Preface

Manual Content

This manual contains instructions for installing, wiring, and calibrating the Analog Input Modules (PPX:505–6108A and PPX:505–6108B), and the Analog Output Modules (PPX:505–6208A and PPX:505–6208B). The modules operate with the Series 505™ controller.

The manual does not give the details of analog-to-digital conversion techniques. Familiarity with these techniques may be necessary in some applications.

References

Refer to the manuals listed below for instructions on installing, programming, and troubleshooting your System 505 controller.

- *SIMATIC® 505 System Manual* (PPX:505–8201–x)
- *SIMATIC 505 Programming Reference Manual* (PPX:505–8204–x)
- *SIMATIC 505 Softshop™ for Windows User Manual (PPX:SS505–8101–x)*
- *SIMATIC 500™/505 TISOFT™ Release 6.3 User Manual* (PPX:TS505–8101–x)

Agency Approvals

Series 505 Analog Input and Analog Output Modules meet standards of the following agencies:

- Underwriters Laboratories: UL® Listed (Industrial Control Equipment)
- Canadian Standards Association: CSA Certified (Process Control Equipment)
- Factory Mutual Approved; Class I, Div. 2 Hazardous Locations
- CE Marking: Low Voltage Directive 73/23/EEC; Electromagnetic Compatibility Directive 89/336/EEC
- Verband Deutscher Elektrotechniker (VDE) 0160 Electrical Equipment (Self-Compliance)

Series 505 products have been developed with consideration of the draft standard of the International Electrotechnical Commission Committee proposed standard (IEC–65A/WG6) for programmable controllers (released as IEC 1131–2, Programmable Controllers, Part 2: Equipment Requirements and Tests, First Edition, 1992–09). Contact Siemens Energy & Automation, Inc., for information about regulatory agency approvals that have been obtained on Series 505 units.

Telephoning for Assistance

For technical assistance, contact your Siemens Energy & Automation, Inc. distributor.

Chapter 1
Product Overview

Calculating Digital Words for the PPX:505–6108A

The PPX:505–6108A module has a resolution of 8 counts out of 32000. That is, the smallest unit into which the module divides a unipolar input is 1 part out of 4000. For a voltage input of 0 to +5 V, this division corresponds to a step of 1.25 mV. For a current input of 0 to 20 mA, a step of 5 μA can be resolved.

Use the following equations to calculate the digital word which results from a particular voltage or current input.

$$Digital\ word\ (WX) = \frac{Input\ voltage}{5\ V} \times 32000$$

$$Digital\ word\ (WX) = \frac{Input\ current\ (mA)}{20\ mA} \times 32000$$

If the module is set for ±10 V input range, each step of eight counts corresponds to an input voltage change of 2.5 mV, and the digital word is defined as follows:

$$Digital\ word\ (WX) = \frac{Input\ voltage}{10\ V} \times 32000$$

Calculating Digital Words for the PPX:505–6108B

The PPX:505–6108B module has a resolution of 4 counts out of 32000. That is, the smallest unit into which the module divides a unipolar input is 1 part out of 8000. For a voltage input of 0 to +5 V, this division corresponds to a step of 625μV. For a current input of 0 to 20 mA, a step of 2.5 μA can be resolved.

Use the following equations to calculate the digital word which results from a particular voltage or current input.

$$Digital\ word\ (WX) = \frac{Input\ voltage}{5\ V} \times 32000$$

$$Digital\ word\ (WX) = \frac{Input\ current\ (mA)}{20\ mA} \times 32000$$

If the module is set for ±10 V input range, each step of eight counts corresponds to an input voltage change of 1.25 mV, and the digital word is defined as follows:

$$Digital\ word\ (WX) = \frac{Input\ voltage}{10\ V} \times 32000$$

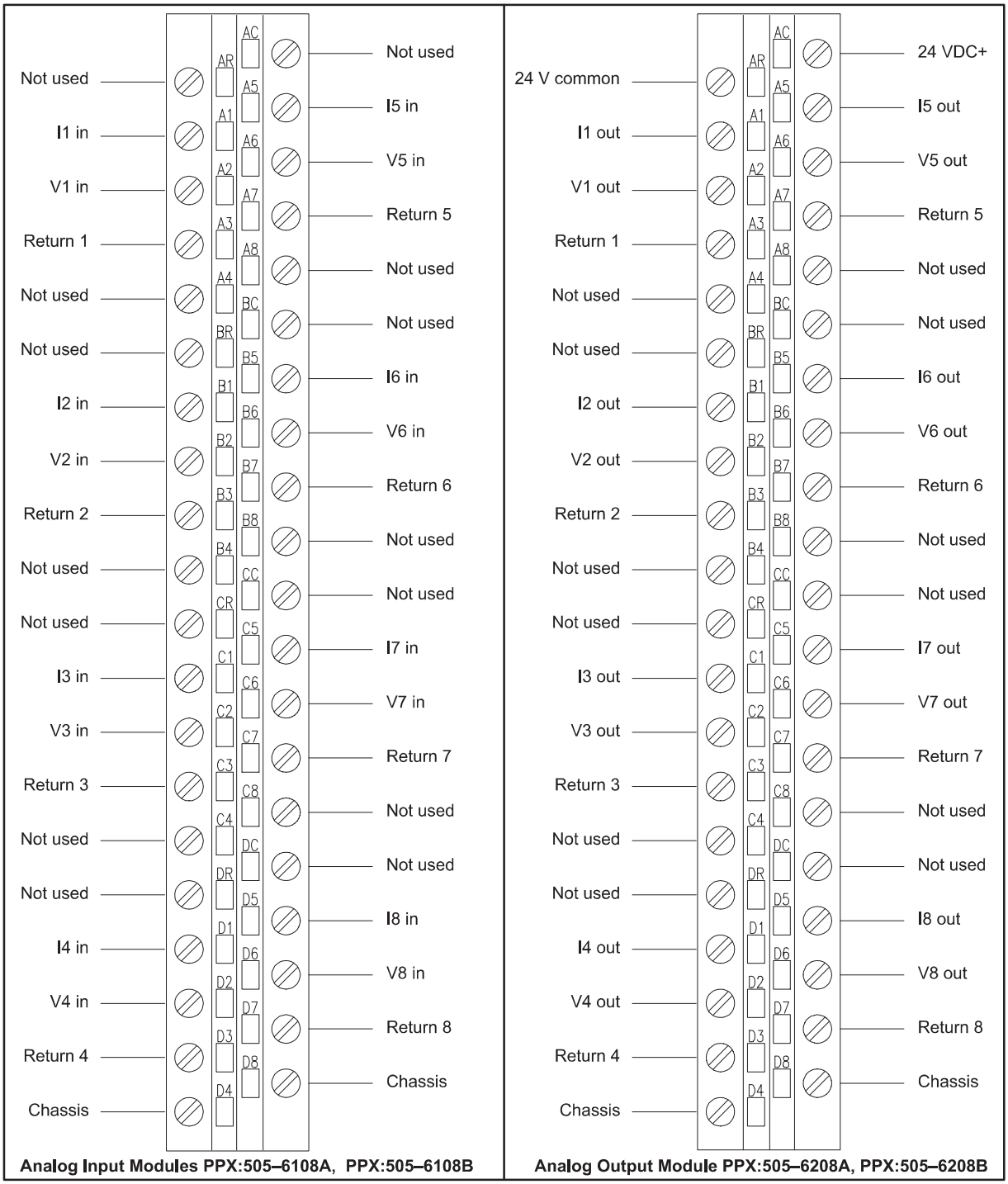

Figure 2-4 Pinouts for PPX:505–6108A, PPX:505–6108B, PPX:505–6208A, and PPX:505–6208B

6. Prompt the programming device to display the module points and their associated values.

7. Send +5.000 V to all input points (+10.000 V with the ±10 V input range).

8. Locate the calibration potentiometer on the circuit board (Figure 3-2). Turn the screw with a non-metallic screwdriver until the programming screen shows all addresses at an average of +32000.

9. Send –5.000 V to all input points (–10.000 V with the ±10 V input range).

10. Turn the screw on the calibration potentiometer until all the addresses read an average of –32000.

11. Input +5.000 V to all channels (+10.000 V with the ±10 V input range).

12. Verify that all addresses read the value shown below for your module. If not, return to step 9 and ensure that the calibration voltage source is accurate to three decimal places.

    For the PPX:505–6108A and PPX:505–6208A, verify that all addresses read +32000 +129/–128.

    For the PPX:505–6108B and PPX:505–6208B, verify that all addresses read +32000 +81/–80 .

13. Disable all power to the system.

14. *If you are using a Euro-extender card:*

    Remove it and insert the module into the I/O slots.

    Connect the field wiring.

    If you are not using a Euro-extender card:

    Replace all I/O modules and the analog module in the proper slots.

    Reconnect terminal block wiring.

    Reconfigure the WX input point for the analog input module.

    Reconfigure slot 1 to its original state.

15. Power up the system.