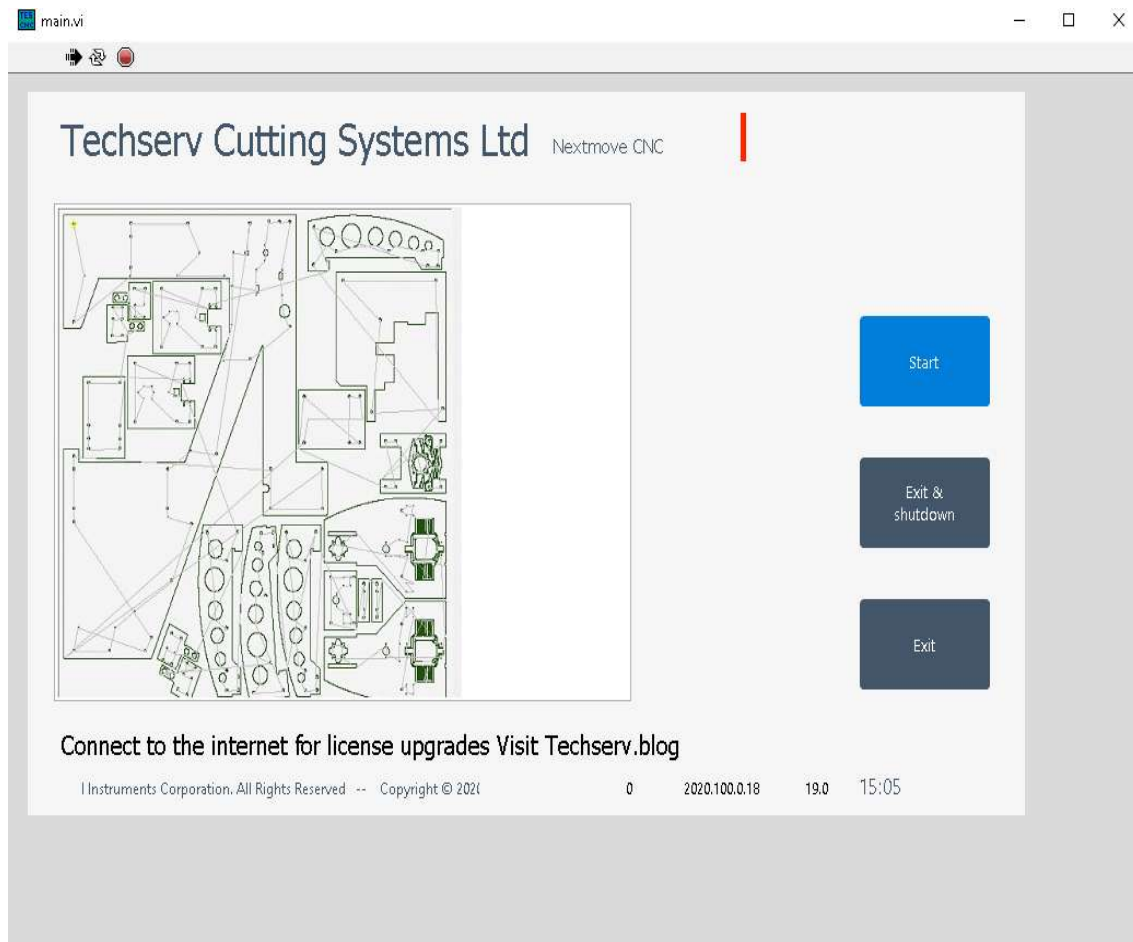


Techserv CNC Controller



Operator Manual

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Overview

The Techserv CNC system is an intuitive PC based controller designed specifically for 2D cutting using plasma, gas and water jet processes.

The Controller can be retrofitted to upgrade outdated machines.

Selecting material thickness, type and cutting current automatically sets cutting speed, initial pierce height, cutting height, pierce time delay, arc voltage height control etc.

In conjunction with a suitable Plasma, gas pressures / gas flow and cutting current are automatically controlled.

When flame cutting, oxygen pre-heat and cut pressures are automated. Cutting speed is set but can be varied on the fly, along with torch height, oxygen pressure etc.

The CNC system produces a daily log file, detailing most functions including, cut on, gas on, job running, job name, screen name etc. Data is logged per second and an off-line viewing programme gives an easy-to-read visual indication of activity together with a job list and timings.

Comprehensive diagnostics and test screens allow all functions to be checked. Network connectivity provides for remote log-in and fault finding.

Numerous drawing file types can be imported, including ESSI, Word Address, G-Code and DXF etc. Parts can be previewed prior to selection and rotated, mirrored and scaled if necessary.

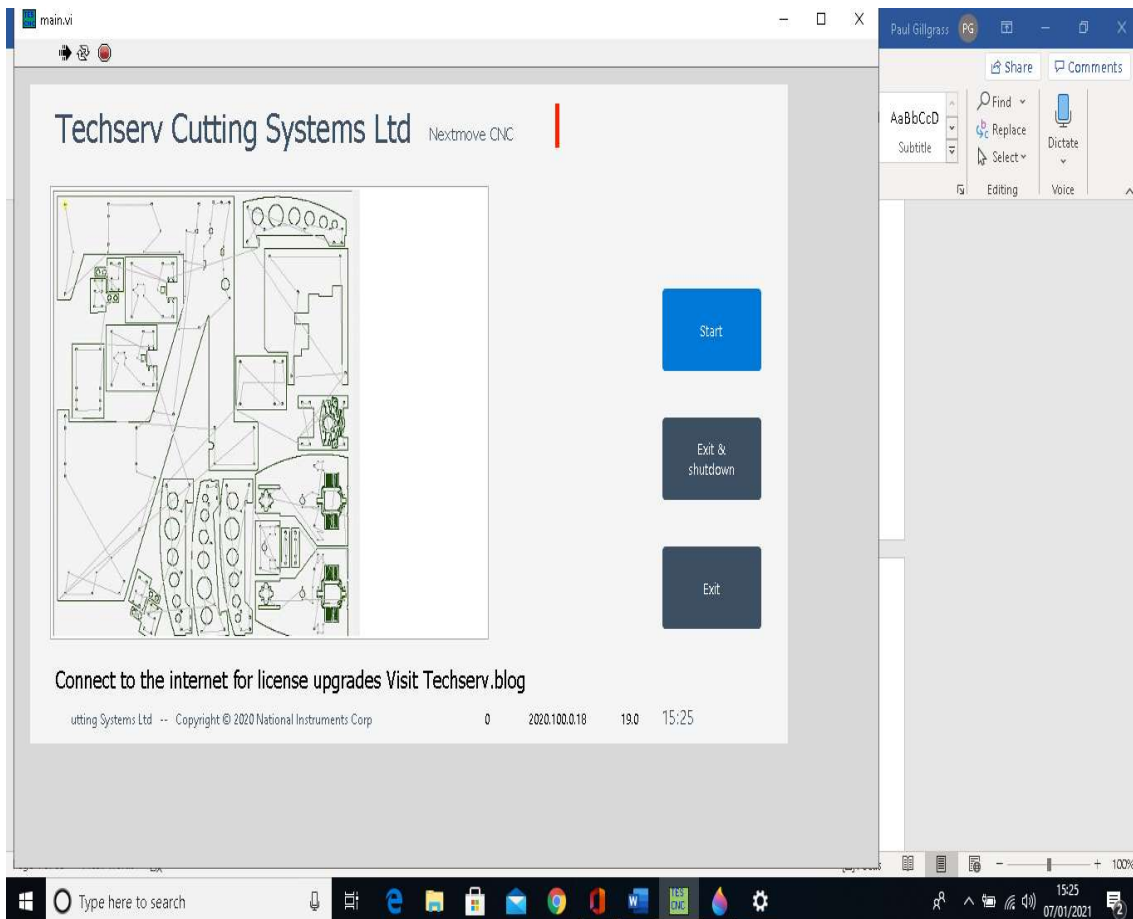
The 'Flexi Shape' facility incorporates a range of templates, from rectangles and rings through to lugs and floor plates. Selecting a generic shape and following the simple dimension prompts creates a part that can be nested, cut and saved with no further programming.

The 'Manual Cut' facility enables basic control of the cut process and point to point cutting. Normally automated processes i.e., Cut speed, height sense etc are maintained.

Semi automatic nesting fills plates with minimum wastage, allowing multiple parts to be cut from a sheet. Additionally, row and column array nesting with adjustable scrap allowance provide maximum plate utilisation.

Super-Hole Technology optimises plasma hole cut quality for 'bolt ready' holes.

Start Screen



Touch **'start'** to start the controller and open the Main Screen.

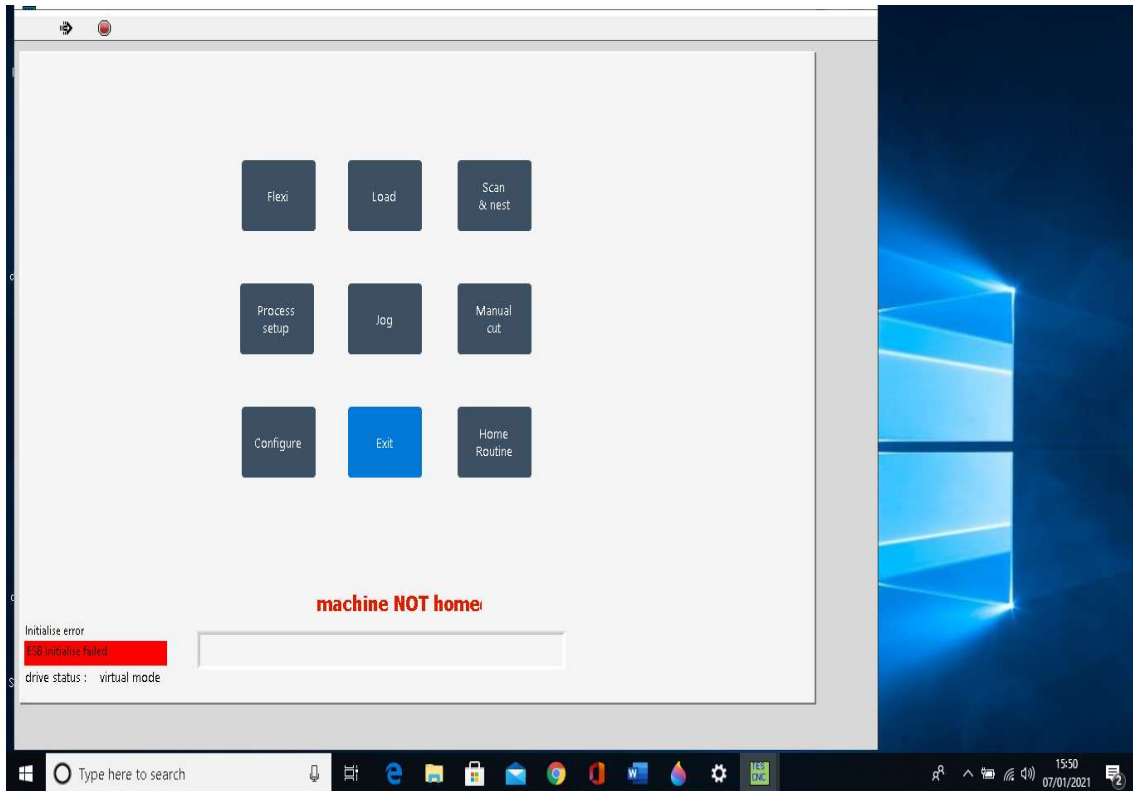
Touch **'Exit and Shutdown'** to exit the controller and shutdown the PC.
(Note: This does not turn off the machine which should be electrically isolated at the mains)

Touch **'Exit'** to exit the controller.

This page displays the system information, motion controller serial number, number of power cycles & version of installed software.

In this state the controller is not running, and the drives are disabled.

Main Screen



This screen allows access to the controllers' main functions. Additionally, it provides error messages in the bottom left corner and the machine home status in a red scrolling message.

(Note: The home status will flash a red error message until the machine is homed and in the case of 3 axis machines squared.)

The 'status pane' displays any limits that are actuated.

Main Screen Functions

<u>Flexi Shape</u>	Allows the operator to create shapes from the parts library within the controller.
<u>Load Shape</u>	Allows the operator to load a shape from an external source, from either a memory stick or over a wired or wireless net work.
<u>Scan and Nest</u>	(Optional includes simple CAD). Allows scanning of drawings into software to be cut and or edited. (requires camera).
<u>Process Setup</u>	Allows setup and adjustment of gas pressures if required.
<u>Jog</u>	Moves cutting torch to any point on the bed.
<u>Manual Cut</u>	Used for removing scrap, point to point and strip cutting.
<u>Configure</u>	Changes setting such as plasma, type, homing, encoder, calibration, etc.
<u>Exit</u>	Returns to previous screen.
<u>Home routine</u>	Homes the machine and allows access to the preset table positions. Access to lost cut recovery.

Emergency Stops



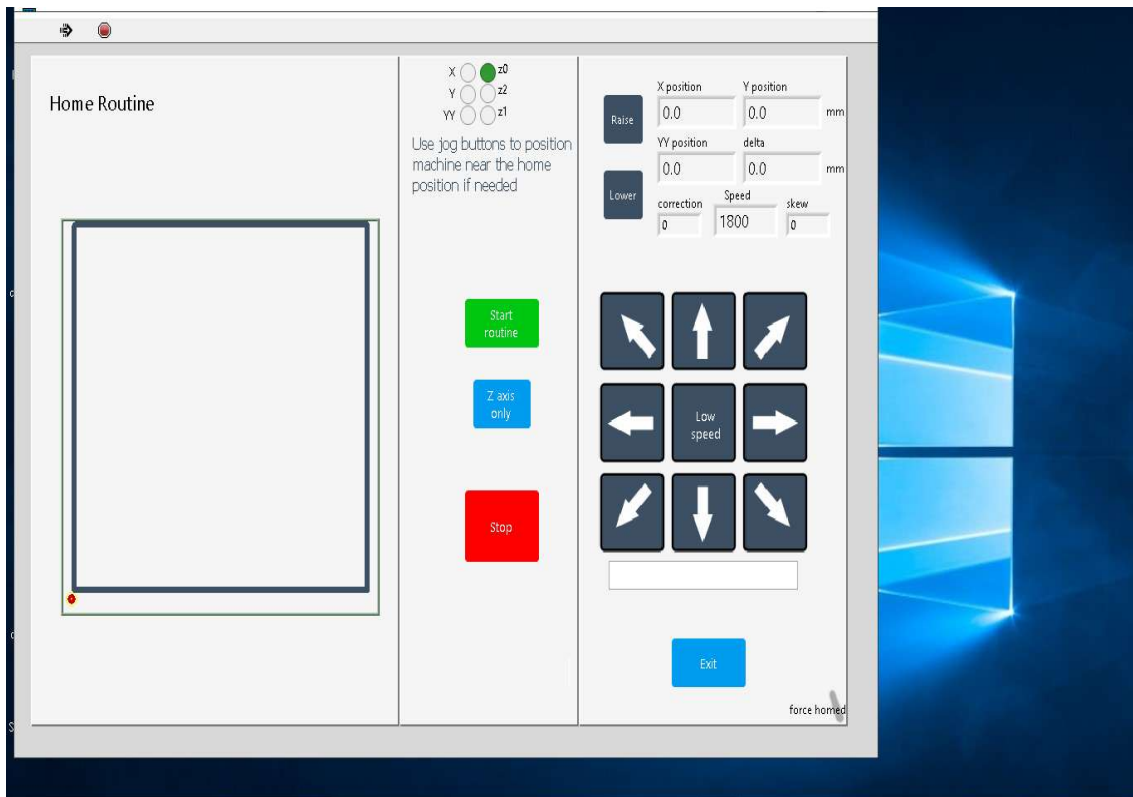
The machine will be fitted with one or more emergency stops. In some situations, collision protection, barriers or wire safety systems will be used. When operated the machine will stop and the cutting process will be interrupted.

The red stop screen will appear barring any further input until any obstruction has been removed and the emergency stop has been returned to a normal operating state. If necessary, the exit controller button can be used to close down the software and return to the Windows desktop.

Homing

The machine should be homed before cutting commences. This will ensure the machine soft limits are operational and the axis have the correct alignment.

After pressing the home routine button, the following screen will appear.



Using the **Jog** buttons position the machine near the pre-set home points.

Press the **Start routine** button.

