



# UDC 3500 Application Note

## First Current Output Calibration

### Introduction

Calibrate the controller so that the output provides the proper amount of current over the desired range. The controller can provide a current output range of from 0 mA to 21 mA. The controller is usually calibrated at 4 mA for 0 % of output and 20 mA for 100 % of output, but it may be calibrated for any other values between 0 mA and 21 mA. It is not necessary to re-calibrate the controller in order to change from 4 to 20 mA operation over to 0 to 20 mA operation, a simple configuration change is all that is required.

### Equipment Needed

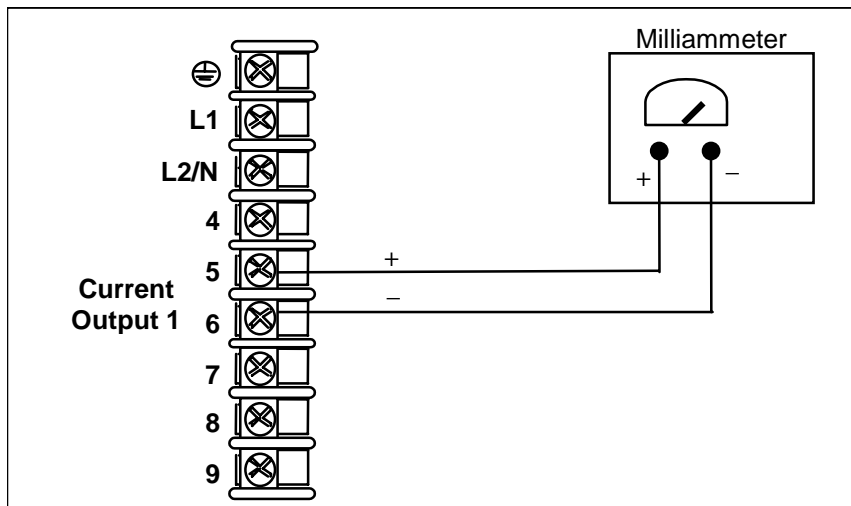
You will need a standard shop type milliammeter, with whatever accuracy is required, capable of measuring 0 to 20 milliamps.

### Calibrator Connections

Refer to Figure 1 and wire the controller according to the procedure given in Table 1.

**Table 1 Set Up Wiring Procedure for the First Current Output**

| Step | Action   |
|------|--|
| 1    | Apply power and allow the controller to warm up 30 minutes before you calibrate.                                 |
| 2    | <b>Set LOCK in the Tuning Set Up group to NONE.</b>  |
| 3    | Tag and disconnect the field wiring, at the rear of the controller, from terminals 5 (+) and 6 (-). See Figure . |
| 4    | Connect a milliammeter across these terminals.   |





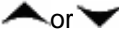
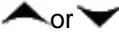

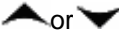
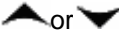


**Figure 1 Wiring Connections for Calibrating the First Current Output**



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The procedure for calibrating the First Current Output is listed in Table 2. Make sure that LOCK in the Tuning Set Up group is set to **NONE**.

**Table 2 First Current Output Calibration Procedure**

| Step | Operation                 | Press   | Result  |
|------|---------------------------|---|---|
| 1    | Enter Calibration Mode    | <br>until you see  | <i>Upper Display</i> = <b>CALIB</b><br><i>Lower Display</i> = <b>CURRENT</b>  |
| 2    | Calibrate 0 %             | <br><br> or      | You will see:<br><i>Upper Display</i> = A Value<br><i>Lower Display</i> = <b>ZERO VAL</b><br><br>Until the desired 0 % output is read on the milliammeter, use the values shown below depending on the action of your controller. Normally, this will be the setting that produces 4 mA.                                  |
| 3    | Calibrate 100 %           | <br><br> or  | This stores the 0 % value and you will see:<br><i>Upper Display</i> = A Value<br><i>Lower Display</i> = <b>SPAN VAL</b><br><br>Until the desired 100 % output is read on the milliammeter, use the values shown below depending on the action of your controller. Normally, this will be the setting that produces 20 mA. |
| 4    | Exit the Calibration Mode | <br><br>  | The controller stores the span value.<br><br>To exit the calibration mode.  |



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## Second Current Output Calibration

### Introduction

Calibrate the controller so that the output provides the proper amount of current over the desired range. The controller can provide a current output range of from 0 mA to 21 mA. The controller is usually calibrated at 4 mA for 0 % of output and 20 mA for 100 % of output, but it may be calibrated for any other values between 0 mA and 21 mA. It is not necessary to re-calibrate the controller in order to change from 4 to 20 mA operation over to 0 to 20 mA operation, a simple configuration change is all that is required.

### Equipment Needed

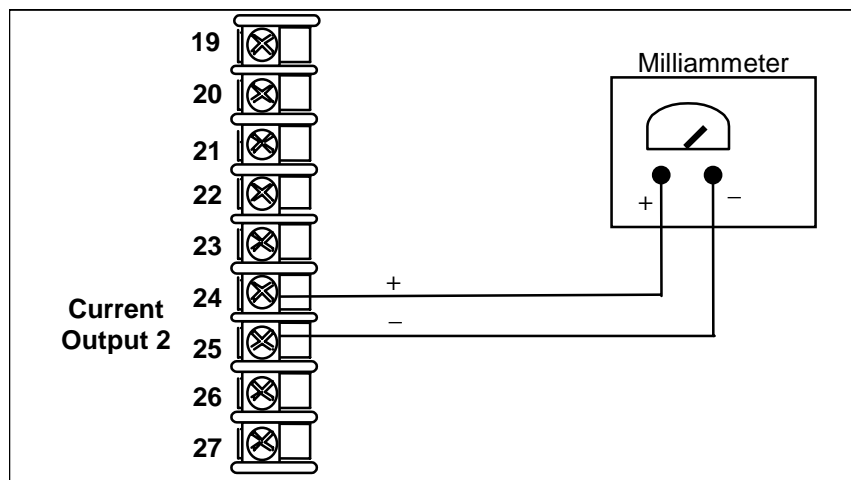
You will need a calibrating device with whatever accuracy is required, capable of measuring 0 to 20 mA.

### Calibrator Connections

Refer to Figure 2 and wire the controller according to the procedure given in Table 3.

**Table 3 Set Up Wiring Procedure for the Second Current Output**

| Step | Action   |
|------|--|
| 1    | Apply power and allow the controller to warm up 30 minutes before you calibrate.                                   |
| 2    | <b>Set LOCK in the Tuning Set Up group to NONE.</b>  |
| 3    | Tag and disconnect the field wiring, at the rear of the controller, from terminals 24 (+) and 25 (-). See Figure . |
| 4    | Connect a milliammeter across these terminals.   |



**Figure 2 Wiring Connections for Calibrating the Second Current Output**


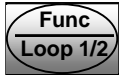
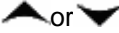
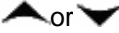

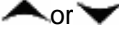
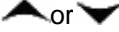




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## Procedure

The procedure for calibrating the Second Current Output is listed in Table 4.  
 Make sure that “LOCK” in the Tuning Set Up group is set to “NONE”

**Table 4 Second Current Output Calibration Procedure**

| Step | Operation                 | Press   | Result  |
|------|---------------------------|---|---|
| 1    | Enter Calibration Mode    | <br>until you see  | <i>Upper Display = CALIB</i><br><i>Lower Display = CUR OUT2</i>   |
| 2    | Calibrate 0 %             | <br><br> or      | You will see:<br><i>Upper Display = A Value</i><br><i>Lower Display = ZERO VAL</i><br><br>until the desired 0 % output is read on the milliammeter.<br>Normally, this will be the setting that produces 4 mA.                           |
| 3    | Calibrate 100 %           | <br><br> or  | To store the 0 % value you will see:<br><i>Upper Display = A Value</i><br><i>Lower Display = SPAN VAL</i><br><br>until the desired 100 % output is read on the milliammeter.<br>Normally, this will be the setting that produces 20 mA. |
| 4    | Exit the Calibration Mode | <br><br>  | The controller stores the span value.<br><br>To exit the calibration mode.  |



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## Third Current Output Calibration

### Introduction

Calibrate the controller so that the output provides the proper amount of current over the desired range. The controller can provide a current output range of from 0 mA to 21 mA. The controller is usually calibrated at 4 mA for 0 % of output and 20 mA for 100 % of output, but it may be calibrated for any other values between 0 mA and 21 mA. It is not necessary to re-calibrate the controller in order to change from 4 to 20 mA operation over to 0 to 20 mA operation, a simple configuration change is all that is required.

