 1000 ohms. It also shows a schematic for adding a power supply to allow loop resistances up to 2000 ohms. Use the following equation to determine the resistance of an output loop for a channel:

Resistance = (2 x CL x RFT) + TFL

where: CL is the cable length
RFT is the conductor resistance (ohms/unit length)
TFL is the resistance of the field device

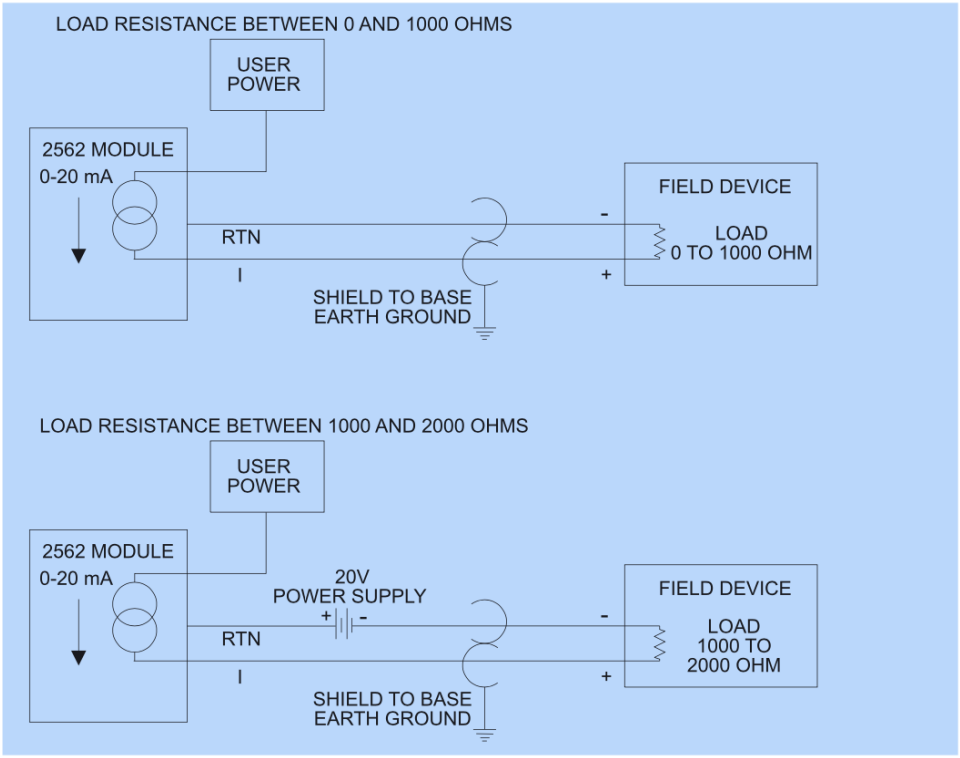


Figure 6 Current Output Circuits

2.1.5. Requirements for Signal Wire Providing Voltage

Applications using voltage signals require some special considerations to ensure the module's accuracy. Two additional parameters must be considered:

- Resistive load of the field device
- Capacitance of the cable wiring

The resistive load of the field device must be no lower than 1K ohms. The cable capacitance must be less than 0.01 microfarad.

The cable capacitance is a function of the cable length. To determine the maximum cable length allowed, find the nominal value of cable capacitance per unit length as given by the manufacturer. Use this value in the following equation to determine the maximum cable length:

$$\text{Maximum Cable Length} = \frac{0.01 \text{ microfarads}}{\text{Nominal Cable Capacitance (per unit length)}}$$

NOTE:
Nominal capacitance is measured between the conductors. However, if one conductor is connected to the shield via a grounded power supply, then the nominal value will usually double in value.

The length of a cable and the cable conductor resistance are used to find the fixed error which would appear at the field device. Use the following equation to determine the fixed error:

$$\text{Fixed Error (\%)} = \frac{[1-R1] \times 100}{[R1 + 2 \times CL \times RC]}$$

where: R1 is the field device resistive load
CL is the cable length
RC is the conductor resistance per unit length

The following figure provides a schematic for a voltage output circuit.

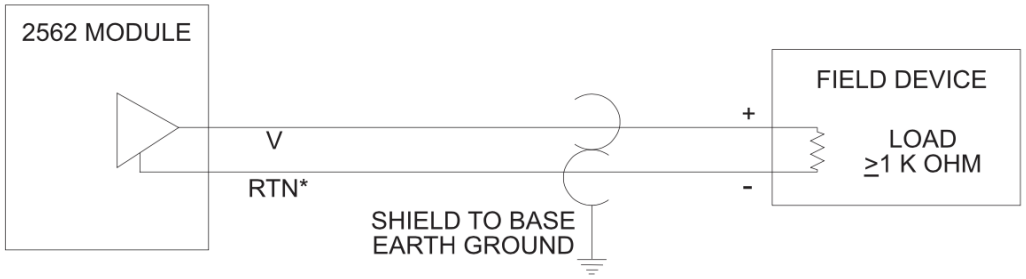


Figure 7 Voltage Output Circuit

CAUTION:
HANDLING STATIC SENSITIVE DEVICES
The components on the 2562 module printed circuit card can be damaged by static electricity discharge. To prevent this damage, the module is shipped in a special anti-static bag. Static control precautions should be followed when removing the module from the bag, when opening the module, and when handling the printed circuit card during configuration.

