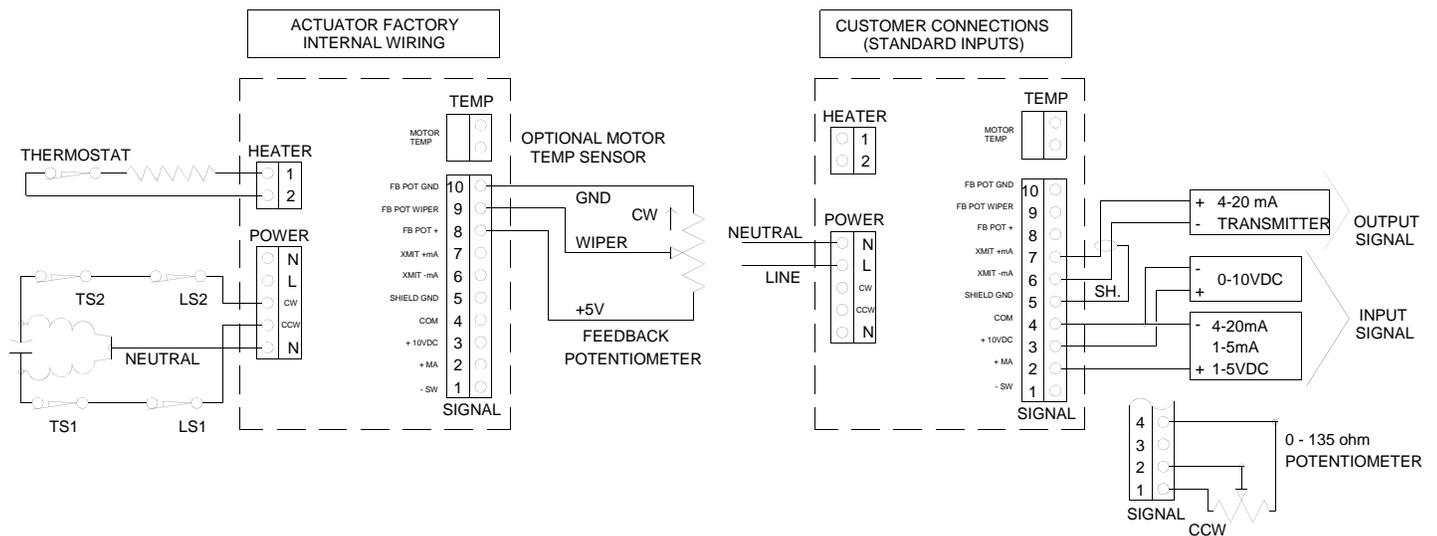


## TMC3-115 QUICK CALIBRATION PROCEDURE

The WEM / XEM series electric actuators come standard with the TMC3 servo card already factory installed and calibrated. No additional settings need to be set prior to standard operation. This quick calibration procedure has been provided as a resource for information on calibration of the TMC3 servo card. For more detailed information, please see IOM8031.

### Wire Termination

The Triac TMC3-115's are typically mounted inside a Triac WEM series electric actuator. The incoming power and control signal should be terminated per the actuators wiring diagram. The wiring diagram below illustrates the terminal connections on the TMC3-115 circuit board.



### WARNING

**TAKE VALVE OUT OF SERVICE PRIOR TO CALIBRATION. CALIBRATION WILL CAUSE THE VALVE TO MOVE. PLEASE MAKE SURE VALVE IS ISOLATED FROM PROCESS AND VALVE MOVEMENT WILL NOT CAUSE SAFETY ISSUES.**

## Input signal

The TMC3-115 can accept various input signals, with the factory default set at 4-20mA dc. The chart below shows all of the input configurations with the jumper locations. Please check input signal termination when moving input jumpers from factory settings.

	4-20mA dc	1-5mA	1-5Vdc	0-10Vdc	0-5Vdc	2-10Vdc	0-135 Ohm	0-1k Ohm	
GAIN	GAIN	GAIN	GAIN	GAIN	GAIN	GAIN	GAIN	GAIN	
mA / V							•	•	
SW	•	•	•	•	•	•		•	
INPUT	INPUT	INPUT	INPUT	INPUT	INPUT	INPUT	INPUT	INPUT	
4-20mA		•	•	•	•	•	•	•	
1-5mA	•		•	•	•	•	•	•	
10V / SW	•	•	•			•			

**Note:**  
DIP #4 & DIP #5 are  
not active when input  
jumper is on 10V / SW

## Auto Calibration

The TMC3-115 / WEM series electric actuator are factory calibrated, and no further calibration is required. The TMC3-115 / WEM series electric actuator can be field calibrated if necessary. The Auto Cal will set the open and closed position just before the limit switch trips at the end of travel. If a specific open or closed position is required, please see the Manual Calibration section.

- Push DIP switch #1 and #6 to the ON position. When the PGM button is pressed, the TMC3-115 will start the automatic calibration procedure. The actuator will stop and the green light will turn on when the auto cal is complete.
- Push DIP switch #1 and #6 to the OFF position will change the state to RUN MODE. Once in RUN MODE the actuator is ready for service.

## Manual Calibration

- Push DIP switch #1 to the ON position will change the state from RUN MODE to CAL MODE. **(NOTE: MAKE SURE DIP SWITCHES #2 - #7 ARE OFF WHEN PROGRAMMING TRAVEL POSITION)**
  - When in CAL MODE the actuator will rotate clockwise when the CW button is pressed and counter clockwise when the CCW button is pressed.
  - To program the CW position, push the CW button to rotate the actuator to the desired closed position. Ensure that the close limit switch does not engage. Apply the minimum input signal and push the red PGM button. The red CW light and the yellow PGM light should flash confirming action.
  - To program the CCW position, push the CCW button to rotate the actuator to the desired open position. Ensure that the open limit switch does not engage. Apply the maximum input signal and push the red PGM button. The green CCW light and the yellow PGM light should flash confirming action.
- Push DIP switch #1 to the OFF position will change the state to RUN MODE. Once in RUN MODE the actuator is ready for service.

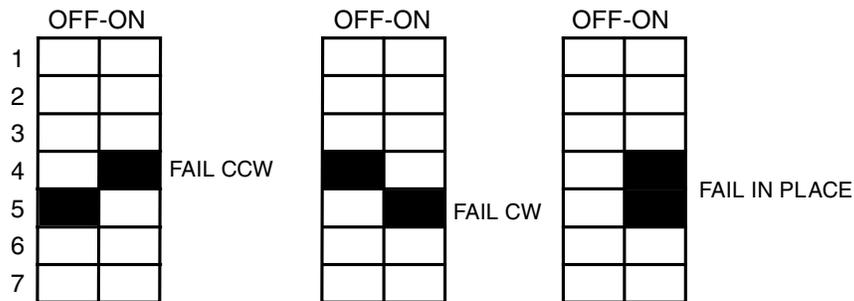
### Reverse Acting

- Push DIP switch #3 to the ON position will reverse the direction the actuator will rotate when a minimum signal is applied. This change will take place the next time the input moves or the power is cycled.

### Fail Position

- The factory setting will rotate the actuator to the full clockwise direction when in direct acting mode (DIP #3 is OFF). The actuator will rotate to the full counter clockwise direction when in the reverse acting mode (DIP #3 is ON). The fail position can be controlled with DIP # 4 and DIP #5.

**Note:**  
DIP #4 & DIP #5 are not active when input jumper is on 10V / SW



### Transmitter Adjustment

- There is additional capability to adjust the 4-to-20 mA transmitter output. The adjustment range is about  $\pm 0.5$  mA at the 4 mA end and  $\pm 1$  mA at the 20 mA end. To adjust the output, start at the 4mA end by moving the actuator to the position that corresponds to a 4mA output (typically the fully closed position). Turn on switches 1, 3 and 4 (and only those switches), which puts the card in CAL mode and the 4 mA adjustment setting. Turn the calibration potentiometer while observing the 4mA output. When you have obtained the desired output, push the red PGM button to save the setting.
- Move the actuator to the position that corresponds to a 20 mA output. (*You can stay in CAL mode and use the push buttons or switch to RUN mode and use the input to drive the actuator. Changing to run mode will necessitate turning off switch 3 unless you are operating in Reverse mode.*) When you have reached the 20 mA position, make sure that only switches 1, 3 and 5 are on and turn the calibration potentiometer for the desired output. When the output is correct, use the red PGM button to save the setting. From now on, the card will use the new settings for the 4-to-20 mA transmitter.
- To revert to the factory settings, repeat the above calibration procedure but set the calibration potentiometer to an approximate center position. For ease of centering the potentiometer, there is a “dead zone” in the center where the transmitter output does not change.

### Slide Wire Installation

Connect the slide-wire (135 ohm potentiometer)

1. Connect the Low Water Level side of the slide-wire to terminal 1. Connect the wiper of the slide-wire to terminal 2. Connect the High Water Level side of the slide-wire to terminal 4.
2. Put the INPUT jumper in the 10V/SW position. Put the GAIN jumper in the SW position.

### Calibrating the span with a slide-wire. (An example of a slide-wire would be a McDonnell & Miller water feeder)

1. Move the actuator to the fully closed position (using the black push buttons). Set the wiper of the slide-wire to the High Water Level side. Push the red PGM/AUTO CAL push button. The red and yellow LEDs should flash.
2. Move the actuator to the fully open position (using the black push buttons). Set the wiper of the slide-wire to the Low Water Level side. Push the red PGM/AUTO CAL push button. The green and yellow LEDs should flash.
3. Please note that for a somewhat less accurate calibration it is possible to perform the procedure without the slide-wire connected.

### Running the actuator with a slide-wire

1. Turn off DIP-switch 1 (run mode). In slide-wire mode filtering can be applied to the signal from the slide-wire. There are four possible settings for the filtering: slow, medium, fast and no-filter.
2. The slow setting is activated by turning DIP-switches 6 and 7 off. This will yield a first order filter response with a time constant of about 16 seconds (to 63%). This is the default setting.
3. The medium setting is activated by turning on DIP-switch 6. This will yield a first order filter response with a time constant of about 4 seconds (to 63%).
4. The fast setting is activated by turning on DIP-switch 7. This will yield a first order filter response with a time constant of about 4 seconds (to 63%).
5. The no-filter setting is activated by turning on DIP-switches 6 and 7. This will yield a response with no filtering.
6. When in the slide-wire mode, square and square root responses are not available (DIP-switches 6 and 7 are used for filtering options).

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## Using Dual Gain Feedback Input on the TMC3 Board

### Selecting the proper gain for the Feedback Input.

1. Determine the rotation in degrees of the feedback potentiometer. The rotation equals the actuator shaft rotation (typically 90°) times the gear ration of the actuator shaft-to-potentiometer gear.
2. If the potentiometer rotates *less than 120°* (this would typically indicate a 1:1 gear ratio on the shaft-to-potentiometer gear), use the H position on the FB jumper.
3. If the potentiometer rotates *more than 120°* (this would typically indicate a 2:1 or 3:1 gear ratio on the shaft-to-potentiometer gear), use the L position on the FB jumper.

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