

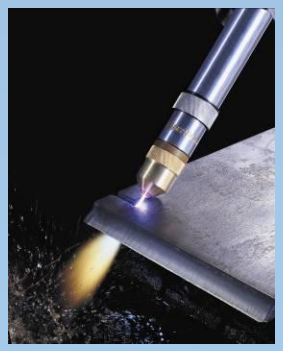

Hypertherm®
Technical Training Institute

Tech Service HTTI
HTA Program
“Cutting/Marking Routines”

Author: JDE

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Cutting/Marking Routines

Our controllers are used for a variety of functions – but lets look at the three major routines.

- Plasma Cutting
- Marking
- Oxyfuel

Cutting/Marking Routines

When we look at a “routine” we are going to be talking about:

- Sequence of operation
- I/O required
- How to configure the CNC system

Cutting/Marking Routines

Typical Oxyfuel Operation:

The Oxyfuel process operates three different gas flows or stages

One to ignite the flame
One to heat the surface plate
One to cut the plate.

These stages are called Low Preheat, High Preheat (or Preheat Control), and Cut Gas

Cutting/Marking Routines

Typical Oxyfuel Operation:

The three stages are defined as:

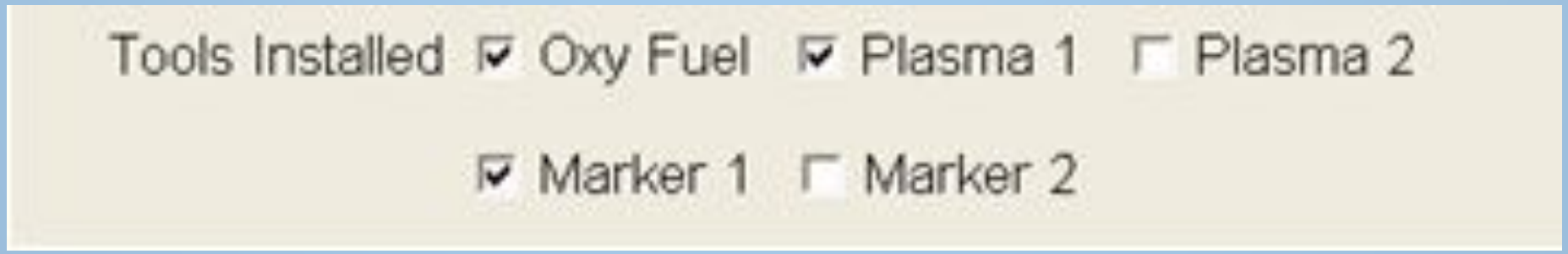
- Low Preheat: Low pressure fuel gas used to ignite the flame
- High Preheat: High pressure fuel gas with low pressure Oxygen used to heat the plate to the point where piercing/cutting can occur
- Cut Gas: High pressure Oxygen and fuel gas used to pierce/cut the plate.

Cutting/Marking Routines

Install Oxyfuel in the Special Password Screen.

- ✔ In order to have an Oxyfuel cut mode, Oxyfuel needs to be selected as a Tool Installed in the Special Password Screen (6931)

- ✔ This assignment also gives you the Oxyfuel Process screen



Cutting/Marking Routines

Notice* -

You do not need to install a OxyFuel torch into the Station Configuration Screen (4170)

Checking OxyFuel in Special Setups (6931) will give you the OxyFuel Process settings

Cutting/Marking Routines

Typical Inputs used in the Oxyfuel Routine:

Cut Select:

Manually activates the Cut Control output

Operators use this input to manually adjust the cut oxygen gas flow.

Input is typically driven by a momentary push button switch

Cutting/Marking Routines

Typical Inputs used in the Oxyfuel Routine:

Low Preheat Select:

Manually activates the Low Preheat output

Operators use this input to manually adjust the low preheat gas flow.

Input is typically driven by a momentary push button switch

Cutting/Marking Routines

Typical Inputs used in the Oxyfuel Routine:

High Preheat Select:

Manually activates the High Preheat output.