The machine will move to the home switch points, depending on the machine type the home sequence should be as follows:

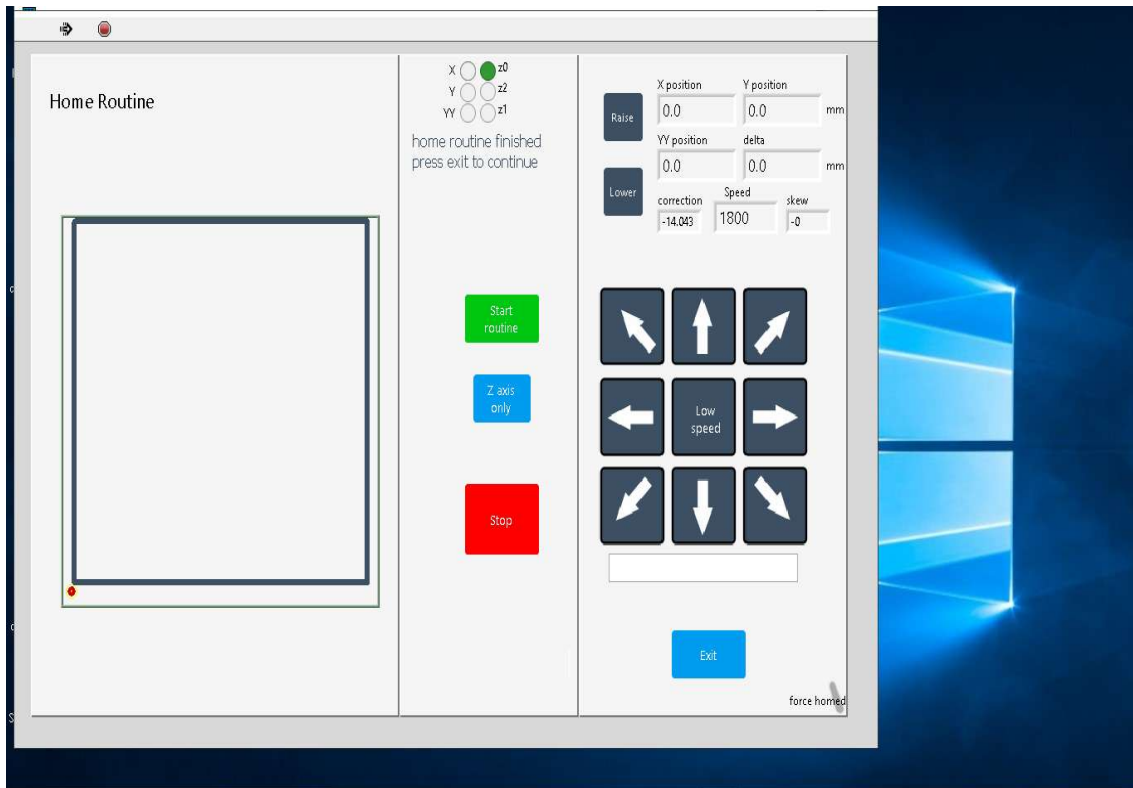
The plasma height sensing head will home

The X axis will home

The Y and YY axis will home

Any square offset will be applied to square the machine.

When the machine has homed all its' axes, the following screen will appear, with additional buttons revealed.



After this point you do not have to home the machine again unless you suspect the machine is out of square or you have exited the program.

There are 4 preset table positions (set via the configuration screen) to move the torch to one of these, i.e. to unload, ensure the bed is clear of obstructions and select the desired table position. The machine will traverse to selected point.

The movement can be halted by pressing *Stop*.

Lost cut recovery

This feature retains the origin coordinates for the last few jobs cut. It is used if the machine is inadvertently shut down, or the job has been stopped before completion.

If there has been a power loss investigate the reason for this and the subsequent shut down of the system. Once satisfied the fault has been rectified restart the controller.

Carry out the home routine as normal.

Once the home routine is complete using the drop-down menu select the job required from the list.

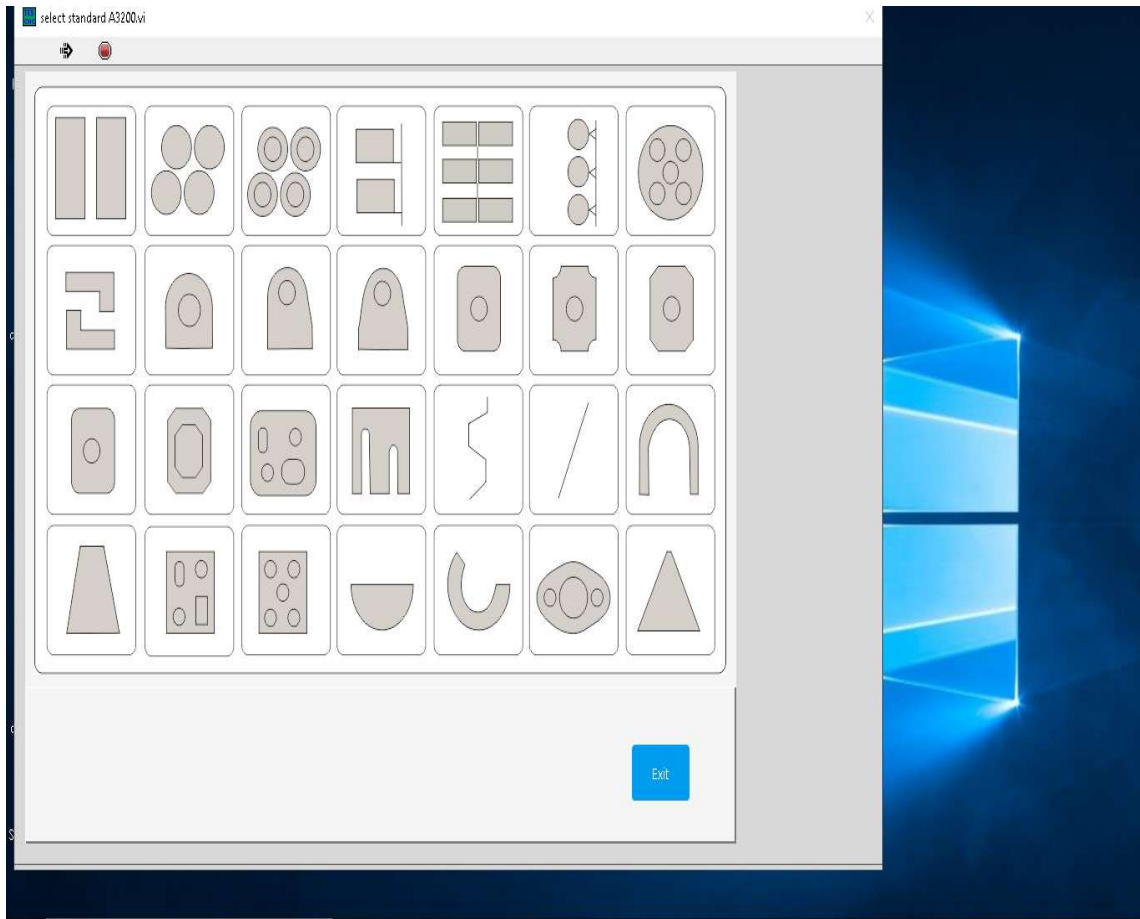
Press the *lost cut recovery* button. The machine will now traverse to the origin of the last plate cut. From this point load the shape / nest as normal and advance through the pierce points / cut path to continue cutting.

Note: *These functions will be explained in subsequent sections.*

To exit the homing screen and return to the main screen press *Exit*.

Flexi Shapes

Flexi shapes are predefined shapes which can be individually tailored by the operator.



Press the *Flexi Shape* button and select the icon of the desired shape.

A basic outline of the selected shape will appear together with a series of prompts and a keypad to enter the required data.

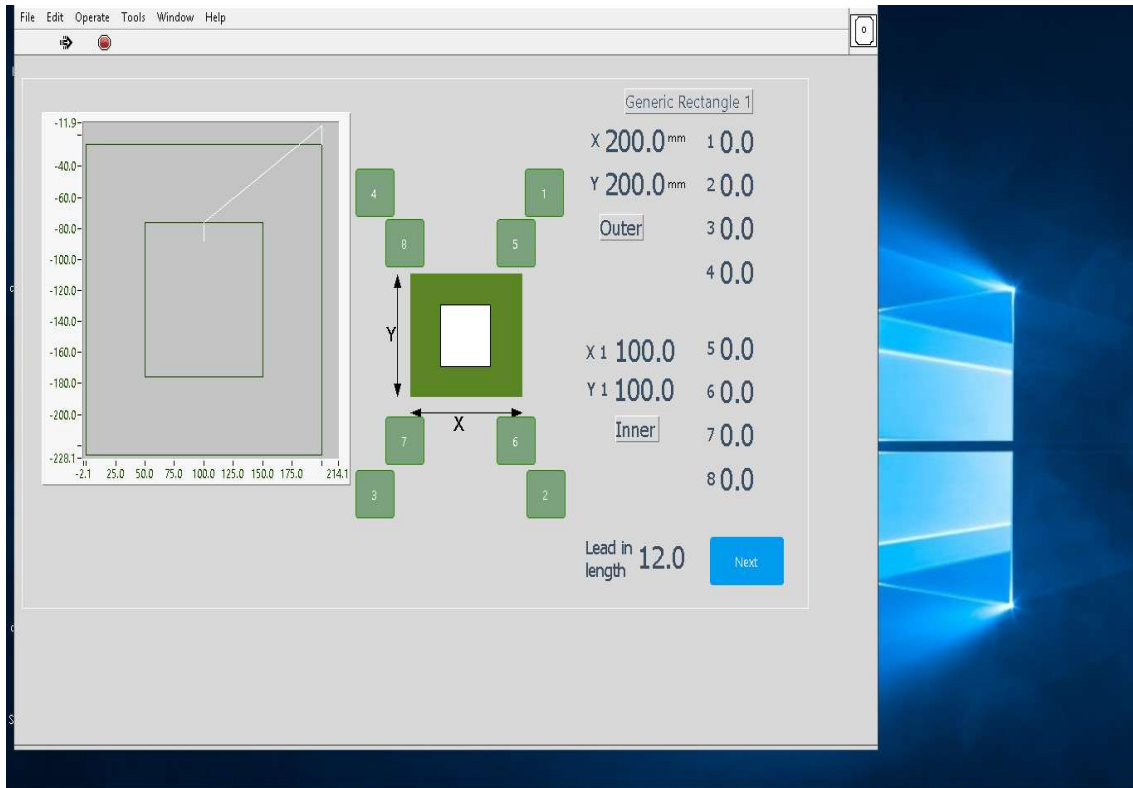
Enter the required measurements using the keypad.

Other parameters include: -

Lead in – this is the distance from pierce point to the cut path.

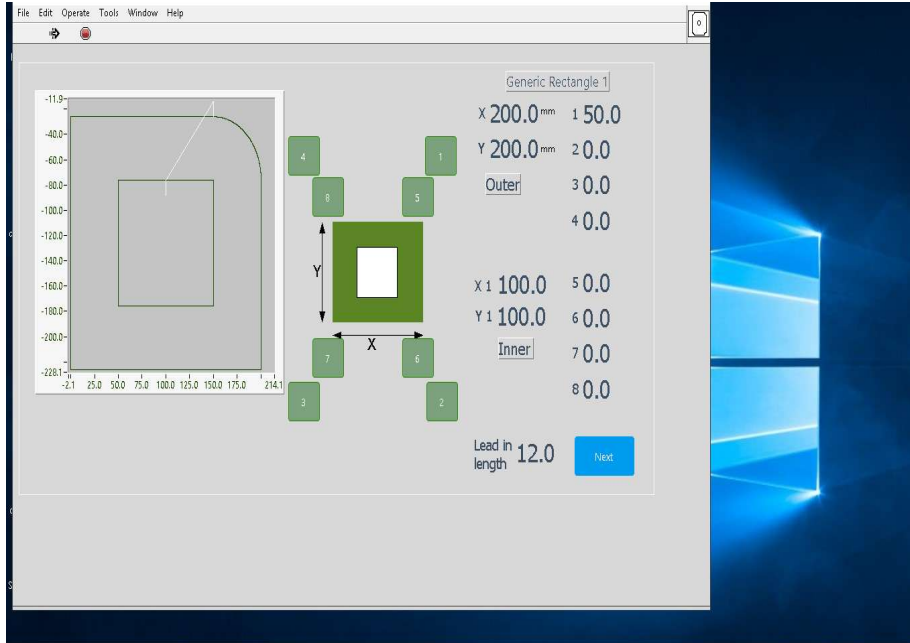
Start position – this is the corner from which the machine starts the operation. It is usually the same as the origin.

When all dimensions have been entered a screen like the one below will appear showing the basic shape. Several different options will also appear on this screen depending on the chosen Flexi Shape.

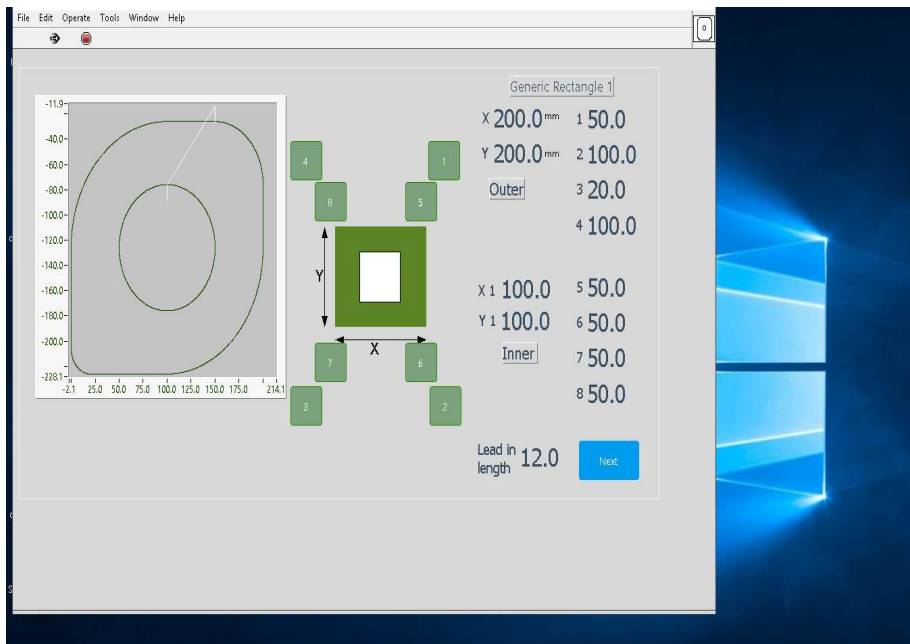


On this screen it is possible to rectify mistakes or customise the shape further. For example, to change a dimension highlight the required value on the screen, the keypad will appear. Enter new value and press 'enter'. The new value will be displayed, and the drawing will change to the new dimensions.

It is possible to alter each corner individually. Refer to the numbered buttons around the shape in this case 1 to 4 are the outer corners and 5 to 8 are the inner corners.



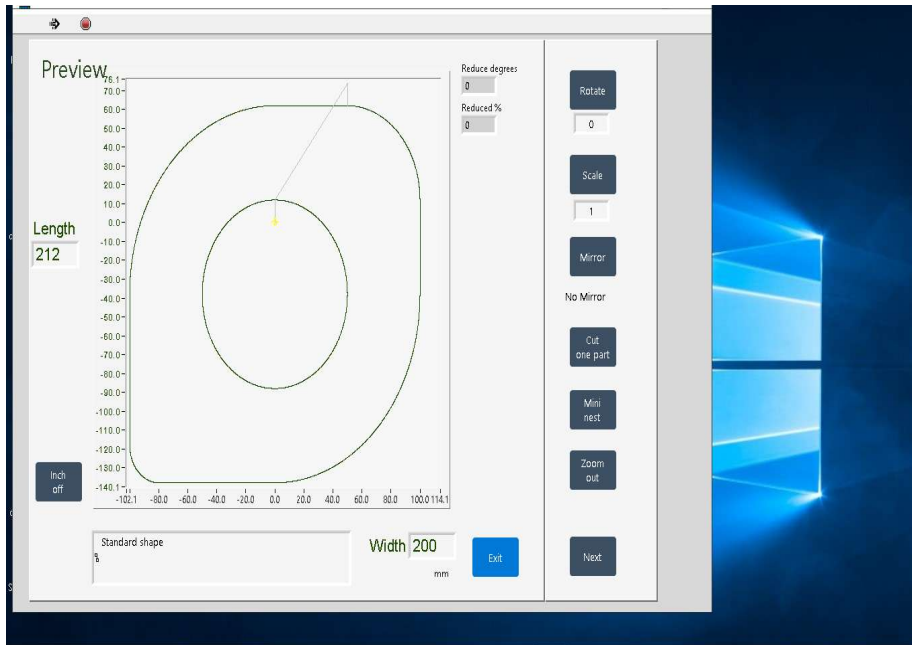
To change the style of the corner, press the corresponding corner style button, this will toggle between outside radius, inside radius and chamfer. Each corner can be modified individually to give maximum flexibility.



