

## XM POWER SUPPLY CURRENT CALIBRATION WITHOUT LOAD BANK

### 1. INTRODUCTION

This procedure is used to calibrate the XM System Power Supply Module current functions to assure accurate and reliable control of the welding power supply. This procedure applies to all XM Power Supply Modules.


### 2. RESPONSIBILITIES

Performer	Responsibility
Technician	<p>After assuring prerequisites are met, performs a calibration and check of the XM Power Supply Current Control function using steps 4.1.1 through 4.1.28. Performs a calibration and check of the XM Power Supply Current Feedback functions using steps 4.2.1 through 4.2.16.</p> <p>If the Power Supply fails to calibrate properly, initiate troubleshooting with assistance of AMET Technical Support.</p>

### 3. PREREQUISIT

Record the XM Module serial number in Appendix A. The following tools and equipment are required to perform this calibration:

- 3.1 Clamp-on DC Ammeter, ranged for the weld power supply maximum amperage. The calibration of this meter must be verified and current.
- 3.2 A work piece upon which welding will be performed during the calibration procedure.

 <b>Note:</b>	<p>Without the use of a load bank, welding must be performed in order to conduct the calibration procedure. This requires a work piece of sufficient size and thickness to accept an arc at full output current of the welding power supply being used.</p>
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### 4. INSTRUCTIONS

#### 4.1 Current Control Calibration

- 4.1.1 Clamp the DC ammeter around the welding Work cable and set the meter to DC current. This meter reading will be used to calibrate the current control.
- 4.1.2 Verify that the welding Work lead runs through the current transducer in order for current feedback to be calibrated properly.
- 4.1.3 Prior to applying power to the welding power supply, verify all welding power supply connections are correct and tight. Turn the welding power supply ON.

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- 4.1.4 Turn the XM System ON. Press the SET UP Mode Button on the controller.
- 4.1.5 Use the SELECT MODULE Programming Knob to highlight the Power Supply Module being calibrated.
- 4.1.6 Press the CALIBRATE Programming Knob to enter the CALIBRATION Mode.
- 4.1.7 Use the ADJUST CURRENT Programming Knob to adjust the SET CURRENT value to 20 amps.
- 4.1.8 Verify that a substantial work piece is installed that will handle the maximum output current of the welding power supply. The next steps will initiate an arc and an insufficient work piece may fail causing interruption of the calibration procedure.
- 4.1.9 Place the torch a sufficient distance from the work piece in order to allow for a successful arc strike.
- 4.1.10 Press the TORCH GAS Function Button on the XM controller to initiate the shield gas flow.
- 4.1.11 Press the ENABLE ARC Soft Button at the top of the controller screen.
- 4.1.12 Press the **Start** Sequence Button and monitor the current reading on the clamp-on ammeter.
- 4.1.13 If the current reading is  $20 \pm 2.0$  amps proceed with step 4.1.16. If the current reading does not represent  $20 \pm 2.0$  amps continue with step 4.1.14.
- 4.1.14 Use the SELECT PARAMETER Programming Knob to highlight the COARSE OFFSET parameter under the CURRENT CNTL calibration section.
- 4.1.15 Use the ADJUST VALUE Programming Knob to adjust the value of the COARSE OFFSET to obtain a reading on the ammeter of  $20 \pm 2.0$  amps. If you cannot obtain a correct value on the ammeter by using the COARSE OFFSET, adjust the FINE OFFSET to obtain the correct reading.
- 4.1.16 Press the **Stop** Sequence Button to open the weld contactor on the welding power supply.
- 4.1.17 Use the ADJUST CURRENT Programming Knob to adjust the SET CURRENT value to approximately 5 amps below the maximum output current of the welding power supply.
- 4.1.18 Press the **Start** Sequence Button and monitor the current reading on the clamp-on ammeter.
- 4.1.19 If the current reading is  $\pm 2.0$  amps of the value set in step 4.1.17, proceed with step 4.1.22. If the reading does not represent the correct current set in step 4.1.17, continue with step 4.1.20.
- 4.1.20 Use the SELECT PARAMETER Programming Knob to highlight the COARSE GAIN parameter under the CURRENT CNTL calibration section.
- 4.1.21 Use the ADJUST VALUE Programming Knob to adjust the value of the COARSE GAIN to obtain a reading on the ammeter that is  $\pm 2.0$  amps of

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the value set in step 4.1.17. If you cannot obtain the correct value on the ammeter by using the COARSE GAIN, adjust the FINE GAIN to achieve the correct reading.

- 4.1.22 Press the **Stop** Sequence Button to open the weld contactor on the welding power supply.
- 4.1.23 Repeat steps 4.1.7 through 4.1.21 until no further adjustments are needed.
- 4.1.24 Use the ADJUST CURRENT Programming Knob to adjust the SET CURRENT value to 20 amps.
- 4.1.25 Press the **Start** Sequence Button and monitor the current reading on the ammeter.
- 4.1.26 Use the ADJUST CURRENT Programming Knob to adjust the SET CURRENT value in increments of 25 amps from 20 amps to 5 amps below the maximum value of the welding power supply. Each time a new current value is entered, you must press the **Start** Sequence Button for the new value to take effect. Record the ammeter readings at each step in Appendix A, Table A-1, *Current Control Calibration Linearity Check*.
- 4.1.27 Press the **Stop** Sequence Button to open the weld contactor on the welding power supply.
- 4.1.28 Verify the current readings on the ammeter are  $\pm 2.0$  amps of all current set point values.