Operators use this input to manually adjust the high preheat gas flow.

Input is typically driven by a momentary push button switch

Cutting/Marking Routines

Typical Inputs used in the Oxyfuel Routine:

Manual Ignition Select:

Manually activates the ignition output.

Operators use this input to manually activate the igniters'.

Input is typically driven by a momentary push button switch

Cutting/Marking Routines

Typical Inputs used in the Oxyfuel Routine:

Lower Torch:

Activates the Torch Down output

The output is used to signal the Oxyfuel Cutting Station to lower the torch.

Input is typically driven by a manual toggle switch

Cutting/Marking Routines

Typical Inputs used in the Oxyfuel Routine:

Lower All Torches:

Activates all Torch Down outputs

Used in multiple torch applications.

The input is typically driven by a manual toggle switch

Cutting/Marking Routines

Typical Inputs used in the Oxyfuel Routine:

Raise Torch:

Activates the Torch Up output

The output is used to signal the Oxyfuel Cutting Station to raise the torch.

Input is typically driven by a manual toggle switch

Cutting/Marking Routines

Typical Inputs used in the Oxyfuel Routine:

Raise All Torches:

Activates the all Torch Up outputs

Used in multiple torch applications.

The input is typically driven by a manual toggle switch

Cutting/Marking Routines

Typical Inputs used in the Oxyfuel Routine:

Torch Down Sense:

De-activates the Torch Down output when active.

This input is used as a lower limit switch in an Oxyfuel Cutting Station.

Input is typically a limit switch or proximity switch

Cutting/Marking Routines

Typical Inputs used in the Oxyfuel Routine:

Torch Up Sense:

De-activates the Torch Up output when active.

This input is used as a upper limit switch in an Oxyfuel Cutting Station.

Input is typically a limit switch or proximity switch

Cutting/Marking Routines

Typical Outputs used in the Oxyfuel Routine:

Ignition:

Used to activate the ignitors.

Output is timer driven; timer setting is located in the Oxyfuel Process screen

Cutting/Marking Routines

Typical Outputs used in the Oxyfuel Routine:

Low Preheat Control:

Used to activate the low preheat gas valves.

The output is timer driven; timer setting is located in the Oxyfuel Process screen

Cutting/Marking Routines

Typical Outputs used in the Oxyfuel Routine:

High Preheat Control:

Used to activate the high preheat gas valves

Output is timer driven; timer setting is located in the Oxyfuel Process screen

Cutting/Marking Routines

Typical Outputs used in the Oxyfuel Routine:

Pierce Control:

Output activates during Pierce and remains active until the Pierce timer is complete.

Pierce Timer is located in the Oxyfuel Process screen

Cutting/Marking Routines

Typical Outputs used in the Oxyfuel Routine:

Cut Control:

Used to activate the cut oxygen gas valves.

The output activates after the preheat outputs and remains active until the M08 (cut off) command is executed in the part program

Cutting/Marking Routines

Typical Outputs used in the Oxyfuel Routine:

Torch Down:

Used to signal the Oxyfuel cutting station to lower the torch.

Output is timer driven; timer setting is located in the Oxyfuel Process screen.

Output will shut off if the Torch Down timer expires or the Torch Down Sense input activates

Cutting/Marking Routines

Typical Outputs used in the Oxyfuel Routine:

Torch Up:

Used to signal the Oxyfuel cutting station to raise the torch.

Output is timer driven; timer setting is located in the Oxyfuel Process screen.