Once the shape is as desired press *Next* to move on to the preview screen

Preview Screen

This screen shows a preview of the flexi shape or loaded part.



Here, the following options are available: -

Rotate

This rotates the shape through -360 to 360 degrees.

Press *rotate*, the keypad will appear, type in value then press enter.

The preview will be modified, and the value entered will appear in the box.

Scale

The scale multiplier makes the shape larger or smaller.

Press *scale* and enter the scale factor required, followed by enter. The preview will be updated.

Mirror

Mirrors the shape around different axes. Pressing *Mirror* toggles between mirror X, mirror Y, mirror X & Y and No mirror. The mirror status is displayed below the button and the preview modified.

Cut one part.

This feature allows a single part to be selected from a nest of parts and then cut or re nested. This is used when a part has been lost or damaged by subsequent processing. Simply select *Cut one part* and press the part required.

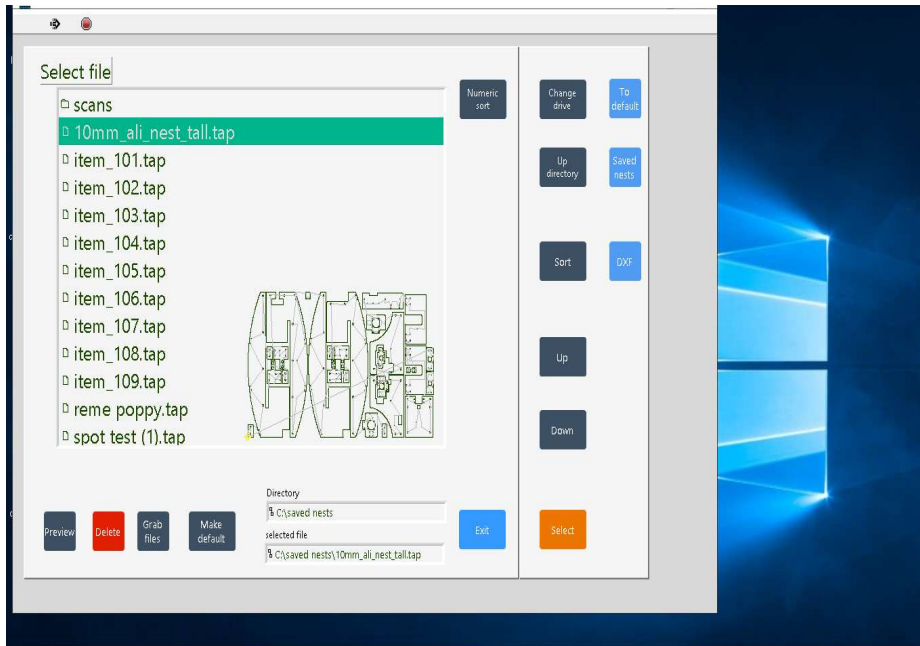
Mini Nest

Certain shapes can be inter-linked to make for more efficient cutting. This mode can be used to manually link 2 of the same shape together. This can be combined with standard row and column nesting, accessed via the process setup screen.

Load Shape

This allows the operator to load nests of parts from an external source such as a memory stick or network.

From the main menu screen press *Load shape*.



A list of available files will be displayed.

Use *up* / *down* to highlight the required file, after a brief pause, a thumbnail will be generated. If this is the correct nest press, *Select*.

If the desired drive is not shown, press the *Change drive* button and use the *Up* / *Down* buttons to highlight the required drive, then press *Select*.

If there are many nests available to download, press the *Sort* button and type in the first few letters / numbers of the required nest and press *enter*. From the abridged list use *Up* / *Down* to highlight the required file and press *Select*. This will open the Preview screen - this operates in exactly the same way as described previously for the Flexi shape operations.

Numeric Sort

Files are listed alpha numerically, selecting *Numeric sort* will toggle the list to file creation date.

Change Drive

Lists all drives that the computer can access, this will show all internal drives and any memory sticks or available networks.

Sort

If many nests are available for downloading, scrolling through the list can be time consuming. Pressing *Sort* will open an alpha numeric keyboard, part or all of the file name can then be typed in thus, narrowing the search.

Up and Down

Moves cursor through the available drives or files displayed on the screen.

Select

Selects the required drive file highlighted on the screen.

Exit

Exits back to the main screen.

Directory & File name

Displays path and file selected.

Delete

Deletes selected file (this option may not be available in certain configurations)

Preview

Generates a “thumbnail” sketch of the nest. Please note if this button is pressed when a directory is selected it will generate previews for all the nests within that directory, which may take some time depending on the number of nests and their complexity.

Tip!

The initial search path is defined within the configuration, if an alternative file path is extensively used, this path can be set to default as follows.

Press the *Change drive* button and use the *up / down* button to highlight the required drive, then press *select*.

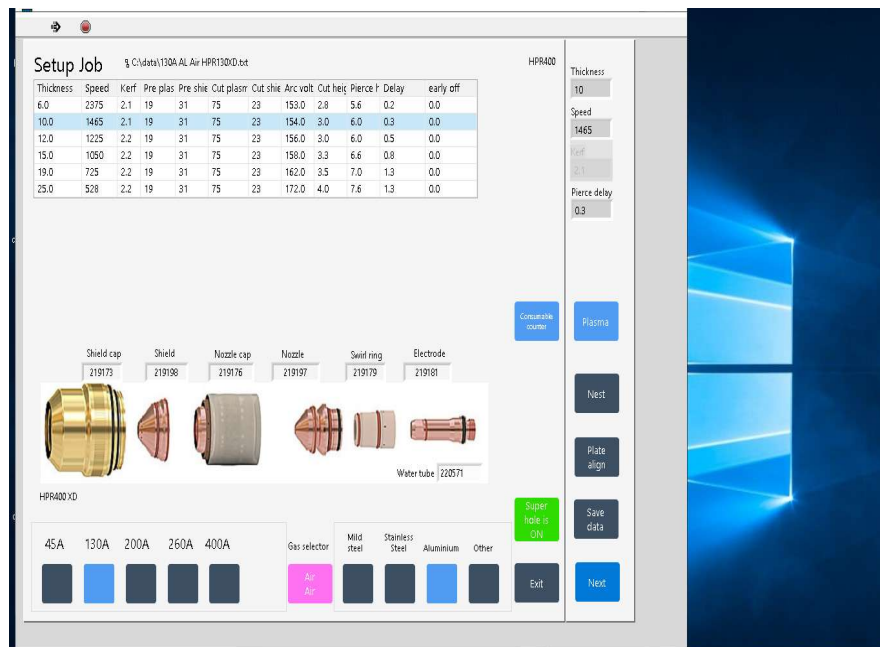
A list of available directories will appear, use the *up / down* buttons to highlight the desired directory, then press *Select*. Pressing *Make Default* will complete the operation.

Setup Job screen

The procedure for cutting with plasma is the same for both flexi shapes and loaded shapes / nests.

The controller will automatically set the correct cutting speed, initial pierce height, cut height and the arc voltage control value for any given material type, and thickness.

There are many factors that can affect these parameters, for example the quality of the plate and type. For this reason, the operator can tailor these setting to suit the particular application and if needed, save the settings permanently.



Press the buttons to select the *current* and *material* required, the system will highlight the relevant information in the cutting table and the consumable chart will change automatically to provide the correct part numbers for the required consumables.

Press the material thickness display and the keypad will appear, type in the thickness of material to be cut and press *enter*.

The information for the thickness will be highlighted and the cutting speed etc will be set automatically.

Tip!

To add a different thickness or modify existing data. In this example information for 12mm material thickness will be added in the material thickness box enter 12 then press enter Press Save Data

At this point, if no changes are required simply press *Next* to proceed to the Cut screen.

Super Hole

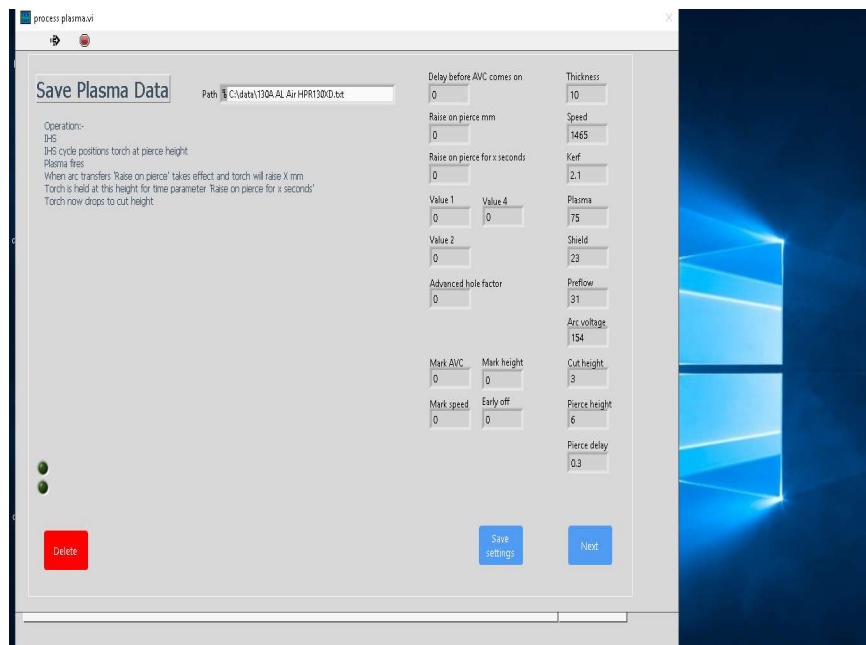
This feature identifies round holes within a profile and automatically applies a predefined algorithm to improve the 'roundness' of the hole and reduce the edge taper. The height sense is also frozen and cutting speed adjusted. Pressing *super hole* will toggle the action on and off.

Once all changes have been made on the Set up Screen

Press next to move to the Origin Screen.

Save Data

If required most parameters can be changed and set to replace the default settings. To do this press the *save data* button.



The screen shown above will appear, press the parameter to be changed, the keypad will appear, type in the new value and press enter.

Parameters that can be changed are as follows: -

Cutting Speed	speed.
Kerf	Allowance for width of the process.
Plasma	Plasma gas pressure (HPR systems only)
Shield	Shield gas pressure (HPR systems only)
Preflow	Preflow gas pressure (HPR systems only)
Arc voltage	the arc voltage measured by the height sense (if fitted) the higher the value the larger the distance above the plate.
Cut height	the height above the plate that the height sense (if fitted) moves to once the arc is detected, prior to Arc voltage sensing activating.
Pierce height	the distance above the plate the height sense (if fitted) moves to prior to piercing. Generally, twice the cut height.
Pierce delay	Time (s) machine waits before starting movement to allow plasma arc to pass through the plate.
Early Off	Time (ms) before end of cut path the plasma is turned off to prevent damage to end of part and increase consumable life.
Delay before AVC comes on.	allows the arc to stabilise before arc sensing starts.
Raise on pierce mm	Raises the torch by the amount entered. This takes place just after the arc is established and prior to motion commencing. Raising the torch will reduce the amount of spatter coming into contact with the shield cap.
Raise on pierce for x seconds	This feature is used in conjunction with ' <i>Raise on pierce mm</i> ' Setting the raise on pierce value to x seconds will allow the torch to remain at the raised height before lowering to cut height, thus avoiding the molten spatter pool

When all parameters are set press *save*. Saving Data will appear briefly on the screen to confirm the setting have been saved. The Setup screen will now reappear.

To discard all changes, press *Next*.

Nesting

The controller has a row and column nesting facility built in, this can be used with all shapes, flexi or downloaded.



Press the *Vertical* and / or *Horizontal* boxes and type in the required quantities. The scrap allowance is used to adjust the distance between the components. Note the scrap allowance is in addition to the lead in line and can be set to a negative value to move parts closer together.

Once the required number of parts are nested press Next to return to the setup screen.

Other options are:

Standard / Cut Inter component moves - Standard turns off cut between pierces so parts can be chain cut. Warning: proceed with caution, this function can only be used on parts with No internal cut outs.

Stagger - Gives better plate usage when cutting circles.

Mirror/ Rotate - Allows nest to be manipulated by rotating and mirroring.

Save Nest - if the nest is to be cut several times it can be saved to prevent having to re input it again. The nest is given a name and can then be reloaded from the saved nest directory on the C drive.

Zoom In /Out - Toggles Zoom mode. If the screen is touched the view will zoom in or out to view nest.

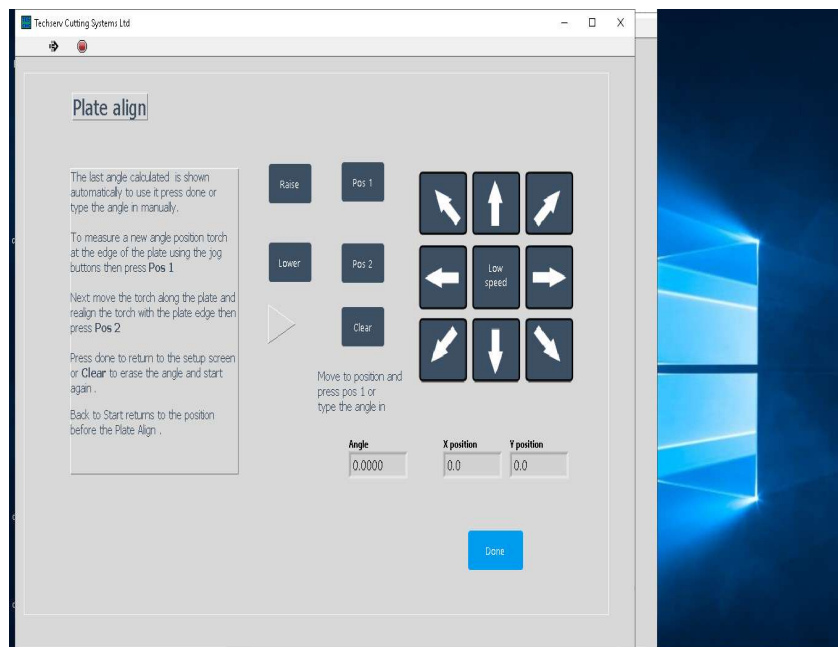
Redraw - Returns to original view.

Next - Returns to Setup page.

Plate Align

The plate align function allows the operator to account for a plate that is not parallel to the bed / rail.

Press the *Plate Align Button*



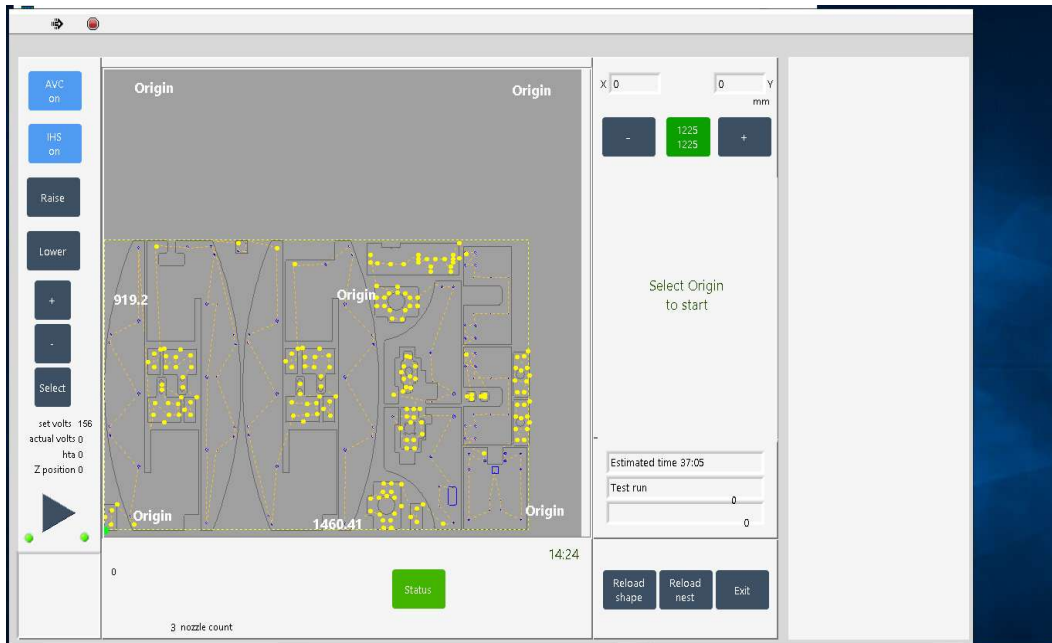
Follow the on-screen instructions and press *Done* to go back to the setup screen.

