

1.1 Description

The Series 505 Analog Input (PPX:505–6108A and PPX:505–6108B), and Output (PPX:505–6208A and PPX:505–6208B) Modules are single-wide versions of the Analog I/O Modules (PPX:505–6108 and PPX:505–6208), and can replace the double-wide models without any wiring changes. The Input Modules (PPX:505–6108A and PPX:505–6108B) offer the additional benefit of an optional ± 10 V input range, and they do not require external user-supplied power. The Output Modules (PPX:505–6208A, and PPX:505–6208B), like the double-wide PPX:505–6208, require user-supplied 24 VDC power to maintain low power consumption from the base.

The Series 505 Analog I/O Modules (Figure 1-1) connect the controller with devices which monitor or control pressure, position, flow, temperature, or speed using voltage or current signals. The input module translates an analog input signal from a monitoring device into an equivalent digital word and transmits that data to the controller for processing. The output module translates a digital word from the controller into an equivalent analog signal and transmits that data to an output device that controls pressure, position, flow, temperature, or speed.

A Module Good LED on the front of each module indicates the status of the power, self-diagnostics, and the fuse (for the output module). Figure 1-1 shows the location of the Module Good LED indicator of the PPX:505–6108B and PPX:505–6208B.

If the LED is on:

- System and user power are good
- Fuse is good
- Module has passed self-diagnostics

If the LED is off, one of the above has failed. See Chapter 3 for instructions on using the LED to troubleshoot.

1.3 Analog Output Operation

The analog output module operates synchronously with the controller. Any change in the output signal is dependent on the update time of the module. Figure 1-5 shows this relationship.

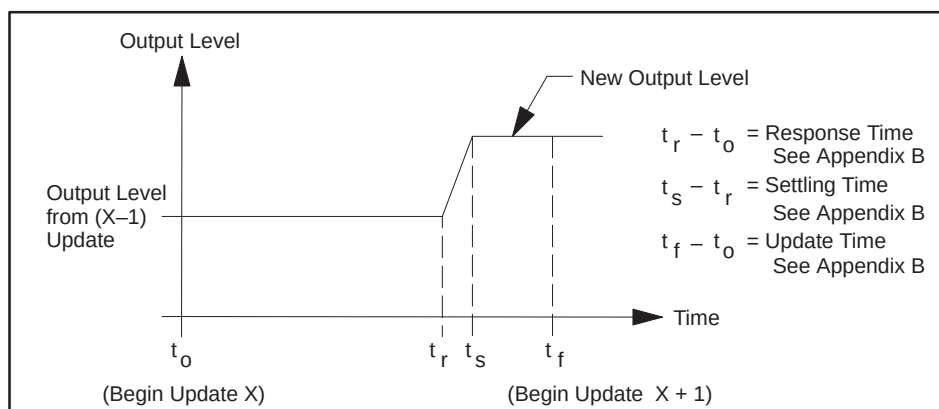


Figure 1-5 Relationship of Update Time to Change in Signal Output

The analog output module has eight channels, providing simultaneous voltage and current, ranging from 0 to 10 V and from 0 to 20 mA. Note that the current output is a sourcing type. Therefore, any shorts in the output circuit cause the output current to bypass the field device in the circuit.

The controller sends a 16-bit binary word to the module. Figure 1-6 shows the data word format. The digital value, which is translated into an analog output signal, occupies 12 of the 16 bits. The most significant bit (MSB) denotes the sign of a value. The remaining bits are unused.

NOTE: Bit 1 (the sign bit) is used to check for a negative number sent to the output module. If this bit is set to 1, the output for the point is not updated, and the last positive output is repeated.

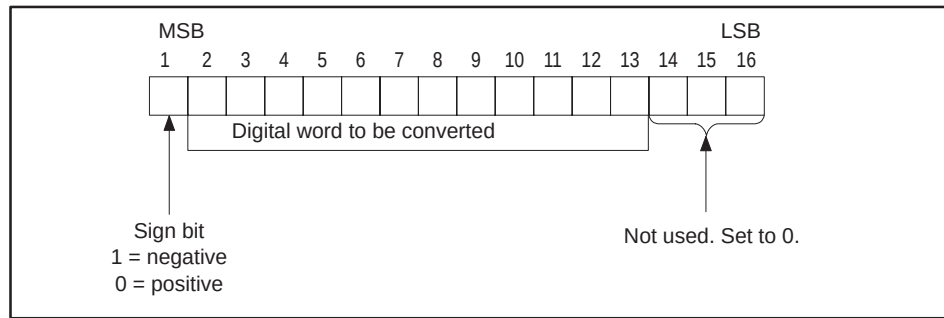


Figure 1-6 Output from Controller to Module

The resolution of the module is 8 counts out of 32000, regardless of whether the signal is used as voltage or current. Therefore, the smallest step unit for voltage is 2.5 mV and for current is 5 μ A. To calculate the digital word necessary to achieve a certain output voltage or current, use the following equations.

$$\text{Digital word (WY)} = \frac{\text{Desired output voltage}}{10 \text{ V}} \times 32000$$

$$\text{Digital word (WY)} = \frac{\text{Desired output current (mA)}}{20 \text{ mA}} \times 32000$$

1.4 Power Sources

The output module requires both user-supplied and base-supplied power.

Table 1-1 shows the input module response at power-up and power-down.

Table 1-1 Analog Input Module Power Cycling

Base Power	User Power	Module
Transition on	Not applicable	Module resumes converting and controller resumes reading from module
Transition off	Not applicable	Module and controller power down. All input data cleared

Table 1-2 shows the output module response at power up and power down.

Table 1-2 Analog Output Module Power Cycling

Base Power	User Power	Module
On	Transition off	Off—module sets fail bit
On	Transition on	Resumes prior state until next update
Transition off	On	Freezes last value
Transition on	On	Holds last value until next update
Off	Transition on	Off

Wiring and Installing the Terminal Block (continued)

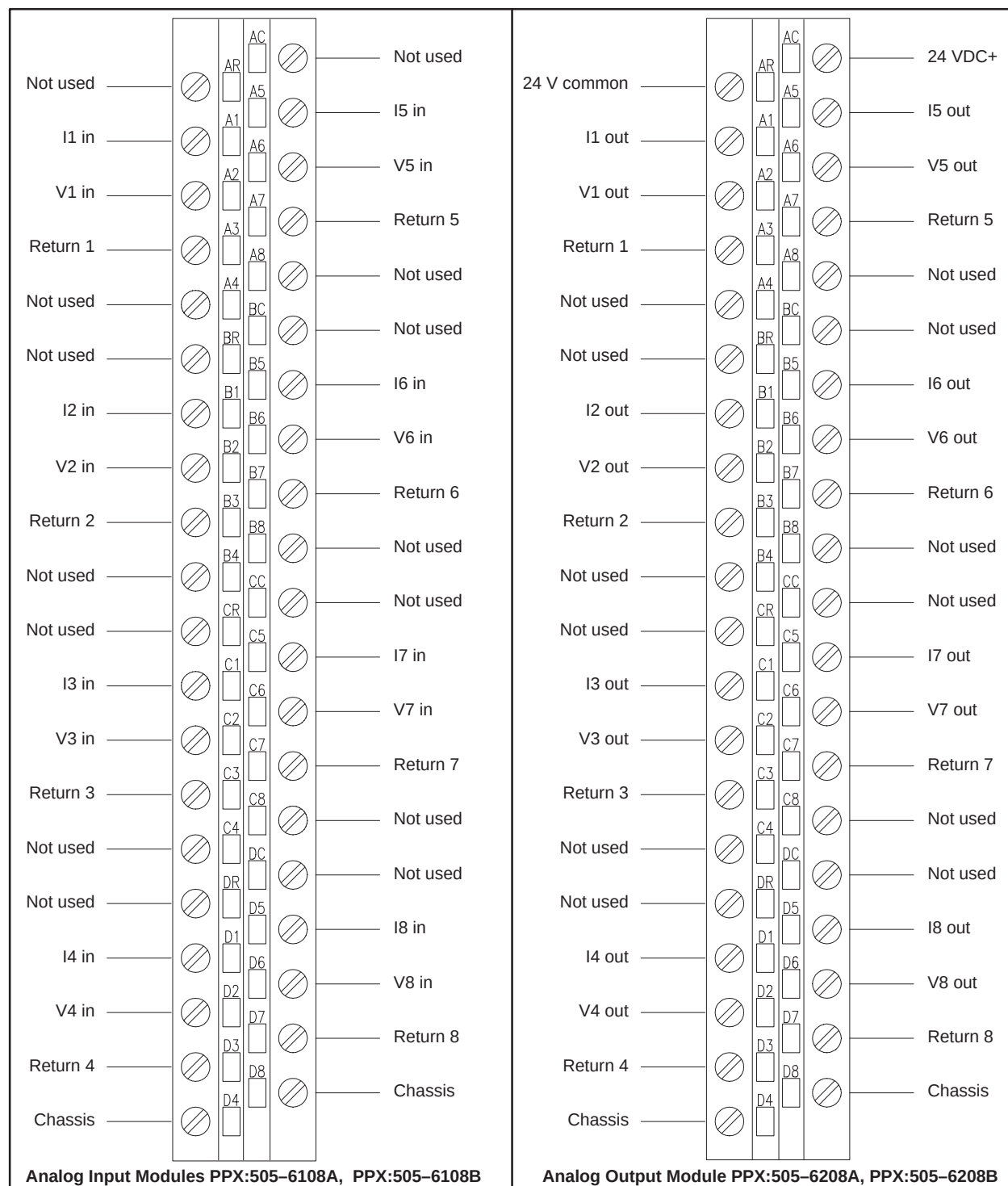


Figure 2-4 Pinouts for PPX:505-6108A, PPX:505-6108B, PPX:505-6208A, and PPX:505-6208B