Open the shipping carton and remove the special anti-static bag which contains the module. After discharging any static build-up, remove the module from the static bag**. Do not discard the static bag. Always use this bag for protection against static damage when the module is not inserted into the I/O backplane.**

WARNING:
Ensure that the power supply is turned OFF before connecting the wires to the I/O base.

2.3. Configuring the Module for Operation

The 2562 must be configured for voltage output range, unipolar or bipolar mode, offset mode, and zero/last value mode before wiring the output connectors and inserting the module into the I/O base. As shipped, all output channels are configured for the 5V output range, unipolar outputs, disabled offset mode, and last value output at power up (see **Figure 11 Jumper Configuration as Shipped).**

Configuring the 2562 for operation consists of the following steps (notations in parenthesis are actual printed board titles):

1. Selecting 0-5V (5V) or 0-10V (10V) output voltage range for each channel.
2. Selecting unipolar (UNI) or bipolar (BI) mode for each output channel.
3. Setting DIP switches for each channel to match the hardware configuration.
4. Selecting offset scaling enabled (EN) or disabled (DIS) for the entire module.
5. Selecting either zero (ZERO) or last value (LAST VALUE) at power up for the module.

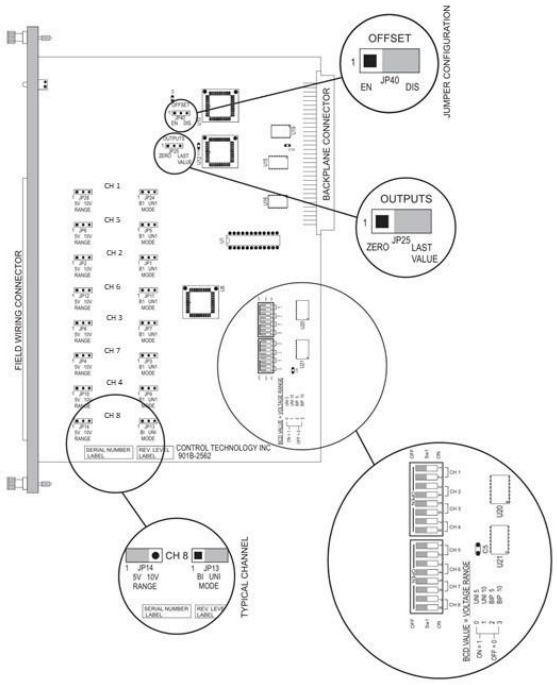


Figure 8 **Configuring the Module**
(Jumpers and DIP Switches shown in default shipping position.)

