

DIWI^{RE}+

USER INSTRUCTION GUIDE

SECTION 01

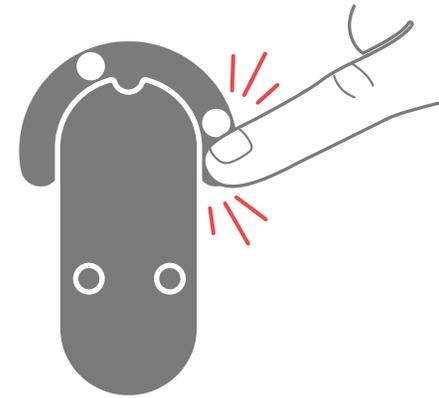
Introduction

Introduction

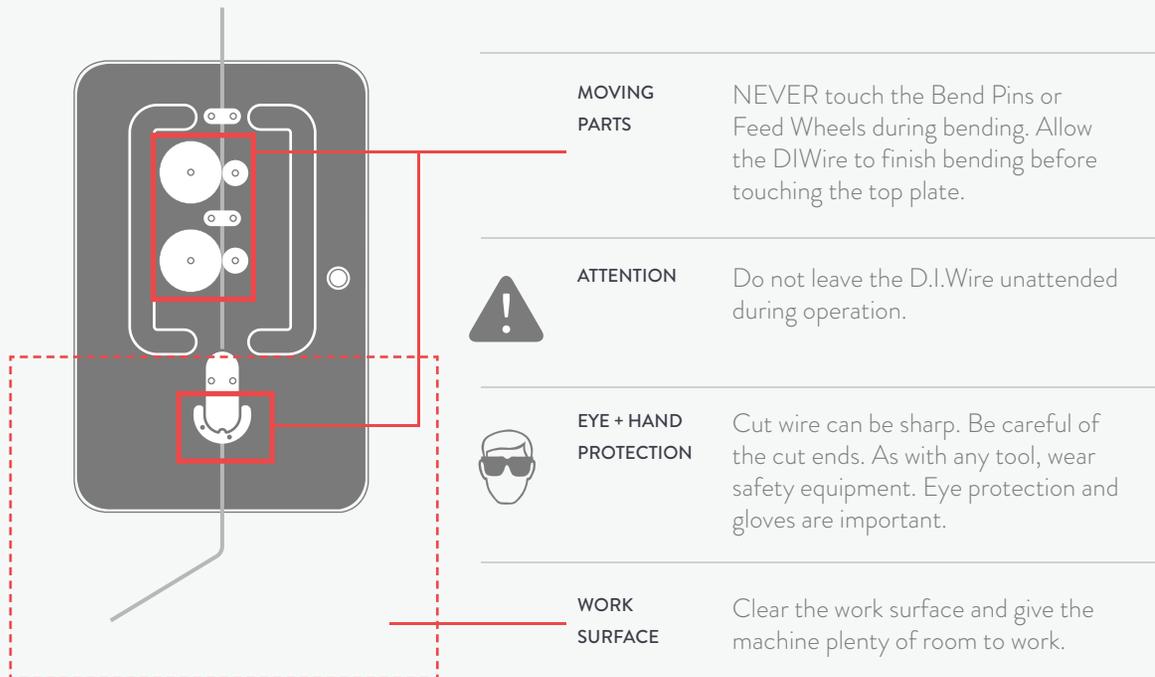
- BEND SAFETY
- WHAT'S IN THE BOX
- GETTING TO KNOW THE D.I.WIRE PLUS
- WIREWARE MODES OVERVIEW

Bend Safety

The D.I.Wire Pro has moving parts that should be treated with care. While the wheels and Bend Pin may move slowly, the D.I.Wire is powerful and can cause injury.



**NEVER TOUCH
MOVING PARTS!**



**TO STOP
MACHINE**

- Hit the Power Button
- Unplug Machine
- Hit the computer Spacebar
- Press STOP or PAUSE in WireWare



POWER OFF

Power off when not in use



**ADULT
SUPERVISION
REQUIRED**

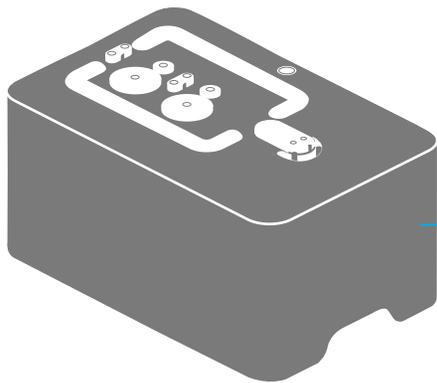
Not a toy and is intended for use by or under supervision of adults



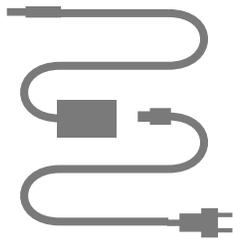
**AVOID
WATER**

Do not use near or place in water

What's in the Box



DIWIRE PLUS



POWER CORD

AC Wall Adaptor
24 Volts/ 2.5 Amps



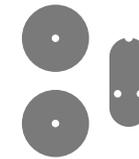
USB CORD

USB allows DIWire
to communicate
with the computer



PRE-CALIBRATED WIRE

Sample of our favorite wire
to use with the tutorials. Visit
www.PensaLabs.com/materials
to learn more!



BEND HEAD + FEED WHEELS

DIWire is assembled with either
1/8" or 1/16" Bend Head and Feed Wheels.

If the Starter Kit was purchased then the 1/16"
versions are provided in the little black pouch.
Keep these somewhere safe!

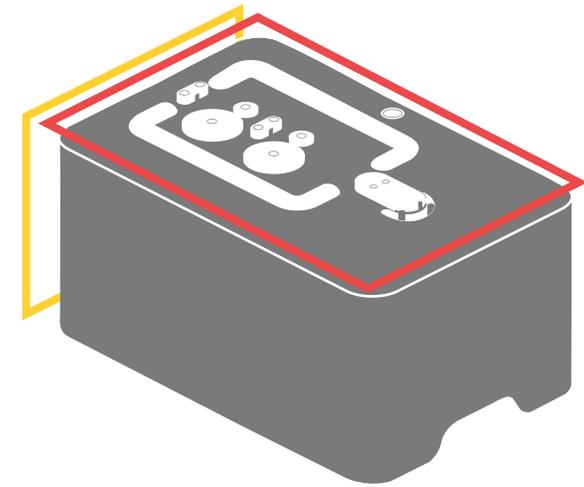


T15 TORX SCREWDRIVER
+ 5/32 HEX CREWDRIVER

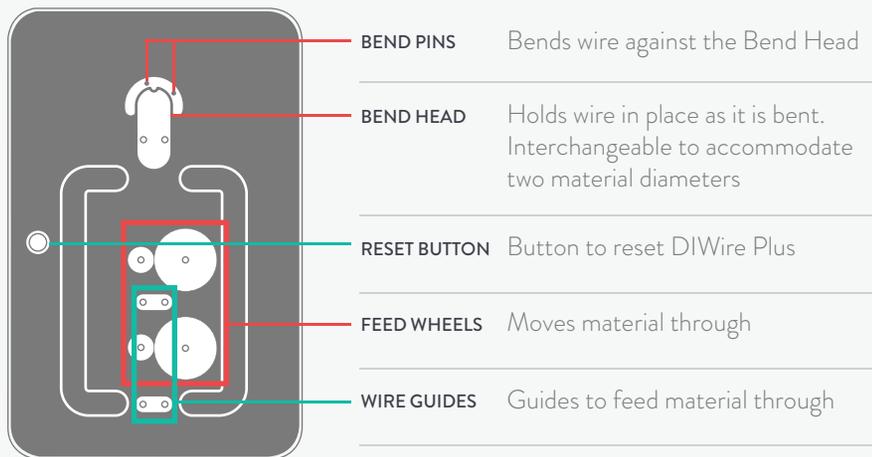
Used to change Bend Head and
Feed Wheels and Clamp Adjust

Getting to know the D.I.Wire Plus

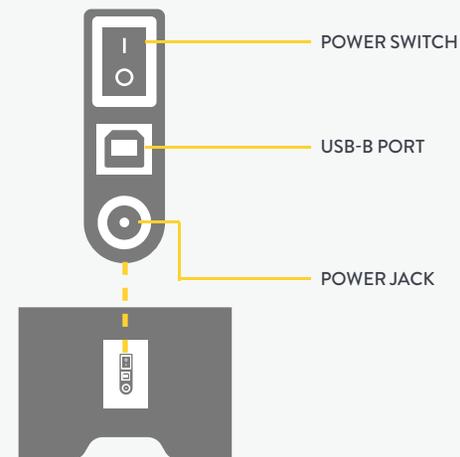
Take a few minutes to get oriented to the D.I.Wire Plus.



TOP VIEW



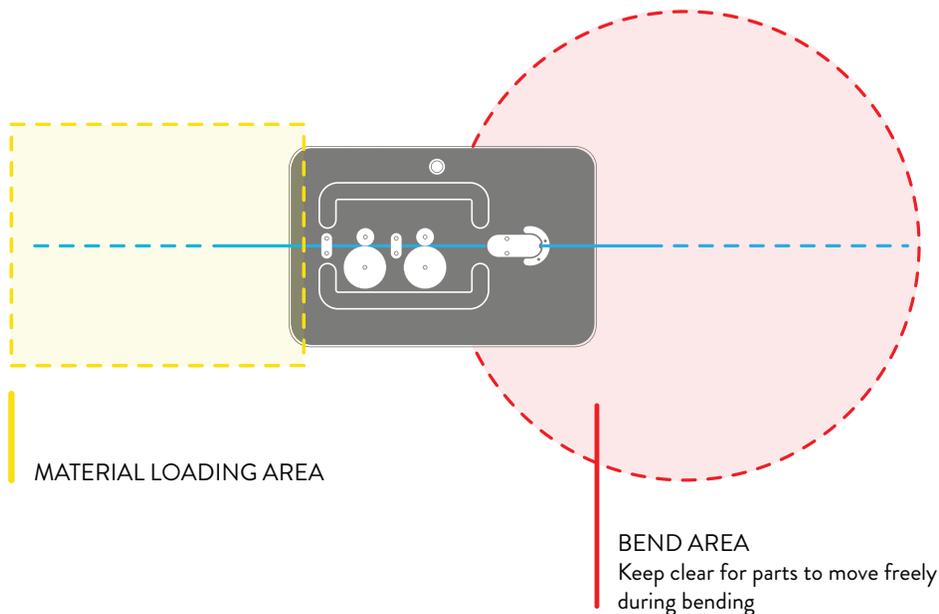
BACK VIEW



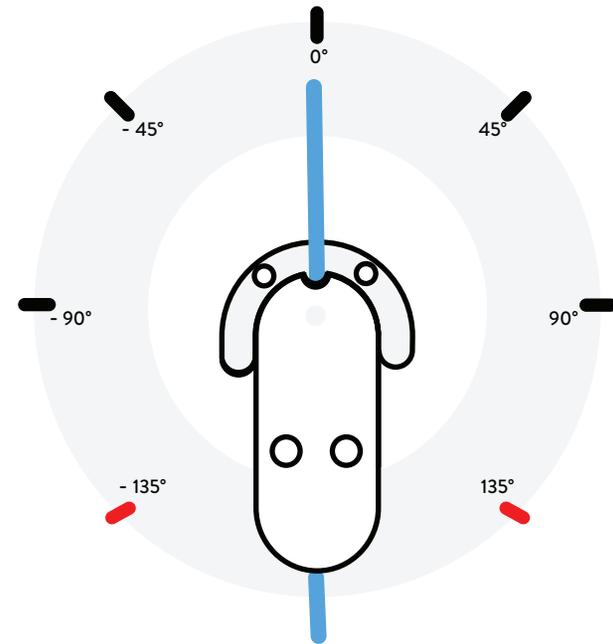
D.I.Wire Plus Orientation

Work area requires space for material loading and bending, as well as a space for the computer with WireWare installed.

