

## ANALOG PERSONALITY MODULE

### Installing an Analog Personality Module (APM)

**! CAUTION !**

The APM is a static sensitive device and should be treated as such. MTS recommends a static wrist wrap be worn during installation and that these procedures are conducted in a clean environment.

1. Place the transducer hex in a vise.
2. Unscrew the cover using hand pressure only. Note that cover has right hand threads. A specially designed cover wrench is available from MTS.

**! CAUTION !**

Hands must be clean. Ensure that no foreign material contacts the inside components.

3. Once the cover is removed, clean the inner threads of the cover and bracket with a lint free cloth. Spray ONLY the cover threads with Sherwin Williams #00217 Teflon® spray.
4. Remove APM from the static sensitive bag by holding the module by its edges, being careful that the plastic does not contact the transducer mechanism. The old coil block design has a key that can interfere with a new APM. If an APM is being installed on a transducer with the old coil block design, be sure to cut off the key before installing the new APM as indicated in the drawing below. Refer to the programming procedures on the next page if the APM needs to be reprogrammed.

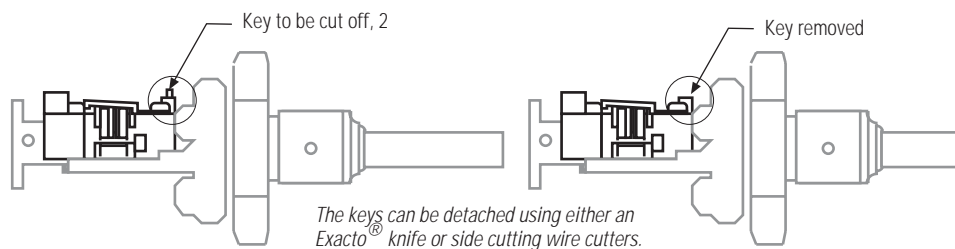
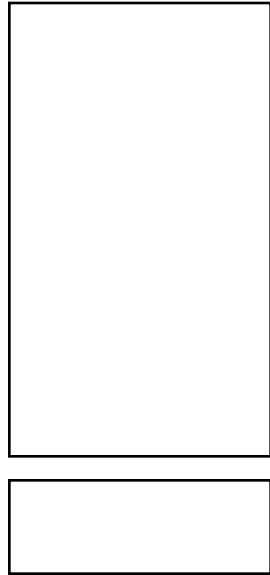


Figure 1

5. Place insulator on coil block.
6. Align the 12 pin connector on the interconnect board with the socket on the APM, ensure the pins are straight, and press gently until the module is securely inserted.
7. Once the module is inserted, secure the 2 Plastite screws that are provided until they are snug. DO NOT OVER TIGHTEN!



*To assure full coverage under warranty and error-free future replication orders, install this label as instructed in Step 9.*

8. Carefully align the cover to the threads and hand tighten until snug against the gasket.  
DO NOT OVER TIGHTEN COVER
9. Once cover is secure, attach the label provided as shown in Figure 2.

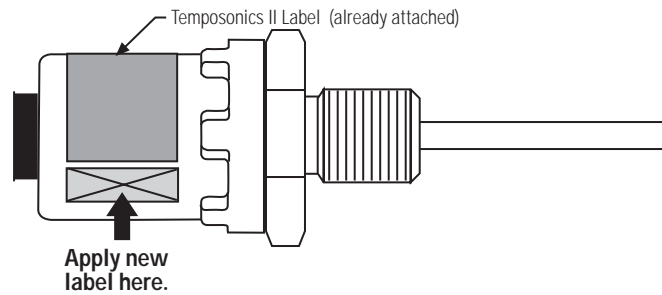


Figure 2

10. Connect transducer and verify proper operation.

## APM Programming Procedure

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<p><b>! CAUTION !</b> IMPORTANT: Before beginning the programming procedures, supply power to the APM for a full 5 minutes. This will allow all components to stabilize and ensure set point accuracy.</p>
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The output range of the APM is determined by choosing two endpoints within the active stroke length of the transducer and using the two push-buttons to assign a voltage to each point. The two endpoints are called Set Point 1 (SP1) and Set Point 2 (SP2). Any voltage from -10 volts to +10 volts may be assigned to either point; the APM will automatically scale the output to the specified range. Set Point 1 must be the set point closest to the head electronics.