Provided the Plate Align button is pressed on proceeding jobs the correction will be retained until another plate alignment is carried out, allowing multiple nests to be cut from the same plate. If the Plate Align button is not pressed for subsequent jobs then no angular correction will take place.

Once all changes have been made on the Set up Screen press *next* to move to the Origin Screen.

Origin Selection

The controller calculates the maximum area of the shape.

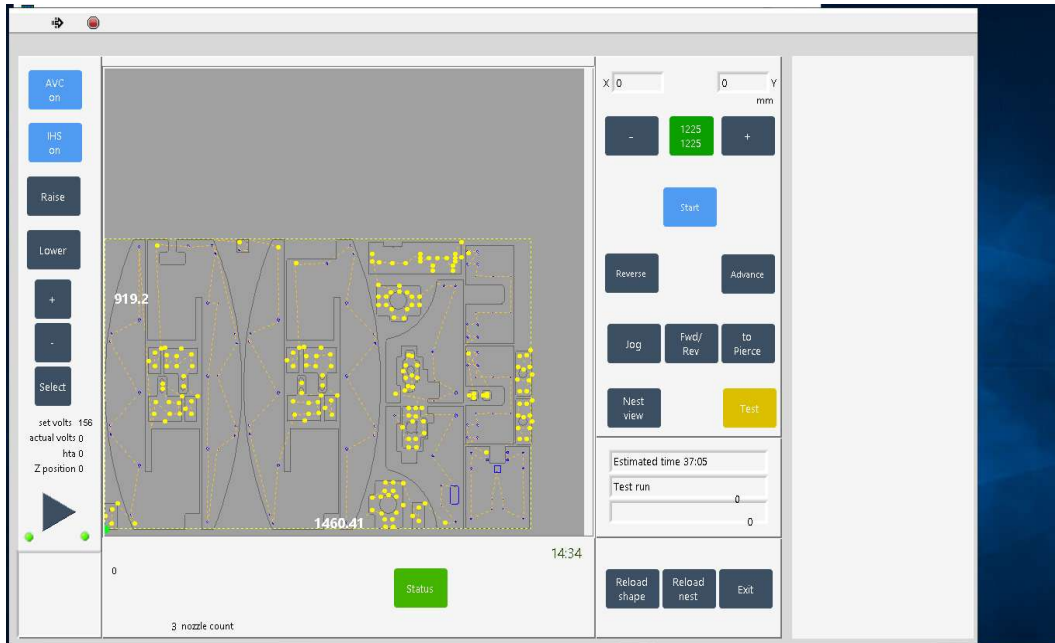


The origin is the point that best defines the position of the cutting torch to the plate. When cutting nests from whole sheets this position will generally be the same each time, depending on machine configuration. However, when cutting pieces from part plates it is sometimes easier to align to a good edge, from this position the machine will traverse to the first pierce point (an optional centre origin is shown in this view).

Press the relevant origin to select it.

This will move to the cut screen.

Cut Screen



The indicators and controls on the Cut screen have the following functions:

Motion Pane

X & Y position indicator

Manual speed adjustment + or - speed

Speed indicator

Upper Number: Theoretical speed

Lower Number: Actual speed

Cycle Start / Stop

Starts and Stops the cutting process.

Reverse

Reverses the cutter around the cut path.

Advance

Advances the cutter around the cut path

To pierce / origin

The first press returns the cutting head to the last pierce point, the second press returns the cutting head to the origin point of the nest.

Forward

Jumps forward through the pierce points.

Reverse

Jumps backwards through the pierce points.

Jog

Opens the *jog* panel.

Test / Cut

Toggles between cut and test mode.

Nest view / Zoom view

Toggles between nest and zoom view, pressing the numeric button increases the zoom level further

Limit Status Pane

Indicates the limit and cut status. For example, *cut on*, or *+ Y limit*.

Arc Voltage Pane (optional)

AVC	Selects Arc Voltage Control.
HIS	Selects Initial Height Sense
Raise	Raises the cutting head (not during AVC operation)
Lower	Lowers the Cutting head (not during AVC operation)
+	Increases the arc voltage value, raising the cutting head.
-	Reduces the arc voltage value, lowering the cutting head.
Set Volts	Displays the theoretical arc voltage.
Actual Volts	Displays the actual arc voltage during cutting.

Graphical Display Area

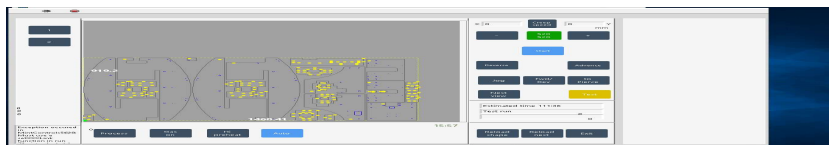
This shows the profile being cut. The black line is the original geometry, the white line is the cutter path. Internal lines are shown in blue, secondary processes are shown in purple. The yellow rectangle represents the extents of the box. The Yellow dots are the pierce points.

The graphical display area is interactive and pressing the screen causes the view to zoom in, in certain modes pressing the screen selects a pierce point.

Process Pane

Status	Indicates if the Cut signal has been applied, machine will be conducting the IHS / Pierce sequence, or it will be cutting.
--------	--

In gas mode the status indicator is replaced by the process, gas on, hi preheat, and automatic / manual selection buttons. As shown below.



Additionally, the AVC, IHS buttons and indicators in the AVC Pane are replaced by head select buttons. The number of these buttons would reflect the number of gas torches fitted to the machine.

Exit Pane

Reload Nest	Reloads the nest allowing the origin to be re selected.
Reload Shape	Returns to preview screen allowing the shape to be rotated etc & re nested.
Exit	Clears the shape memory and returns to the main menu.

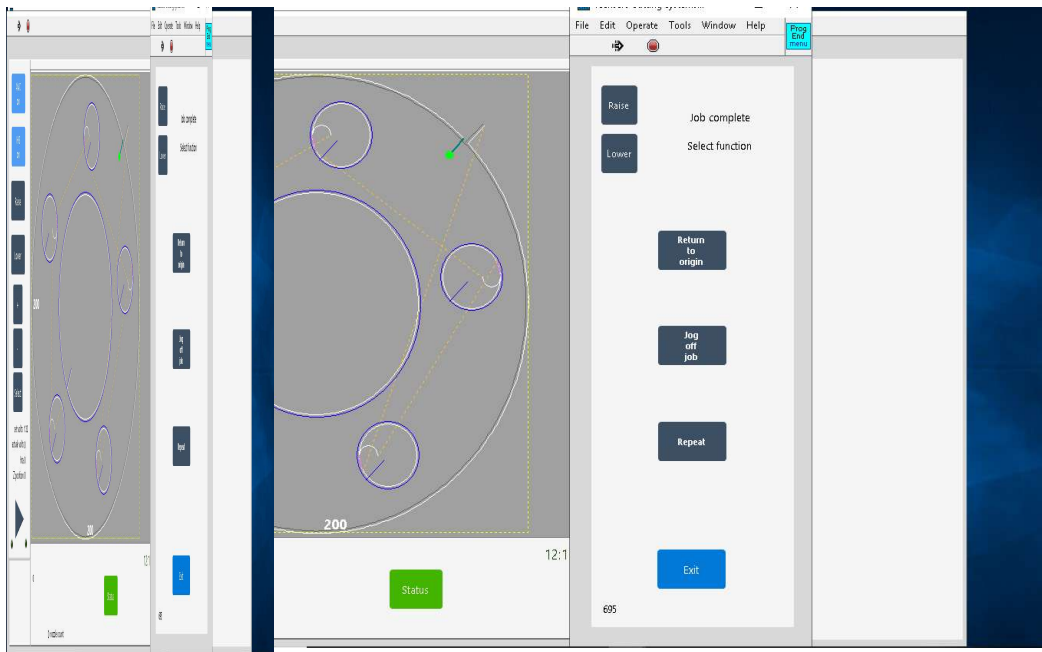
Operation

If the plate is against a datum and the torch is correctly positioned, simply press the Test / Cut button to select cut mode, this will then go red indicating cut mode is selected.

Press Start, the machine will traverse to first pierce point and begin the cutting process. As the machine moves round the shape the cut path will turn red.



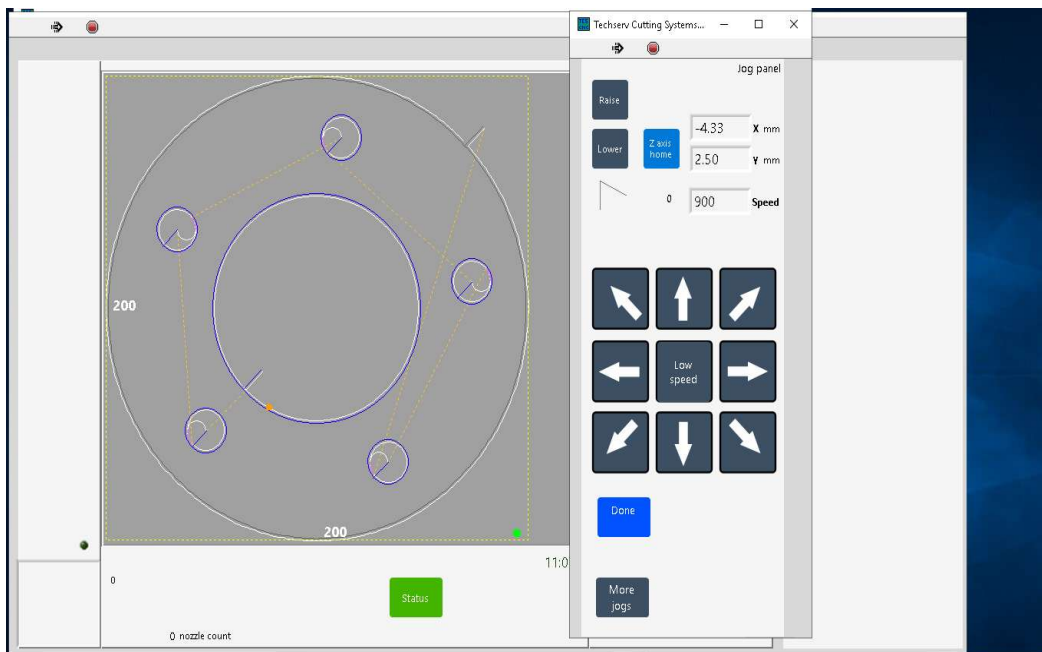
Once the nest has been cut the end of cut screen will be displayed, the following choices can be selected:



- Return to origin:** select this to return to the origin of the part, this is usually used after the shape has been run in test mode, prior to selecting cut mode.
- Jog off job:** displays a jog panel allowing the cutter to be moved a set distance away from the job so it can be removed.
- Repeat:** this displays a jog panel with four direction arrows indicating a repeat direction. The extents of the shape are measured, and the correct repeat traverse distance is calculated and applied when a button is pressed.
- Exit:** this returns to the main menu screen and clears the shape memory.

If the nest is a tight fit within the plate it may be necessary to carry out a test run. This involves running the machine around the shape without the cutting process. A test run can be done at high speed to save time.

Jog the cutting head to the start point and select Test using the *Cut / Test* button Press *Start*. The machine will begin to move round the nest, the torch can be raised or lowered manually to help with alignment. In the example below if the nest is too far to the right press *Stop*.



Press the *Jog* button

Press the left direction button to move the torch back on to the plate.

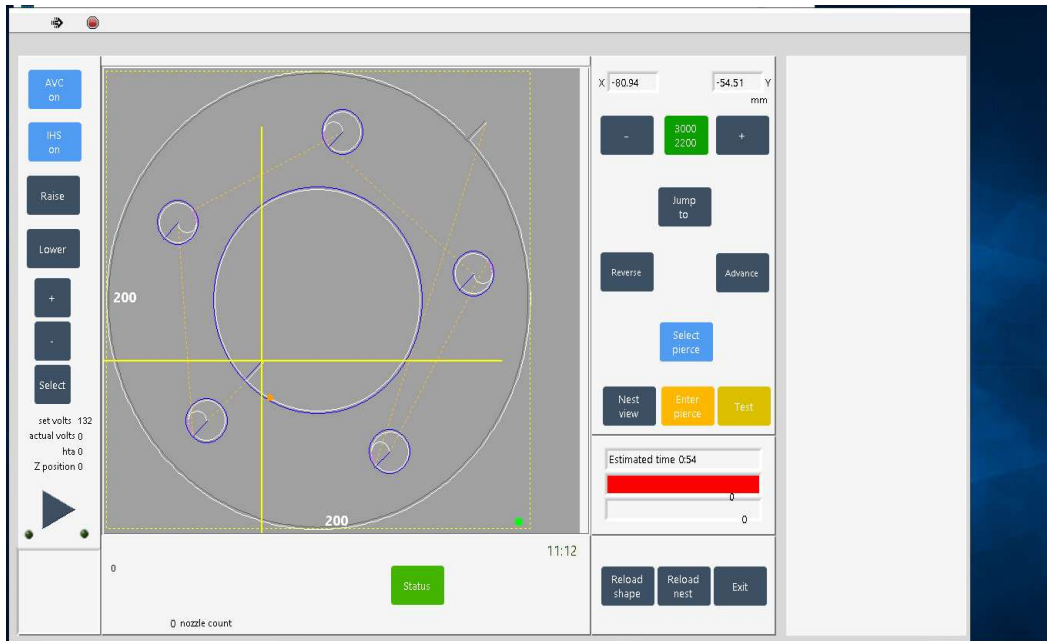
Press *Move Job* to “reposition” the nest on the plate.

The other Jog functions will be covered in a later section.

Press *Start* to continue round the nest.

To speed up the process it is possible to skip through pierces. To do this press *Stop* followed by the *Fwd / Rev* button

The following Screen will appear.



Press and hold the *Advance* button.

The cursor will initially move slowly through the pierce points then after 5 seconds increase speed.

When the required pierce is reached release the button, if the cursor overshoots the required pierce, briefly press the *reverse* button until the correct pierce point is reached.

Press the *Jump to Pierce* button the machine will now move to the selected pierce point.

Press *Start*, the machine will then continue around the shape.

Alternatively, pressing *Enter piece* will display a numeric keypad allowing the pierce number to be input directly. Or, touch the screen to select the part required, the yellow dot represents the first pierce point of each shape.

If any further positional adjustments are required, follow the Jog / move Job procedure as described earlier.

Once the nest is positioned correctly press *Stop*

Press the *To Pierce* button - the machine will move to its last pierce point.

The *To Origin* Button will now replace the *To Pierce* button

Press this and the machine will return to its origin (which will now be offset by the Jog / Move Job operation)

To Cut the shape press the *Test / Cut* Button and press *Start*.

Other Features of the cut screen

Back Up is not often used in plasma cutting (unless the plasma does not have an arc sensing unit)

The speed can be adjusted at any time to take in to account the plate condition etc.

Nest view / Zoom View Allows operator to zoom in on the cursor.

Press to return to Nest view.

What to do if:

The plasma stops cutting part way round a shape.

Most plasma systems have an arc on sense circuit. The machine will stop when the arc is lost. In this state the head will rise to a pre-determined height.

Clear any debris etc that may have caused the arc to go out.

Position the torch close to the plate using the raise/ lower buttons.

Press and hold the *reverse* button, the machine will reverse round the shape, release the button just after the point at which the arc extinguished.

Note: do not position the torch over an existing cut path as the arc needs metal beneath it to strike.

If the machine moves too far use the *advance* button to position it correctly

Raise the torch.

Press the Start Button the machine will carry out the HIS sequence and continue cutting.

A stitch is required in the job.

If a stitch (an uncut area on the nest) is required to hold a part in the plate, for example to prevent movement or ease unloading, carry out the following procedure.

When the required point is reached press *Stop*.

Press and hold the *advance* button until the machine has moved along the cut path by the required stitch length.

Press *Start*, the machine will resume cutting.

The Consumables fail part way round a job.

The machine should stop automatically if the arc is lost. If it does not press *stop*. Select *Jog* and use the Jog buttons to move the machine to a position where the consumables can be changed.

Replace the consumables.

Press *back to path*.

The machine will now move back to its original position.

