

## CM2125 CALIBRATION PROCEDURE

|        |                       |       |              |
|--------|-----------------------|-------|--------------|
| 73P217 | VGA/SVGA MONITOR      |       |              |
| 73P22  | FLUKE 5101 CALIBRATOR |       |              |
| 73P268 | FLUKE                 | 1722A | INST         |
| 73P410 | FLUKE                 | 8842A | DVM MULTIMET |
| 73S216 | O-SCOPE               |       | 60MHZ        |

1.0 Units must be warmed up for 20 minutes prior to calibration. (Check that the 300v LED flashes.) RECALL 1 ENTER MUST READ 18.4 KHZ - H IN UPPER LEFT DISPLAY. TURN UUT OFF THEN ON - MUST READ 18.4 KHZ - H AND COME ON IMMEDIATELY.

1.1 CHECK TO SEE THAT THE FAN IS WORKING.

1.2 Recall 9, enter.  
Hook up monitor.

1. Check that all video patterns are present and not distorted.  
Go to RASTER.

### IEEE Buss Check

- 1.3
1. Plug in the RS232 cable.  
Follow the prompt on the screen.

### Battery Check

- 1.4
1. Turn UTT off.
  2. Set the 5100 to +3VDC  
Set the DVM to DC Amps.
  3. Hook the negative lead of the 5100 to UUT ground.
  4. Hook the positive lead of the 5100 to ground on the DVM.
  5. Hook the positive lead of the DVM to the battery holder - positive clip.
  6. Place an insulator between the battery and its positive clip.
  7. Press OPR/standby on the 5100.  
The DVM should read less than 6nA.
  8. Remove the leads and insulator. Depress 1 key and turn UUT on.

### DVM Calibration

- 2.0
1. Set the DIGITAL DISPLAY switch to EXT DCV.
  2. Inject -5 VDC into the EXT. DCV & VPP INPUT jacks.
- 2.1
3. Adjust R42 for a reading of -5.00 +/- .01 VDC.

# EMG CALIBRATION PROCEDURE

| TEST    | TIME | FLUR | FLUR | FLUR |
|---------|------|------|------|------|
| DYNAMIC | 15.0 | FLUR | FLUR | FLUR |
| 00M     | 15.0 | FLUR | FLUR | FLUR |

1. The patient is lying on their back with the feet supported. The patient is asked to perform a series of voluntary contractions of the muscles to be tested. The patient is instructed to perform the contractions at a rate of 10-15 times per second. The patient is instructed to perform the contractions at a level of 10-15% of their maximum voluntary contraction (MVC). The patient is instructed to perform the contractions at a level of 10-15% of their MVC for a period of 10-15 seconds. The patient is instructed to perform the contractions at a level of 10-15% of their MVC for a period of 10-15 seconds. The patient is instructed to perform the contractions at a level of 10-15% of their MVC for a period of 10-15 seconds.

CHECK TO BE SURE THE EMG IS WORKING

FLUR - error  
FLUR - error

2. Check the EMG signal for any artifacts. The patient is instructed to perform the contractions at a level of 10-15% of their MVC for a period of 10-15 seconds. The patient is instructed to perform the contractions at a level of 10-15% of their MVC for a period of 10-15 seconds. The patient is instructed to perform the contractions at a level of 10-15% of their MVC for a period of 10-15 seconds.

3. EMG Baseline Check

4. Plug in the 252 cable  
Follow the prompt on the screen

5. Battery Check

1. Turn off the EMG.
2. Check the EMG signal for any artifacts.
3. Check the EMG signal for any artifacts.
4. Check the EMG signal for any artifacts.
5. Check the EMG signal for any artifacts.
6. Check the EMG signal for any artifacts.
7. Check the EMG signal for any artifacts.
8. Check the EMG signal for any artifacts.