SPATIAL ARRANGEMENT



BEND ANGLE COMPASS



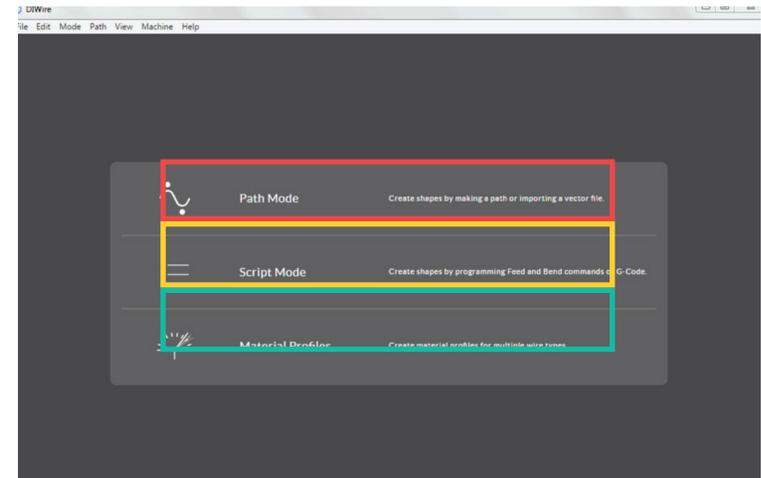
The A axis is the bend axis, with 0° at “12 o’clock.” Use negative values for counter-clockwise bends and positive values for clockwise bends.

The X axis is the feed axis. Positive values move material forward, negative values move it back.

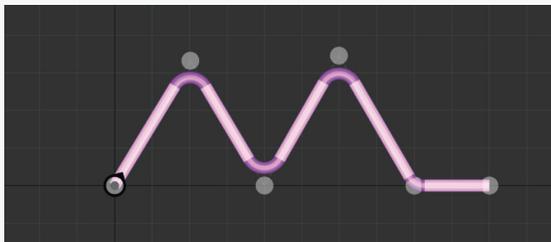
The maximum angles for the D.I.Wire Plus are 135° and -135°, but spring back will make a significant impact on that. WireWare will display an error message if the angle attempted is out of range.

WireWare Modes

WireWare is comprised of three sections, Path Mode, Script Mode and the Material Profile Mode. Path Mode and Script Mode are used to edit and create input for bending. The Material Profile Mode contains a library of Material Profiles for each wire type that compensate for the spring back of the wire during a bend.



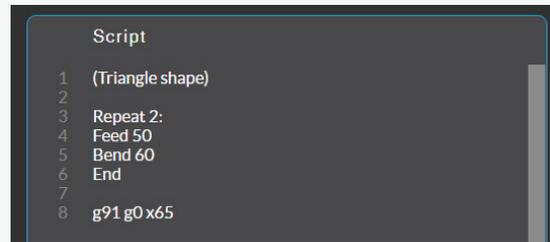
PATH MODE



Create or manipulate curves visually or numerically within the workspace.

- FEATURES OVERVIEW**
- Create bend path or import SVG files from other programs
 - Manipulate bend angles and segment lengths on the workspace
 - Reference saved Material Profiles for best accuracy
 - Save files as paths or G-Code

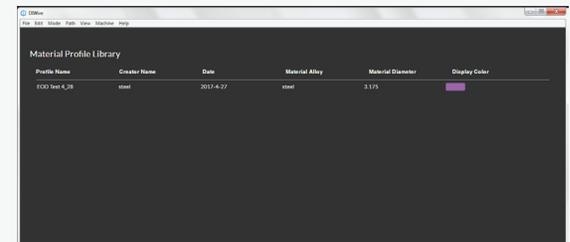
SCRIPT MODE



Use WireWare Scripts and G-Code to precisely control bend actions.

- FEATURES OVERVIEW**
- High level of control over your output
 - Use WireWare scripts or basic G-Code
 - Create complex, smooth curves
 - Access advanced features like roll bending

MATERIAL PROFILES



Save Material Profiles for all wire types.

- FEATURES OVERVIEW**
- Create and save new calibrated Material Profiles for any wire.
 - The Material Profile works with Path Mode and WireWare Script to compensate for material springback.

SECTION 02

Getting Set Up

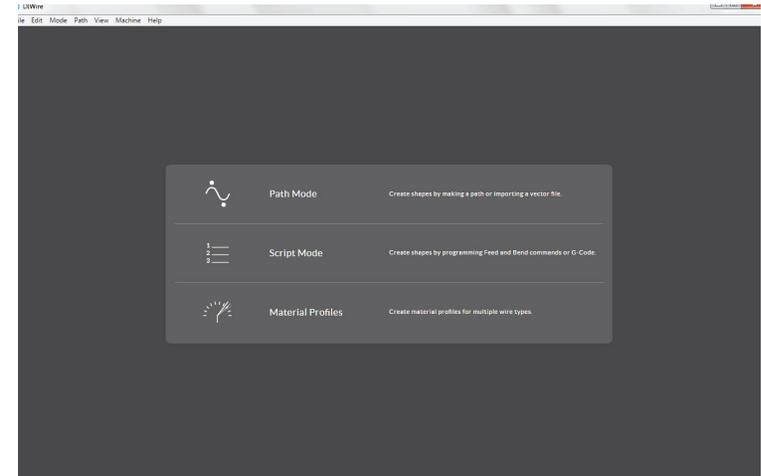
Getting Set Up

- DOWNLOAD WIREWARE
- SET UP HARDWARE
- LOADING WIRE

02 | SETUP

Download WireWare

Download WireWare software to run the D.I.Wire Plus. WireWare prepares your files for bending on the DIWire.



1 INSTALL WIREWARE

After receiving WireWare, download to the computer. Reference the materials that come with the software.

WINDOWS / Choose either Windows or Mac version
MAC of WireWare to install on the computer.

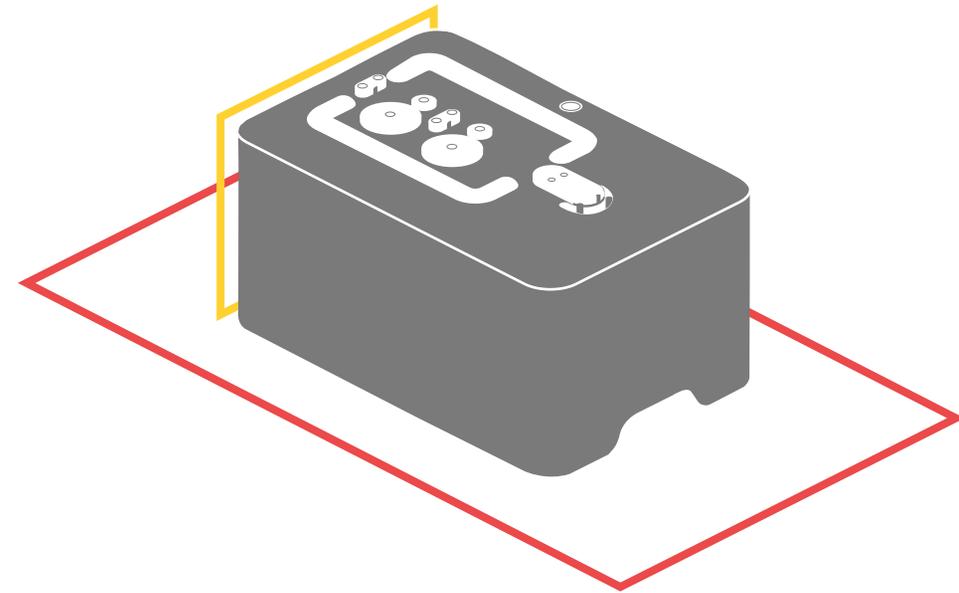
2 CONTACT US

For any questions or problems with download or installation contact Pensalabs.

EMAIL support@pensalabs.com

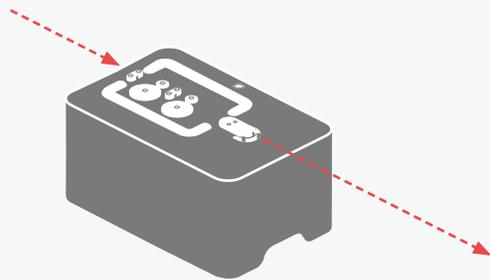
PHONE 844-434-9473, ext. 2

Set Up Hardware



Choose a work area and plug in the D.I.Wire.

1 PREPARE WORK AREA

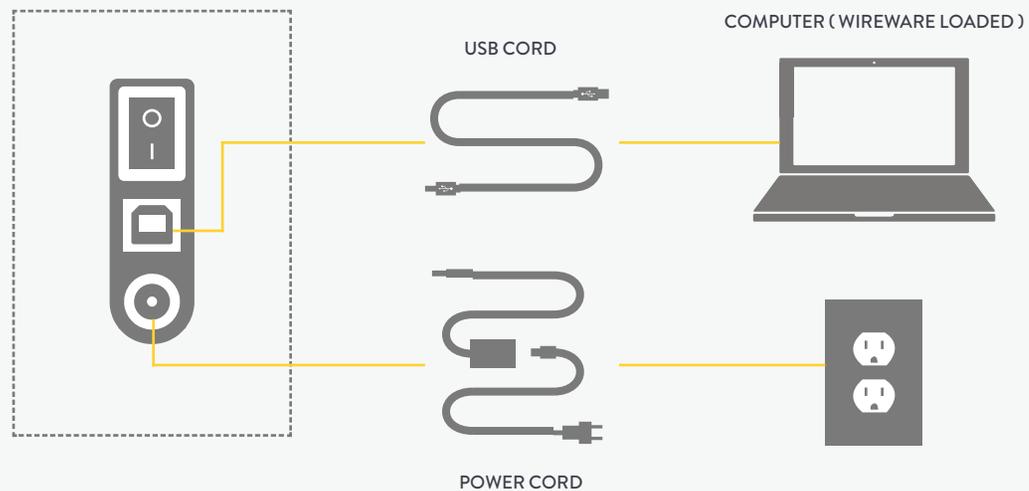


Choose a work area for the D.I.Wire Plus. Consider the area needed for wire entering the feed wheels and exiting the bend head.

WHAT'S NEEDED DIWire Plus, USB Cord, Power Cord

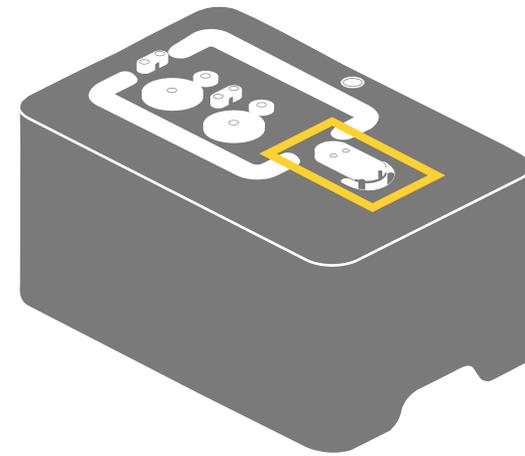
ADDITIONAL ELEMENTS Computer

2 PLUG-IN

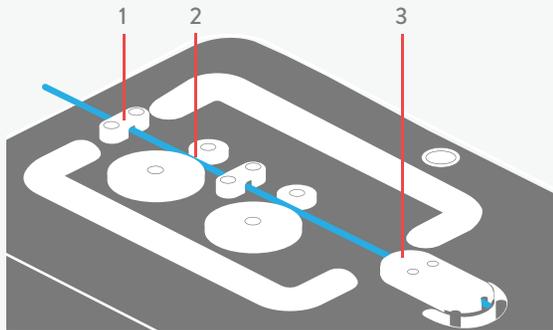


Loading Wire

Loading wire into the D.I.Wire is a simple process.