### Equipment Needed

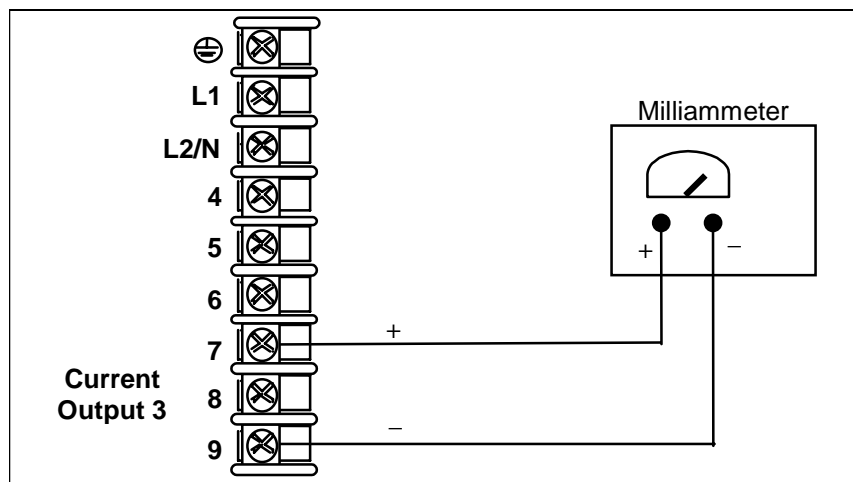
You will need a calibrating device with whatever accuracy is required, capable of measuring 0 to 20 mA.

### Calibrator Connections

Refer to Figure 3 and wire the controller according to the procedure given in Table 5.

**Table 5 Set Up Wiring Procedure for the Third Current Output**

| Step | Action   |
|------|--|
| 1    | Apply power and allow the controller to warm up 30 minutes before you calibrate.                                 |
| 2    | <b>Set LOCK in the Tuning Set Up group to NONE.</b>  |
| 3    | Tag and disconnect the field wiring, at the rear of the controller, from terminals 7 (+) and 9 (-). See Figure . |
| 4    | Connect a milliammeter across these terminals.   |



**Figure 3 Wiring Connections for Calibrating Third Current Output**


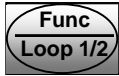
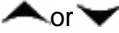
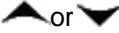

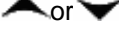
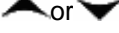
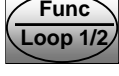



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## Procedure

The procedure for calibrating the Third Current Output is listed in Table 6.  
 Make sure that “LOCK” in the Tuning Set Up group is set to “NONE”

**Table 6 Third Current Output Calibration Procedure**

| Step | Operation                 | Press   | Result  |
|------|---------------------------|---|---|
| 1    | Enter Calibration Mode    | <br>until you see  | <i>Upper Display = CALIB</i><br><i>Lower Display = CUR OUT3</i>   |
| 2    | Calibrate 0 %             | <br><br> or      | You will see:<br><i>Upper Display = A Value</i><br><i>Lower Display = ZERO VAL</i><br><br>until the desired 0 % output is read on the milliammeter.<br>Normally, this will be the setting that produces 4 mA.                           |
| 3    | Calibrate 100 %           | <br><br> or  | To store the 0 % value you will see:<br><i>Upper Display = A Value</i><br><i>Lower Display = SPAN VAL</i><br><br>until the desired 100 % output is read on the milliammeter.<br>Normally, this will be the setting that produces 20 mA. |
| 4    | Exit the Calibration Mode | <br><br>  | The controller stores the span value.<br><br>To exit the calibration mode.  |