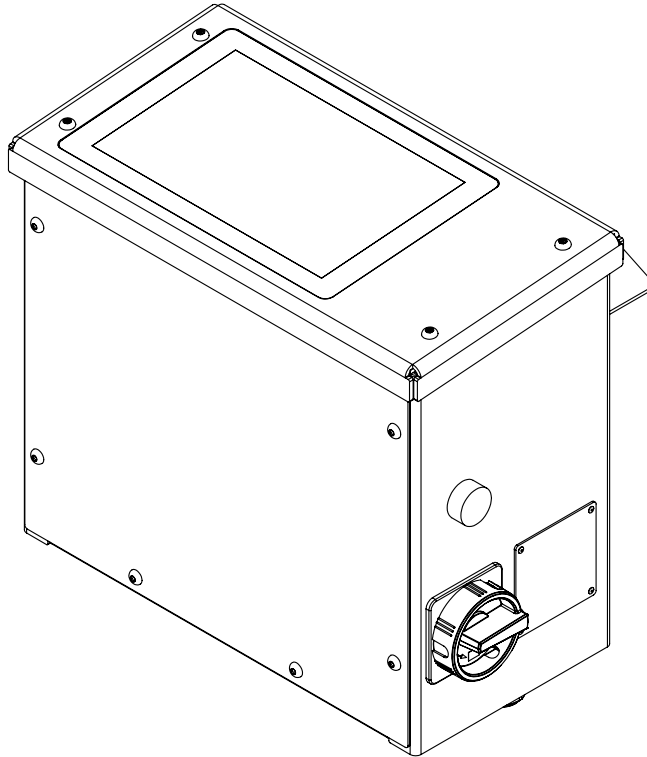


M54 Tube Bender HMI1000 Operation Manual



JD Squared, Inc.
2025.12.1

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Powering the Machine

1.1 Powering on the Machine

Turn the disconnect handle to the **ON** position to power the machine on. The M54 user interface launches automatically after the machine boots.



Figure 1.1: M54 Power Disconnect Handle

1.2 Powering off the Machine

1. Safely shutdown the machine by navigating to the main menu and selecting the Power workspace.
2. Select the **Power Off Machine** button.
3. When the screen goes black, turn off the power disconnect.

Note

The machine has large capacitors in the power supply. If you are power cycling the machine:

1. Shutdown the machine normally.
2. Wait for the LED indicator light to extinguish.
3. Count 20 seconds.
4. Power the machine on normally.

Settings

2.1 User Settings

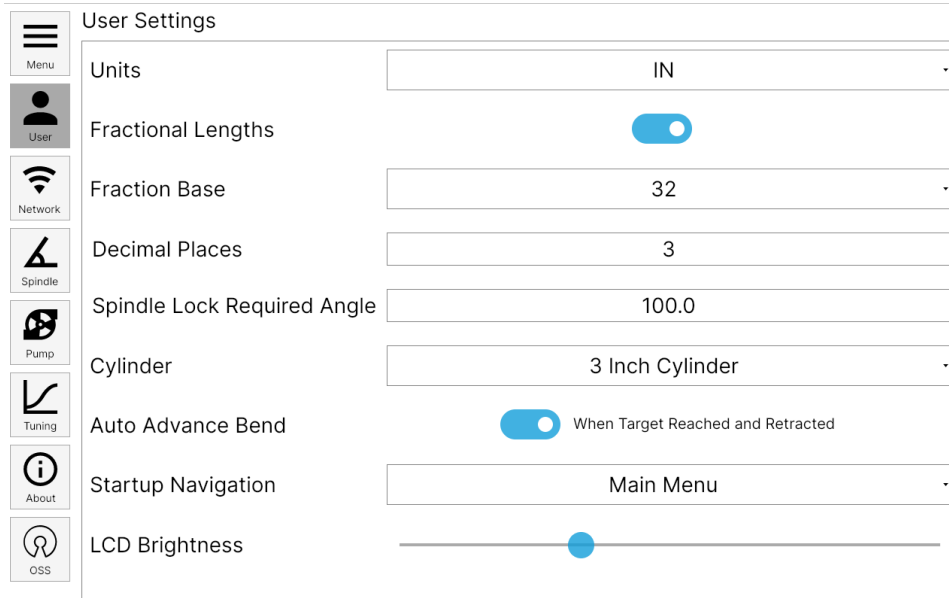


Figure 2.1: Attachment Settings

User Settings

Setting	Description
Units	The length unit system. Angles are always shown in degrees.
Fractional Lengths	Enable to show lengths as fractions instead of decimals
Decimal Places	The number of decimal digits to display
Spindle Lock Required Angle	The spindle target angle that causes the spindle lock icon reminder to appear
Cylinder	The installed cylinder size
Auto Advance Bend	Enable to automatically move to the next bend after retracting the spindle in part mode
Startup Navigation	The first page to show after startup
LCD Brightness	Adjust the display brightness