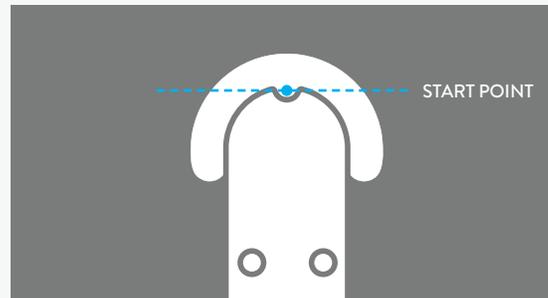


1 LOAD WIRE



Load the wire through the Wire Guides (1), the Feed Wheels (2) and into the Bend Head (3).

2 START POINT



Load the wire up to the Start Point.

START POINT

There is an indent at the front of the bend head at the Start Point. The wire can be marked with a Sharpie in this indent.

Loading the wire past the Start Point will cause the Bend Pins to hit the wire during the homing sequence.

3 HOMING SEQUENCE



Before bending, the D.I.Wire needs to go through the homing sequence to ensure the bend pin is in the proper position.

HOME BUTTON

Commands the D.I.Wire to locate and rest at Home (machine position zero)

The machine must be homed when turning on the machine or restarting, or if it has lost its location

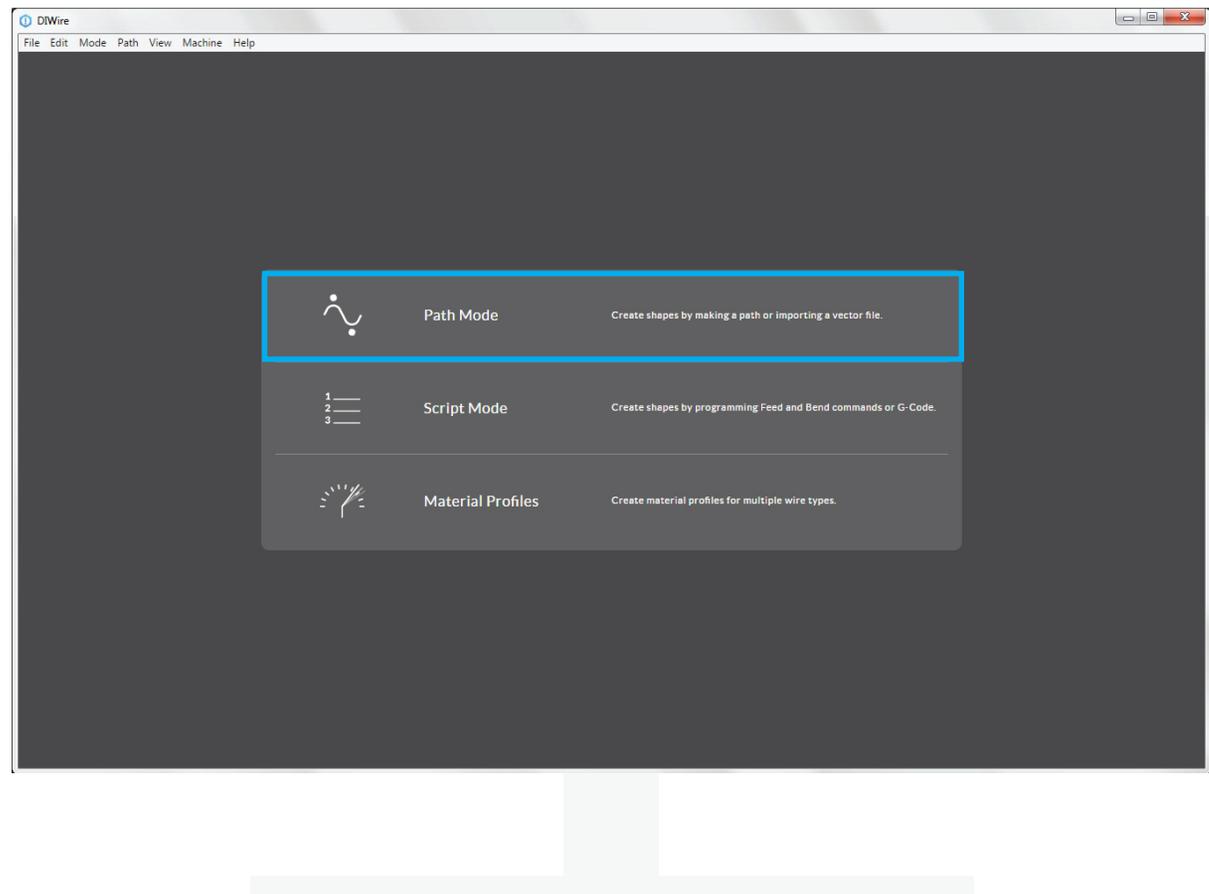
SECTION 04

Path Mode

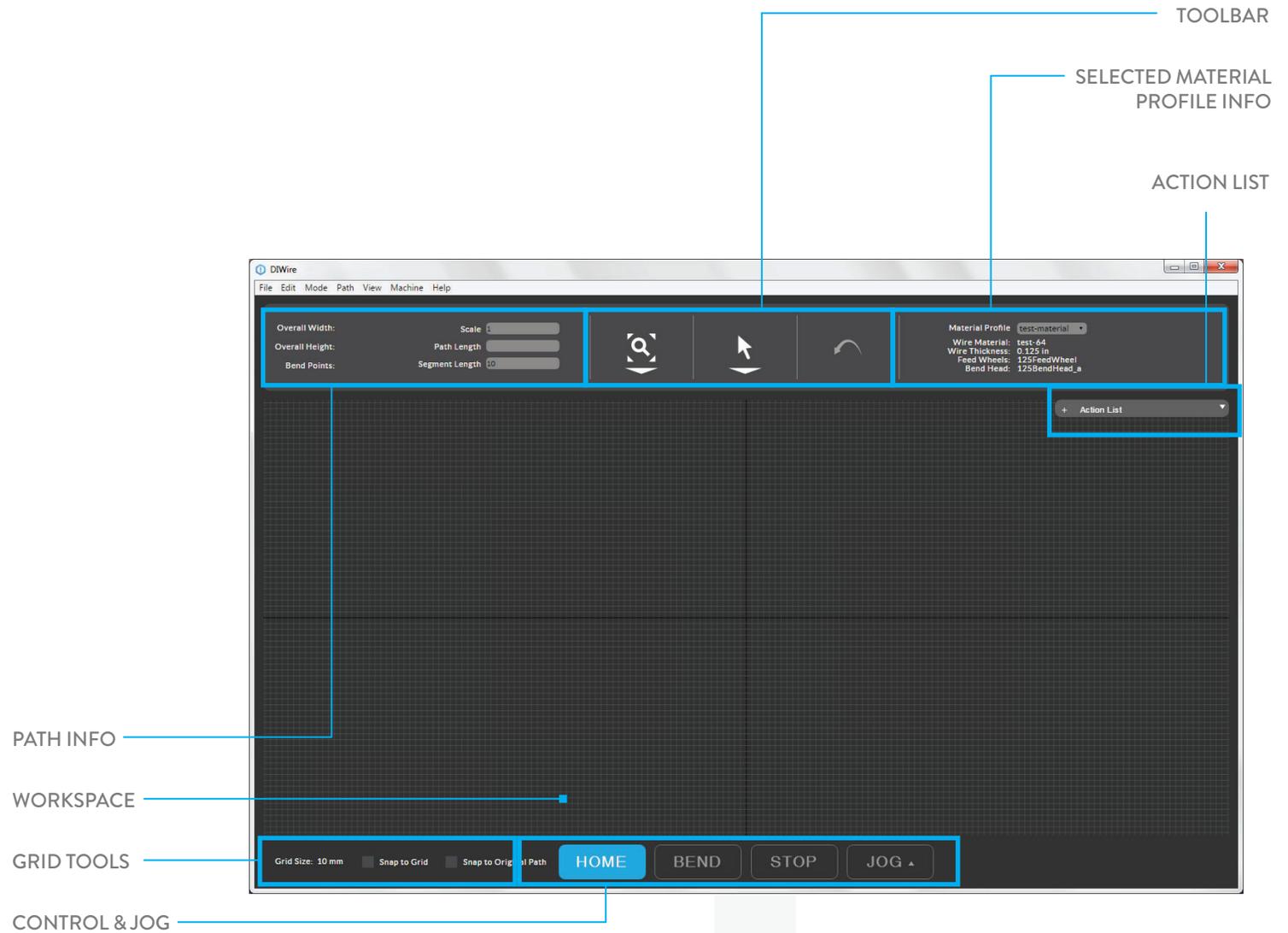
Path Mode

Import .SVG files, or create a bend path in Path Mode. It is an interactive workspace to view and edit paths and prepare them for bending. It has been designed to provide basic manipulation and adjustments to bend points and line segments and to manage multiple paths on the work area.

- OVERVIEW
- GETTING STARTED
- PATH & WORKSPACE INFO
- TOOLBAR
- MATERIAL PROFILE SELECTION
- ACTION LIST
- CONTROL & JOG BAR
- ARROW KEY CONTROLS
- OTHER FEATURES

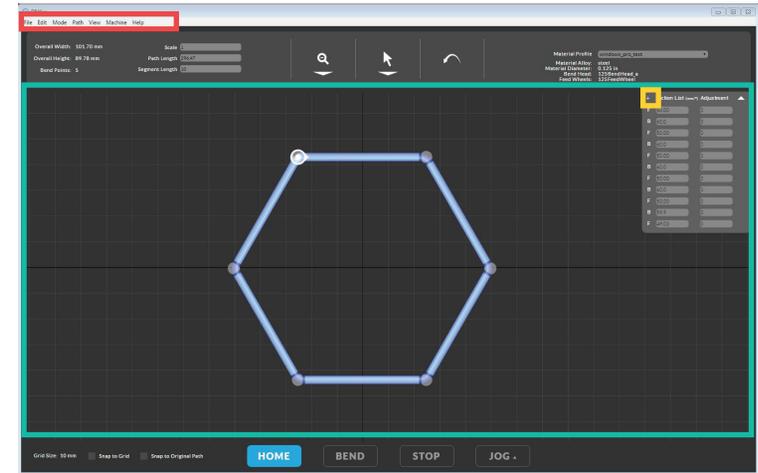


Screen Overview

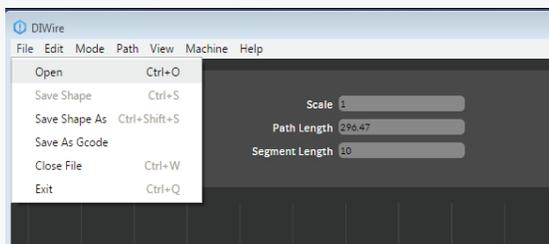


Getting Started

Import a curve as an .SVG format or create a path.



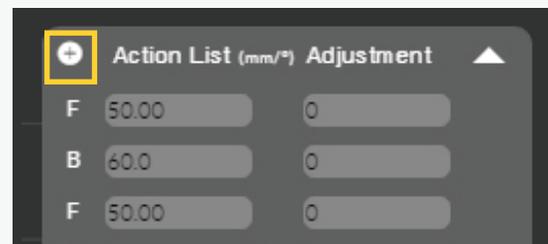
IMPORT A FILE



Go to File, Open a saved SVG file from your computer.

