## 1. INTRODUCTION

This procedure is used to calibrate the ADVENT System welding power supply current control and feedback to assure accurate and reliable current control of the welding power supply. This procedure applies to all ADVENT Systems.

## 2. RESPONSIBILITIES

| Performer | Responsibility |
|---|---|
| Technician | After assuring prerequisites are met, performs a calibration of the ADVENT power supply current control function using steps 4.2.1 through 4.2.18.<br><br>Performs a calibration and check of the ADVENT power supply current feedback function using steps 4.3.1 through 4.3.13.<br><br>If the ADVENT control system fails to calibrate properly, initiate troubleshooting with assistance of AMET Technical Support. |

## 3. PREREQUISITS

Record the ADVENT serial number, current shunt serial number and DC voltmeter serial number in Appendix B. The tools and equipment required to perform this calibration include:

3.1. DC Volt Meter (4-½-digit). The calibration of this meter must be verified and current.
3.2. Standard head screw driver, size 00
3.3. Shunt (1,000 amps @ 100 millivolts)

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|  | **CAUTION**: Arc welding is performed during this procedure. Take appropriate measures to prevent personal injury and/or death. |

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|  Note: | Arc welding is performed in order to conduct this calibration procedure. This requires a work piece of sufficient size and thickness to accept an arc at full output current of the welding power source being used. |

## 4. INSTRUCTIONS

### 4.1. Initial Setup

4.1.1. Connect the current shunt in series with one of the legs of the power supply. Connect a digital voltmeter across the shunt to read the millivolt drop that will be present when current flows through the shunt. The meter that is attached to the shunt is the meter that should be used as a reference to determine the actual output of the power supply. Refer to Appendix A, *DC Current Shunt to Millivolt Conversion Chart* to compute the required settings.

4.1.2. Verify that the welding Work lead runs through the current transducer in order for current feedback to be calibrated properly.

### 4.2. Current Control Calibration Procedure

4.2.1. Launch CALIBRATION from the ADVENT Control Panel.

4.2.2. Expand the "Analog Out Channels" on the left side of the screen by clicking on the arrow next to "Analog Out Channels."

4.2.3. Expand the "Digital Channels" on the left side of the screen by clicking on the arrow next to "Digital Channels."

4.2.4. Double Click on "Current Cntl" from the Analog Out Channels in the I/O Channels.

4.2.5. Double Click on Digital DO 1-1 from the Digital Channels in the I/O Channels.

4.2.6. Double click on Digital DO 1-2 from the Digital Channels in the I/O Channels. DO 1-2 is the standard location for the "HF Enable." If the "HF Enable" is not located in DO 1-2 you will have to locate "HF Enable" by referencing your system electrical schematics.

4.2.7. From the "Current Cntl" window, input into the edit field a value of 20 amps. Click on the arrow button to activate the value.

4.2.8. Using the Remote Pendant drive the torch toward the work piece until the tungsten has approximately 1/8 inch standoff.

4.2.9. Using the Remote Pendant, enable Torch Gas.

4.2.10. Click on the "Weld Contactor" button on the Digital Out 1-1 window. This will enable the weld power source output.

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|  Note: | **NOTE**: *If your system does not have and arc starter, instead of turning on the "HF Enable" in the next step, you will need to drive the tungsten until it touches the work piece and then retract approximately 1/8 inch with an arc.* |

4.2.11. Click on the "HF Enable" button on DO 1-2. Once the arc has transferred turn off the "HF Enable."

4.2.12. Check to make sure that the voltmeter, that is connected across the shunt, reads 2mV (20 amps).

4.2.13. If the voltmeter does not read 2mV (20 amps) then locate the analog output board that is used for Current Cntl, this can be found on the system electrical schematics, and adjust the OFFSET POT until the voltmeter across the shunt reads 2mV (20 amps).

4.2.14. From the "Current Cntl" window, input into the edit field a value of 1 amp less than the maximum output of the welding power source. Click on the arrow button to activate the value.

4.2.15. Check to make sure that the voltmeter connected across the shunt, reads the proper millivolt reading for the commanded current value in step 4.2.14.

4.2.16. If the voltmeter does not read the correct millivolt reading then locate the analog output board that is used for Current Cntl, this can be found on the system electrical schematics, and adjust the COURSE and FINE POTS until the voltmeter across the shunt reads the proper reading.

4.2.17. Repeat steps 4.2.7 through 4.2.16 until no adjustments are needed.

4.2.18. Perform a linearity check of the system. Use the "Current Cntl" window edit field to adjust the current in increments of 25 amps from 25 amps to 1 amp below the maximum value of the welding power source. Record the millivolt readings at each setting in Appendix B, Table B-1, *Current Control Linearity Check.*

**4.3. Current Feedback Calibration Procedure**

4.3.1. Expand the "Analog In Channels" on the left side of the screen by clicking on the arrow next to "Analog In Channels."