### 4.2 Current Feedback Calibration

- 4.2.1 Use the ADJUST CURRENT Programming Knob to adjust the SET CURRENT value to 20 amps.
- 4.2.2 Press the **Start** Sequence Button and monitor the CURRENT readout on the controller display. If the CURRENT readout reads  $20 \pm 2.0$  amps then proceed with step 4.2.5. If the CURRENT readout does not read  $20 \pm 2.0$  amps then proceed with step 4.2.3.
- 4.2.3 Use the SELECT PARAMETER Programming Knob to highlight the COARSE OFFSET parameter under the CURRENT FDBK calibration section.
- 4.2.4 Use the ADJUST VALUE Programming Knob to adjust the value of the COARSE OFFSET to obtain a reading of  $20 \pm 2.0$  amps. If you cannot obtain a correct value by using the COARSE OFFSET adjust the FINE OFFSET to obtain the correct reading.
- 4.2.5 Press the **Stop** Sequence Button to open the weld contactor on the welding power supply.
- 4.2.6 Use the ADJUST CURRENT Programming Knob to adjust the SET CURRENT value to approximately 5 amps below the maximum current output of the welding power supply.
- 4.2.7 Press the **Start** Sequence Button and monitor the CURRENT readout on the controller display. If the CURRENT readout is  $\pm 2.0$  amps of the value set in step 4.2.6, proceed to step 4.2.10. If the CURRENT readout does



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- not read  $\pm 2.0$  amps of the value set in step 4.2.6 then proceed to step 4.2.8.
- 4.2.8 Use the SELECT PARAMETER Programming Knob to highlight the COARSE GAIN parameter under the CURRENT FDBK calibration section.
  - 4.2.9 Use the ADJUST VALUE Programming Knob to adjust the value of the COARSE GAIN to obtain a reading of  $\pm 2.0$  amps of the value set in step 4.2.6. If you cannot achieve a correct value by using the COARSE GAIN, adjust the FINE GAIN to obtain the correct reading.
  - 4.2.10 Press the **Stop** Sequence Button to open the weld contactor on the welding power supply.
  - 4.2.11 Repeat steps 4.2.1 through 4.2.10 until no further adjustments are needed.
  - 4.2.12 Use the ADJUST CURRENT Programming Knob to adjust the SET CURRENT value to 20 amps.
  - 4.2.13 Press the **Start** Sequence Button and monitor the CURRENT readout on the controller display.
  - 4.2.14 Use the ADJUST CURRENT Programming Knob to adjust the SET CURRENT value in increments of 25 amps from 20 amps to 5 amps below the maximum value of the welding power supply. Each time a new current value is entered, you must press the **Start** Sequence Button for the new value to take effect. Record the ammeter readings at each setting in Appendix A, Table A-2, *Current Feedback Calibration Linearity Check..*
  - 4.2.15 Press the **Stop** Sequence Button to open the weld contactor on the welding power supply.
  - 4.2.16 Verify that the CURRENT readings at each set point on the controller are  $\pm 2.0$  amps of all set point values.



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### **5. RECORDS**

The records for this calibration are in Appendix A, *XM Current Calibration Without a Load Bank Data*.

### **6. DEFINITIONS**

None

### **7. REFERENCES**

- 7.1 XM System Manual, SM-001
- 7.2 XM Maintenance Manual, MM-001 (DRAFT)

### **8. APPENDIXES**

Appendix A, *XM Current Calibration Without a Load Bank Data*



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### **APPENDIX A**

#### **XM Current Calibration Without a Load Bank Data**

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Technician:

\_\_\_\_\_  
Date:

\_\_\_\_\_  
XM Module Serial Number:

**Table A-1, Current Control Calibration Linearity Check**

Step 4.1.26, Set Current Value (Amps)	Shunt Voltage Measured (Millivolts)	Expected Value (Millivolts)
20.0		1.8 – 2.2
45.0		4.3 – 4.7
70.0		6.8 – 7.2
95.0		9.3 – 9.7
120.0		11.8 – 12.2
145.0		14.3 – 14.7
170.0		16.8 – 17.2
195.0		19.3 – 19.7
220.0		21.8 – 22.2
245.0		24.3 – 24.7
270.0		26.8 – 27.2
295.0		29.3 – 29.7
320.0		31.8 – 32.2
345.0		34.3 – 34.7
370.0		36.8 – 37.2
395.0		39.3 – 39.7
420.0		41.8 – 42.2
445.0		44.3 – 44.7
470.0		46.8 – 47.2
495.0		49.3 – 49.7



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**Table A-2, Current Feedback Calibration Linearity Check**

Step 4.2.14, Set Current Value (Amps)	Indicated CURRENT readout (Amps)	Expected Value (Amps)
20.0		18.0 – 22.0
45.0		43.0 – 47.0
70.0		68.0 – 72.0
95.0		93.0 – 97.0
120.0		118.0 – 122.0
145.0		143.0 – 147.0
170.0		168.0 – 172.0
195.0		193.0 – 197.0
220.0		218.0 – 222.0
245.0		243.0 – 247.0
270.0		268.0 – 272.0
295.0		293.0 – 297.0
320.0		318.0 – 322.0
345.0		343.0 – 347.0
370.0		368.0 – 372.0
395.0		393.0 – 397.0
420.0		418.0 – 422.0
445.0		443.0 – 447.0
470.0		468.0 – 472.0
495.0		493.0 – 497.0