Output will shut off if Torch Up timer expires or the Torch Up Sense input activates

Cutting/Marking Routines

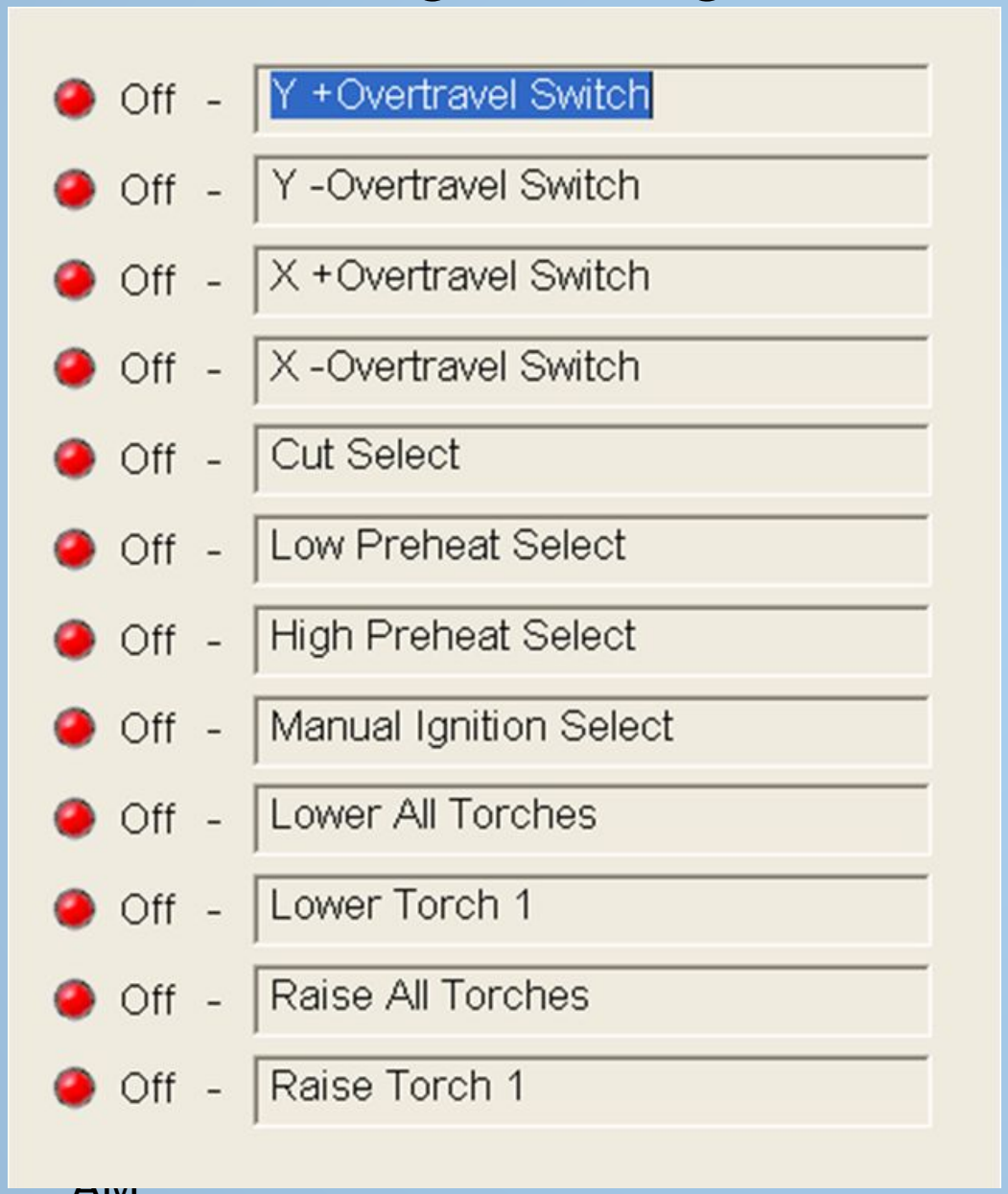
Typical Outputs used in the Oxyfuel Routine:

Lets look at the OxyFuel process screen and timing chart

Assign Inputs and Outputs for Oxyfuel in the I/O setup screen

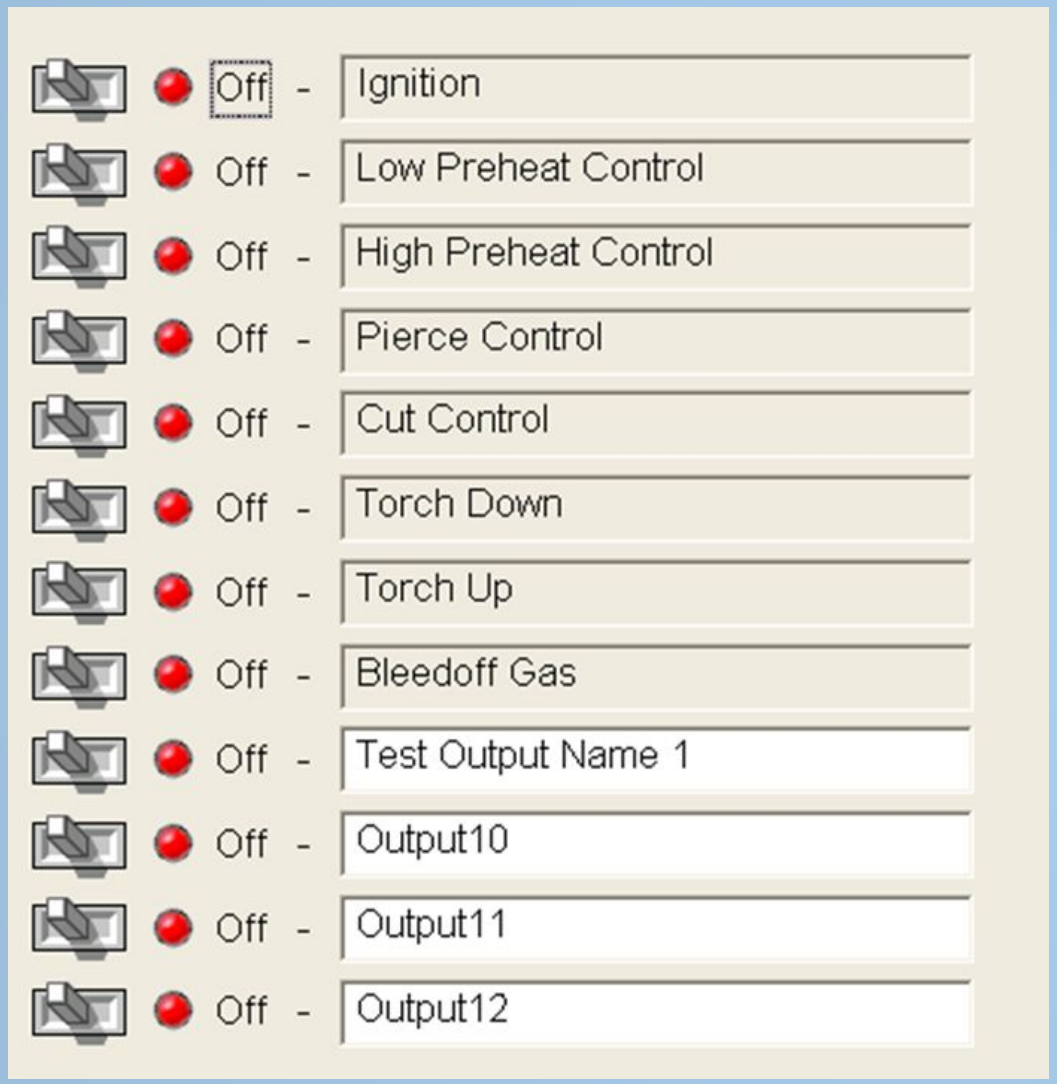
The I/O assignments for the Oxyfuel system on the cutting table will depend on the number of Oxyfuel torches and whether the CNC will be operating all the torches independently

Cutting/Marking Routines



Typical Input layout for OxyFuel Table with Igniters.

Cutting/Marking Routines



Typical Output layout for OxyFuel Table with Igniters.

Notice – How much I/O did we use up?

Cutting/Marking Routines

Setting Up “Watch” window

The Watch window is a great tool for watching timing and I/O function.

Lets setup Load Phoenix and Setup a Watch Windows for Oxyfuel