EMG Calibration

1. Set the EMG signal to 10-15% of MVC.
2. Set the EMG signal to 10-15% of MVC.
3. Set the EMG signal to 10-15% of MVC.

4. Inject +5 VDC into the EXT. DCV & VPP INPUT jacks.
  - 2.2 5. Adjust R39 for a reading of +5.00 +/- .01 VDC.
  6. Repeat steps 2 - 5 until both readings are within the .01 volt tolerance.
  7. Set the DIGITAL DISPLAY switch to EXT VPP.
  8. Inject 10 VPP @ 1KHz sine wave into the EXT. DCV & VPP INPUT jacks.  
(Push 3.536V, enter, 1 k hz, enter)
  - 2.3 9. Adjust C63 for a reading of 10.0 +/- .1 VPP. AT 1 KHZ
  10. Inject 100 VPP @ 1KHz sine wave into the EXT. DCV & VPP INPUT jacks.  
(Push 35.36V, enter.)
  11. Adjust C66 for a reading of 100 +/- 1 VPP
  12. Inject 300 VPP @ 10 KHz sine wave into the EXT. DCV & VPP INPUT jacks.  
(Push 106.1V, enter.)
- Set the 5100 to .7425V 1KHZ.  
The 2125 display should read 2.1VPP +/- .2V.  
Set the 5100 to 6.7185V 1 KHZ.  
The 2125 display should read 19VP-P +/- .4V.  
Set the 2125 to DCV.  
Set the 5100 to 210VDC.  
The 2125 display should read 210V +/- 3V.  
Set the 5100 to 1KVDC.  
The 2125 display should read 1000V +/- 7V.

### Video Levels Calibration

Go back to DRIVE SIGNAL.

1. Connect a 75 ohm load to pins 1,2 & 3 of the SYNC AND VIDEO OUTPUT jack.
2. Recall storage location #7. (Recall 7, enter)

TURN UNIT OVER

3. Set the VIDEO PATTERN switch to RASTER.
- 4.0 4. Connect the SC61 to TP14 (pin 7 of IC68) on VIDEO BOARD. Gd to TP21.
5. Adjust R45 for reading of .714 +/- .025 (.689 to .739)  
(7 DIV) (high) V/D to .1 adj. for 7 DIV. on the CRT.
6. Connect the SC61 to TP13.
- 4.1 7. Adjust R46 for reading of .714 +/- .025 VPP.
8. Connect the SC61 to TP12.
- 4.2 9. Adjust R47 for reading of .714 +/- .025 VPP.
10. Set the VIDEO PATTERN switch to STAIRCASE.
11. Connect the SC61 TP14.
- 4.3 12. Adjust R72 for reading of .714 +/- .025 VPP.
13. Connect the SC61 Tp13.
- 4.4 14. Adjust R74 for reading of .714 +/- .025 VPP.
15. Set the VIDEO PATTERN switch to RASTER.



- 4.5 16. Enable sync on all three guns by pressing the R, G & B SYNC ADDER buttons. (LED'S on)
- 17. Connect the SC61 to TP13.
- 4.6 18. Adjust R77 for reading of  $-.286 \text{ V. } +/- .025$ .
- 19. Connect the SC61 to TP14.
- 4.7 20. Adjust R79 for reading of  $-.286 \text{ V. } +/- .025$ .
- 21. Connect the SC61 to TP12.
- 4.8 22. Adjust R76 for reading of  $-.286 \text{ V. } +/- .025$ .
- 23. Set the VIDEO PATTERN switch to STAIRCASE.
- 24. Connect the SC61 to TP13.
- 4.9 25. Adjust R78 for reading of  $-.286 \text{ V. } +/- .025$ .

### Drive Signal Levels Calibration

- 1. Set the DRIVE SIGNAL switch to H DRIVE.
- 2. Connect SC61 to TP1. Set timebase to 5uS
- 4.10 3. Adjust R25 for a reading of  $1.00 +/- .05 \text{ VPP}$ . (5 DIV high at 0.2 V/D AC)
- 4. 4. Set the DRIVE SIGNAL switch to V DRIVE. Set the timebase to 2mS.
- 4.11 5. Adjust R19 so the bottom portion (square wave) of the signal is  $.500 +/- .025 \text{ VPP}$ . (5 1/2 DIV high when set at .1 V/D.)
- 4.12 6. Adjust R26 so the top portion (ramp) of the signal is  $.500 +/- .025 \text{ VPP}$ .