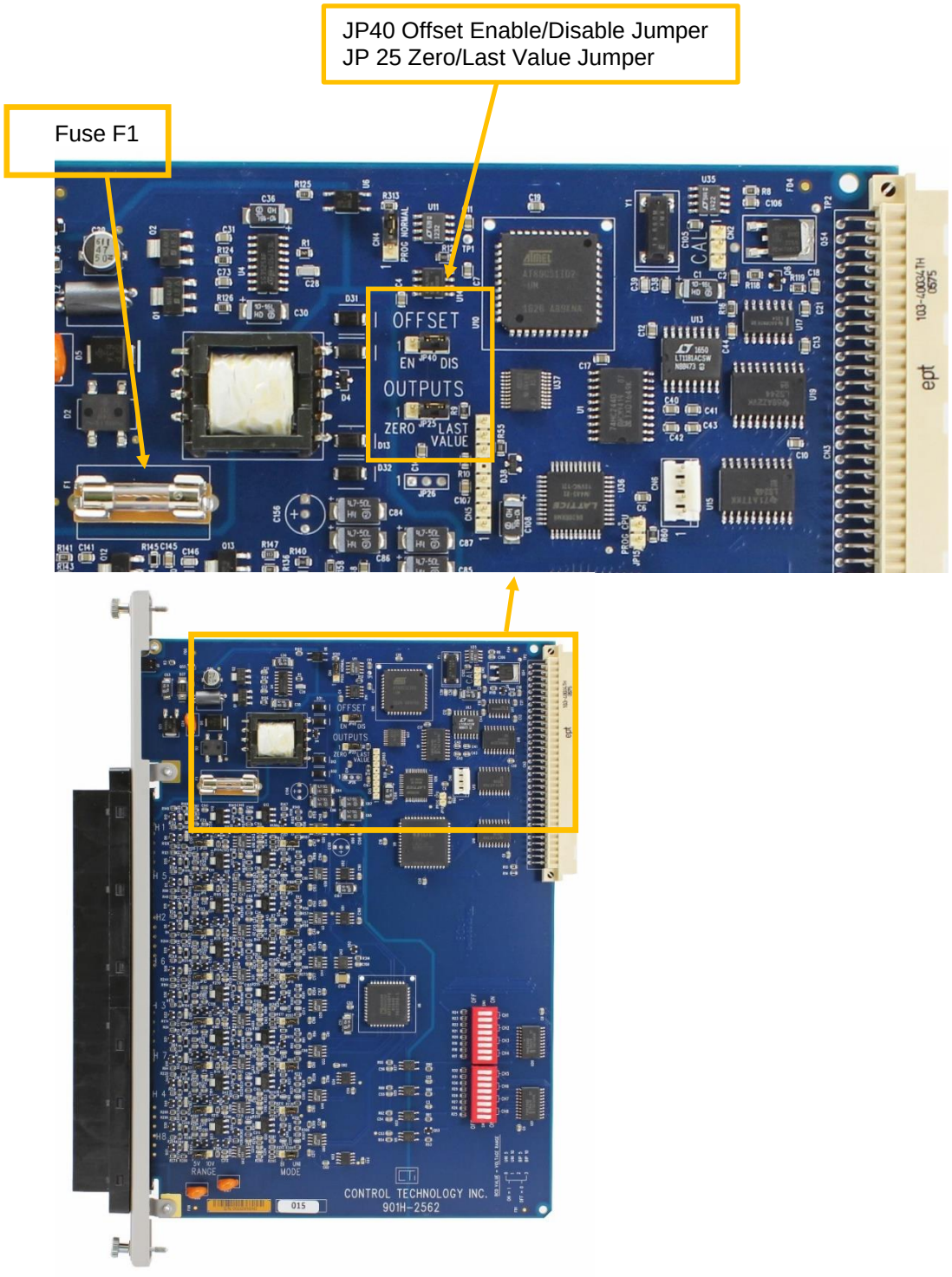


Figure 9 F1 and JP25 and JP40 Locations

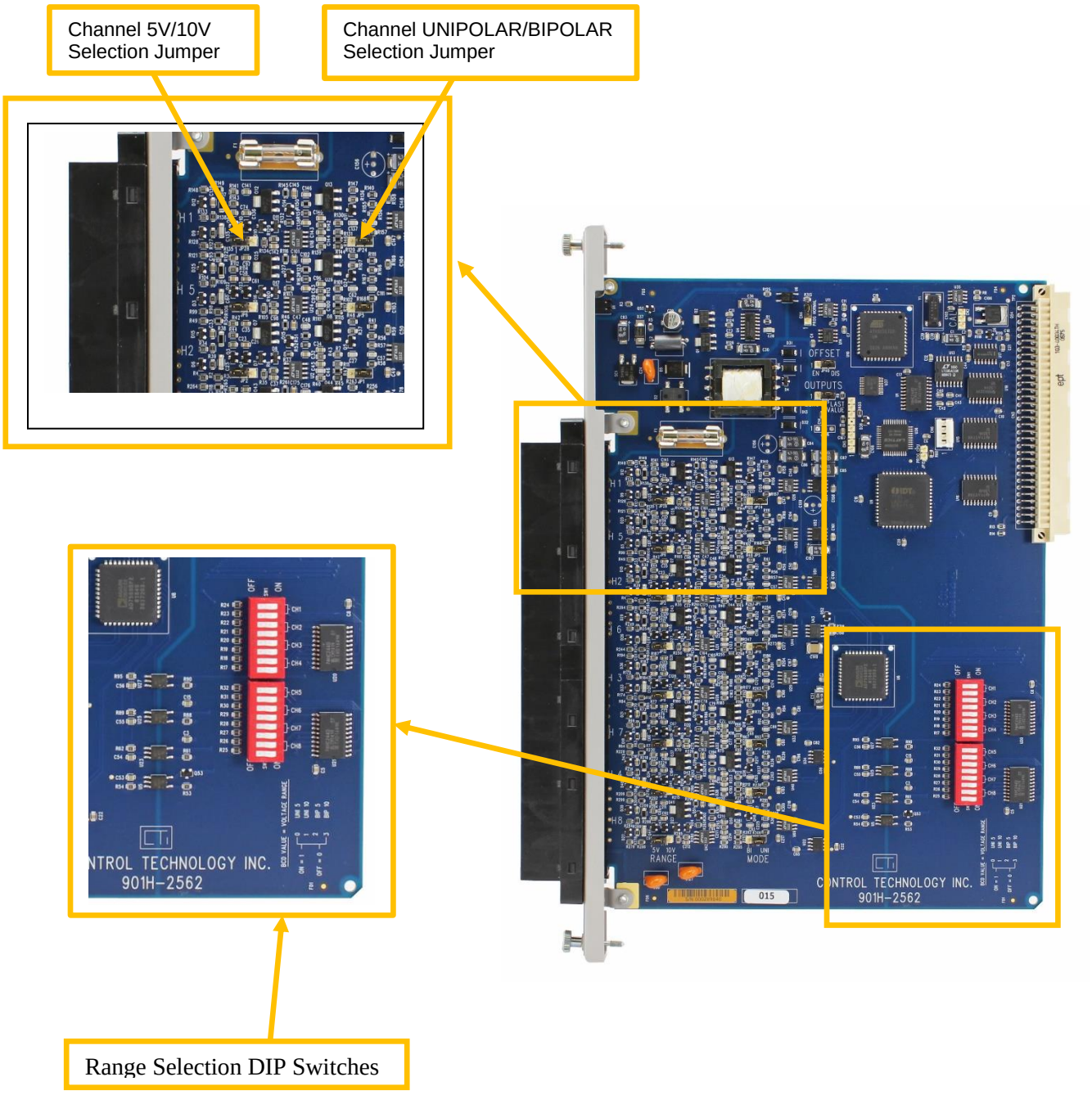


Figure 10 Channel Voltage and Range Selection

Channel Number	Voltage Range Jumper	Jumper Position *5V or 10V*	Unipolar/Bipolar Jumper	Jumper Position *Uni or Bi*
1	JP28	5V	JP24	UNI
2	JP6	5V	JP5	UNI
3	JP2	5V	JP1	UNI
4	JP12	5V	JP11	UNI
5	JP8	5V	JP7	UNI
6	JP4	5V	JP3	UNI
7	JP10	5V	JP9	UNI
8	JP14	5V	JP13	UNI

All Channels	Offset Mode Jumper	Offset Mode Jumper Position	Outputs at Power Up Jumper	Outputs at Power Up Jumper Position
1-8	JP40	DISABLED	JP25	LAST VALUE

Figure 11 Jumper Configuration as Shipped

2.3.1. Selecting Either 5 VDC or 10 VDC Range for Each Channel

The 2562 is capable of supporting Unipolar or Bipolar applications with an output range of 0 to +5 VDC, 0 to +10 VDC, -5 to +5 VDC or -10 to +10 VDC. For each channel a hardware jumper selects the range for that output circuit. (See **Figure 8 Configuring the Module**.) Select 5 VDC range for all current applications. As shipped, the 5V range is selected.

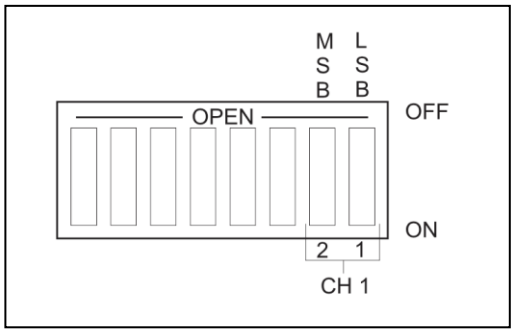
2.3.2. Selecting Unipolar or Bipolar Output

Each output channel on the 2562 supports Unipolar or Bipolar output operation. Hardware jumpers select operation of the output. (See **Figure 8 Configuring the Module**) Select Bipolar for applications that drive the outputs from -5 to +5 VDC, -10 to +10 VDC, or -20 to +20 mA. As shipped, Unipolar range is selected.

2.3.3. Setting DIP Switches to Match the Hardware Selections