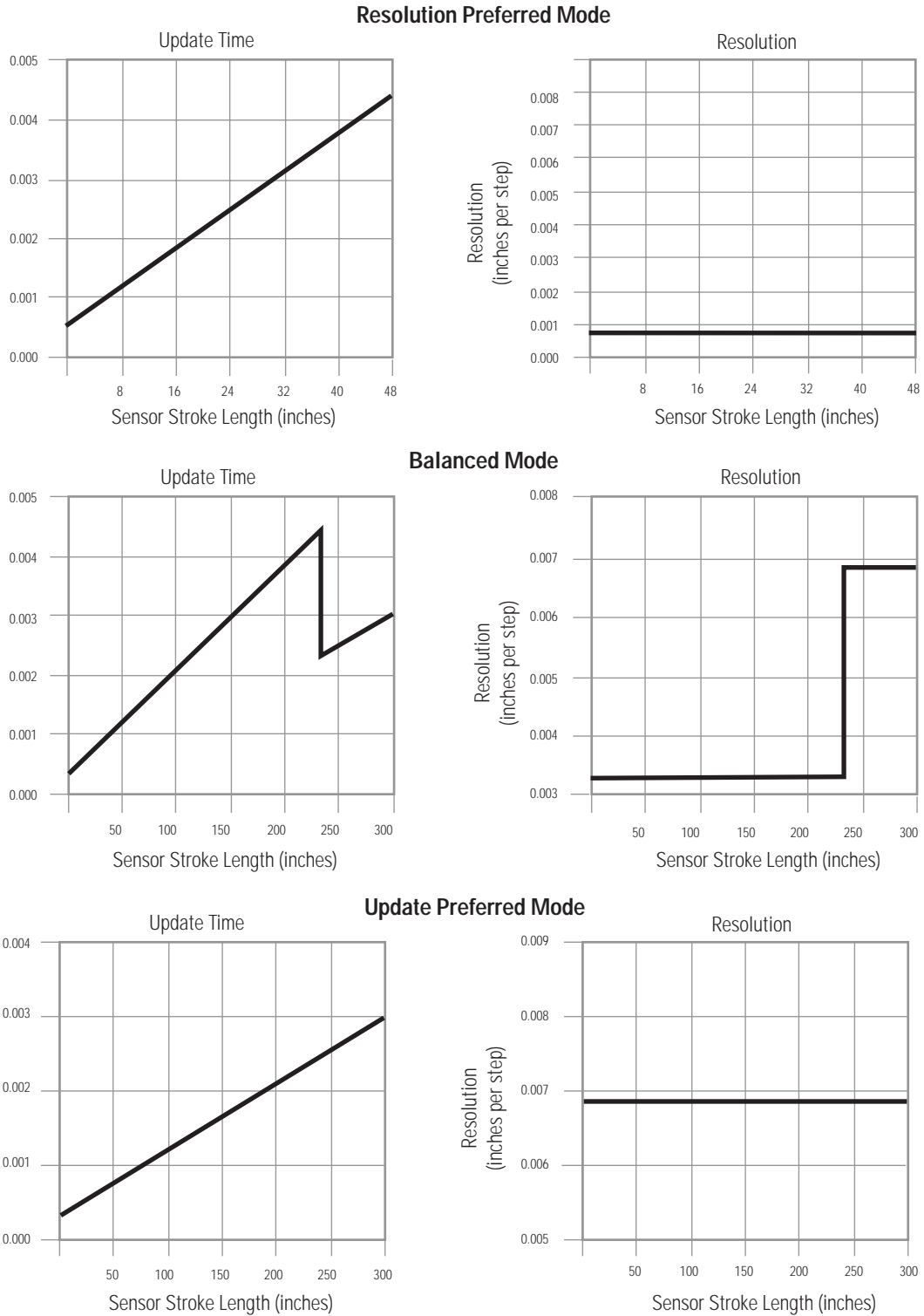
In addition, the APM can be programmed for one of three performance modes. During the programming procedure, each mode is represented by a particular output voltage. The three modes are as follows:

**Resolution-Preferred Mode** - In this mode the APM generates a high resolution output while sacrificing update time. The Resolution Preferred Mode is limited to stroke lengths up to 48 inches and will provide an output resolution of approximately 0.001 inches. In applications exceeding 48 inches, the APM must be set for Balanced Mode or Update Preferred Mode. In the programming procedure, the Resolution Preferred Mode is indicated by an output of 0 volts.

**Balanced Mode** - In this mode the APM offers a "balance" between update time and resolution. For stroke lengths up to 250 inches, the output resolution will be approximately 0.003 inches. In the programming procedure, this mode is indicated by an output of +10 volts.

**Update Preferred Mode** - In this mode the APM produces the fastest possible update time while sacrificing resolution. For stroke lengths up to 300 inches, the output resolution will be approximately 0.007 inches. In the programming procedure, this mode is indicated by an output of -10 volts.

The following charts identify the Update Time versus the Resolution for stroke lengths up to 300 inches for each of the three mode selections.



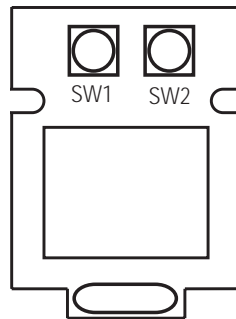
It is necessary to monitor the analog output with a digital volt meter while performing the following steps.

1. Move the permanent magnet to the desired position for Set Point 1. Press the SP1 push-button until the APM enters the programming mode (3 seconds) and acknowledges by producing an output voltage of about +5 volts. Release the SP1 button.

2. Press and release the SP2 button to enter the performance-mode setup mode. The APM will acknowledge by producing an output voltage which corresponds to the currently stored performance mode (see below). If the APM has never been programmed, the default mode will be resolution-preferred (that is, the output voltage will be 0 volts).
  - Resolution Preferred Mode = 0 volts
  - Balanced Mode = +10 volts
  - Update Preferred Mode = -10 volts
3. At this point, repeated presses of the SP2 button will cause the APM to cycle through the three performance modes. Continue to press and release the SP2 button until the voltage output indicates the voltage associated with the correct mode for your application. Once the correct voltage is displayed, press and release the SP1 button to accept the mode setting. The APM acknowledges by producing an output voltage of approximately -5 volts.
4. Press and release the SP1 button to enter the Set Point 1 setup mode. The APM will acknowledge by producing an output voltage of about -2.5 volts.
5. At this point, you can use the SP1 and SP2 buttons to choose the voltage to assign to Set Point 1. Pressing and holding the SP1 button causes the output voltage to move in the positive direction; pressing and holding the SP2 button causes the output voltage to move in the negative direction. If either button is held for more than five seconds, the output voltage will begin to change more quickly. Release the button when the desired output voltage is displayed on the digital volt meter. (For testing purposes, it is not necessary to perform this step. It can be skipped entirely since it only assigns the final voltage to the Set Point.)
6. To complete the setup for Set Point 1, press and release both buttons simultaneously. If the transducer has been previously programmed, it will resume operation with the new voltage assigned to SP1. If it has not been previously programmed, it will return to the same voltage it had prior to entering the programming mode (near 0 volts).
7. Move the permanent magnet to the desired position for Set Point 2. Press the SP1 push-button until the APM enters the programming mode (3 seconds) and acknowledges by producing an output voltage of approximately +5 volts. Release the SP1 button.
8. Press and release the SP2 button to enter the performance-mode setup mode. The APM will acknowledge by producing an output voltage which corresponds to the currently stored performance mode. If the APM has never been programmed, the default mode will be resolution-preferred (that is, the output voltage will be 0 volts).
9. At this point, repeated presses of the SP2 button will cause the APM to cycle through the three performance modes. Continue to press and release the SP2 button until the voltage output indicates the voltage associated with the correct mode for your application. Once the correct voltage is displayed, press and release the SP1 button to accept the mode setting. The APM acknowledges by producing an output voltage of approximately -5 volts. (Note that the mode chosen in this step should be the same as the one chosen in step 3. If a different mode is chosen, it will overwrite the one chosen previously.)
10. Press and release the SP2 button to enter the Set Point 2 setup mode. The APM will acknowledge by producing an output voltage of +2.5 volts.
11. At this point, you can use the SP1 and SP2 buttons to choose the voltage to assign to Set Point 2. Pressing and holding the SP1 button causes the output voltage to move in the positive direction; pressing and holding the SP2 button causes the output voltage to move in the negative direction. If either button is held for more than five seconds, the output voltage will begin to change more quickly. Release the button when the desired output voltage is displayed on the digital volt meter. (For testing purposes, this step may be skipped completely.)
12. To complete the setup for Set Point 2, press and release both buttons simultaneously. If the transducer was previously programmed, it will resume operation with the new voltage assigned to Set Point 2.

**! CAUTION !**

If the APM is being programmed for the first time, the analog output at power-up will be near zero volts. The programming steps are the same in this case, but the analog output will return to zero volts until valid information is stored for both Set Point 1 and Set Point 2. When both Set Points have been programmed, the transducer will enter normal operating mode and produce an analog output scaled according to the information permanently stored in the APM's memory.



*Figure 3*  
*APM, Top View*



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