4.3.2. From the "Current Cntl" window, input into the edit field a value of 20 amps. Click on the arrow button to activate the value.

4.3.3. Using the Remote Pendant drive the torch toward the work piece until the tungsten has approximately 1/8 inch standoff.

4.3.4. Using the Remote Pendant, enable Torch Gas.

4.3.5. Click on the "Weld Contactor" button on the Digital Out 1-1 window. This will enable the welding power source.

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|---|---|
| Note: | **NOTE**: *If your system does not have and arc starter, instead of turning on the "HF Enable" in the next step, you will need to drive the tungsten until it touches the work piece and then retract approximately 1/8 inch with an arc.* |

4.3.6. Click on the "HF Enable" button on DO 1-2. Once the arc has transferred turn off the "HF Enable."

4.3.7. Check to make sure that the "Current Fdbk" window on the operator console reads 20 amps.

4.3.8. If the "Current Fdbk" window does not read 20 amps then locate the analog input board that is used for Current Fdbk, this can be found on the system electrical schematics, and adjust the OFFSET POT so that the current feedback window reads 20 amps.

4.3.9. From the "Current Cntl" window, input into the edit field a value of 1 amp less than the maximum output of the welding power source. Click on the arrow button to activate the value.

4.3.10. Check to make sure that the "Current Fdbk" window on the operator console reads the same value as the value entered in the "Current Cntl" window edit field.

4.3.11. If the "Current Fdbk" window does not read the same value as the value commanded in the "Current Cntl" window edit field then locate the analog input board that is used for Current Fdbk, this can be found on the system electrical schematics, and adjust the COURSE and FINE POTS until the "Current Fdbk" window reads the proper reading.

4.3.12. Repeat steps 4.3.2 through 4.3.11 until no adjustments are needed.

4.3.13. Perform a linearity check of the system. Use the "Current Cntl" window edit field to adjust the current in increments of 25 amps from 25 amps to 1 amp below the maximum value of the welding power source. Record the ammeter readings at each setting in Appendix B, Table B-2, *Current Feedback Linearity Check.*

## 5. RECORDS

The records for this calibration are in Appendix B, *ADVENT Current Control and Feedback Calibration Data*.

## 6. DEFINITIONS

None

## 7. REFERENCES

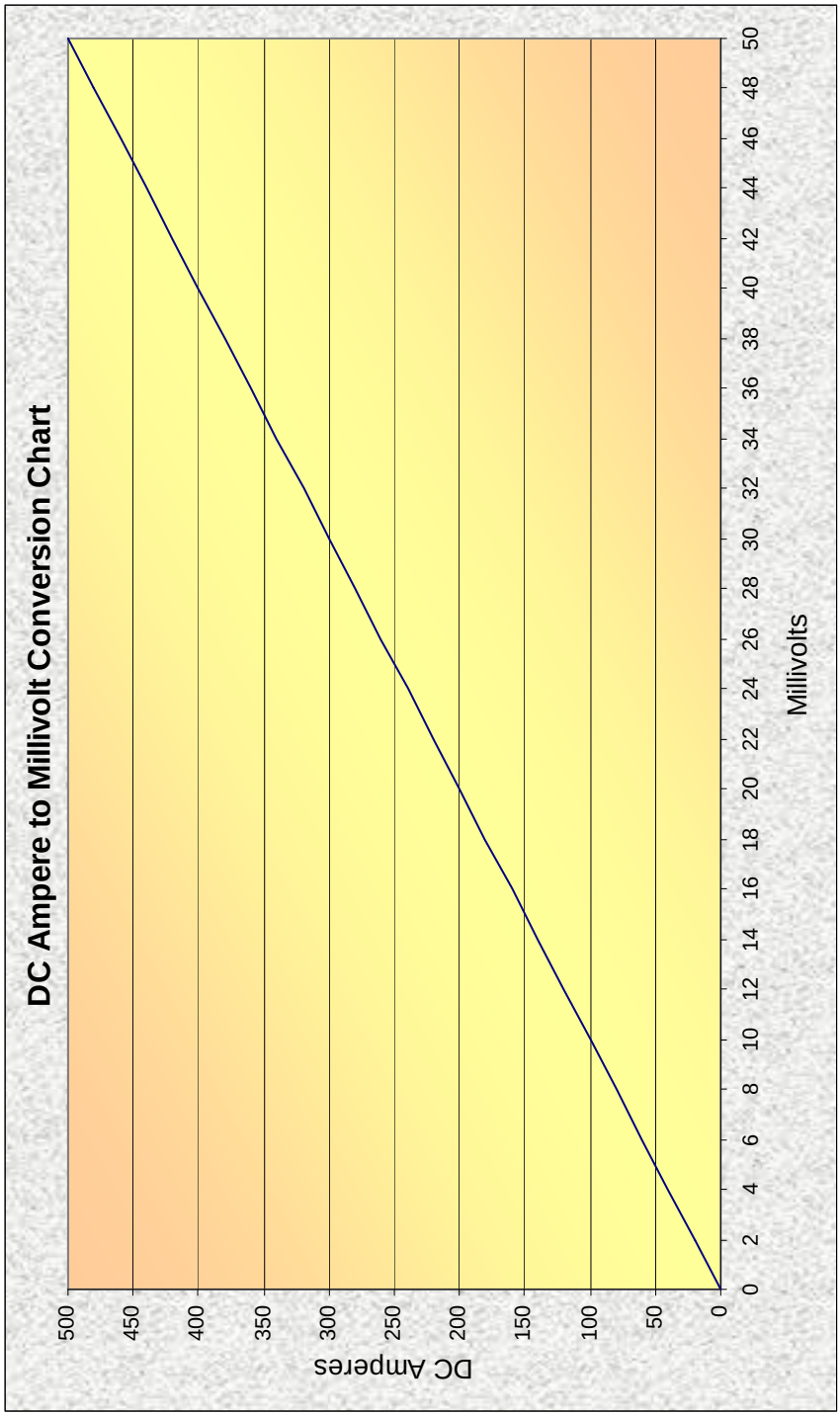
ADVENT System Manual, SM-[TBD – DRAFT]
ADVENT Maintenance Manual, MM-[TBD – DRAFT]