Press Start to continue cutting. (It may be necessary to use the Advance / Reverse buttons to pick up at the correct point)

In this situation do not use the Cut back to Path feature as this will damage the Plate, this feature is used when gas cutting or if the plate being cut is too thick to pierce as it allows an edge start to be carried out.

I need to cut a part out of sequence.

During the cutting process, wait until the present shape is finished.

Press *Stop*.

Press the *Fwd / Rev* button as described in the previous section to select the required part (remember the inner components of the parts are cut first).

Once the correct pierce is selected press *Jump to*.

When the machine gets to position press *Start*.

The cutting sequence will begin again.

Once the part is cut you have the option to continue cutting to the end of the nest or returning to the point where you originally broke off cutting. Whichever option is chosen, use the *Fwd/Rev* button again and jump to the required pierce, press *Start* and continue cutting.

Arc Voltage height sensing.

If the Controller is fitted with a Techserv Height Sensing Head the following controls and indications will be available.

AVC on/off

Initial Height sense on/off

Manual head raise / lower.

Arc Voltage increase/decrease

Set Arc Volts

Actual Arc Volts (only displays a value when cutting)

Status LEDs

The height sense uses two integrated systems:

Initial Height Sense (IHS) - when the cutting sequence is initiated the torch will lower and touch the plate. This sends a signal back to the controller which then retracts the torch to the pierce height in the setup data.

Arc Voltage height sense Control (AVC) - This system measures the voltage created between the torch and the plate. The larger the voltage the greater the distance above the plate.

The system will start the arc at the pierce height as set by the IHS - once the plasma arc strikes an arc on signal is sent from the plasma, when the controller receives this it holds position for the preset pierce time, then commences motion. The torch will then lower to the cutting height in the setup data.

When the machine reaches cutting speed the AVC will turn on and adjust the torch height to maintain the arc voltage.

When the machine slows to go round a corner the AVC is turned off to prevent the torch diving into the plate.

The machine will cut with either of the functions disabled – but the operator will have to adjust the torch position manually using the *Raise Lower* buttons.

Running in this mode for any length of time is not recommended due to poor cut quality and the reduction in consumable life.

Changing the AVC cutting height.

The Set voltage displayed is derived from the setup data, if it is necessary to adjust this value, press the +/- buttons to increase or decrease the set voltage when the machine is cutting and AVC is enabled.

The actual voltage displayed will closely follow the set voltage.

Factors affecting the arc voltage are:

Cutting speed - if for some reason the speed is reduced the plasma will burn more material away, this increases the arc voltage causing the torch to run closer to or touch into the plate.

If the speed is too fast the plasma will not penetrate the plate.

Material Type / Quality - different materials require different arc voltages, ensure the correct material is selected during setup.

Rust and scale on the plate – this can affect the height sensing causing inconsistent operation.

Current - Ensure the plasma pack is set to the correct current value as defined during set up.

Consumable Wear - a badly worn consumable will cause the torch to cut closer to the plate, this is not normally an issue if consumables are changed before they are excessively worn.

NOTE: When adjusting the arc voltage settings, it is recommended to carry out the changes in 1 volt increments.

Additional Information:

Quick Stop

The Precision Height Sense head is fitted with a breakaway device. This is designed to prevent torch damage caused by catching tipped components during cutting or traversing. If activated the machine will stop movement and turn off the cutting process. A Limit Hit warning will appear on the cut control panel.

Cutting with Gas

Most of the main controls are the same as for gas as previously described for plasma.

If the machine has the optional automatic gas system fitted, it will automatically control the High and Low preheating oxygen pressure. Along with the cutting pierce ramp and cutting oxygen pressure.

Thickness	Nozzle	Speed	Kerf	Pre-heat	Pierce	Fuel lo	Fuel hi	Preheat	Preheat	Cut 1st	Cut full
5	4/0 VVC	410	1.0	10	1.0	1.4	1.4	1.0	2.0	0.7	4.0
6	4/0 VVC	410	1.0	10	1.0	1.4	1.4	1.0	2.0	0.7	4.0
8	3/0 VVC	500	1.5	11	1.0	1.4	1.4	1.0	2.0	0.7	4.0
10	00 VVC	600	1.5	10	1.0	0.5	1.0	1.0	2.0	0.7	6.0
12	00 VVC	370	2.0	10	1.0	1.4	1.4	1.0	2.0	0.7	6.0
15	0 VVC	365	2.0	10	1.0	1.4	1.4	1.0	2.0	0.7	6.0
20	0% VVC	350	2.0	25	1.0	1.4	1.4	1.0	2.0	0.7	6.5
25	0% VVC	325	2.0	25	1.0	1.4	1.4	1.0	2.4	0.7	7.0
35	1 VVC	270	2.0	36	2.0	0.5	1.0	1.0	2.0	0.7	7.0
40	1 VVC	250	2.0	30	3.0	1.4	1.4	1.0	2.0	0.7	6.5
50	1% VVC	260	2.0	30	3.0	1.4	1.4	1.3	2.5	0.7	7.0
60	1% VVC	260	2.5	30	3.0	1.4	1.4	1.3	2.5	0.7	6.0
70	2 VVC	240	2.5	35	3.5	1.4	1.4	1.5	2.5	0.7	6.5
75	2 VVC	240	2.5	35	3.5	1.4	1.4	1.5	2.5	0.7	6.5
80	2% VVC	220	2.5	40	3.5	1.4	1.4	1.6	2.6	1.0	7.0
90	2% VVC	220	2.5	40	3.5	1.4	1.4	1.6	2.6	1.0	7.0
100	3 VVC	190	2.5	45	4.0	1.8	3.0	2.0	3.0	2.2	7.0

On a gas only machine the above table will appear by default however on a combined Gas / Plasma machine the plasma screen appears first. Press the plasma / gas select field to toggle between the two processes.

As with the plasma process select the required plate thickness. The thickness will be highlighted on the screen. Cutting speed, preheat etc will be adjusted to automatically.

The Nest and Plate Align function work in the same manner as described in the plasma section.

If no changes are required press next to move to the origin screen.

Gas process data

To enter new data or edit existing press *Save Data*.



Turn on the process you wish to change.

To adjust a pressure, press *Gas on* and light torch. Select at least 1 torch on the head select buttons in the left-hand pane.

To adjust a pressure i.e. High preheat oxygen. Select *oxy hi* in the process set up pane. (The current pressure in bar and psi will be displayed).

Press the *up/down* buttons to adjust the pressure.

To see the actual effect the adjustments are having press *High preheat* in the Test Gases Pane.

The pressure can be further adjusted. When the desired results have been achieved press the *gases off* button.

Other variable settings are.

Cutting Speed

Kerf allowance for thickness of cutting flame.

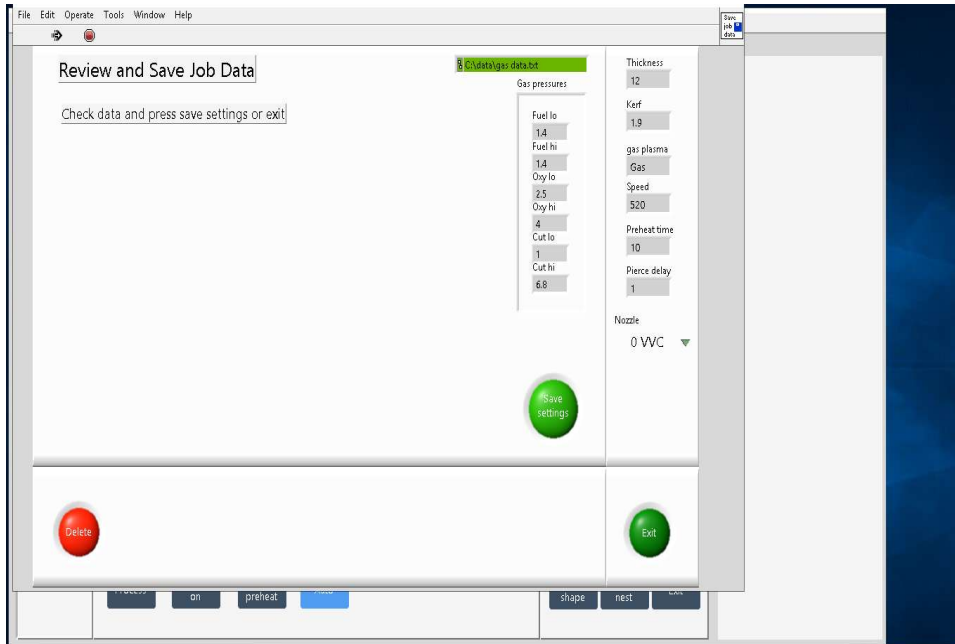
Preheat Time (s) machine turns on high preheat (to speed up pierce time) before turning on the cut.

Pierce Delay Time in (s) the machine takes to accelerate to cutting speed whilst ramping cut pressure from low to high.

Nozzle size.

When all adjustments have been made press *Save Settings*.

The review screen will then appear.



If values are correct press *save settings*, this will return to the adjustment screen from there press *next*.

The Setup screen will reappear.

Press *Next* to move to the Origin Screen.

Select the required origin as per the plasma section.

To carry out a gas cut.

Position the torches over plate.

Select the number of torches required for cutting using the individual cut buttons. Press the *Gas On* button and light the torches (adjust the trim valves on torches if necessary).

Select *Cut* using the *Test / Cut* Button.

Press *start*.

The machine will move to the pierce point, turn on the high pre heat, wait for the time defined in the set up screen, then turn on the cut and move off round the shape.

This process will continue until all parts are cut.

Press *Exit* to return to the Main Screen.

The fwd / rev, jog and view functions all work as described in the Plasma section.
The other functions will be described in the following section.

What to do if the cut stream starts but fails to pierce the plate.

The plate was not hot enough when the cut turned on.

Press *Stop*.

Press *To Pierce* - the machine will move back to the pierce point.

Press *Start* - the machine will restart its preheating cycle.

The same thing happens at the next pierce.

This indicates that the preheat time is too short.

Whilst the machine is in the high preheat cycle press the *Hi preheat* button. This will hold the preheat cycle on.

When the plate is hot enough press *Hi Preheat* button again - this will begin the cutting process.

The machine will then remember the new time for all following preheat cycles in the nest.

One of the torches extinguishes part way round a cut.

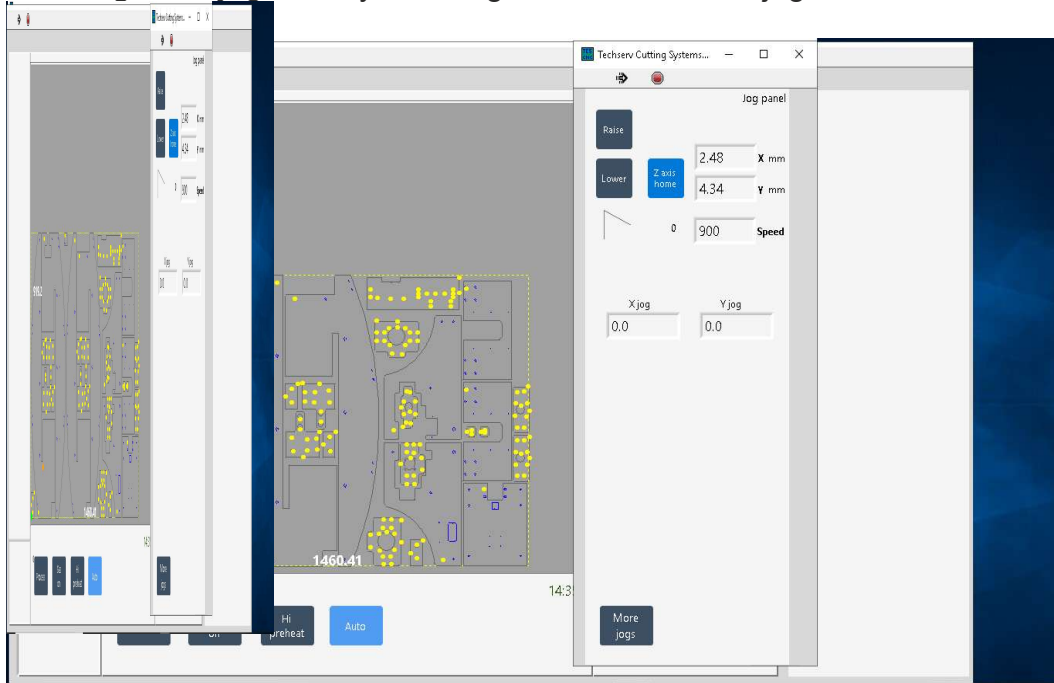
Press and hold the *Backup* button - the machine will slowly reverse round the cut path, when the torch reaches the position it blew out release the button.

The machine will then carry out a normal preheat/cut cycle and set off along the cut path.

The main difficulty arises when trying to pick up the cutting paths of the other torches. As the torches approach uncut metal press the *Creep Speed* Button this will reduce the cutting speed (to a creep) when the cuts re establish in the fresh metal press *Creep Speed* again -the machine will return to normal cut speed.

Jog Options

Pressing *More jogs* will cycle through some additional jog screens.



The relative jump screen is shown.

Tap the number fields and enter a relative distance to travel (this can be a positive or negative value).

Pressing the *do relative jog* button will move the distances as input.

To move to a Table position press one of the Table positions.

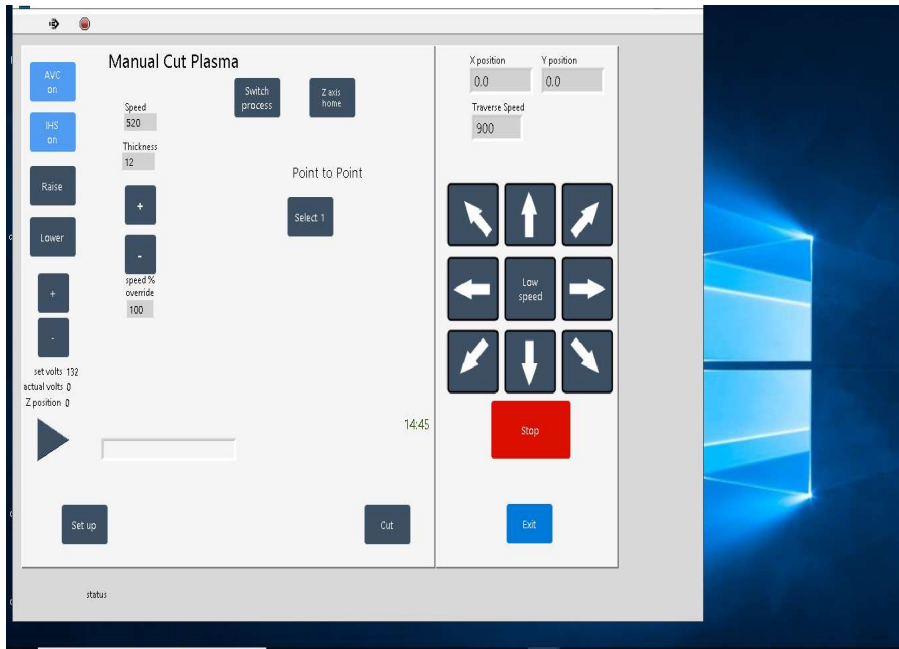
Tip:

Pressing the numeric display on the jog screen will cause the display to zero, making relative moves easier to measure.

Manual Cut

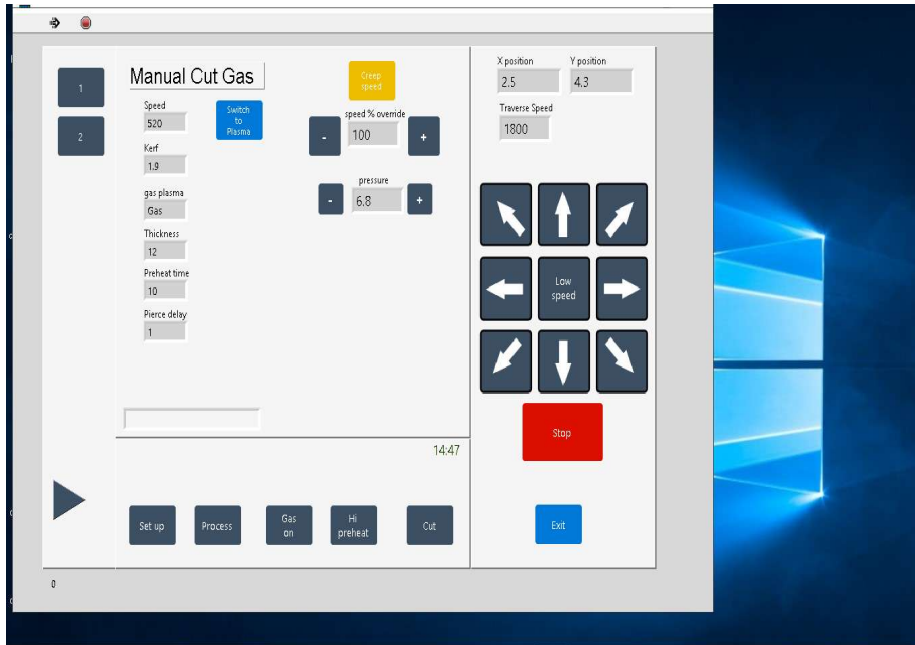
Manual Cut - Plasma

This is useful for cutting Scrap and strip cutting.