Once the hardware jumpers are selected this information needs to be reported to the microcomputer. The information is reported via DIP switches SW1 and SW2. Each output channel uses 2 switches with a BCD code to indicate the state of the hardware jumpers. As shipped, Unipolar 5VDC is selected.

2 (MSB)	1 (LSB)	Range
OFF	OFF	Unipolar 5VDC
OFF	ON	Unipolar 10VDC
ON	OFF	Bipolar 5VDC
ON	ON	Bipolar 10VDC



2.3.4. Selecting Automatic Offset Mode for the Entire Module

Some applications require an Offset mode of 4-20 mA or 1-5 VDC. The SIMATIC® TI PLC can adjust an output loop calculation to provide an offset output. If the application does not use the PID control block then the processing must be done in relay ladder logic. The 2562 can perform this offset calculation and output an offset signal independent of the PLC. Selecting this function with JP40 causes all eight outputs to be scaled. Move the jumper to the ENABLED position to select this function. As shipped the module offset is DISABLED.

2.3.5. Selecting Either Zero or Last Value Output at Power Up

Upon power up of the base power, the 2562 allows the user to choose between either a zero output value or last output value when transitioning to the next update. A hardware JP25 jumper setting (see **Figure 9 F1 and JP25 and JP40 Locations**) sets the entire module for the mode chosen. Section 2.9. Power Cycling explains the details of each selection. As shipped the module power up mode is LAST VALUE. **Note: this jumper only has effect when power is lost from the base.**

2.3.6. Jumper Settings for Future Reference

See Appendix B. Jumper Settings Log Sheet to record any changes to the module's factory jumper settings.