CTRL + O Quick key to open a file

CREATE A SHAPE

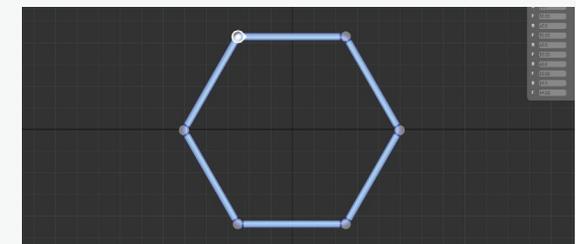


Add Bend (B) and Feed (F) points to the Action List to start creating a new part.

(+) The Plus icon adds feed and bend points to the list. Clicking the Plus will add a bend and feed after the last segment of a shape.

After adding several Feed/Bend Actions, zoom out to view and manipulate the new set of segments and bend points.

WORKSPACE

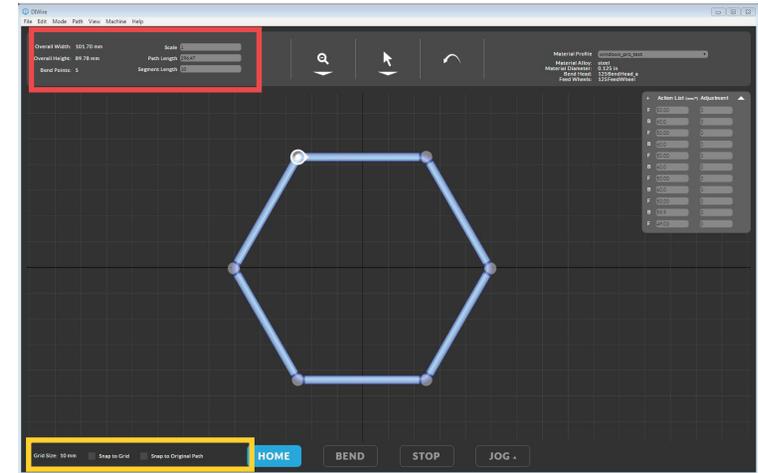


The path is a series of bend angles and line segments.

These bend angles and line segments can be manipulated using the tools on the following pages.

Path & Workspace Info

The Path Info section displays properties of the shape and Grid Tools provide Grid Size units and Snap behavior control.



PATH INFO

Overall Width: 101.70 mm	Scale: 1
Overall Height: 89.78 mm	Path Length: 296.47
Bend Points: 5	Segment Length: 10

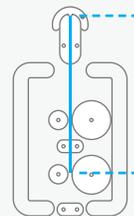
OVERALL WIDTH Overall width of the path

OVERALL HEIGHT Overall height of the path

BEND POINTS Number of bend points of the active path

SCALE The scale of the part relative to its initial size.

PATH LENGTH The estimated total wire length needed for the part



8.25" (209mm) of extra wire is needed so that the feed wheels are always engaged.

SEGMENT LENGTH Shows the minimum distance between bend points on a path. Enter a small segment length value to get a smoother curve with many bend points. Segment lengths smaller than 0.47" (12mm) may require using the Adjustment Fields for additional compensation.

GRID TOOLS

Grid Size: 10 mm	Snap to Grid	Snap to Original Path
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GRID SIZE Size of the grid on the workspace and the units in use

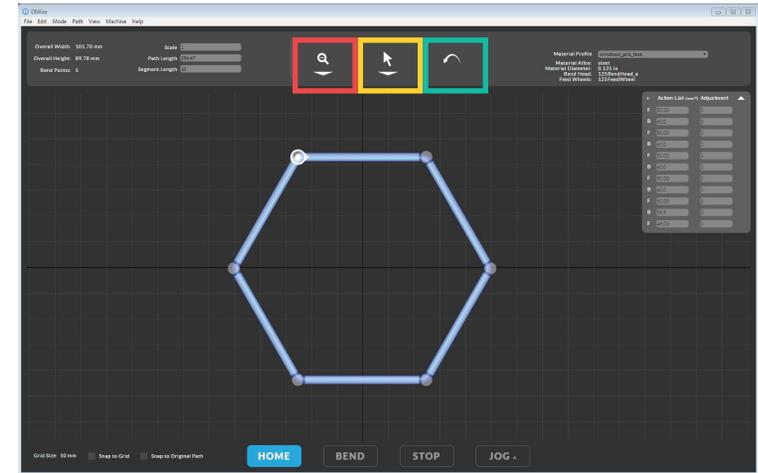
Change the units by going to the Edit Tab and selecting Change Units.

SNAP TO GRID Bend points and line segments will snap to the grid as they are moved around on the workspace.

SNAP TO ORIGINAL PATH Bend points and line segments will snap to the ghosted imported path as they are moved around on the workspace.

Toolbar

The Zoom, Select and Undo tools allow for flexible navigation of the workspace and control of the path.



ZOOM



Zoom tools help you to navigate around your workspace.

	FIT TO SCREEN	Resize the view of the workspace to show the entire active part.
	ZOOM IN	Zoom into desired details of the workspace.
	ZOOM OUT	Zoom out to view more of the workspace.
	PAN	Move around the viewable area of the workspace by clicking and dragging.

SELECT



Select Tool allows you to click on line segments and bend points and move them.

	SELECT VERTICES	Click on line segments and bend points to move them around on the workspace.
	ADD A VERTEX	Add new bend points on the active path
	REMOVE A VERTEX	Remove bend points from the active path
	ADD A PAUSE POINT	Select a Bend Point where the machine will pause before the bending at that location
	CHANGE STARTING POINT	Choose which end of the path to start bending

UNDO TOOL

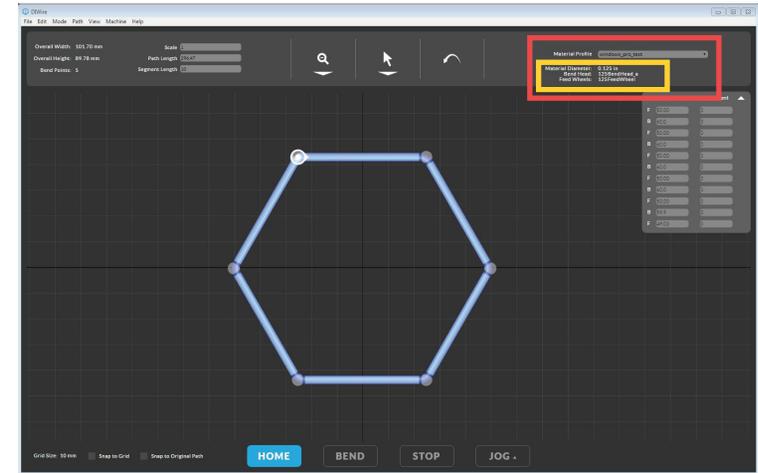


Undo changes made to the Path.

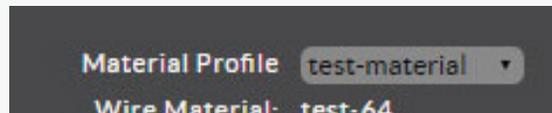
	UNDO TOOL	Click on the Undo Tool to undo changes made on the path
CTRL + U		Undo previous action on the Workspace
CTRL + SHIFT + U		Redo previous action on the Workspace

Material Profile Selection

Selecting the Material Profile that matches the wire in use ensures accurate bending of the Path. A Material Profile is needed to bend from Path Mode or WireWare Script commands in Script Mode.



MATERIAL PROFILE

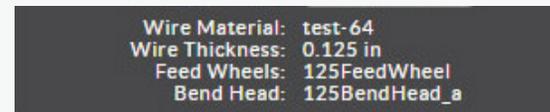


The Material Profile data is used to compensate for the spring back of the wire. Any material used in the D.I.Wire needs a Material Profile

DROPDOWN MENU Select among saved Material Profiles

In order to modify or create new Material Profiles go to [Material Profile Mode](#)

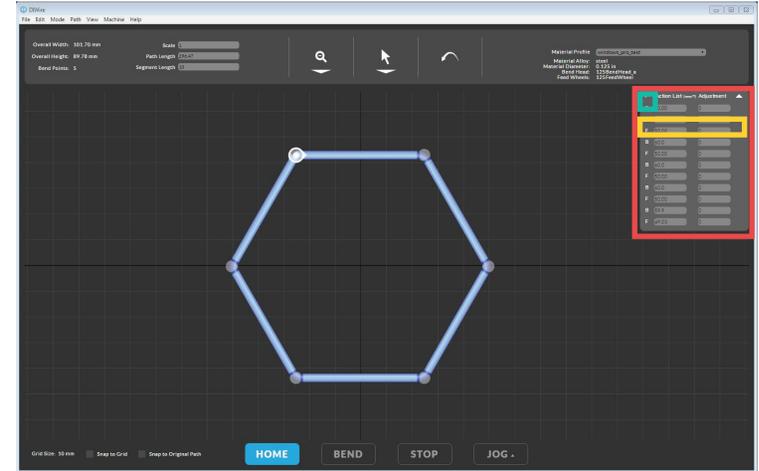
SELECTED MATERIAL INFO



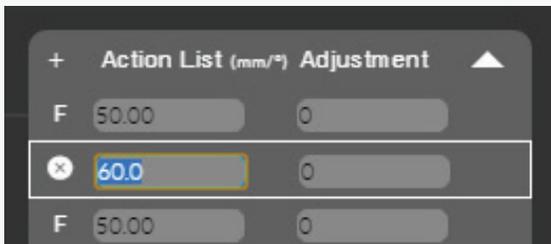
Displays the associated Wire Material, Wire Thickness, Feed Wheels and Bend Head

Action List

The Action List shows an editable sequential list of all of the actions that the machine will make while bending the Path.



BENDS (B) & FEEDS (F)



If a file is imported into the Path Mode workspace, WireWare breaks the shape up into Feed and Bend actions.

BEND (B) & FEED (F) FIELDS A sequential list of feed (F) and bend (B) actions and their values.

SELECTION Click on a Bend Point or line segment to see its corresponding Action, or click on the Action to see the corresponding Bend Point/ line in the Path. Change values to adjust Path.

ACTION LIST ADJUSTMENTS

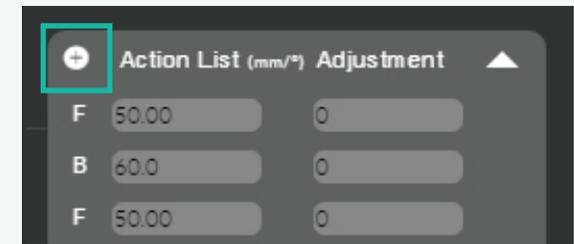


Action List values can be changed on the list and the Path will update on the workspace.

ADJUSTMENT FIELDS Allows for corrections to discrepancies on the bent wire part.

For example, if a 10° Action results in a 9° bend output simply put a 1° in the adjustment field for a correction.