### Drive Board Calibration

- 1. Turn R55 fully CCW.
- 2. Turn the DRIVE LEVEL control to the center detent.
- SC61 grd to TP1.
- 3. Connect the SC61 to TP7 and measure the DC voltage.
- 4. Connect the SC61 to TP8.
- 5.0 5. Adjust R56 for the voltage measured in step 3.
- 6. Set the DRIVE SIGNAL switch to H DRIVE.
- 7. Set the DRIVE RANGE switch to 3VPP.
- 8. Put 100 ohm load on Drive Output and connect SC61 to load.
- 9. Turn the DRIVE LEVEL control fully CCW.
- 5.1 10. Adjust R3 for a reading of 3.0 VPP on the Scope CRT. Check all other Drive signals to see if they are present. Set the DRIVE SIGNAL back to H drive.
- 11. Set the DRIVE RANGE to 30. Turn the DRIVE LEVEL to + on the horizontal drive. Measure the Drive Signal on the Scope CRT. Adjust C64 on the DVM board so the CM2125 meter reads 1 count higher than the reading on the Scope CRT.
- 12. Put on 10K load on DRIVE OUTPUT and connect the SC61 to the load.
- 13. Set the DRIVE RANGE to 300 VPP.  
Set the Drive Signal to Video, Video Pattern to Raster, Drive Level to + side.
- 5.2 14. Adjust R55 for a reading of 330-340 Vpp on the Scope CRT.

1. Measure the on-off time of the motor with a 1000 Hz sine wave.

2. Measure the on-off time of the motor with a 1000 Hz sine wave.

3. Measure the on-off time of the motor with a 1000 Hz sine wave.

4. Measure the on-off time of the motor with a 1000 Hz sine wave.

5. Measure the on-off time of the motor with a 1000 Hz sine wave.

6. Measure the on-off time of the motor with a 1000 Hz sine wave.

7. Measure the on-off time of the motor with a 1000 Hz sine wave.

8. Measure the on-off time of the motor with a 1000 Hz sine wave.

9. Measure the on-off time of the motor with a 1000 Hz sine wave.

10. Measure the on-off time of the motor with a 1000 Hz sine wave.

11. Measure the on-off time of the motor with a 1000 Hz sine wave.

Five Signal Level Adjustment

1. Set the DRIVE to STOP position.

2. Connect the oscilloscope to the DRIVE output.

3. Adjust the DRIVE output level to 1.00 V (100 mV) on the oscilloscope.

4. Set the DRIVE SIGNAL switch to V DRIVE.

5. Adjust the DRIVE output level to 1.00 V (100 mV) on the oscilloscope.

6. Set the DRIVE SIGNAL switch to V DRIVE.

7. Adjust the DRIVE output level to 1.00 V (100 mV) on the oscilloscope.

Five Speed Adjustment

1. Turn the DRIVE to STOP position.

2. Turn the DRIVE to RUN position.

3. Measure the on-off time of the motor with a 1000 Hz sine wave.

4. Measure the on-off time of the motor with a 1000 Hz sine wave.

5. Measure the on-off time of the motor with a 1000 Hz sine wave.

6. Measure the on-off time of the motor with a 1000 Hz sine wave.

7. Measure the on-off time of the motor with a 1000 Hz sine wave.

8. Measure the on-off time of the motor with a 1000 Hz sine wave.

9. Measure the on-off time of the motor with a 1000 Hz sine wave.

10. Measure the on-off time of the motor with a 1000 Hz sine wave.

11. Measure the on-off time of the motor with a 1000 Hz sine wave.

12. Measure the on-off time of the motor with a 1000 Hz sine wave.

13. Measure the on-off time of the motor with a 1000 Hz sine wave.

14. Measure the on-off time of the motor with a 1000 Hz sine wave.

15. Measure the on-off time of the motor with a 1000 Hz sine wave.

16. Measure the on-off time of the motor with a 1000 Hz sine wave.

17. Measure the on-off time of the motor with a 1000 Hz sine wave.

18. Measure the on-off time of the motor with a 1000 Hz sine wave.

19. Measure the on-off time of the motor with a 1000 Hz sine wave.

20. Measure the on-off time of the motor with a 1000 Hz sine wave.

21. Measure the on-off time of the motor with a 1000 Hz sine wave.

22. Measure the on-off time of the motor with a 1000 Hz sine wave.

- 5.3 14A. Set the Drive Signal to H. Drive. Press H. Freq.. 250, enter. The Drive signal should read greater than 250 Vpp on the Scope CRT +/- side.  
Recal R55 if necessary.  
TURN DRIVE LEVEL TO CENTER POSITION.  
Digital display should read between 0 VPP to 10 VPP.
  
- 5.5 15. Tip the unit up so you can see the back of the FRONT PANEL BOARD. To the left of the VIDEO PATTERN SWITCH is a 3-pin connector, hook the scope to the left pin and adjust for 160VPP +/- 1VPP.

2. The following information is provided for your reference:

TRUCKS AND TRAILERS  
MOTOR VEHICLES

3. The following information is provided for your reference: