

# ***HPR400XD / HPR800XD Firmware Upgrade***

**Field Service Bulletin**

***806510 – Revision 2 – March, 2012***

***Hypertherm®***

		<b>DANGER</b> <b>ELECTRIC SHOCK CAN KILL</b>
		<b>Disconnect electrical power before performing any maintenance. All work requiring removal of the power supply cover must be performed by a qualified technician. See the <i>Safety Section</i> of the system's Manual for more safety precautions.</b>

## Introduction

### Purpose

This field service bulletin enables a trained technician to upgrade the firmware in an HPR400XD or an HPR800XD power supply and in the selection and metering consoles (auto gas) or the manual gas console. The same firmware is used to update the HPR400XD power supply and the HPR800XD Primary power supply. The HPR800XD secondary power supply uses unique firmware.

### 228527 (HPR400XD auto gas) – Kit Contents

Part Number	Description	Qty
027338	Tool: Firmware chip extractor	1
081110 (labeled 081096)	Firmware: Auto gas	2 sets (4 chips)
081136 (labeled 081135)	Firmware: Power supply	1 set (2 chips)

### 228528 (HPR400XD manual gas) – Kit Contents

Part Number	Description	Qty
027338	Tool: Firmware chip extractor	1
081109 (labeled 081093)	Firmware: Manual gas	1 sets (2 chips)
081136 (labeled 081135)	Firmware: Power supply	1 set (2 chips)

### 228632 (HPR800XD auto gas) – Kit Contents

Part Number	Description	Qty
228527	Kit: HPR400XD auto gas firmware upgrade	1
081179 (labeled 081178)	Firmware: HPR800XD secondary power supply	1 set (2 chips)

### 228631 (HPR800XD manual gas) – Kit Contents

Part Number	Description	Qty
228528	Kit: HPR400XD manual gas firmware upgrade	1
081179 (labeled 081178)	Firmware: HPR800XD secondary power supply	1 set (2 chips)

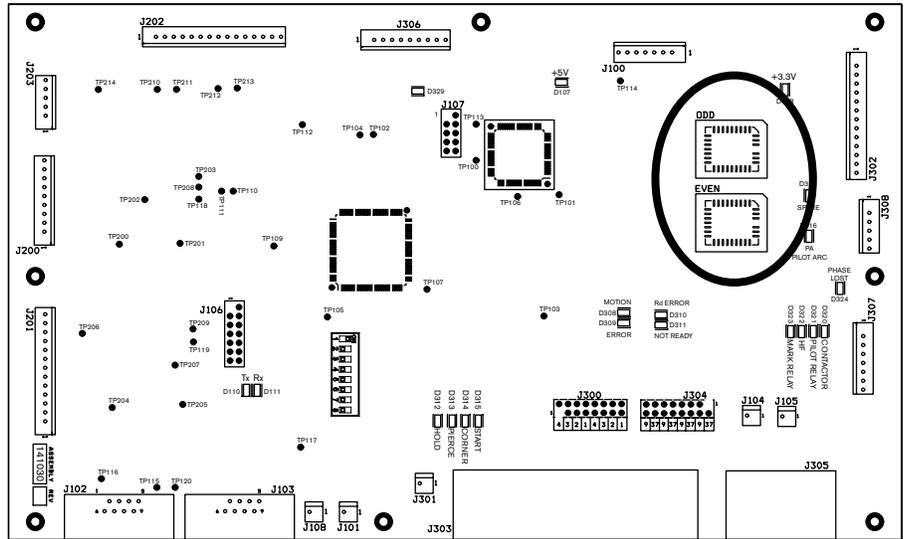
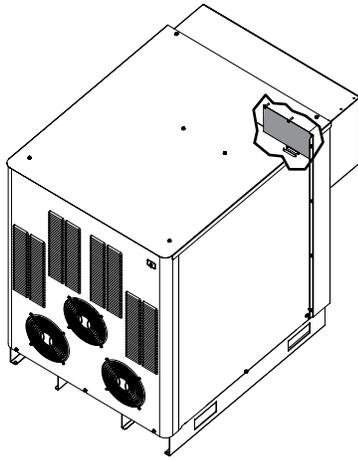
**Revision history for 081135 firmware**

<b>Revision</b>	<b>Description of Changes</b>
D	<ol style="list-style-type: none"><li>1. Corrected 400 amp non-O2 waveforms.</li><li>2. Increased OCV clamp to about 80% for 200 amp and below processes to improve starting reliability</li></ol>
E	<ol style="list-style-type: none"><li>1. Corrected current current calculation when set to single chopper operation,</li><li>2. Corrected power up sequence when previous process was H35 mixed gas. We were not sending the mixing setpoints after power up.</li><li>3. When switching from H35 to O2 system would do a fast purge instead of an N2 purge, this was corrected.</li><li>4. The fast purge was extended to 3.85 seconds, adding an additional 0.5 seconds of preflow. This allowed the plasma pressure of the low current (130amps and less) to stabilize prior to torch firing.</li></ol>
F	Added code to support XD upgrade. This includes the O2/O2 hole cutting process. Eliminated contactor cycling and pressure dips on the plasma and shield lines due to burkert valve switching.
G	Official revision to merge with HPR400XD REV F -> G
H	Reset incomplete purge cycles – fix to protect auto gas console from jittery start signals
J	Correct rampup curves – 0-400 match rev D; 600, 800 match rev H
K	Fix corner current calculation above 400A
L	Add protection for setting current above immediately configured capacity (800A on a 400XD configuration)
M	Fix Pump Motor Drive compatibility, Expand 200A rampdown current range, Display 7 digits for timers including Arc On Timer, fix current setting via serial link routine causing spurious false error code 11
N	<p>Increased the surge charge time to allow the surge circuit to get closer to its max value before going full on. This was done because of over-current errors detected at Crisp Manufacturing. This end user had a system with a high Delta secondary on the main transformer that was causing additional current flow while charging the surge circuit.</p> <p>Fixed a bug where the system was not storing new process data when switching between O2/O2 processes and O2/Air and vice versa. For this particular switch we skip the purge state and also the trigger to store the process change. Now we make sure to store the new process info.</p>

**Changes in 081093, revision D**

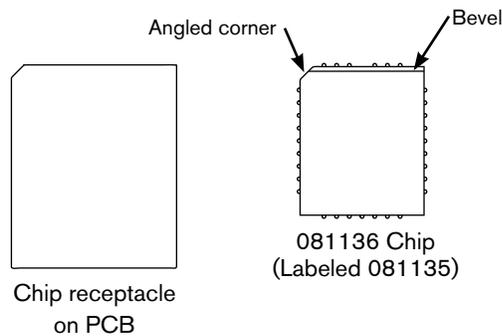
The firmware supports error code reporting when used in an HPR800XD cutting system

HPR400XD Power supply and HPR800XD primary power supply



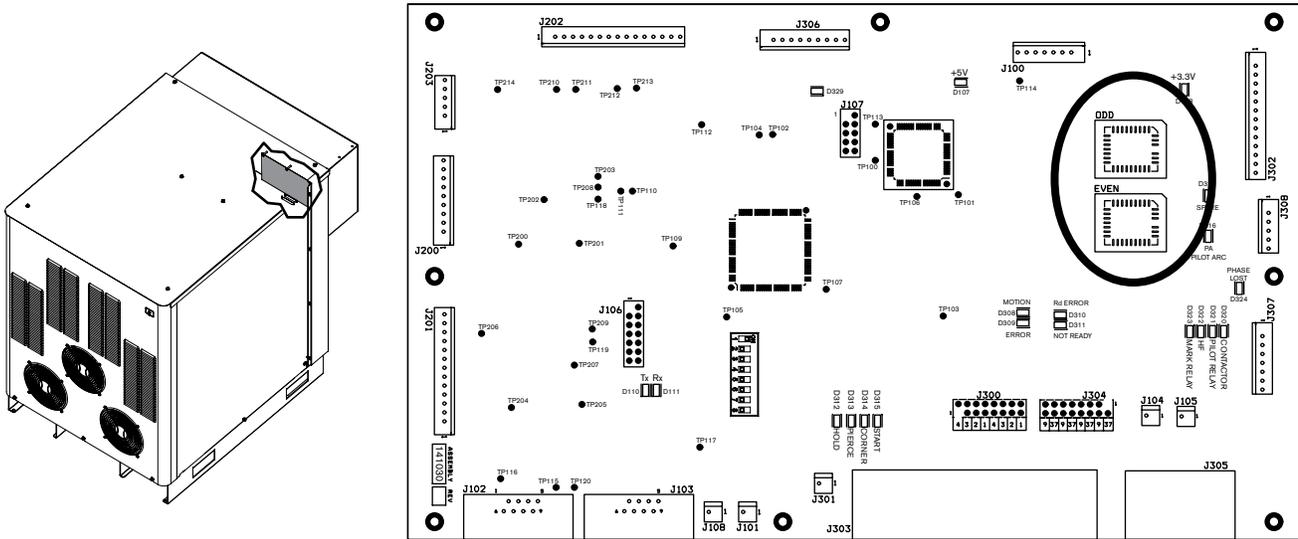
1. Turn OFF all power to the system.
2. Remove the right side cover from the power supply to access the control PCB (see figure above).
3. Remove the even (U110) and odd (U109) chips from the board using the extraction tool (027338) provided in this kit.
4. Install new chips 081136 (labeled 081135) onto the control board.

NOTE: Make sure the chips are oriented correctly before installation. There is a bevel on the top edge of each chip and the upper left corner is angled (see figure below).



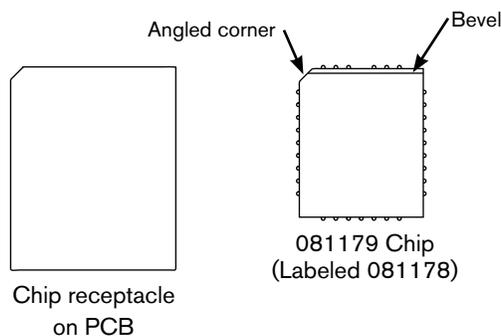
5. Replace the right side cover and turn ON the power. The system will be idle while the software code is being updated. The update process may take up to 1 minute to complete. The system may show a “watchdog interlock” error after the update. Turn the power OFF and then ON to clear the error.

## HPR800XD secondary power supply



1. Turn OFF all power to the system.
2. Remove the right side cover from the power supply to access the control PCB (see figure above).
3. Remove the even (U110) and odd (U109) chips from the board using the extraction tool (027338) provided in this kit.
4. Install new chips 081179 (labeled 081178) onto the control board.

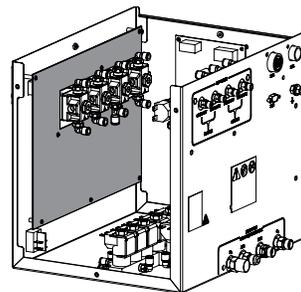
NOTE: Make sure the chips are oriented correctly before installation. There is a bevel on the top edge of each chip and the upper left corner is angled (see figure below).



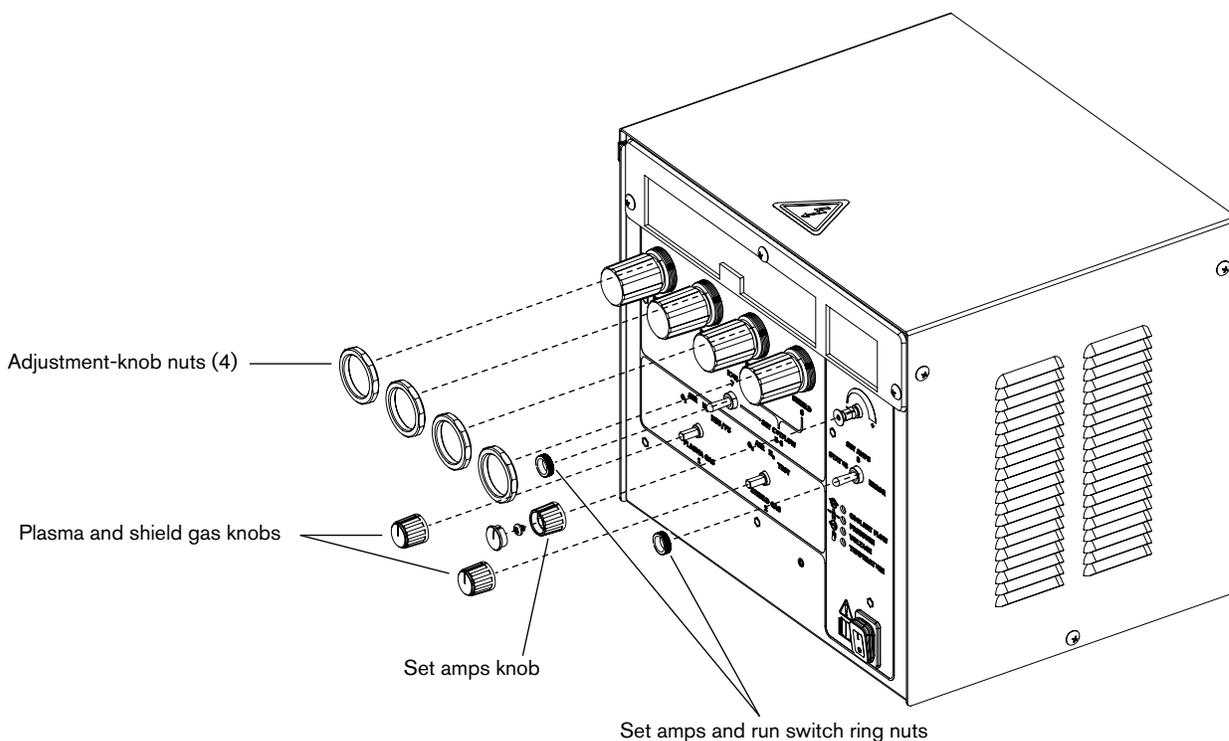
5. Replace the right side cover and turn ON the power. The system will be idle while the software code is being updated. The update process may take up to 1 minute to complete. The system may show a “watchdog interlock” error after the update. Turn the power OFF and then ON to clear the error.

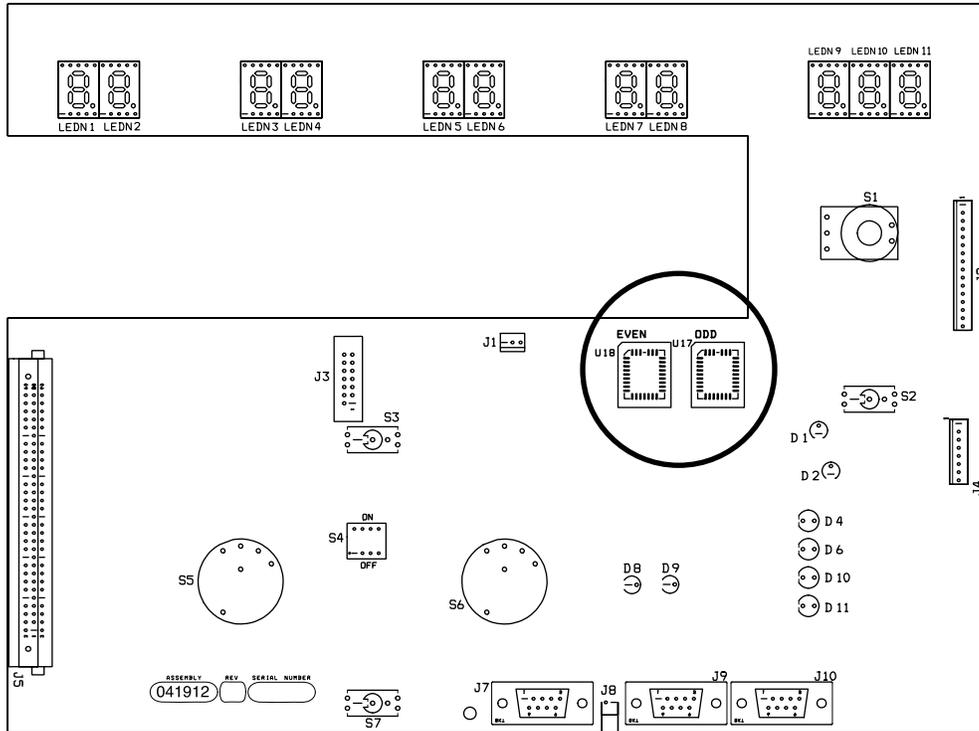
## Manual gas console

1. Turn OFF all power to the system.
2. Remove the top/side cover from the gas console to access the control PCB.



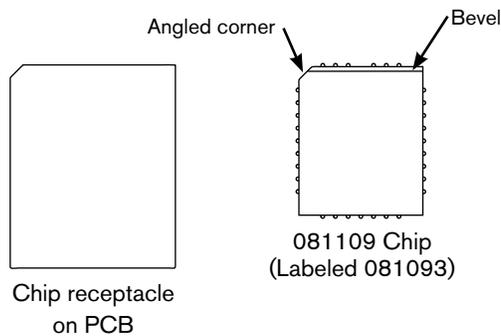
3. The PC board needs to be removed from the console to access the firmware chips.
  - 3.1 Remove the ring nuts from the SET AMPS (8) and RUN (7) toggle switches.
  - 3.2 Loosen the hex head screws (older models) on the PLASMA GAS (1), SHIELD GAS (2) and SET AMPS knobs.  
Remove the knobs. The hex head screw is 1/16".
    - 3.2.1 On newer gas consoles the PLASMA GAS (1) and SHIELD GAS (2) knobs can be pulled off. You must remove the cap from the SET AMPS knob and remove the screw before you can remove the knob.
  - 3.3 Remove the 4 plastic nuts from the adjustment knobs
  - 3.4 Remove all connectors from the back of the PC board.
  - 3.5 Remove 8 screws from the back of the PC board.
  - 3.6 Carefully remove the PC board. It will require some patience and careful manipulation to remove the board without damage.





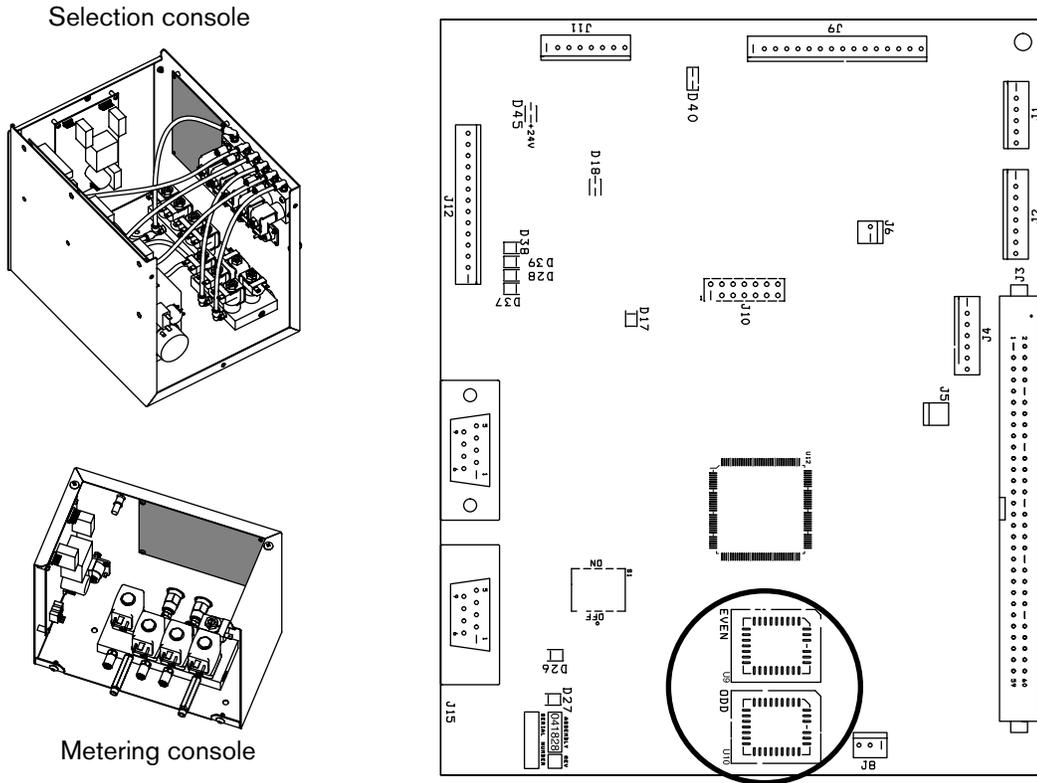
3. Remove the even (U18) and odd (U17) chips from the board using the extraction tool (027338) provided in this kit.
4. Install the new chips 081109 (labeled 081093) onto the control board.

NOTE: Make sure the chips are oriented correctly before installation. There is a bevel on the top edge of each chip and the upper left corner is angled (see figure below).



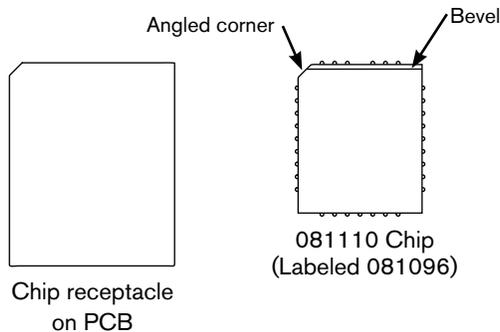
5. Replace the right side cover and turn ON the power. The system will be idle while the software code is being updated. The update process may take up to 1 minute to complete. The system may show a “watchdog interlock” error after the update. Turn the power OFF and then ON to clear the error.

**PART 2b – HPR automatic gas console**



1. Turn OFF all power to the system.
2. Remove the covers from the selection console and the metering console to access the control PCB (see figure above).
3. Remove the even (U9) and odd (U10) chips from the boards using the extraction tool (027338) provided in this kit.
4. Install the new chips 081110 (labeled 081096) onto the control board.

NOTE: Make sure the chips are oriented correctly before installation. There is a bevel on the top edge of each chip and the upper left corner is angled (see figure below).



5. Replace the covers and turn ON the power. The system will be idle while the software code is being updated. The update process may take up to 1 minute to complete. The system may show a “watchdog interlock” error after the update. Turn the power OFF and then ON to clear the error.



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