ADDING TO A SHAPE



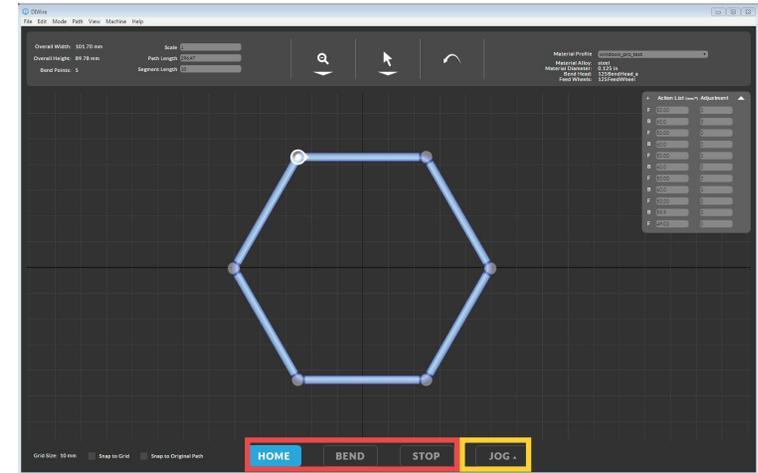
Add Bend (B) and Feed (F) points to the Action List to add to the end of a Path.

(+) The Plus icon adds Feed and Bend Points to the list. Clicking the Plus will add a bend and feed after the last segment of a shape.

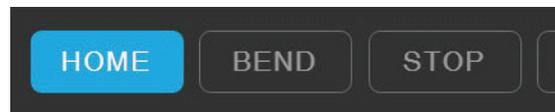
After adding several Feed/Bend Actions, zoom out to view and manipulate the new set of segments and bend points

Control & Jog Bar

The Control Bar and Jog Bar at the bottom of the workspace can be found in every mode. These controls Home the bend pin, Bend the path or Run the script and Stop the D.I.Wire. The Jog bar shows the location and controls to move the bend pin and feed wheels.



HOME, BEND & STOP



HOME Commands the D.I.Wire to locate and rest at Home (machine position zero)

The machine must be homed when turning on the machine or restarting or if it has lost its location

BEND Starts bending the active path

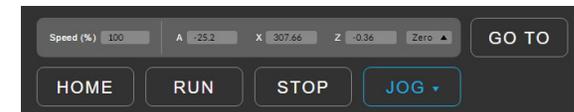
STOP Immediately stops moving the machine axes

JOG



Jog controls the machine with simple movements set in the numerical fields for each moving part of the machine

This may be helpful for loading wire



SPEED % Shows the speed the machine is running as a percent of the maximum speed determined by machine settings

A Controls position of the bend pin, measured in degrees

X Controls the feed of the wire, measured in the units in use (inches or mm)

Z Controls the up/down position of the pin

ZERO Sets the current position of the specified axis to 0

GO TO Go to the position entered in the jog bar

Arrow Key Controls



Hold control and press arrow keys to manually move the bend pin or feed the wire. This is helpful loading new wire.

1 FEED WIRE



UP ARROW Feeds the material forward
+
CMD/CTRL

DOWN ARROW Feeds the material back
+
CMD/CTRL

2 MOVE BEND PIN



LEFT ARROW Moves the bend pin (counter-clockwise)
+
CMD/CTRL

RIGHT ARROW Moves the bend pin (clockwise)
+
CMD/CTRL

3 INCREMENTAL MOVES

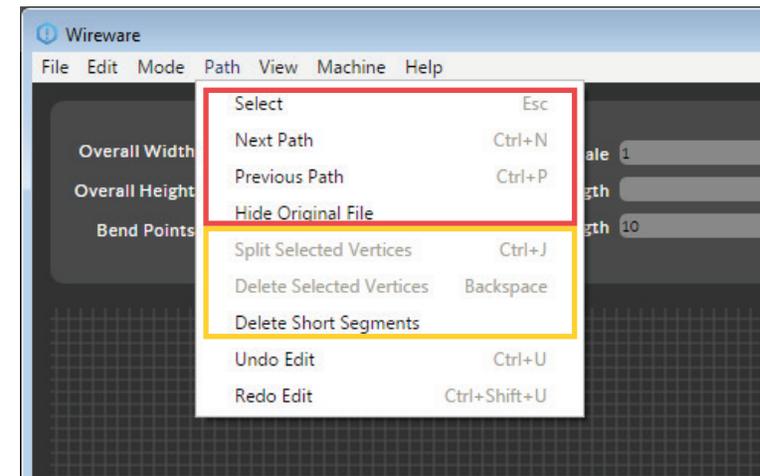


LEFT / RIGHT ARROW Moves the bend pin incrementally
(0.5° per move)
+
SHIFT + CMD/CTRL

ARROW UP / DOWN Moves the material incrementally
(0.047" / 1mm per move)
+
SHIFT + CMD/CTRL

Other Path Features

These are other Path Mode tools that are helpful for Path selection, imported file clean up and quick undo/redo of actions on the Workspace.



PATH SELECTION

SELECT
ESC KEY
Selects the “Select bend points” Tool

NEXT PATH
CTRL+N
Selects the next Path in order of creation

PREVIOUS PATH
CTRL+P
Selects the Path that was previously selected

HIDE ORIGINAL FILE
Hides / Shows the ghosted silhouette of the imported path

PATH CLEAN UP

Use these tools to modify the imported Path. Paths must be modified to accommodate Bend Head geometry and minimum segment lengths.

SPLIT SELECTED VERTICES
CTRL+J
Divides a selected Bend Point into two equal angle Bend Points.
e.g. a 160 ° bend angle into two 80 ° Bend Points. This allows easier manipulation of larger angles.

DELETE SELECTED VERTICES
BACKSPACE
Deletes selected Bend Point.

PATH CLEAN UP

DELETE SHORT SEGMENTS
Simplifies complex Paths by deleting segments smaller than a threshold relative to the path size.

For more on handling Path issues, see [Pensalabs.com](https://pensalabs.com)

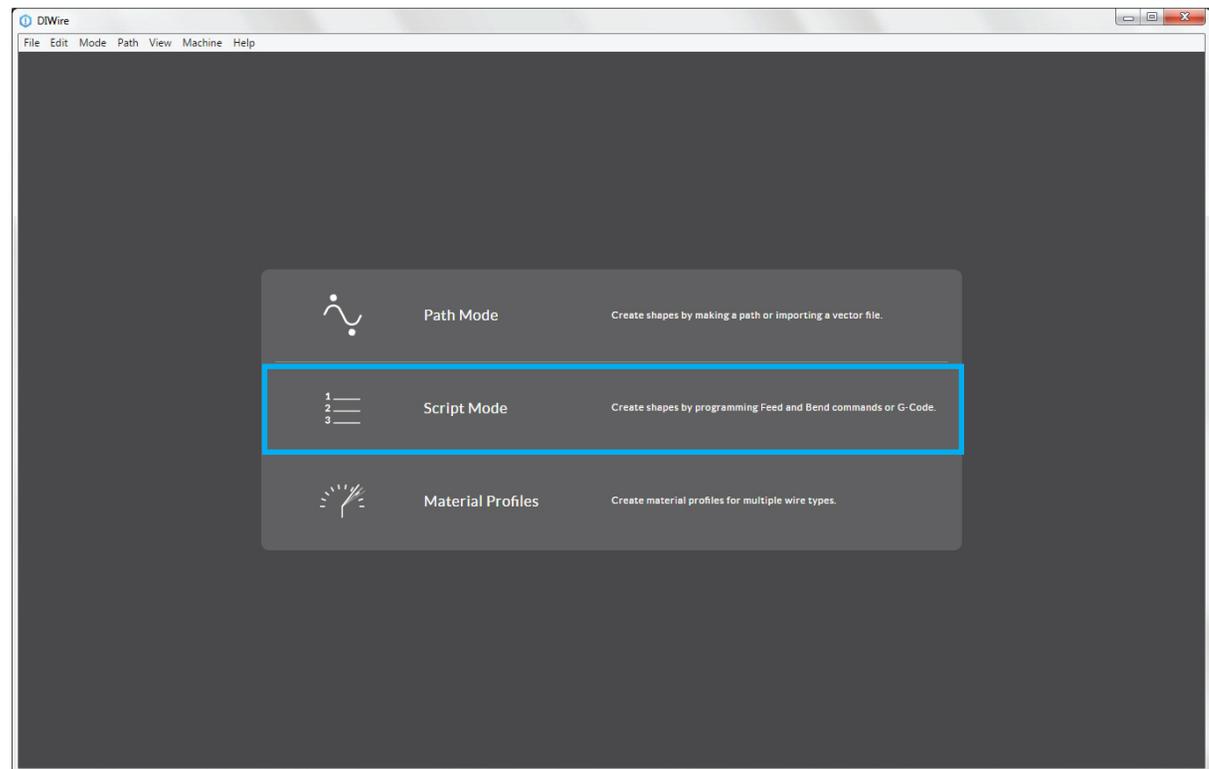
SECTION 05

Script Mode

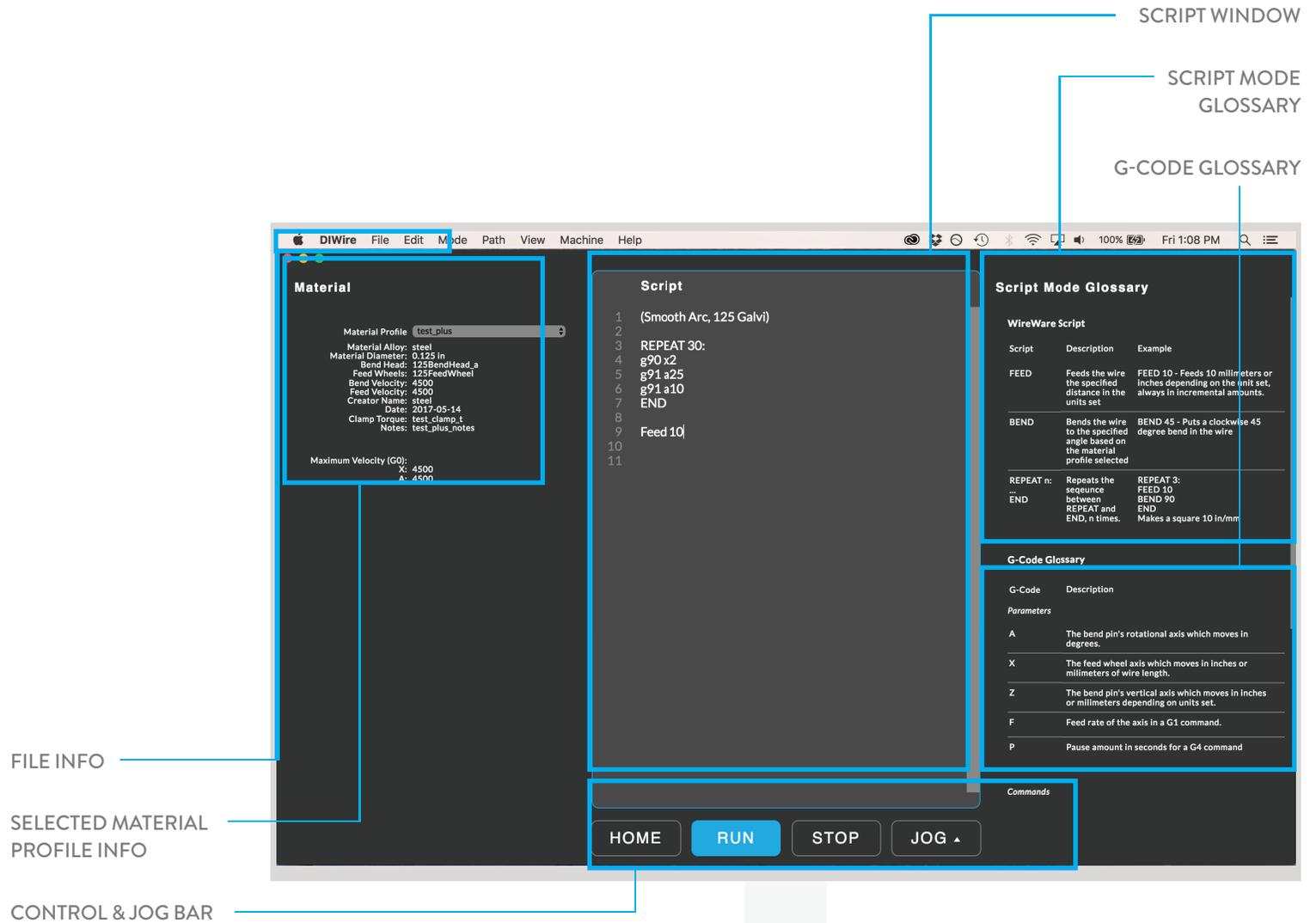
Script Mode

Create precise shapes using written WireWare script commands or G-Code commands to control the D.I.Wire. These allow for a higher level of control over the output.

- OVERVIEW
- GETTING STARTED
- MATERIAL PROFILE SELECTION
- CONTROL & JOG BAR
- ARROW KEY CONTROLS

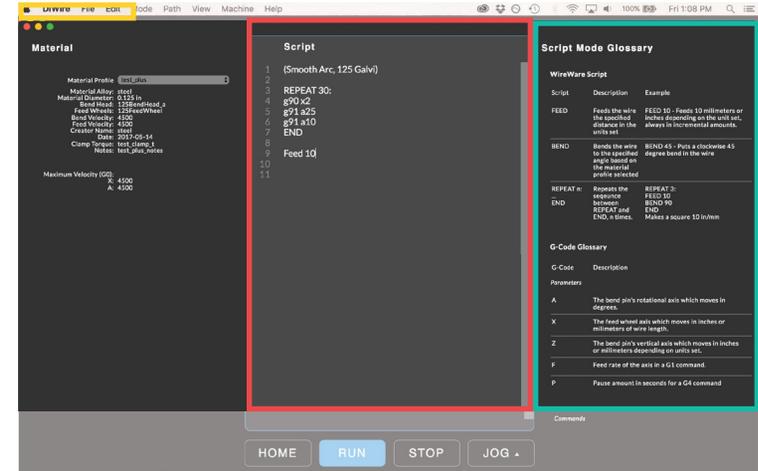


Screen Overview

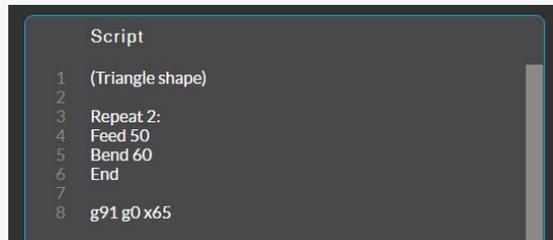


Getting Started

Start a new Script in the Script Window using WireWare Script or G-Code commands.



SCRIPT WINDOW

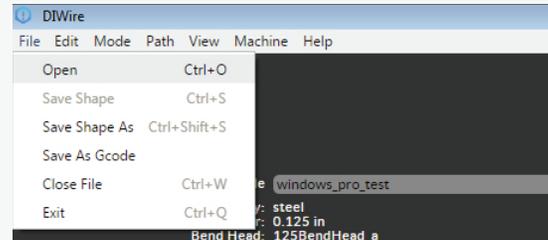


Click into the Script Window to copy and paste text or type in commands.

WIREWARE SCRIPT + G-CODE Create shapes using the WireWare script commands or G-Code

The Script Window is active when it has a blue outline. Click anywhere outside of the Script Window to be able to use the keys for manually driving the machine.

IMPORT A FILE

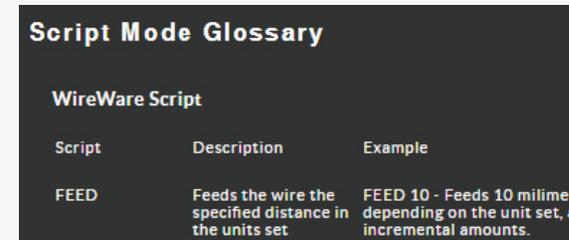


Use the file menu to open a saved file from your computer.

CTRL + O Open a file from your keyboard

Paths can be saved as G-Code from Path Mode and opened in Script Mode.

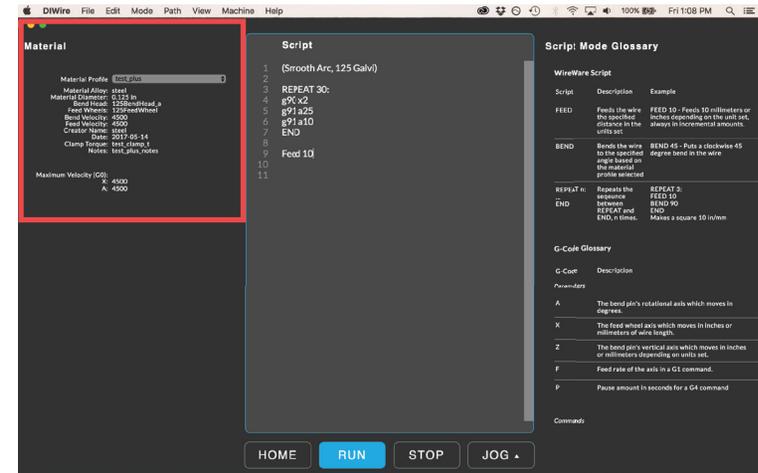
SCRIPT MODE GLOSSARY



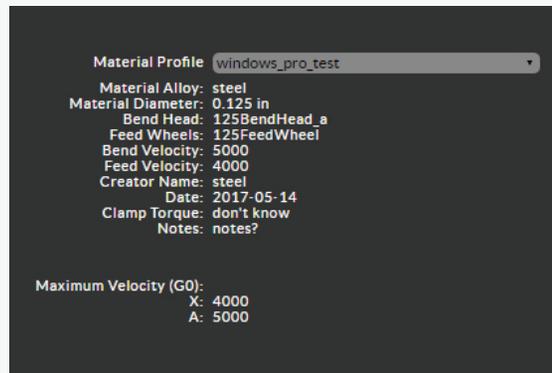
This is a glossary of WireWare Script and G-Code commands.

Material Profile Selection

When using the WireWare script select a material profile to compensate for the wire spring back.



MATERIAL PROFILE



When you select a Material Profile you will also be able to view its associated information.

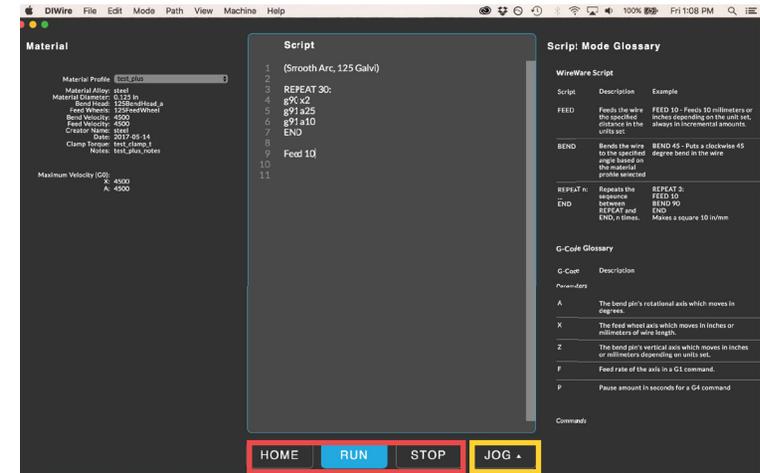
DROPDOWN MENU Drop down menu lets you select among saved Material Profiles

G-Code will not use Material Profile information.

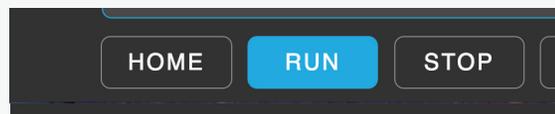
In order to modify or create new material profiles go to [Material Profile Mode](#).

Control & Jog Bar

The Control Bar and Jog Bar at the bottom of the workspace can be found in every mode. These controls Home the bend pin, Bend the path or Run the script and Stop the D.I.Wire. The Jog bar shows the location and controls to move the bend pin and feed wheels.



1 HOME, RUN & STOP



HOME Commands the D.I.Wire to locate and rest at Home (machine position zero)

The machine must be homed when turning on the machine or restarting or if it has lost its location.

RUN Runs the full Script

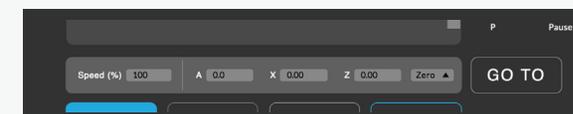
STOP Immediately stops moving the machine axes

2 JOG



Opens jog controls to use the machine with simple movements set in the numerical fields for each moving part of the machine.

This may be helpful for loading wire or during the prototyping process.



SPEED % Shows the speed the machine is running as a percent of the maximum speed determined by machine settings

A Controls position of the bend pin, measured in degrees

X Controls the feed of the wire, measured in the units in use (inches or mm)

ZERO Sets the current position of the specified axis to 0

GO TO Go to the position entered in the jog bar

Arrow Key Controls



Hold control and press arrow keys to manually move the bend pin or feed the wire. This is helpful loading new wire.

1 FEED WIRE



UP ARROW Feeds the material forward
+
CMD/CTRL

DOWN ARROW Feeds the material back
+
CMD/CTRL

2 MOVE BEND PIN



LEFT ARROW Moves the bend pin (counter-clockwise)
+
CMD/CTRL

RIGHT ARROW Moves the bend pin (clockwise)
+
CMD/CTRL

3 INCREMENTAL MOVES



LEFT / RIGHT ARROW Moves the bend pin incrementally
(0.5° per move)
+
SHIFT + CMD/CTRL

ARROW UP / DOWN Moves the material incrementally
(0.047" / 1mm per move)
+
SHIFT + CMD/CTRL

SECTION 06

Material Profile Mode

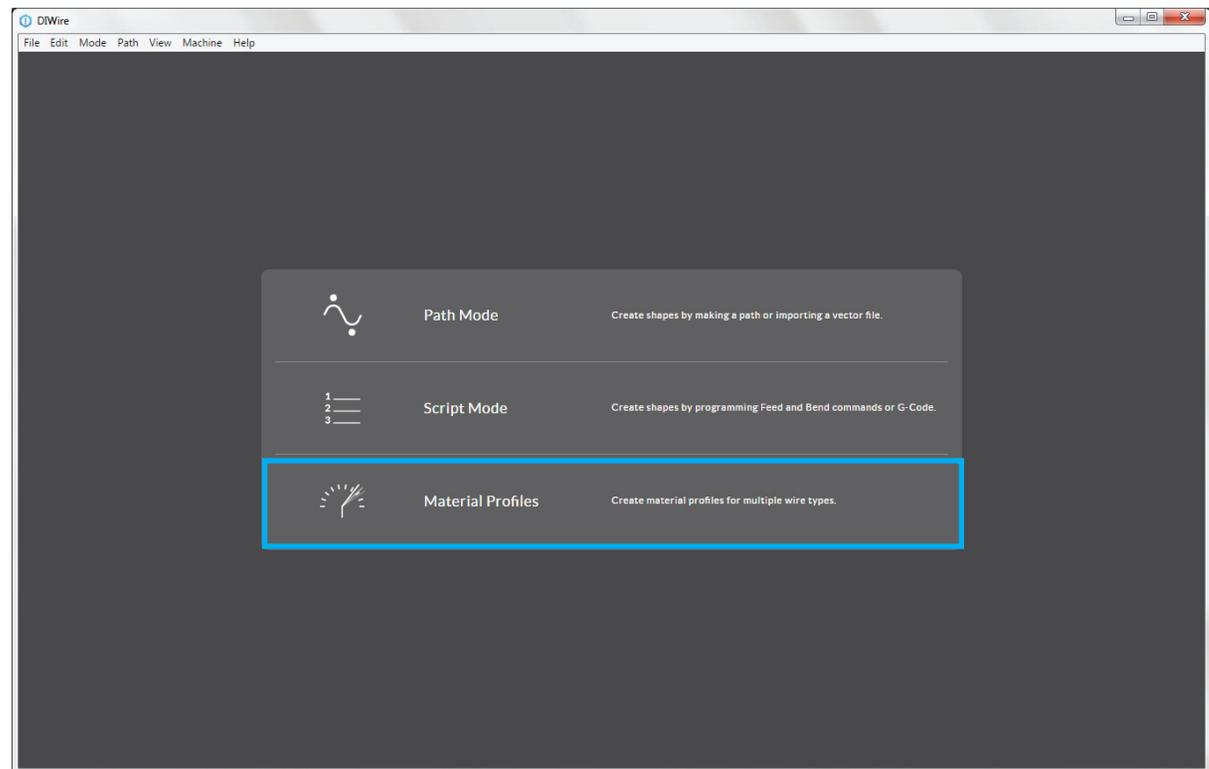
Material Profile Mode

A Material Profile can be created for any material used in the D.I.Wire. Material Profile data is used to compensate for material spring back during a bend.

A Material Profile is needed to bend from Path Mode or run WireWare Script commands in Script Mode.

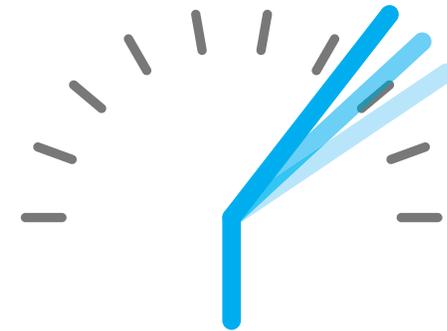
WireWare comes pre-loaded with Material Profiles for wire sold on Pensalabs.com

- WHAT IS A MATERIAL PROFILE?
- LIBRARY OVERVIEW
- CREATE NEW MATERIAL PROFILE
- EDIT A MATERIAL PROFILE

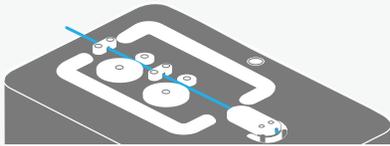


What is a Material Profile?

When creating a Material Profile the D.I.Wire learns how much to compensate for wire spring back. Material Profiles consist of hardware definition information and dataset measurements.



HARDWARE DEFINITION



The Material Profile Definition is information about the wire material, and Bend Head and Feed Wheel setup of the D.I.Wire.

This information needs to be entered every time a new Material Profile is created.

DATASET MEASUREMENTS



A dataset consists of bending discrete angles, measuring each using a protractor and inputting the results into a table. It is necessary to complete all three Datasets.

Library Overview

The Material Profile Library is a collection of wire materials that have been calibrated for the D.I.Wire.

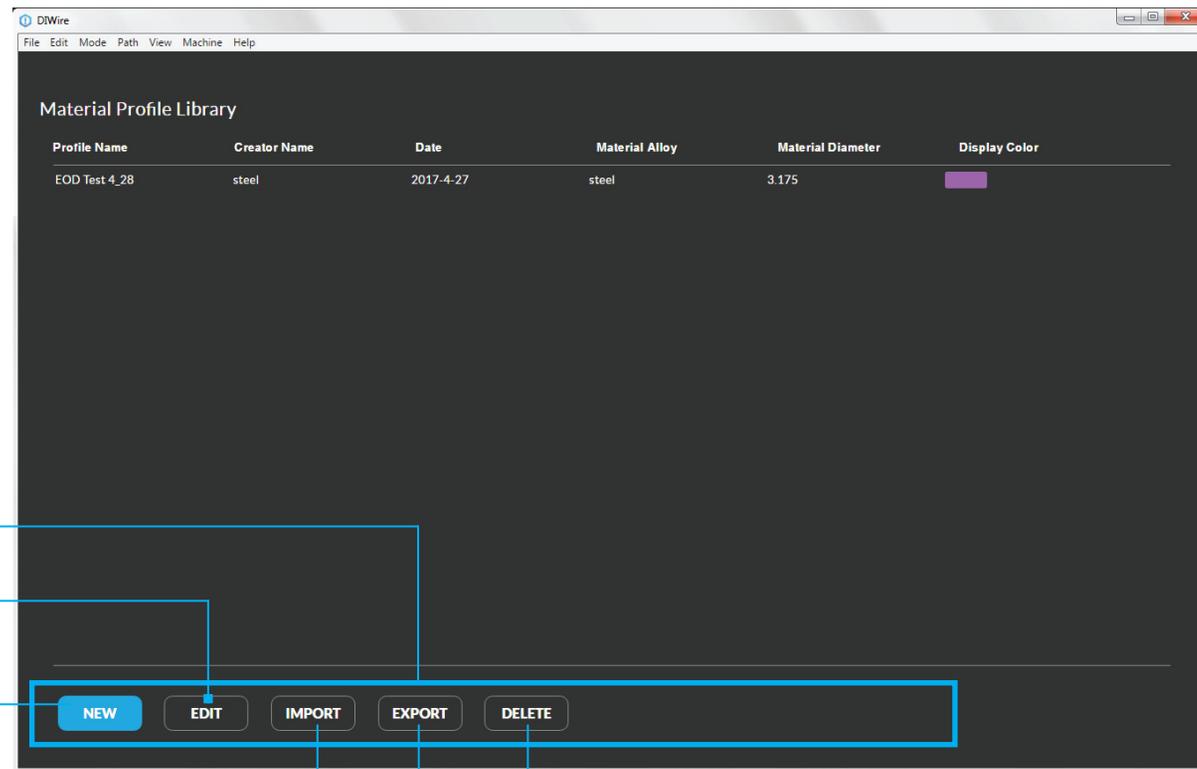
MENU BAR

EDIT
EXISTING PROFILE

CREATE
NEW PROFILE

IMPORT & EXPORT
EXISTING PROFILE

DELETE
EXISTING PROFILE



Creating a Material Profile

1 PREPARATION

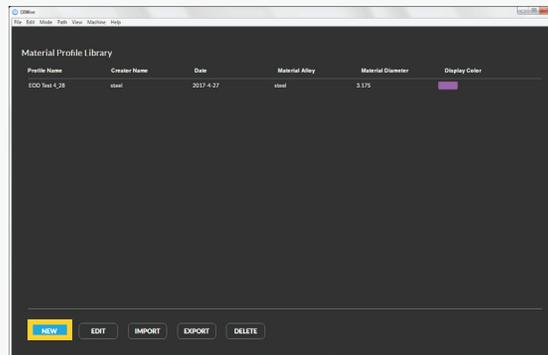
Prepare the following to create a NEW Material Profile.

MATERIALS NEEDED D.I.Wire, at least ~20 feet (610cm) of wire, cutting tool and protractor

A digital protractor is recommended

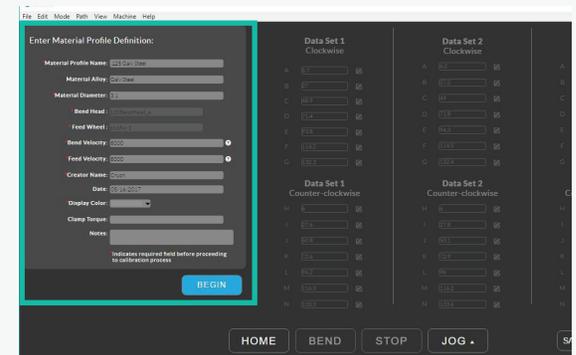
TIME NEEDED 1-2hrs total

2 CREATE NEW PROFILE



Select the NEW button from the Material Profile Library Screen

3 PROFILE DEFINITION



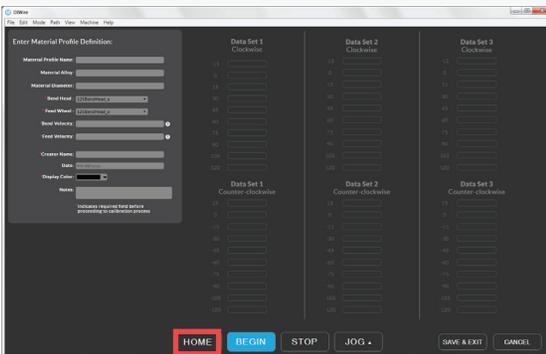
Fill in the information about the wire and the D.I.Wire hardware setup and click BEGIN when ready to move on.

Red fields are required, others are optional*

To determine the Bend and Feed Velocities for the wire being used, refer to [Pensalabs.com/support/](https://pensalabs.com/support/) for a reference guide.

Creating a Material Profile

4 HOME BEND PIN

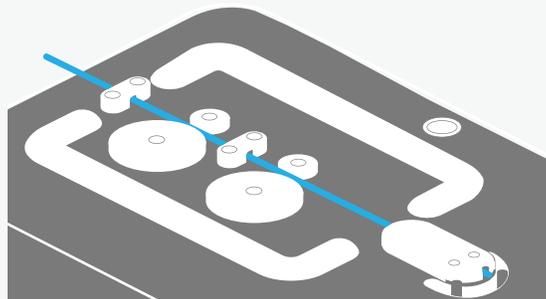


Before bending, the D.I.Wire needs to go through the homing sequence to ensure the bend pin is in the proper position.

HOME Commands the D.I.Wire to locate and rest at Home (machine position zero)

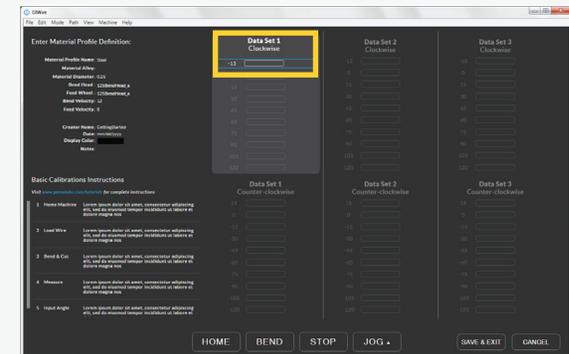
The machine must be homed when booted or if it has lost its location

5 LOAD WIRE



Load the wire through the Wire Guides, the Feed Wheels and into the Bend Head.

6 BEND



Click BEND to bend your first datapoint. Use the cutting tool to remove the bent wire from the D.I.Wire

The BEND button will automatically feed material out and bend the angle of the active data field.

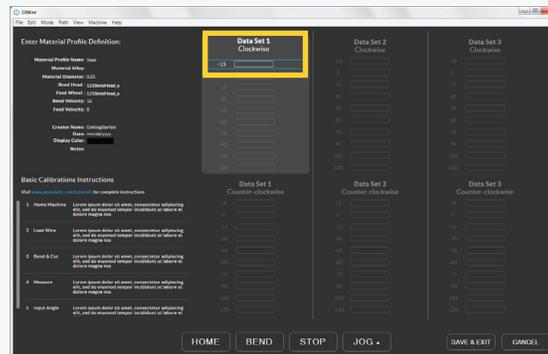
Creating a Material Profile

7 MEASURE ANGLE



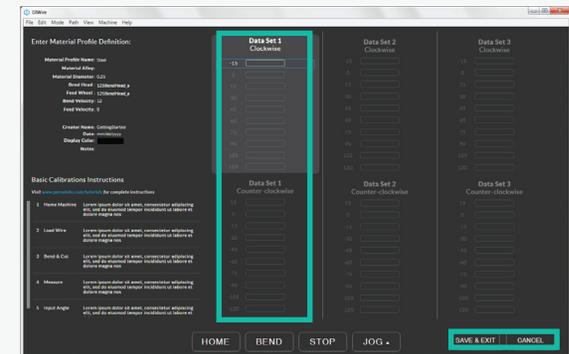
Measure the angle of the bent wire using a protractor.