2.4. Inserting the Module into the I/O Base

When the module is fully seated in the slot, captive screws at the top and bottom will hold the module in place. To remove the module from the I/O base, loosen these captive screws, and then remove the module from the I/O base. Do not damage the edge connector at the back of the module when inserting or removing the module.

2.5. Wiring the Output Connector

Output signals are provided through a connector assembly located on the front of the module. The connector assembly consists of a header attached to the printed circuit card and a mating removable screw terminal plug (see **Figure 12 Output Screw Terminal Plug Wiring**). Wiring is connected through the removable screw terminal plug.

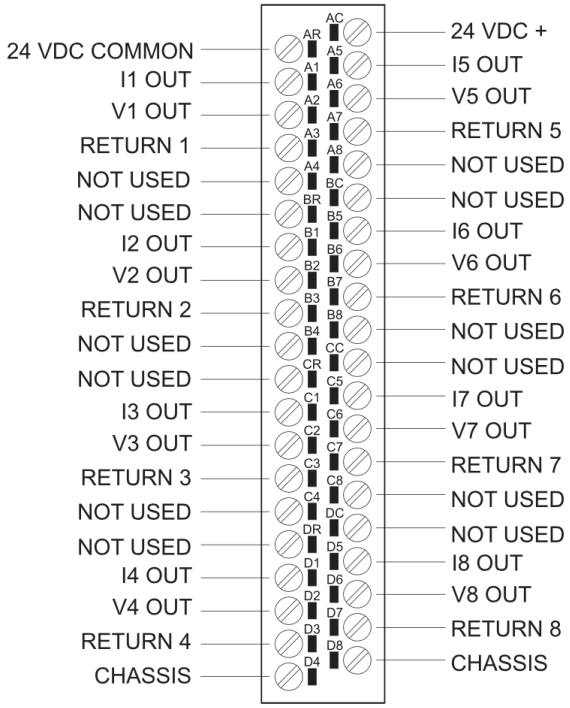


Figure 12 Output Screw Terminal Plug Wiring

2.5.1. Connecting Voltage Output Wiring

First, loosen the wire locking screws on the output screw terminal plug. For voltage output circuits, connect the signal wire to the VO screw terminal, and the return wire to the Return (channel ground) screw terminal. Insert the wires in the appropriate holes next to the screws. When the wires are inserted, tighten the screws. Repeat this procedure for the remaining voltage output channels.

2.5.2. Connecting Current Output Wiring

For current output circuits, connect the signal wire to the IO screw terminal, and the return wire to the Return (channel ground) screw terminal. Insert the wires in the appropriate holes next to the screws. When the wires are inserted, tighten the screws. Repeat this procedure for the remaining current output channels.

2.5.3. Connecting the Shield Wiring

See Figure *13* Connecting the Shield Wiring below that describes cable grounding and chassis ground.

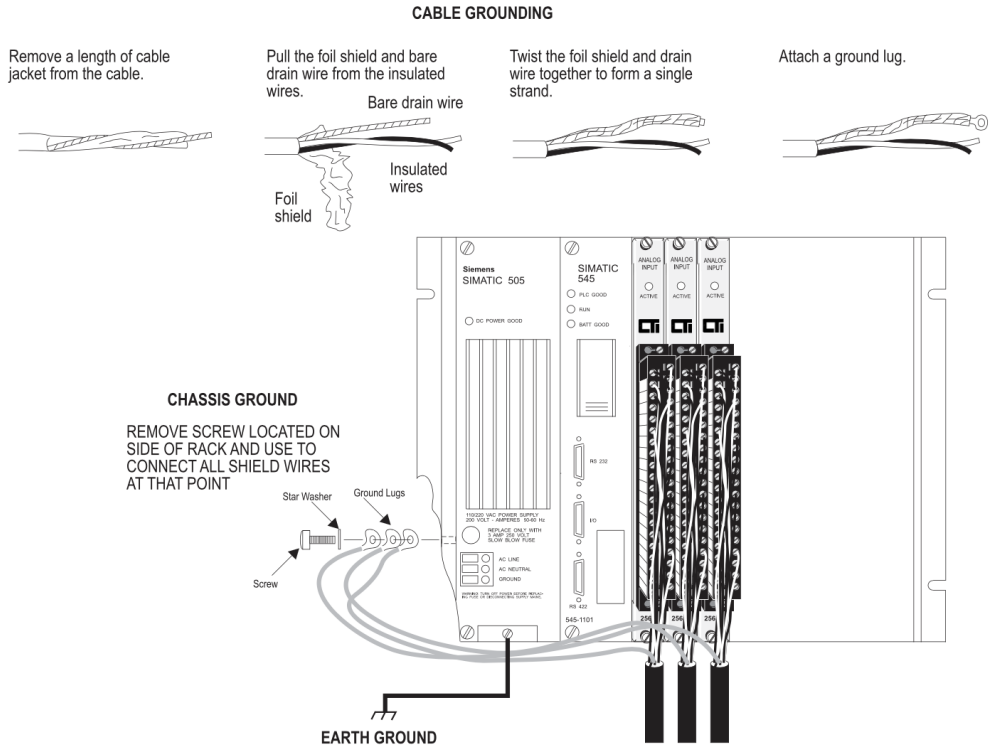


Figure 13 Connecting the Shield Wiring

Note:
A static drain is recommended on the 2562 to prevent a static charge buildup from occurring. A 10K to 1M resistor from any analog common to earth ground (chassis ground is front panel output connector pins D4 or D8) is sufficient for protection.

2.6. Inserting the Screw Terminal Plug

When all the output signal wires are connected to the screw terminal plug, carefully insert the plug into its header. Both the plug and header are keyed to prevent reverse wiring. When the screw terminal is fully inserted onto the header, use the captive screws to secure the plug to the front panel.

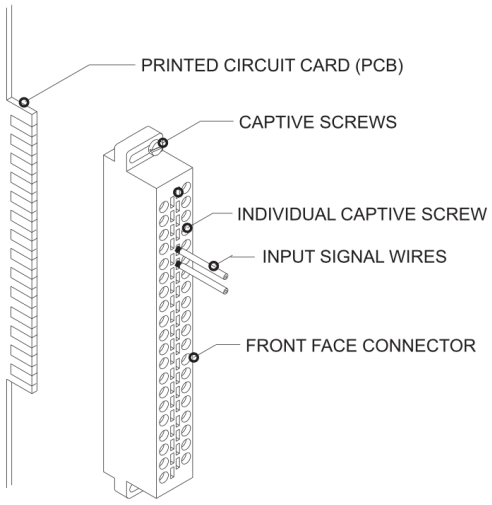


Figure 14 Attaching the Screw Terminal Plug

WARNING:
Always remove power from the I/O base before inserting a module to minimize the risk of injury of damage to equipment. Never insert a module into a powered I/O base.

2.7. Connecting the 24 VDC User Power Supply

The power supply is connected to the top 2 positions of the top connector on the front of the module as shown in Figure 2.7 below. Be sure to check that the 24V fuse is present and intact. See Chapter 3 Troubleshooting recommendations for replacement fuses.

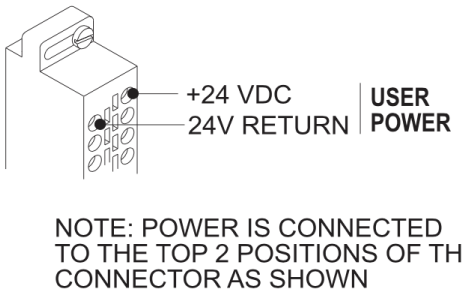


Figure 15 Power Supply Connections

2.8. Checking Module Operation

First turn on the base supply power. If diagnostics detects no problems, the front panel status indicator will light. If the indicator does not light (or goes out during operation), the user 24VDC is not present or the module has detected a different failure. For information on viewing failed module status, refer to your SIMATIC® TISOFT Programming Manual. To diagnose and correct a module failure, refer to the next section on troubleshooting.

NOTE:
If 24 VDC power fails or is removed and then later restored, the module will automatically resume normal operation. No external reset is required after power is restored.

You must also check to check that the module is configured in the memory of the PLC. This is important because the module will appear to be functioning regardless of whether it is communicating with the PLC. To view the PLC memory configuration chart listing all slots on the base and the inputs or outputs associated with each slot, refer to your SIMATIC® TISOFT Programming Manual. An example chart is shown in the following figure.

In this example, the 2562 Module is inserted in slot 1 in I/O base 0. Data for channel 1 appears in word location WY1, data for channel 2 appears in word location WY2, etc. For your particular module, look in the chart for the number corresponding to the slot occupied by the module. If word memory locations appear on this line, then the module is registered in the PLC memory and the module is ready for operation.

```
I/O MODULE DEFINITION FOR CHANNEL . . . 1    BASE . . . . . 00

              I/O    NUMBER OF BIT AND WORD I/O   SPECIAL
SLOT  ADDRESS          X     Y     WX   WY        FUNCTION

 01 . . . . 0001 . . . . . . . . 00 . . 00 . . 00 . . 08 . . . . . . . NO
 02 . . . . 0000 . . . . . . . . 00 . . 00 . . 00 . . 00 . . . . . . . NO
                                  .
                                  .
                                  .
 15 . . . . 0000 . . . . . . . . 00 . . 00 . . 00 . . 00 . . . . . . . NO
 16 . . . . 0000 . . . . . . . . 00 . . 00 . . 00 . . 00 . . . . . . . NO
```

Figure 16 I/O Configuration Chart

If the line is blank or erroneous, re-check the module to ensure that it is firmly seated in the slots. Generate the PLC memory configuration chart again. If the line is still incorrect, contact your local distributor or CTI at 1-800-537-8398 for further assistance.

NOTE:
In the event a CTI analog module detects no user 24VDC or an onboard module failure, the module will assert the module fail line and report the module failure in the I/O Status Word, which is reported to the PLC CPU. CTI strongly recommends the user application monitor the I/O Module Status Words which are Status Words 11-26 and apply to SIMATIC® Controllers TI/545, TI/555, TI/560 & 565, and the TI/575. The I/O Module Status Word can be used to report a module failure for an I/O Module in any of the SIMATIC® 505 I/O slots. Please refer to Siemens® SIMATIC® 505 Programming Reference Manual for more information. If a module failure is reported by the status word, the module should be replaced with a working unit and the failed module sent in for repair.

2.9. Power Cycling

The 2562 reacts the following ways upon various power cycling scenarios:

Base Power (5V)	User Power (24V)	2562 in Last Value Mode	
		Unipolar Mode*	Bipolar Mode*
On	Transition off	Output to zero.	Output to zero.
On	Transition on	Output from zero to PLC value.	Output from zero to full scale (+), then PLC value.
Transition off	On	Maintains last value.	Maintains last value.
Transition on	On	Maintains last value.	Maintains last value.
Off	Transition on	Output stays at zero.	Output to full scale.

Figure 17 Last Value Mode Module Reactions

Base Power (5V)	User Power (24V)	2562 in Zero Mode	
		Unipolar Mode*	Bipolar Mode*
On	Transition off	Output to zero.	Output to zero.
On	Transition on	Output from zero to PLC value.	Output from zero to full scale (+), then to zero, then to PLC value.
Transition off	On	Maintains last value.	Maintains last value.
Transition on	On	Output to zero for several seconds, then to PLC value.	Output to zero, then to PLC value.
Off	Transition on	Output stays at zero.	Output from zero to full scale (+).

Figure 18 Zero Mode Module Reactions

*see Section 2.3.5. Selecting Either Zero or Last Value Output at Power Up for further explanation.

Note: the zero/last value setting only has effect when power is lost from the base. It does not control what happens when the PLC is put in PROGRAM mode. The PLC always continues to update I/O modules when in PROGRAM mode.

CHAPTER 3. TROUBLESHOOTING

When it is inconvenient to visually check the status indicator, use the TISOFT "Display Failed I/O" or "Show PLC Diagnostics" support functions. Note that if the module power supply (user supply) fails, the module will still be logged into the PLC even though it is not operating.

In the event the user serviceable fuse blows, its replacement should be a 1 A, 250V Fast Blow 5x20mm fuse (Littlefuse 217-001 or equivalent).

If after consulting the chart below, you are unable to diagnose or solve the problem, contact your local distributor or CTI at 1-800-537-8398 for further assistance.

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Indicator is not lit	Not receiving power	Check power supply and connections
	Base or PC power is off	Turn base or PC on
	User 24 VDC not present	Check 24 VDC power
Incorrect outputs	Wrong connections	Trace wiring to check connections
	Wrong addresses for word output	Check program for correct word output addresses
	Not logged-in	Read I/O configuration
	Incorrectly calibrated	Return the module to CTI for calibration
	24 VDC user supply not within specification	Repair /replace user supply
Incorrect output values	Output load < 1K ohm voltage mode or > 1000 ohm current mode	Verify output load impedance is within specifications
No output	Blown fuse, or failed isolator	Contact CTI

Figure 19 Trouble shooting Matrix

SPECIFICATIONS

Output Channels:	8 analog output channels
Response Time:	4 mSec total module (includes settling time)
Output Range:	Unipolar: 0 to +5.12 VDC 0 to +10.24 VDC 0 to +20 mA Bipolar: -5.12 to +5.12 VDC -10.24 to +10.24 VDC -20 to +20 mA
Resolution 12 bits:	0-5 VDC range = 1.25 mV/step 0-10 VDC range = 2.5 mV/step 0-20 mA range = 5 µA/step -5 to +5 VDC range = 2.5mV/step -10 to +10 VDC range = 5.0 mV/step -20 to +20 mA range = 10 µA/step
Isolation:	1500 VDC channel-to-PLC
Capacitance Drive:	0.01 microfarads
Load Resistance:	Voltage: 1KΩ minimum, no maximum Current: 0Ω to 1KΩ max. @ 24VDC or greater
Voltage Accuracy:	0.125% of full scale from 0° to 60°C over total load range
Current Accuracy:	0.225% of full scale from 0° to 60°C over total load range
User Supply:	20 to 30 VDC @ 0.50 Amps (maximum ripple of 0.4 V) UL Class 2 power supply
Backplane Power Consumption:	1.7 Watts
Module Size:	Single-wide
Operating Temperature:	0° to 60°C (32° to 140°F)
Storage Temperature:	-40° to 85°C (-40° to 185°F)
Humidity, Relative:	5% to 95% non-condensing
Agency Approvals:	UL, UL-C

Specifications subject to change without notice.

APPENDIX A. COMPATIBILITY WITH SIEMENS® 505-6208-A/B

Overview

The CTI 2562 Analog Output Module was designed to be a drop-in replacement for the Siemens® models 505-6208-A and 505-6208-B. From set up of the module to wiring and PLC reporting, the user will find many similarities between the CTI and Siemens® models.

Using the CTI 2562 in a 505-6208-A and/or 505-6208-B application

The CTI 2562 should fulfill all the following requirements for the 505-6208-A and 505-6208-B replacement(s), as outlined below:

Module setup

Since the CTI 2562 allows for both Unipolar and Bipolar setup, the module does have a slightly different module setup. See Chapter 2.3 Configuring the Module for Operation to determine the details in module setup.

Wiring

The wiring of the output connector is the same between the modules. See Chapter 2.5. Wiring the Output Connector for a detailed explanation of how this is accomplished.

If the module is used to supply voltage, the requirements of the input voltage to the module (20-30VDC) remains the same in order to supply the resistive load of the field device (>1000Ω). However, the maximum load resistance for current output drops to 600Ω at 20VDC and then climbs linearly to 1000Ω at 24-30VDC.

Also noteworthy is the isolation achieved module to module with the same power supply by using the CTI 2562 versus the Siemens® modules. With the 2562, each module is dielectrically isolated from a common 24V power supply.

PLC Reporting

The word format is the same between the modules. See Chapter 1.3 for a more detailed explanation on PLC reporting.

Power Cycling

When the user power is supplied and the base power is transitioning on, the 2562 has the option to either transition to hold the last output value until the next PLC update, as the Siemens® modules do, or to go to zero until the next PLC update. See section 2.3.5. Selecting Either Zero or Last Value Output at Power Up for further details.

APPENDIX B: JUMPER SETTINGS LOG SHEET

Channel Number	Voltage Range Jumper	Jumper Position *5V or 10V*	Unipolar/Bipolar Jumper	Jumper Position *Uni or Bi*
1	JP28		JP24	
2	JP6		JP5	
3	JP2		JP1	
4	JP12		JP11	
5	JP8		JP7	
6	JP4		JP3	
7	JP10		JP9	
8	JP14		JP13	

All Channels	Offset Mode Jumper	Offset Mode Jumper Position	Outputs at Power Up Jumper	Outputs at Power Up Jumper Position
1-8	JP40		JP25	

Record the configuration jumper settings on this log for future reference. Make additional copies if necessary.

LIMITED PRODUCT WARRANTY

CTI warrants that this CTI Industrial Product shall be free from defects in material and workmanship for a period of one (1) year after purchase from CTI or from an authorized CTI Industrial Distributor. This CTI Industrial Product will be newly manufactured from new and/or serviceable used parts which are equal to new in the Product.

Should this CTI Industrial Product fail to be free from defects in material and workmanship at any time during this (1) year warranty period, CTI will repair or replace (at its option) parts or Products found to be defective and shipped prepaid by the customer to a designated CTI service location along with proof of purchase date and associated serial number. Repair parts and replacement Product furnished under this warranty will be on an exchange basis and will be either reconditioned or new. All exchanged parts or Products become the property of CTI. Should any Product or part returned to CTI hereunder be found by CTI to be without defect, CTI will return such Product or part to the customer.

This warranty does not include repair of damage to a part or Product resulting from: failure to provide a suitable environment as specified in applicable Product specifications, or damage caused by an accident, disaster, acts of God, neglect, abuse, misuse, transportation, alterations, attachments, accessories, supplies, non-CTI parts, non-CTI repairs or activities, or to any damage whose proximate cause was utilities or utility like services, or faulty installation or maintenance done by someone other than CTI.

Control Technology Inc. reserves the right to make changes to the Product in order to improve reliability, function, or design in the pursuit of providing the best possible Product. CTI assumes no responsibility for indirect or consequential damages resulting from the use or application of this equipment.

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SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR CONSUMER PRODUCTS, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH MAY VARY FROM STATE TO STATE.

REPAIR POLICY

In the event that the Product should fail during or after the warranty period, a Return Material Authorization (RMA) number can be requested orally or in writing from CTI main offices. Whether this equipment is in or out of warranty, a Purchase Order number provided to CTI when requesting the RMA number will aid in expediting the repair process. The RMA number that is issued and your Purchase Order number should be referenced on the returning equipment's shipping documentation. Additionally, if the product is under warranty, proof of purchase date and serial number must accompany the returned equipment. The current repair and/or exchange rates can be obtained by contacting CTI's office at 1-800-537-8398.

When returning any module to CTI, follow proper static control precautions. Keep the module away from polyethylene products, polystyrene products and all other static producing materials. Packing the module in its original conductive bag is the preferred way to control static problems during shipment. **Failure to observe static control precautions may void the warranty**. For additional information on static control precautions, contact CTI's office at 1-800-537-8398.

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