## 8. APPENDIXES

8.1. Appendix A, DC Current Shunt Ampere to Millivolt Conversion Chart
8.2. Appendix B, ADVENT Current Control and Feedback Calibration Data

# Appendix A

DC Ampere to Millivolt Conversion Chart
(1,000 Ampere, 100 mV DC Shunt)



# Appendix B

## ADVENT Current Control and Feedback Calibration Data

Technician _____ Date _____

ADVENT Unit Serial Number _____ Digital Voltmeter Serial Number _____

Current Shunt Serial Number _____

**Table B-1, Current Control Linearity Check**

| Current Cntl Window Setting (Amps) | Corresponding Shunt Millivolts | Voltmeter Millivolt Reading | Expected Value (Millivolts) |
|---|---|---|---|
| 25.0 | 2.5 | | 2.3 – 2.7 |
| 50.0 | 5.0 | | 4.8 – 5.2 |
| 75.0 | 7.5 | | 7.3 – 7.7 |
| 100.0 | 10.0 | | 9.8 – 10.2 |
| 125.0 | 12.5 | | 12.3 – 12.7 |
| 150.0 | 15.0 | | 14.8 – 15.2 |
| 175.0 | 17.5 | | 17.3 – 17.7 |
| 200.0 | 20.0 | | 19.8 – 20.2 |
| 225.0 | 22.5 | | 22.3 – 22.7 |
| 250.0 | 25.0 | | 24.8 – 25.2 |
| 275.0 | 27.5 | | 27.3 – 27.7 |
| 300.0 | 30.0 | | 29.8 – 30.2 |
| 325.0 | 32.5 | | 32.3 – 32.7 |
| 350.0 | 35.0 | | 34.8 – 35.2 |
| 375.0 | 37.5 | | 37.3 – 37.7 |
| 400.0 | 40.0 | | 39.8 – 40.2 |
| 425.0 | 42.5 | | 42.3 – 42.7 |
| 450.0 | 45.0 | | 44.8 – 45.2 |
| 475.0 | 47.5 | | 47.3 – 47.7 |
| 500.0 | 50.0 | | 49.8 – 50.2 |

**Table B-2, Current Feedback Linearity Check**

| Current Cntl Window Setting (Amps) | Current Fdbk Window Reading | Expected Value (Amps) |
|---|---|---|
| 25.0 | | 23 – 27 |
| 50.0 | | 48.0 – 52.0 |
| 75.0 | | 73.0 – 77.0 |
| 100.0 | | 98.0 – 102 |
| 125.0 | | 123.0 – 127.0 |
| 150.0 | | 148.0 – 152.0 |
| 175.0 | | 173.0 – 177.0 |
| 200.0 | | 198.0 – 202.0 |
| 225.0 | | 223.0 – 227.0 |
| 250.0 | | 248.0 – 252.0 |
| 275.0 | | 273.0 – 277.0 |
| 300.0 | | 298.0 – 302.0 |
| 325.0 | | 323.0 – 327.0 |
| 350.0 | | 348.0 – 352.0 |
| 375.0 | | 373.0 – 377.0 |
| 400.0 | | 398.0 – 402.0 |
| 425.0 | | 423.0 – 427.0 |
| 450.0 | | 448.0 – 452.0 |
| 475.0 | | 473.0 – 477.0 |
| 500.0 | | 498.0 – 502.0 |