

## S15 Application Note 1.4.0

### Analog Output Calibration

Setup and calibrate the FM analog output.

Estimated Time: 15 Minutes

Level: 2

Prerequisite:

- S15 Application Note 1.1.0  
Navigating Menus & Parameters

## STEP A

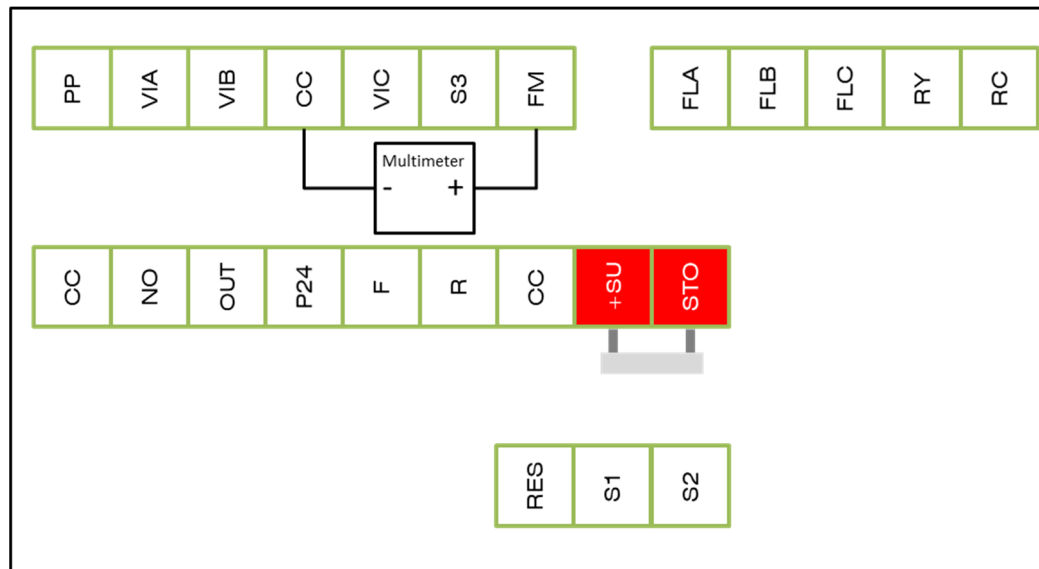
### Connections

A multimeter is used for the calibration process. After calibration, wire the indicator to the FM and CC terminals (PLC, Panel Meter, Door Meter). The desired process values are needed for calibration. i.e. Will 20mA equal 60Hz or 80Hz? Will 10V equal 100% current or 200% current?

**Connect the positive (+) side of the multimeter to the FM terminal.**

**Connect the negative (-) side of the multimeter to any CC terminal.**

S15 Terminal Board—Multimeter Connection Diagram



### Check Your Work

- ✓ **Verify the connection and polarity of the multimeter.**
- ✓ **Verify the multimeter is set for the correct measurement (VDC or mADC).**

## STEP B

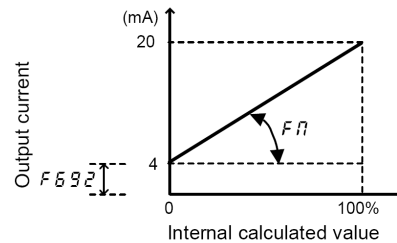
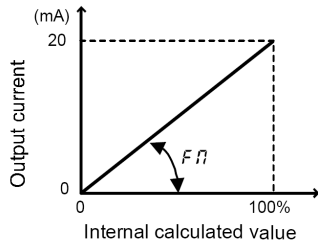
### Programming

#### 1. Select the desired output signal.

| Parameter   | Description                    | Options |
|-------------|--------------------------------|---------|
| <i>F681</i> | Analog Output Signal Selection |         |

#### a. (Optional) Adjust the bias for a 4-20mA output signal.

| Parameter   | Description        | Default Value | New Value |
|-------------|--------------------|---------------|-----------|
| <i>F692</i> | Analog Output Bias | 0%            | 20%       |



#### Check Your Work

✓ Use the multimeter to verify the FM terminal output is 4mA.

#### 2. Select the desired process value.

| Parameter   | Description          | Options |
|-------------|----------------------|---------|
| <i>F75L</i> | Terminal FM Function |         |

#### Notes:

- Options 15: Fixed Output 1 and 16: Fixed Output 2 may be used for Output Current calibration.
- Option 27: Fixed Output 3 may be used for calibration purposes for other process values.
- Do not forget to change *F75L* back to the desired process value after calibration is completed.

## STEP C Procedure

The analog output terminals can be calibrated through two different methods. The first method requires the drive to run, and the second method does not.