The settings on the screen will default to the last values to be cut. If different settings are required, press set up and follow the procedure described in the cutting with plasma section. Use the jog buttons to position the torch to the start position. Press *Cut* - the machine will begin a cut cycle, immediately press the desired direction button. When the plasma arcs up it will cut in the desired direction until either Stop is pressed or it runs out of material. All arc voltage functions are the same as previously described. Press *Exit* to return to the Main screen.

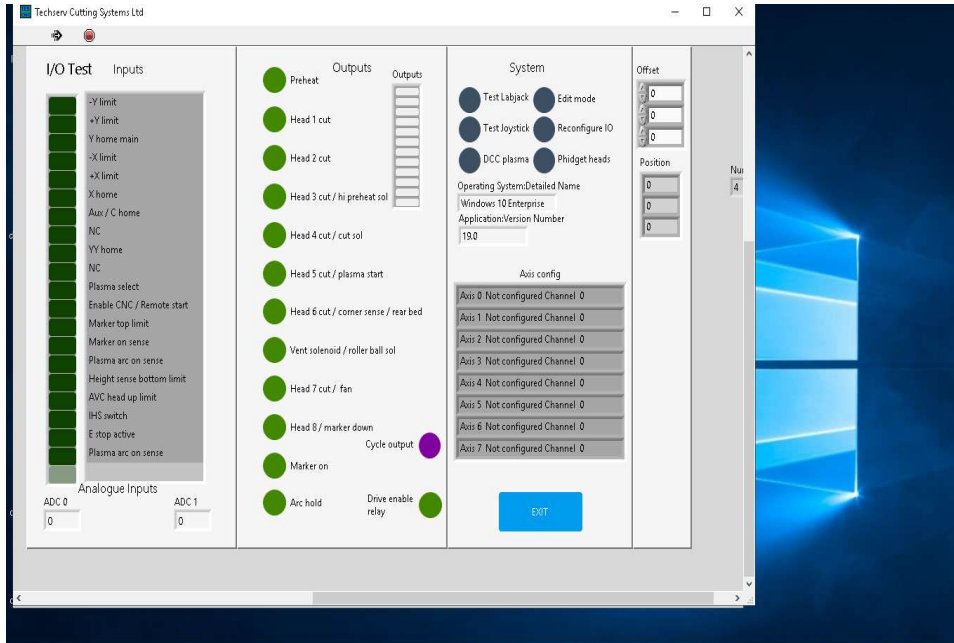
Manual Cutting- Gas



Again, the screen will default to the last setting being cut.
Press *Gas on* - light the torches.
Select heads as required.
Position the torches using the Jog buttons.
Press *Cut*, the machine will start a preheat / cut cycle.
Select the desired cut direction.
When the Preheat cycle finishes the machine will move in the desired direction until the stop button is pressed.
When finished turn the gases off.
Press *exit* to return to main screen.

Diagnostics

The following screen is accessed by pressing in the bottom left corner of the main start screen.

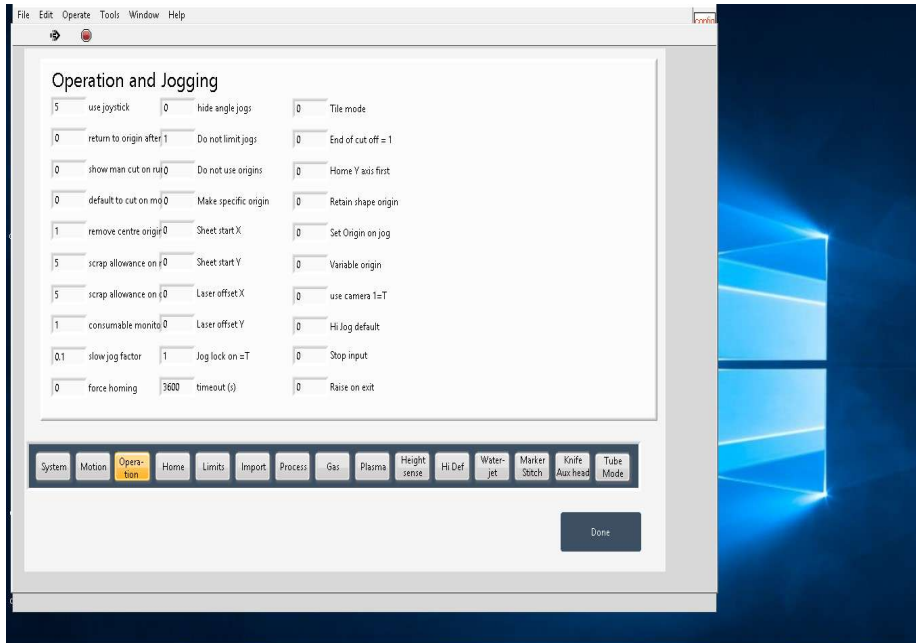


This screen displays the state of the inputs. Outputs can be selected by pressing the relevant buttons.

Additional diagnostic screens can be selected by pressing the buttons on the top right of the screen.

Configuration

The machine configuration screen is accessed via a password. There are several settings selected via the tab buttons as shown below.



Important The Diagnostic and Configuration settings should only be changed by, or under the guidance of experienced personnel. Changing a setting to a wrong value could render the machine inoperable and may cause a lengthy downtime. Before making any changes, please contact Techserv Cutting Systems.

Detailed configuration data.

1) Traverse speed

maximum speed of the machine in mm/min. If this parameter is set too high the machine will lurch on rapid traverse moves.

2) Backup speed

Speed in mm/min when backup, forward or reverse buttons are pressed.
Typically 400mm/min on gas and 2000mm/min on plasma.

3) Min rad speed.

Linked with min rad mm and max rad mm. Fractional speed of a radius of min rad mm.

IE. value of 1 = full speed, 0.5 = half speed and 0 = no speed (at this speed the machine will not move at all) . Above the max rad mm value no slow down is performed. Between the max rad mm setting and min rad setting the drive speed is reduced on a linear basis between 1(full speed) and the min rad speed value. Below the min rad mm setting the arc is cut at the min rad speed.

4) min rad mm

Full slowdown is applied to the minimum radius

5)Max rad mm

slowdown is applied from this radius and smaller on a linear basis

6)Min slow angle

No slow down below this angle of direction change.

7)Max slow angle

Machine stops on the corner at a this angle or above

8)Min corner speed.

Minimum fractional speed at max slow angle. Linked with min slow angle, max slow angle and creep angle parameter on page 2. Fractional speed of an angle. IE. value of 1 = full speed, 0.5 = half speed and 0 = no speed (at this speed the machine will not move at all) . Below the min slow angle value no slow down is performed. Between the min slow angle setting and the creep angle setting the drive speed is reduced on a linear basis between 1(full speed) and the min corner speed speed value. Between the creep angle setting and the max slow angle setting the angle is reduced on a linear basis between the min corner speed and a stop. Above the max slow angle the machine stops as the corner is performed. See also lookahead mode on page 2. If this parameter is set to a 1 i.e. ON - then the motion system will look several moves ahead, this helps the velocity profiler calculate the accel/decel around small rads (kerf fillet rads), ideally set to on when cutting with plasma.

9)Corner slow % height sense disable.

Percentage of drive speed at which the corner height sense is turned on. 100% = lots of corner height sense disable (height sense will not react). 50% = hardly any corner height sense disable (height sense will dive on corners). 90% typical.

10)Calibration X

Theoretical distance traveled (ie display value) divided by actual distance traveled (measured distance) multiplied by axis calibration. Enter this number in the relevant box above and restart controller. Note the value obtained from the calculation should not be much different from the original number possibly just a few decimal places.

The autocalibrate function will perform this automatically.

11)Calibration Y

Theoretical distance traveled (ie display value) divided by actual distance traveled (measured distance) multiplied by axis calibration. Enter this number in the relevant box above and restart controller. Note the value obtained from the calculation should not be much different from the original number possibly just a few decimal places.

The autocalibrate function will perform this automatically.

12)Corner height sense invert

0 = no invert. 1= invert height sense disable output

13)Proportional gain

Sets the proportional gain on the nextmove controller. Independent of the gain of the drive amplifier.

14)Integral gain

Sets the Integral gain on the nextmove controller. Independent of the gain of the drive amplifier.

15)Vff axis 1

Sets the axis 1 Velocity feed forwards parameter on the nextmove controller. Independent of the Vff of the drive amplifier. This parameter acts as a damper, typical value 25.

16)Vff axis 0

Sets the axis 0Velocity feed forwards parameter on the nextmove controller. Independent of the Vff of the drive amplifier. This parameter acts as a damper, typical value 25.

17)Max travel X

Maximum travel distance of the machine in the X axis mm

18)Max travel Y

Maximum travel distance of the machine in the Y axis mm

19)Table 1 X

Table positions in the bed relative to the home position.

20)Table 1 Y

Table positions in the bed relative to the home position.

21)Table 2 X

Table positions in the bed relative to the home position.

22)Table 2 Y

Table positions in the bed relative to the home position.

23)park position X

park position the machine will move to after homing (not yet implemented).

24)park position Y

park position the machine will move to after homing (not yet implemented).

25)Number of gas heads

1 to 8 gas heads - displayed on the left side of the display and individual cut solenoids output from the controller with proportional control of preheat and cut oxygen gas

-1 = no gas heads displayed and solenoid control of all gases.

26)Default plasma

0 = defaults to gas machine, any non zero value = defaults to plasma machine and selects plasma type.

0 = gas

1 = proline 275 amp range

2 = pmax 1650

3 = pmax 1250

4 = pmax 1000

5 = proline 200 amp range

6 = HSD 130

7 = Pac 500

8 = Ultra-cut 300amp

9 = Ultra-cut 100amp

10 = Cutmaster range

11 = Cutmaster A10

12 = HPR

13 = Fine focus 600

14 = HPR130XD

15 = Cutmaster A120

16 = Powermax 45

17 = Autocut

18 = Powermax 105
19 = Kaliburn 400
20 = Dagger 100
21 = Maxpro 200
22 = PowerMax 125
23 = PA S45 Kjellywerbleurble
24 = Cebora CP251
25 = PowerMax 45 XP

27)3 axis drive
0 = two axis drive system
1 = three axis drive system with Y axis slaved
2 = three axis drive system with X axis slaved

28)Machine handing RHC (1)
0 = left hand cut
1 = right hand cut

29)Buffer size
Move buffer size typically 40, maximum of 100 moves. Make this parameter larger if shapes with a large number of small blocks are cut.

30)Home direction X + (1)
Home search direction
0 = - direction (left)
1 = + direction (right)

31)Home direction Y + (1)
Home search direction
0 = - direction (backwards)
1 = + direction (forwards)

32)Rotate on import essi 0-4
Rotates a loaded essi shape before it is displayed
0 = 90 degrees
1 = 180 degrees
2 = 270 degrees
3 = no rotation

33)Rotate on import WADR 0-4
Rotates a loaded word address shape before it is displayed
0 = no rotation
1 = 90 degrees
2 = 180 degrees
3 = 270 degrees

34)Accel rate

Acceleration rate in

35)Decel rate

Deceleration rate in mm/s/s

36)Drive mode

Sets the operating mode of the nextmove controller

1 = servo mode

2 = stepper mode

5 = virtual mode ie no movement from the drive motors

37)Limit 1 = no

Limit switch input sense select

0= normally closed limits

1 = normally open limits

38)Home speed

Speed of home switch search speed in mm/min

39)Home position X

When home routine is finished the machine position is set to this value in mm

40)Home position Y

When home routine is finished the machine position is set to this value in mm

41)Square offset

The offset between the main and slave carriage switch points when the machine is square

42)Maximum skew.

The maximum amount the machine can be out of square, taking into account the square offset. If this value is exceeded during a home routine then the routine will stop and a skew error is displayed. The fault is remedied by returning to the main menu and pushing the slave side to correct the error. The home routing can then be restarted. Normally 25mm but flexible machine can have a higher value if required.

43)Cad traverse

0 = no change

1 = start and end traverse moves are stripped from downloaded programmes.

This action allows the user to specify the plate setup point rather than the cad data.

44)Estop 1 = no

Emergency stop switch input sense select

0= normally closed emergency stop
1 = normally open emergency stop

45)Phase search on start 1 = T

0= no change

1 = on start up the 'please wait phase search' screen is shown. This is used when an AC motor is not equipped with hall sensors and the drive system has to perform a phase search to identify the drive position.

46)Use camera

0 = no camera on jog screen

1 = not implemented

2 = loads USB camera drivers and displays on jog screen

47)Import ABS = T

Essi file import

0 = relative data

1 = Absolute data

48)WA no cut on off

0 = import a standard word address programme with cut on/off commands

1 = import a non standard word address programme with no cut on/off commands ie assume G0 = cut off.

49)Jog lock on = T

0 = do nothing

1 = Display the jog latch button on the jog screen when the machine has not carried out a home routine.

50)Timeout (s)

Time in seconds that the machine will wait at the menu screen before returning to the main screen to switch off the drives.

51)Do kerf = T

0 = no kerf offset routine performed

1 = kerf offset routine performed on standard shapes and downloaded shapes if kerf downloaded shapes is selected (1)

2 = NCTC kerf on all shapes if kerf downloaded shapes is selected (1)

3 = BBS kerf on standard shapes - NCTC kerf on downloaded shapes

52)Plasma off delay

Time dwell in seconds before the machine will move after the arc has been turned off

53)Following error fatal

Position error in mm that the machine can travel before the following error

activated and the motion stopped.

54)Use dongle

0 = no dongle protection

1 = dongle protection activated

55)Small arc speed up factor

no longer used

56)Height sense type

0 = no hs

1 = simple avc / ihs

2 = blue marlin plate riding roller

3 = blue marlin HTA stepper

4 = Hi Def height sense

5 = Hi Def height sense with following error plate detect

6 = simple height sense with touch down switch and HTA

57)x axis rev

selects direction of x axis drive and encoder sense

0 = no change (stepper = no change)

1 = encoder reversed (stepper = reversed)

2 = drive reversed

3 = encoder and drive reversed

58)y axis rev

selects direction of y axis drive and encoder sense

0 = no change (stepper = no change)

1 = encoder reversed (stepper = reversed)

2 = drive reversed

3 = encoder and drive reversed

59)Kerf download shapes

0 = no kerf offset on downloaded shapes

1 = kerf offset downloaded shapes if the do kerf parameter is set to 1

60)Bleed off time

Gas cutting bleed off time in 10 millisecond units ie 200 = 2 seconds (strange)

Page 2

61)Head rl speed

Sets raise lower speed of simple height sense head, no units as this value is hardware dependent typical value 60

62)AVC gain

Sets the gain of the AVC loop hardware dependent typical value 3

63)IHS raise calib

Sets the calibration of the initial height sense raise speed, height is set using a time delay

64)AVC calibrate

Converts arc voltage input to volts for display and height calculations.

65)Plate roller head down delay

Time in milliseconds to allow the plate riding roller head to drop before the plasma is turned on.

66)Hi Def height sense (Hold To Analogue function) HTA kprop

Height sense proportional gain, a negative value changes the hold direction must be used with the damping factor

67)HTA damping

Height sense damping factor

68)HTA kint

Height sense integral gain factor

69)HTA filter

Height sense filter

70)Latch kerf command

For use when the input programme has only one initial kerf command any further kerf commands are implied

71)Use joystick

Enables USB joystick function

1 to 10 = joystick selected and channel number

-1 = numpad

72)Fume bed (See end for Canbus setup data)

0 = no fume bed attached

1 = fume bed attached USB control

2 = fume bed attached Can Bus set node on bed setup screen

3 = Small fume bed uses output 6 for rear section

4 = Escoco fume bed used with Phidget Relay interface type 1017. Phidget tray application should be installed for this to work.