8 INPUT



Type measurement into the dataset fields, press the ENTER key to move down to the next datapoint. All values will be positive for the Material Profile.

9 REPEAT & SAVE



Repeat these steps for every datapoint in the Dataset.

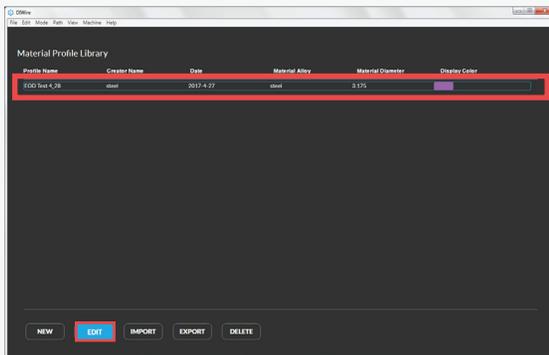
SAVE & EXIT Click the Save & Exit button to save a completed or in-progress Material Profile

The file will not show up in the Material Profile drop down lists until all three datasets are complete.

CANCEL Click the Cancel button to exit without saving the file.

Editing a Material Profile

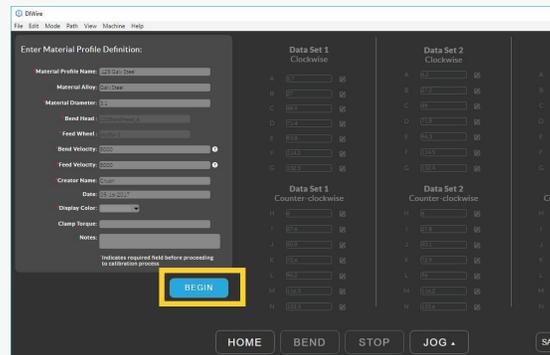
1 EDIT PROFILE



In the Material Profile Library, select the Material Profile to be edited and click the EDIT button.

The blue box will appear around the Material Profile when it is selected

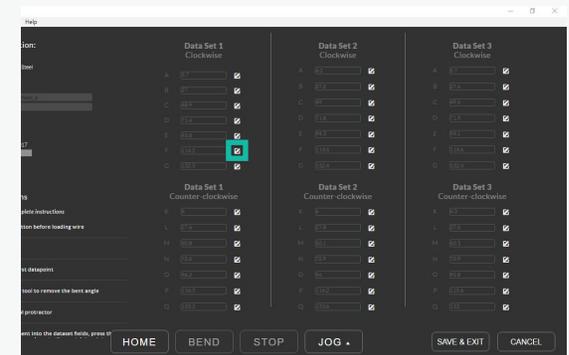
2 EDIT DEFINITION



Make any needed changes to the Material Profile Definition and click BEGIN.

Note that the Bend Head and Feed Wheel types and velocities cannot be changed as the datapoints are linked to this information

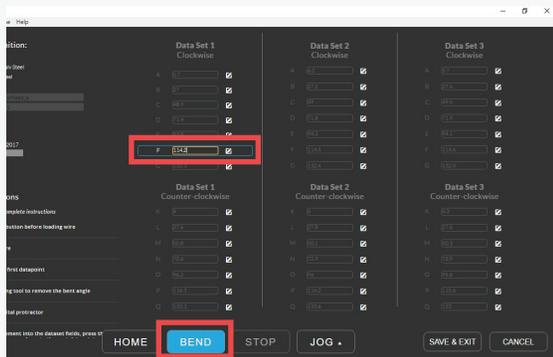
3 INITIATE EDITING



Click the EDIT icon next to the datapoint that needs to be edited.

Editing a Material Profile

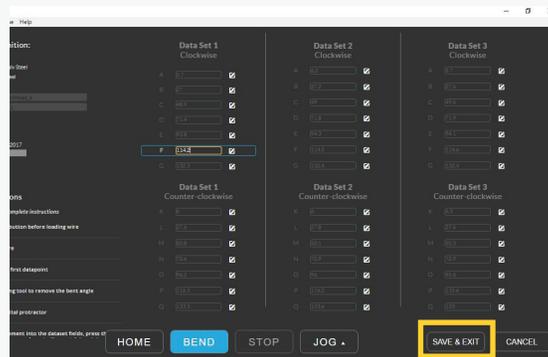
4 EDIT DATAPOINT



Click BEND to rebend this value and/or input measured angle.

After new numerical value is entered, press the ENTER key to move down.

5 SAVE & EXIT



Save and Exit the Material Profile at anytime if needed. However, this file will not appear in a Material Profile drop down list until all 3 Datasets are complete.

SECTION 07

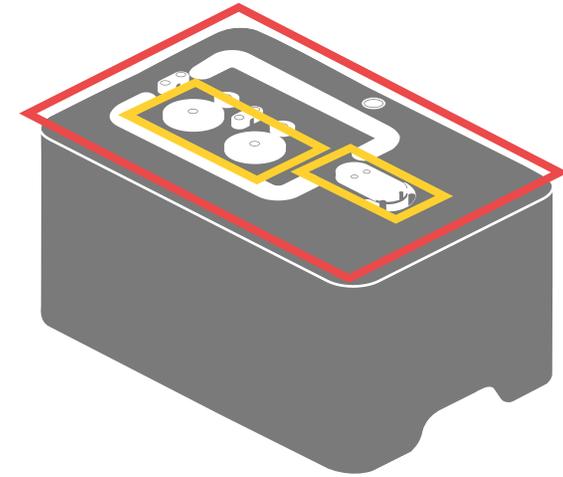
Maintenance

Maintenance

- SWITCHING BEND HEAD & FEED
- CLAMP ADJUST

Switching Bend Head + Feed Wheels

D.I.Wire Bend Head and Feed Wheels must be changed to accommodate different wire dimensions.



1 PREPARATIONS

WHAT'S
NEEDED:



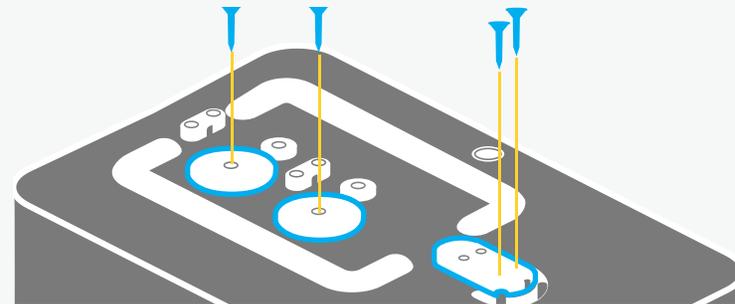
Bend Head and Feed Wheels (1/8" or 1/16")



T15 Torx Screwdriver

The Bend Head and Feed Wheels need to be changed to ensure the wire remains centered while bending. As the wire diameter gets larger, the groove in the Bend Head gets larger and the Feed Wheels get smaller.

2 SWITCH BEND HEAD + FEED WHEELS

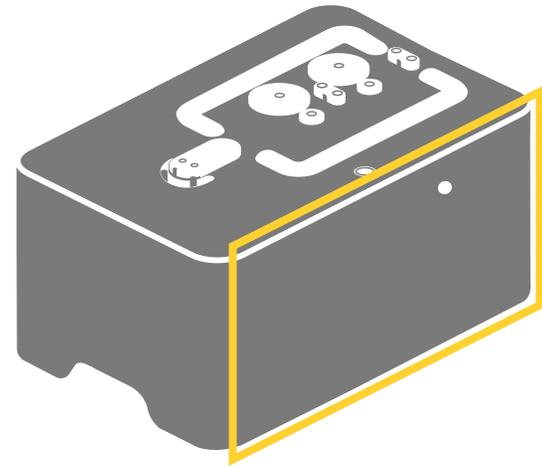


Unscrew assembled Bend Head and two Feed Wheels from the D.I.Wire PLUS machine with the T15 Torx Screwdriver.

Screw the new Bend Head and Feed Wheels onto the D.I.Wire.

Clamp Adjust

If the Feed Wheels are slipping, meaning they are not effectively pulling wire through, the Clamp Adjust needs to be modified.



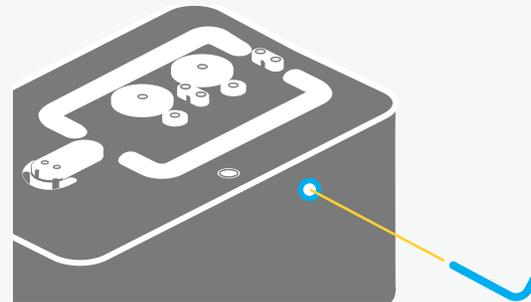
1 PREPARATIONS

WHAT'S
NEEDED



5/32 Hex Screwdriver

2 CLAMP ADJUSTMENT



Turn the Clamp Adjust on the D.I.Wire with the 5/32 Hex Screwdriver. Going against convention, turn left to tighten and turn right to loose.

Overtime, it is possible to get a feel for the variation in how tightly the bearings pull towards the Feed Wheels

SECTION 06

References

Quick Key Commands

MODE	COMMAND	FUNCTION	DESCRIPTION
Global	Command/CTRL + T	Connect	Connect to a plugged in D.I.Wire
Global	Command/CTRL + O	Open	Open a file in either Path or Script Mode
Global	Command/CTRL + Q	Exit	Quits WireWare
Global	Command/CTRL + Shift + C	Material Profile Mode	Switch to Material Profile Mode
Global	Command/CTRL + Shift + G	Script Mode	Switch to Script Mode
Global	Command/CTRL + Shift + P	Path mode	Switch to Path Mode
Path	Command/CTRL + S	Save Shape	Saves shape in Path Mode Workspace
Path	Command/CTRL + Shift + S	Save Shape As	Opens Save As dialog for path in Workspace
Path	Command/CTRL + U	Undo	Undo last action in Workspace
Path	Command/CTRL + Shift + U	Redo	Redo last action in Workspace
Path	Command/CTRL + N	Next Shape	Switch to the next path when there are multiple paths on the Workspace (in order of creation)
Path	Command/CTRL + P	Previous shape	Switch to the previous path when there are multiple paths on the Workspace
Path	L	Zoom Extents	Center camera on Path and zoom to fill application window
Path	Backspace	Delete selected vertices	Delete currently selected Bend Points
Path	Escape	Select Mode	Switch to select mode
Path	CTRL + 1	Snap to Grid	Click and drag Path interactions snap to the grid
Path	CTRL + 2	Snap to Original	Click and drag Path interactions snap to the original shape
Path	E	Show/Hide Original	Show or hide the original Path outline
Path	Click and drag + Shift + CTRL	Snap to Horizontal/Vertical	While in the Workspace, snap interactions to horizontal/vertical
Path	Click and drag + Shift + CTRL	Snap to Tangent	While in the Workspace, snap interactions to the tangent line of the next and previous Bend Points
Path	Click and drag + alt	Pan	While in the Workspace, Pan across the Workspace with mouse
Script	Command/CTRL + X	Cut	Cut selected text
Script	Command/CTRL + C	Copy	Copy selected text
Script	Command/CTRL + V	Paste	Paste text in clipboard