### Method 1

#### 1. Adjust the output signal while the ASD is running.

| Parameter  | Description            | Default Value | New Value                      |
|------------|------------------------|---------------|--------------------------------|
| $F\bar{n}$ | Terminal FM Adjustment | 100%          | Adjust up or down accordingly. |

The output signal is adjusted to the desired level based upon the displayed process value.

Example 1: Run the drive at 60Hz. Adjust parameter  $F\bar{n}$  until the multimeter reads 20mADC or 10VDC.

Example 2: Run the drive under load conditions. Adjust parameter  $F\bar{n}$  until the customer's indicator or control system matches the Output Current displayed in Monitor Mode.

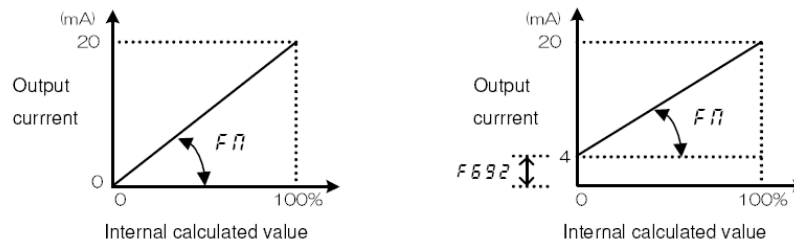
### Method 2

#### 1. Adjust the output signal when set to a fixed process level.

| FM Function       | Fixed Output 3 Level      |                          |
|-------------------|---------------------------|--------------------------|
|                   |                           |                          |
| FM Function       | Fixed Output 1 Level      | Fixed Output 2 Level     |
| 1: Output Current | 100% of ASD Rated Current | 50% of ASD Rated Current |

Fixed Output 3 is 100% of the Internal Calculated Value by default. The x-axis of the graph below is the same process value that is selected for the FM function. The fixed output allows for calibration when load conditions are not controllable.

Example : By default, the Output Voltage function is scaled to provide 20mADC or 10VDC at 150% of the VFD rated voltage.



Step 1: Select Fixed Output 1, 2, or 3 Level for calibration.

Step 2: Program  $F\bar{n}SL$  to the selected output level.

Step 3: Adjust parameter FM up or down to the desired signal at the selected output level.

Step 4: Return parameter FMSL back to the desired process value.

## STEP D Verification

Once the signal is calibrated with a multimeter, install the connections for the PLC, Panel Meter, or Door Meter. Refer to the Connection Diagram in Step A.

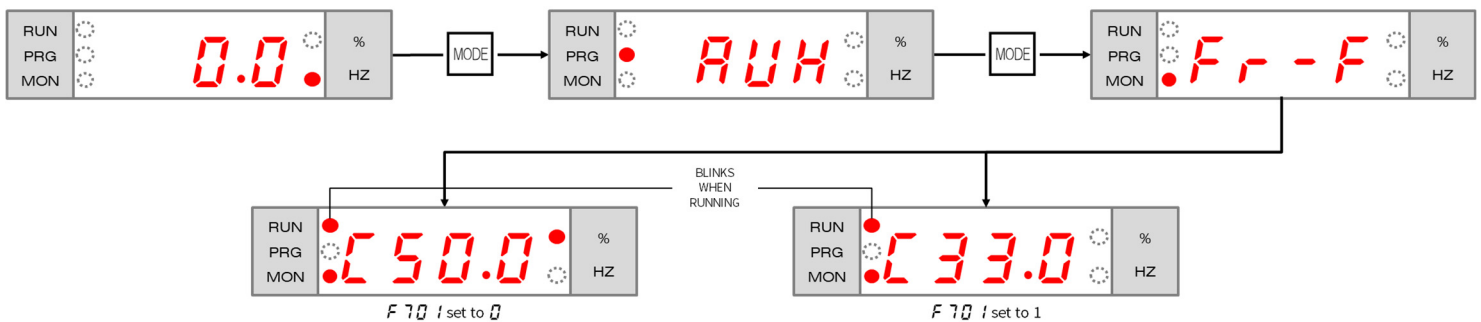
If necessary, use parameters *F692* and *F71* to fine-tune the displayed value on the PLC, Panel Meter, or Door Meter. Refer back to Steps B and C.

These parameters do not reset to default by performing a factory reset. Parameters will need to be returned to default values manually.

During calibration, the output frequency will be displayed on the adjustment screen. This value does not change, but the measurement on the multimeter will change.



When calibrating the analog outputs for the Output Current or Output Voltage function, it is helpful to change the units displayed in Monitor Mode. Change *F701* to 1:A(ampere),V(volt).



### Check Your Work

- ✓ Verify the output signal with a multimeter while the drive is running.
- ✓ Verify the PLC, Panel Meter, or Door Meter displays the correct value.