73)Ignore arc off for(s)

set to 1 second to ignore the arc off signal received when cutting small circles with a lead out and the arc is lost

74)5 volt gas signals

rescales the AO signals for use with 5 volt valves (normally 10 v)

75)external inhibit

external inhibit on DI7. When set to 0 the input is ignored, 1 the input is normally low, 2 for normally high, 3 the input is normally low and the drives are disabled, 4 for normally high and the drives are disabled

76)Idle precision (0.2)

Increasing the idle precision increases the window in which a drive is considered to be Idle, default is 0.2mm, required when motor mount encoders are not used on high mass systems. this parameter needs increasing if the 'return to pierce' function takes a long time to complete. (mm)

77)no enc prescale

Motor mounted encoders require a prescale factor as the pulse count is very high causing the counters to overrun. Machine mounted encoders however have a much lower pulse count so the prescale is not required. The default value is 'no enc prescale' set to 4321 to turn prescale off (the value of 4321 is chosen as it is unlikely to be in this field accidentally)

78)Aux X P Gain

Used in conjunction with the above parameter, this setting allows the P Gain of the axis to be set independantly, used when the axis are of different mass and dynamics.

79)waterjet=1

Waterjet extentions enabled

80)Partial raise height

Sets height sense raise height

81)HS follow error

Sets height sense following error, used when the torch touches the plate during the IHS cycle, if the torch stops short of the plate this value can be increased do not set too high as the torch will press the plate too hard typical value 0.2mm

82)Retract delay

Delay before torch retracts after cut. (ms)

83)IHS Delay

Not used, individual parameter set on process setup screen

Delay before IHS drops to cut height after cut is initiated, helps to clear slag pools on thicker material (seconds)

84)Prop gain
Proportional gain

85)Man speed
HTA height sense manual speed

86)IHS speed
IHS speed mm/min

87)Crossover height
Height above plate at which the head slows down, easured from torch park position, note the plate thickness is included in this value automatically

88)Height sense channel
Axis used by hi def height sense channel 2 on a 2 axis system or 3 on a 3 axis system

89)Height sense drive direction
selects direction of hi def height sense drive and encoder sense on the height sense
0 = no change (stepper = no change)
1 = encoder reversed (stepper = reversed)
2 = drive reversed
3 = encoder and drive reversed

90)HS encoder scale
Hi def encoder scale factor

91)HS K prop

92)HS Accel

93)HS Decel

94)HS lockout (mm)
Height sense is frozen if the cut is within xx mm of a cut off. Used to help prevent the head diving into the plate when reaching the end of the cut. Typical setting 5mm. Red indicator shows on the run screen and cursor turns purple when the lockout is activated. Set to zero to disable. When configured as a waterjet machine, lockout flags the end of a cut and initiates slow down routine.

95)AVC speed

96)HTA deadband

97)Creep angle

see min corner speed setting

98)Treat kerf fillet as line

set to 0

99)Lookahead mode

see min corner speed setting

set to 0 for gas

1 for plasma

100)Close loop for kerf

< 0 checks individual shape geometry for a closed loop, ie start and end point should be the same, if they are not, a correction is added. Note only works with a lead in and out.

0 = no change

1 and above applies granularity factor to kerf routine, increases the tolerance of the offset routine to inaccurate geometry (2)

101)Return to origin after cut

Only functions after the machine has been homed. Note the end of cut screen must be enabled for this feature to function.

0 = no change

1 = return to origin after cut

2 = return to home after cut

3 = return to table 1 after cut

4 = return to table 2 after cut

5 = return to table 3 after cut

6 = return to table 4 after cut

7 = return to park position after cut

102)Generic shape code

activates optional generic shapes

103)Priority

Sets programme priority within windows

5 = realtime

4 = high

3 = above normal

2 = below normal

104)Show man cut on run screen

0 = not shown

1 = shown

105)IO loop speed ms

Speed of the IO loop in ms, a slower PC may need a slower loop speed to prevent USB data clashes (screen hangs up) 30ms on a fast pc, 50ms on a slow pc

106)Cut on delay ms

Sets the amount of time the programme waits whilst setting the cut on logic. Not cut on delay or pierce delay

107)Default to cut on mode (1)

Sets run screen mode to cut rather than test

108)Remove centre origins (1)

Removes centre origins on run screen (reduces screen clutter)

109)Plasma off early decel factor

If set to zero no plasma off early function. If set to 1 then off early distance is calculated on cut speed, an allowance is made for the deceleration of the machine towards the end of the cut i.e. the plasma turns off later (closer towards the end of the cut) the current time value can be used to trim the off early function to ensure cuts finish or to reduce the amount of burn in.

If 2 is entered then the routine just calculates the early off distance on the last line rather than 1 which calculates the early off on the last 2 lines.

if a negative value is set then then this function acts as a slow down at the end of the cut to assist in finishing off the cut when a process with a large drag angle is used i.e. H17 cutting. The negative value representst the % feedrate to be used i.e. -20 = 20 % speed for the last x ms as selected by the current setting on this page.

If this value is set to 3 then the routine is simplified, the earlier current settings in ms are changed to mm. Typical setting of 3mm

110)Table 3 x

Table position

111)Table 3 y

Table position

112)Table 4 x

Table position

113)Table 4 y

Table position

114)scrap allowance on repeat

115)scrap allowance on origin

116)drive direction slave

selects direction ofslave drive and encoder sense on a 3 axis system

0 = no change (stepper = no change)

1 = encoder reversed (stepper = reversed)

2 = drive reversed

3 = encoder and drive reversed

117)close loop, repair arcs (1,1)

leave set to 0 as no longer used

118)Consumable monitor (0)

Display consumable monitor

119)Slow jog factor

Jog multiplier to give low jog speed. (0.05) smaller number gives slower speed

120)AVC source

selects which channel 0 or 1 to be used as the plasma arc voltage input source when 0 is used channel 1 acts as the touch down input channel.

If channel 1 is specified the Labjack input 0 is used as the touch down input

If channel 3 is specified, then channel 0 is used as the HTA input and the Labjack input 0 is used as the touch down input.

121)Use software limits

0 = not active

1 = Do not use type 1, use type 2

on, machine will stop when drive is not between the values below - only when the machine has been homed

2 = similar to 1 but implemented in software to prevent drives from drifting, also has aux x drive support

122)- x limit

software limit stops when less than or equal to this value

123)+x limit

software limit stops when greater or equal to this value

124)- y limit

software limit stops when less than or equal to this value

125)+y limit

software limit stops when greater or equal to this value

126)Canbus gas node

selects which node the canbus will use for the canbus AO signals

127)essi scale factor

Used when esi data is not in the usual 10mm format

128)Force homing

0 = not active

1 = machine must be homed before a shape can be loaded

2 = Z axis must be homed before a shape can be loaded

129)fan on time (s)

0 = no action

non zero = automatic fan time. Fan output turns on when plasma it on and remains on for this time in seconds

130)look for double cut

This parameter freezes the plasma height sense when a cut line passes close to a pre cut line. To prevent inadvertent operation the double cut check is active over the last xx mm of cut line as specified in this parameter (100mm is a good start value) The checking distance is shown on the display by two blue dots, one following just behind the cursor and one xx distance behind (a function of the window size parameter.

131)Window size

This specifies the distance within which a cut is classed as a double cut and the height sense is frozen (3mm)

132)Corner slow mm

133)marker on code

set to match essi marker on code used or word address code without the leading M (automatically inserted)

134)marker off code

set to match essi marker off code used or word address code without the leading M (automatically inserted)

135)x marker offset

x axis offset between cutting torch and marker in mm

136)y marker offset

y axis offset between cutting torch and marker in mm

137)marker type

0 = no marker
1 = drill
2 = plasma marker
3 = pneumatic pen
4 = magnetic drill
5 = hi def plasma marker
6 = Spot marker
7 = Powerma marker

138)marker speed
Travel speed in mm when marking not used with drill

139)marker down time
time in seconds for marker to drop to the plate

140)marker drill time
drill on time in seconds
with marker type 4 this should be set as a maximum time out as the drill will lift the drive inhibit signal once the drill cycle is complete and the marker cycle will finish

141)inhibit homing till drill is up
0 = no action
1 = marker up input has to be on before machine homing is permitted

142)hide angle jogs
0 = no change
1 = hide the jog buttons located at the 45 degree positions

143)hide history
0 = show history
1 = hide history on run screen (default)

144)Draw arcs as lines = T
0 = draws arcs as arcs, can lead to gappy plots
1 = draws arcs as lines, cleans up plot screens but uses more processing time to regen the plot

145)cyb simplify
Factor 0 to5 used to combine small lines as used in Cybermation machines to longer lines while maintaining shape geometry. Small lines can cause buffer underrun (jerky motion)

146)Heartbeat Popular tv series (never watched it so can't comment)

147)DXF simplify

This routine scans a dxf file and identifies lines less than 3 mm long and with an angle change of less than 5 degrees, these lines usually form arcs etc. The lines are then removed to simplify the file. The parameter sets the maximum number of lines that can be removed. For example setting the parameter to 10 would remove 9 lines and leave the 10th. Typical value 10, when set to zero the routine is skipped.

148)Special import filter

For strange machine dialects

1 = Farley fabricator

2 = Sigma nest

3 = Techsoft

4 = Igems

5 = Messer

6 = SheetCam

7 = Stripped word address

8 = CADlink

9 = Sigmanest waterjet

10 =Word address special ABS with relative arcs

11 = Sigmanest ANCA

12 = Sigmanest WA with line numbers

13 = Pronest Word Address

14 = Sigma Word Address with marking codes

15 = Nestmaster Word Address with kerf commands

16 = Shapecut ESSi, kerf command after cut

17 = Word address Vulcan (no cuts, G1 = traverse and no arcs

18 = G code special

149)2nd plasma type

For machines fitted with 2 different plasma packs, specifies the plasma type for plasma 2 same format as default plasma

150)2nd avc calibrate

as above the 2nd plasma pack requires a separate avc calibration value, or if stepper plasma heads are fitted, acts as avc calibrate for second head, defaults to head 1 avc calibrate if left blank

151)Use plasma select input 1 = T 2 = inv

For twin plasma systems allows the switching of the plasma types to be via a front panel switch

0 = dont use switch

1 = use switch

2 = use switch but invert input

152)Pre start plasma

0 = off

1 = on

When selected starts the plasma as soon as IHS routine is started. Hold signal is then issued and released when plasma has started, reducing cycle time

153)Thick pierce lift mm

When the plasma pierce delay is set to a negative value the THC will raise this amount above the plate and start motion, this is to prolong consumable life and to avoid cutting through the splatter

154)Lead in slow factor

Typical 40(%)

This factor reduces speed when cutting a lead in line, useful when cutting reduced speed circles (bolt holes) works for a maximum lead in of 10mm the resumes normal speed.

155)Home Z switch fitted

Set when a plasma height sense is fitted but with no external Z top limit, ie limit is built into motor. Outputs Z raise signal for 5 seconds.

156)Invert plate sense.

Inverts the sense of a plate detect switch.

169)Knife on code

170)Knife off code.

171)HS on code

Specifies WA code to enable auto height sense

172)HS off code

Specifies WA code to freeze auto height sense

173)Mid programme stop code

Specifies WA code to issue a STOP command during a programme. Used when the programme requires a manual change, such as turning a gas head off etc.

174)Head select out =1

outputs gas head select signal when head is selected rather than when head is selected and cut is on, used for selecting height sense etc.

175)Multi plasma heads

Number of plasma heads fitted on a multi head machine

176)Multi plasma mode

mode 1 start as soon as 1 plasma fires

mode 2 start as soon as all plasmas have fired or wait till time out and stop

mode 3 start as soon as all plasmas have fired or wait till time out and start

177)Multi plasma time out (ms)

Timer value used above in milliseconds

178) Invert height sense limits

1 = both limits inverted

2 = only upper limit inverted

3 = only lower limit inverted

inverts height sense raise/lower limits, aids noise supression

179)nesting option code

enables nesting option

180) demo mode

Controller works in demo mode, no external device required

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181)Wiggle pierce dia

set the diameter or the circle when a wiggle pierce is performed , 1mm typical

182)Reduced cut accel

Allows a slower accel/ decel rate to be used when cutting, does not affect the jog or manual cut accel rates. Value is fractional .1 to 1 (do not use 0 as the machine will error and not move)

183)Aux head channel

Axis channel to be used by the aux head (usually 3)

184)Aux axis rev

selects direction of x axis drive and encoder sense

0 = no change

1 = encoder reversed

2 = drive reversed

3 = encoder and drive reversed

185)Aux home direction

Home search direction

0 = - direction (left)

1 = + direction (right)

186)Aux home position

Position assigned to aux axis when home position is found

187)Aux min spacing

Minimum spacing permitted between main head and aux head.

188) WJ Stepper heads

Outputs stepper signals to control raise / lower heads on a water jet and gas machines.

189) Master cut out

Outputs a master cut out signal on OP11

190) AVC thick pierce (s)

Not implemented

191) simple AVC limit

Limits the maximum AVC output used on simple height sense, required to prevent height sense diving into plate. Typical value 25 i.e. 2.5 volts (drive card uses +/- 5v)

192) Simple HS speed % NOT used

used with Simple HS overtravel parameter to speed up the IHS limit switch overtravel, defaulted to 30%

193) Simple HS overtravel NOT used

When using the simple HS IHS (ie touch down on a linear slide or similar) the overtravel parameter is set to equal the amount of movement from the switch remaking to the torch leaving the plate. Used if there is a lot of lost motion in the system or overtravel before the switch operates. Units mm

194) Single prop valve

Combines the analogue value of both preheat and cut oxy, to allow the use of a single proportional valve, must be used with an additional solenoid and non return valve.

195) Use Labjack type

Forces the Labjack outputs to be used regardless of machine configuration.

Set to 1 for Labjack U12

Set to 2 for Labjack U3 with LJ dac tick module

Set to -1 to not call labjack (for test only)

196) More slow lead in

Uses an advanced slow down programme to detect if a small diameter is being cut, if so the lead in line and any small arcs and lines are cut at the slow arc speed. When used this function overrides the 'lead in slow factor' parameter

197) Do not limit jogs

Jog function uses machine software limits to set maximum jog travel, to reduce

the risk of crashing the machine against the hard stops. Only set this bit if there are no values in the software limit fields

198) Do not display kerf

Allows for a faster redraw by only displaying the kerf offset line in blue and not the original geometry, used if large nests are causing the system to run slowly

199) Do not use origins = 1

Overrides the origin select buttons on the run screen when cutting downloaded nests, used if the nests are irregular in shape and fit to remnant plates

When set to 2 overrides the origin as above and traverses to absolute sheet start position X and Y as defined on next column

200) e100 = 1

Set to 1 to use e100 controller, not yet implemented

201) Multi threading = 1

Set to 1 to enable multithreading of the Nextmove ActiveX thread

202) Gas torch type

Selects gas cutting torch type.

0 = Harris

1 = Messer

203) 0 to 10 bar output

Set to 1 to give 10 bar = 10 volt output

normally set to 0 to give 7 bar = 10 volt

204) Disable quickstart

When set to 1 quickstart plasma function is disabled.

205) remap +X limit

remaps the +X limit input, use 6 or 7 to map to input 6 or 7

206) remap x home limit

remaps the x home limit

207) remap IHS switch

remaps the IHS switch

208) Sheet start X

Defines X sheet start position in absolute coordinates

209) Sheet start Y

Defines Y sheet start position in absolute coordinates

210)Default thickness

Sets initial default value used on job setup screen

211)Default material

Sets initial default value used on job setup screen

0 = left hand button

1 = next button etc.

212)Default current

Sets initial default value used on job setup screen

0 = left hand button

1 = next button etc.

213)Short traverse no lift

Specifies maximum distance machine will move without lifting plasma head in mm

0 = always lift, typical value = 50

214)Split long lines mm

Breaks long lines into segments to reduce unwanted slowdown at end of line set to 800mm ish

215) Essi split arcs

Splits circles in two arcs in ESSi programmes, used when +0+0+I+0+ type geometry causes issues.

1 = on

216)Low cut feed %

Sets feedrate whilst low cutting pressure is ramping up, both gas and waterjet process.

217)Small inner min mm

Small holes i.e., inner squares slots etc. (round holes use the settings in the special hole routine) are slowed down by the small hole speed factor (below). This value sets the minimum size the speed is factored over. I.e.

Small inner max mm size = no slow factor

Small inner min mm size = full slow factor

Typical value 20mm

218)Small inner max mm

Small holes ie inner squares slots etc. (round holes use the settings in the special hole routine) are slowed down by the small hole speed factor (below). This value sets the maximum size the speed is factored over. I.e.

Small inner max mm size = no slow factor

Small inner min mm size = full slow factor

Typical value 60mm

219)Small hole speed factor 0-1

Small holes i.e., inner squares slots etc. (round holes use the settings in the special hole routine) are slowed down by the small hole speed factor. This factor sets the minimum speed the minimum size hole is cut at. The factor increases to 1 on a pro rata basis until the Small inner max mm size is reached.

Typical value = 0.4

220)Laser offset X

Laser pointer offset from the cutting torch in mm

221)Laser offset Y

Laser pointer offset from the cutting torch in mm.

222)Abrasive calibrate 1

Waterjet only. Abrasive feed unit 1, use this calibration factor to enable (non-zero value) and calibrate the abrasive feed stepper motor to deliver g/min (grammes per minute)

223)Abrasive calibrate 2.

Waterjet only. Abrasive feed unit 2, use this calibration factor to enable (non zero value) and calibrate the abrasive feed stepper motor to deliver g/min (grammes per minute)

224)Min arc slow down angle.

Waterjet only. Minimum angle which the arc slow down routine will activate, default 30 degrees. I.e., any angle over 30 degrees will be cut at a speed defined by the min rad speed and associated radius settings

225)Plasma no arc on threshold

Used when the plasma pack does not give an arc transferred signal, CNC sees a voltage between 50v and this value as an arc transferred signal when the plasma set to on. Typical value 200v

226) X Kvelff

X axis velocity feed forward

typical value 200, reduces following error, dependent on axis mass etc.

227) Y Kvelff

Y axis velocity feed forward

typical value 200, reduces following error, dependent on axis mass etc.

228)Advanced hyper hole

0 = off

type 1 =Automatic

type 2 =Cmd Li A Lo
type 3 =Cmd Li A A Lo
type 4 =Cmd Li Li A A Lo
type 5 =Cmd Li Li A Lo Lo

type 10 = special for Acad lisp interface by 'Straight Lines'
type 11 = special 270 degree arcs used by days
type 12 = Lantek essi

select type to suit hole program type
Cmd = command
Li = lead in
A = arc
Lo = lead out

229)Reconfigure IO
Enables the reconfigure IO screen.

230)Colour
selects colour scheme.

231)Advanced hole off param
Distance in mm at which the arc turns off, typical set to 2 for hi def plasma, and 0 for conventional.

232)S Ramp
Selects trapezoidal or S ramp accel /decel type.
0 = trapezoidal
1 = S ramp
If S ramp is used the Accel jerk and Decel jerk parameters are also used

233) Accel jerk
Sets the rate of change of acceleration during periods of acceleration, expressed in mms/second³.

234)Decel jerk
Sets the rate of change of deceleration during periods of deceleration, expressed in mm/second³.

235)Max Z travel
If the IHS is attempting to find the plate and heads down a hole, set this parameter to the lowest plate position to reduce the chance of the torch getting snapped off. Default 280mm

236)Re start plasma.
Not yet implemented.

237)Waterjet calib 0mm

Waterjet height sense calibration value, measure the AI value of the height sense potentiometer when the nozzle is touching the plate and enter that value here (typical 85)

238)Waterjet calib 10mm

Waterjet height sense calibration value, measure the AI value of the height sense potentiometer when the nozzle is 10mm above the plate and enter that value here (typical 65)

239)Plasma marker pulse ms

Length of time in milliseconds that the plasma pack is pulsed on, when marker type 6 is selected.

240)Alternative slow down

Water jet only, Calculates the angle of each move and applies is factor to slow the machine in and out of the corner. This is a factor and is applied in two stages 4mm and 2 mm before the corner. 4mm is 0.5 x the factor. Typical value 0.3

241)Stepper head

2nd stepper height sense head T=1

242) Stepper head IHS

2nd stepper head IHS switch offset

243)Collision value

Set to non 0 to enable. This function activates the collision detection sensor. A larger value decreases the sensitivity, i.e., 0.5 would require a larger deflection to activate than 0.1

244) Slave enc scale

Sets the slave (axis 3) encoder scale, if set to zero (default) then the same scale is used as the main axis, only used if the gear ratio or encoder counts are different between the axis.

245) Use old dxf in

Uses the old separate dxf2gcode exe rather than the integrated one. Included for debugging and beta testing.

246)Stepper gas output

Sets proportional gas valve channel when using an ES stepper card, set to 1 or 2 representing channel 0 or 1

247)Tile mode

Removes the outer profile of the shape and auto repeats the inner, used when

cutting multiple parts from a jig eg cutting tiles. Set to 1 to activate.

248)Read NC1

Activates NC and NC1 import filter for Strucad/Tekla files

249)WJ cut off slow mm.

Distance in mm to slow down before a cut off block.

250)Retain shape origin.

setting this parameter to non-zero retains the last parts origin.

251)Plasma corner speed

When cutting with plasma the system uses this corner speed to reduce ringing on less dynamically stable machines. The standard corner speed is used for gas cutting to reduce dwell on corners. If set to 0 the system defaults to the standard corner speed, typical value 0.01.

252)Plasma quick cut

When set to nonzero, this feature bypasses the preview and plasma setup screen, when used with the do not use origin and plate start functions, the system operates in a manner more typical of a duct cutting machine.

253)Hole to marker.

converts a hole of this radius to a marker on/off sequence (fixed at 1.5mm rad). Must have no lead in or out, currently only for sheetcam files.

Create a text file here with the cnc code that should be replaced C:\data\marker substitute text.txt.

254)Marker 6 delay.

Time in seconds the machine waits after marking to allow the plasma purge to stop, about 8 seconds with a Powermax 1250.

255)WJ Press calib

Water Jet pressure calibration multiplier. This value converts the CNC pressure value (in Bar) to volts.

256)WJ Hi Press bleed

Water Jet Hi pressure bleed off time, activates at end of cut to dump high pressure and switches to low pressure. Time in seconds.

257)End of cut off = 1

End of cut screen, showing return to origin - repeat - jog away from job etc. Default is set to on, set to a nonzero value to disable.

258)Backlash X

X axis backlash compensation in mm

259) Backlash Y

Y axis backlash compensation in mm

260) Backlash interval

Time in ms over which the backlash is introduced, typical 1000 ms.

261) Large arc threshold

If an arc is larger than this threshold value it is considered to be a straight line and converted in the import routine.

Typical value 500000 i.e., 500 metres, set to 0 to disable.

262) Hypertherm DCC

Set to nonzero to enable Hypertherm Direct Current Control feature and HPR Autogas control.

RS485 port must be configured to Com 3 via device manager for this feature to function. Also, you must have a compatible plasma pack, a RS485 converter and NI VISA should be installed.

263) Home Y axis first

When set to 1, the Z axis home is found followed by the Y and X rather than X and Y

264) Swap Labjack output

When set to 1 swaps the labjack output channels from 0 to 1 and 1 to 0

265) Precision increment

Distance between measurements listed in the precision table typically 10 mm

266) Precision mode

Setting this parameter enables the use of a precision table.

0 = not loaded

1 = single table for both directions

2 = tables for each direction

The table is a 2d csv array located at C:\data\ precision table.txt.
and represents the actual tool position at each increment i.e.

0.00,10.01,20.00,30.00,40.02,50.03,59.98 etc

The format is:-

x axis forward (or both forward and reverse, if so leave out the last 2 or 3 lines)

y axis forward

yy axis forward (not required for 2 axis systems)

the next are optional.

x axis reverse

y axis rev

yy axis rev (not required for 2 axis systems)

267) Set Origin on Jog

Replaces move job button with a set origin button, when pressed this sets the origin to the current point and reloads the shape so the part will start from the new origin point.

268) Wiggle speed mm/min

Sets the wiggle speed when waterjet cutting. Default 200 mm/min

269) Variable origin

When set to 1 this parameter will use the origin of the shape if the bottom left screen origin is selected, or the shape extents if the other origins are selected. If the shape is rotated or mirrored, then the extents are used in all cases.

270) Autoload file

When set to 1 the load file screen will attempt to load the next file in sequence, if there is no file then the file select screen will be displayed as normal. Cancel by pressing the autoload button.

271) Tube Mode

When set to >1 tube mode is activated and the tube start button appears on the start screen.

A value of 1 sets the cnc in circumferential drive mode, 2 is stepper centre drive mode and 3 is servo centre drive mode.

272) Tube Calibration

Calibration factor for the tube axis circumferential drive mode.

273) Tube backlash X

Tube axis backlash

274) Tube backlash Y

Y axis backlash when in tube mode

275) Tube backlash interval

Time in ms over which the backlash is introduced, typical 1000 ms

276) Tube max speed

Maximum traverse speed when in tube mode

277) X Kderiv

278) Y Kderiv

279) X Kaccel

280)Y Kderiv

281)Test run speed

Traverse speed in mm/min when set to high speed in test run. When set to 0 defaults to 3000.

282)Accel jerk time

The time required to reach profiler ACCEL from zero, expressed in milliseconds.

283)Decel jerk time

The time required to reach profiler DECCEL from zero, expressed in milliseconds.

284)Anti bounce accel

When set, introduces an additional set of accel/decel parameters, only used in plasma mode.

This value is a factor so setting it to 0.5 will reduce the speed in the corner to 50%.

285)Techserv Kerf

When set to a nonzero value the Techserv kerf routine is used on downloaded shaped.

BBS kerf is still used on flexi shapes.

When set to 2 Techserv kerf is used on all shapes.

286)Plasma 2 AVC calib

Calibration factor for second plasma head on multi head (duplicate) plasma systems, takes main calibration value if set to 0

287)Time till low Kprop (s)

This parameter times when the drives are idle and after x seconds sets the Kprop gain to 0.25 of its value. As soon as motion is attempted the Kprop resumes its original value. Set to zero to disable the function.

288)Stepper delay (us)

Delay in microseconds between a change of step direction and the commencement of the pulse train. Range 0 to 4 microseconds.

289)Kerf arc tolerance

If the start and end radii of an arc vary by more than the % tolerance specified, then the arc will be split into straight lines and not recombined. Large arcs at high speed may cause the machine to overrun the move buffer, causing the machine to stutter. If this occurs the ideally adjust the geometry of adjust the tolerance up.

290)Alt import code

0 = not used
1 = tap
2 = cnc
3 = mpx
4 = esi
5 = b3
6 = dxf
7 = nct
8 = awj
9 = tes
10 = cyb
11 = sav
12 = n
13 = N
14 = mpg
15 = lst
16 = mc3
17 = nc
18 = nc1
19 = cod
20 = tf

291)Alt import type

For strange machine dialects

1 = Farley fabricator
2 = Sigma nest
3 = Techsoft
4 = Igems
5 = Messer
6 = SheetCam
7 = Stripped word address
8 = CADlink
9 = Sigmanest waterjet
10 =Word address special ABS with relative arcs

292)Alt Superhole type

0 = off
type 1 =Automatic
type 2 =Cmd Li A Lo
type 3 =Cmd Li A A Lo
type 4 =Cmd Li Li A A Lo
type 5 =Cmd Li Li A Lo Lo

type 10 = special for Acad lisp interface by 'Straight Lines'

type 11 = special 270 degree arcs used by days

type 12 = Lantek essi

select type to suit hole program type

Cmd = command

Li = lead in

A = arc

Lo = lead out

293) Kerf comp Superpole

Compensation applied to Superhole in addition to kerf com to allow for additional material removed due to reduced speed 0.2 mm.

294) Kerf with lead outs

Set to 1 when cnc program has lead outs so kerf corrects properly. Temporary function whilst automatic version is implemented.

295) PlasmaCam

Set to 1 when used with PlasmaCam machine, IE no head top limit fitter.

296) Kerf special

Used with 'Straight Lines' Autolisp routine

297) Tube calib centre mode

Calibration value for a centre driven chuck, should be set so that 360mm of travel equals one turn.

298) Enable input

Default is Din 11.

When set to 0 the input is ignored.

When set to 1 cutting is disabled when high.

Set to 2 cutting is disabled when low.

299) Waterjet deep decel

When set to 1 this function uses the min rad speed slowdown in addition to the waterjet slowdown factor.

Min rad speed.

Linked with min rad mm and max rad mm. Fractional speed of a radius of min rad mm.

IE. value of 1 = full speed, 0.5 = half speed and 0 = no speed (at this speed the machine will not move at all). Above the max rad mm value, no slow down is performed. Between the max rad mm setting and min rad setting the drive speed is reduced on a linear basis between 1(full speed) and the min rad speed value.

Below the min rad mm setting the arc is cut at the min rad speed.

300) Flip kerf side

Set to 1 when kerf appears on wrong side.

301)HPR marker gas

set to 0 the HPR uses Nitrogen, set to 1 it uses Argon and air or nitrogen depending on the material type.

302)Default to High-speed jog

303)Drive to point after homing.

Only functions after the machine has been homed.

0 = no change

1 = Park at table 1

2 = Park at table 2

3 = Park at table 3

4 = Park at table 4

5 = Park at park position, as entered positions below

304)Make origin top left.

Only used if Do not use origins is set to 1, default mode is bottom left origin, when set to 1 this makes the origin top right,

2 = top left

3 = bottom right

4 = bottom left

5 = top middle

6 = bottom middle

7 = centre

305)Micro waterjet

Set to 1 for use with a micro waterjet and utilises a phidget card for the abrasive feed unit.

306)Set from job.

Sets the diameter of the tube from the incoming data automatically.

307)Powermax lead length

Sets the plasma to the correct pressure for the lead length fitted. Only used when the CNC sets the plasma current, i.e., DCC is set to on. Only valid with the Powermax 65, 85 and 105 plasma packs.

0 = 15.2m = 80 psi (default)

1 = 7.6m = 75 psi

2 = 22.9m = 85 psi

308)Kerf squeeze

Minimum angle for the kerf squeeze factor to take effect.

If two lines meet at an (outside) angle above this value the routine truncates the lines and inserts a small line to prevent the kerf compensation line becoming too long, given a very large angle it would approach infinity.

Typical value 99 degrees set higher if spurious lines appear.

309)Stop input.

Enables a remote motion stop / start input.

0 = disabled

1 = enabled n.c.

2 = enabled n.o.

310)Alt marker offset X.

311)Alt marker offset Y.

312)Use alt marker

If multiple process machines are fitted with a separate marker then two sets of marker offsets are required.

Set to 0 to just use the standard marker offset.

When set to 1 the standard marker offset is used for gas cutting and plasma uses the alternative marker offset.

313)Simple CAD

Enables the simple cad drawing tool when the code is entered.

314)Short traverse

Ignores traverse moves less than this length when cut one-part feature is used. A short traverse usually indicates the use of a tab when waterjet cutting. If one part is selected the part will have to be tabbed manually.

315) Invert home switch

Set to 1 to invert the home switches.

316)Sleep on exit

When set to 1 the pc will sleep rather than shut down on exit. Used when the pc will not restart after AC power loss.

317)Language

Selects language.

0 = English

1 = Dutch

Set to -number to reset to English.

318)Remove kerf arcs.

set to 1 to remove arcs less than or equal to the kerf radius before kerfing (tes kerf only)

319)Trim Kerf ends

trims off the last line of each shape before kerfing if the line is less than this value

long (mm)

320)Marker Z height

Head moves to this height when marker type 3 is used (pneumatic pen) plate thickness is taken into consideration.

321)Combi Machine

Set to 1 if the machine is a waterjet / plasma combination machine.

322)Change proc code.

This code sets the subsequent cutting process to the secondary selected process. The code +1 activates the primary process. Default 61 & 62

323)Multi pro-offset X

Offset between plasma and waterjet torch on a combination machine, X axis.

324)Multi pro-offset Y

Offset between plasma and waterjet torch on a combination machine, X axis.

325)Outboard gain factor

Use this factor to damp the outboard drive (YY). Acts as a factor so setting to 0.5 would half the gain. If set to zero, the gain will use the same value as the Y axis.

326)Kerf square point off.

setting this value to nonzero turns off the kerf square point calculation.

327)Temporary autonest code

361)

Setting the Wago can bus module.

Power off

Set all dip switches to off.

Power on

set dip switch 3 to on (125kb) followed by dip switch 8 to on (save data)

Power off

Wait 10 seconds.

Set dip switch to binary node value i.e. sw2 on = node 2. Do not use node 1 as this is the supervisory node (note switch 8 should now be off).

Power on

Wago is now set. Run light will be flashing along with Tx & Rx (waiting for data)

If you are still having difficulties it may be necessary to power down the machine and bed completely as the Nextmove may require bus reset.

Enter machine configure screen.

set fume bed to a 2.

enter fume bed setup and set can bus node to a 2 (or the node selected)