2.2 Network Settings

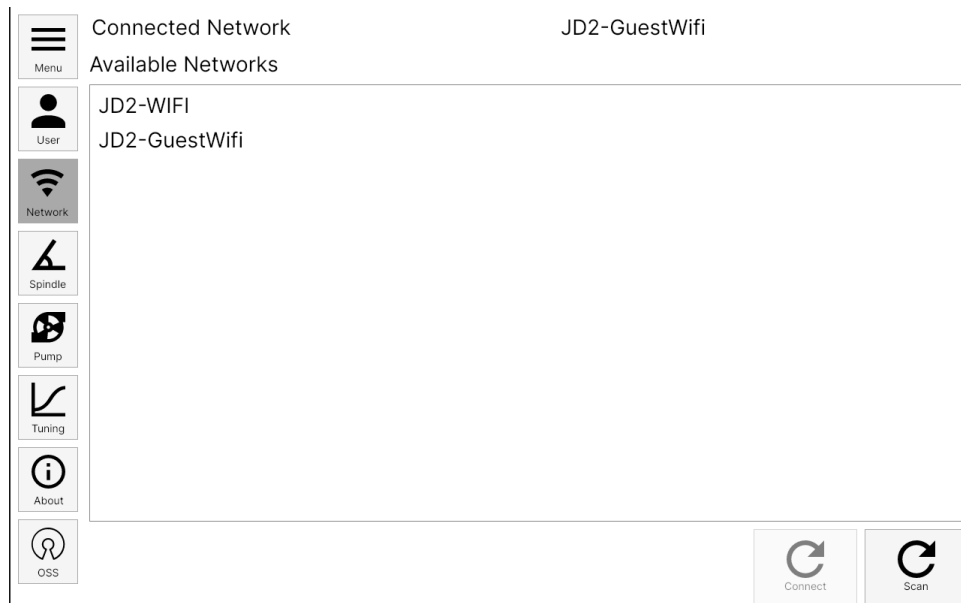


Figure 2.2: Network Settings

Connection to a publicly broadcast WIFI network that requires a simple password can be done directly in the HMI.

1. Scan for available networks.
2. Select the network to connect.
3. Press Connect
4. Enter the password

On successful completion, the connected network will be displayed.

2.2.1 Advanced Network Settings

- Close the HMI software, but do not shut down the machine.
- Select the WIFI icon in the top right of the taskbar.

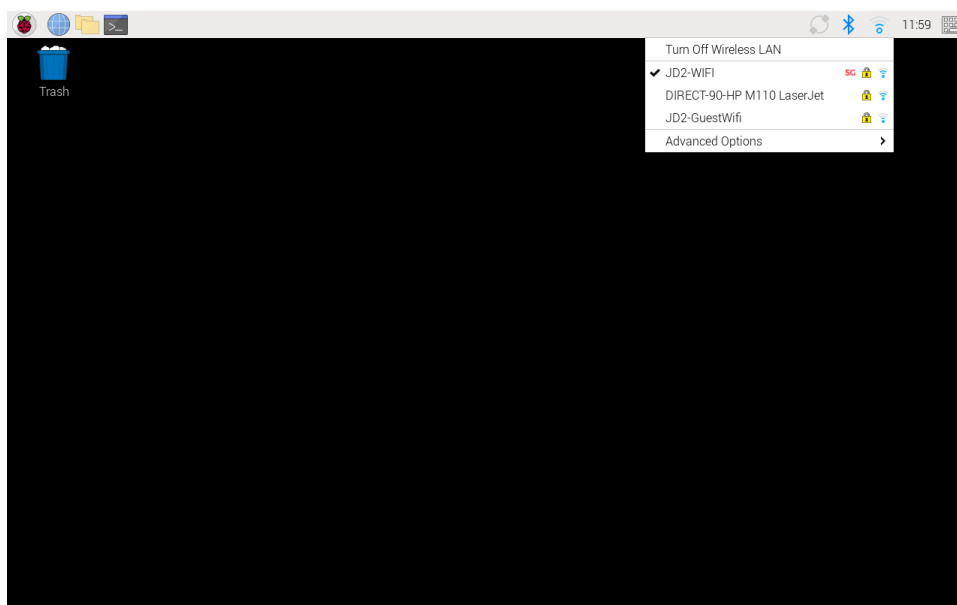


Figure 2.3: Desktop WIFI Drop-Down Menu

- Select Edit Connections

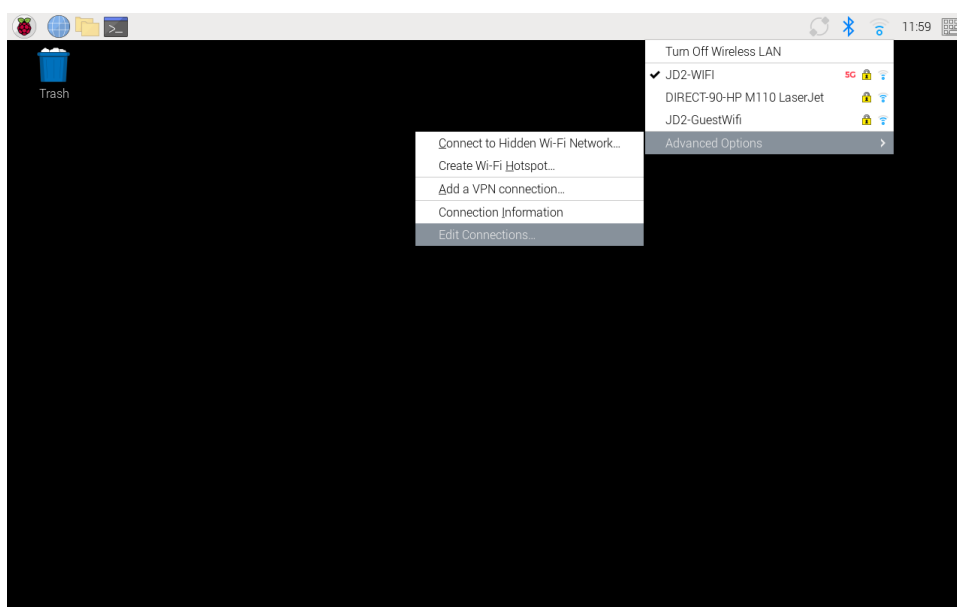


Figure 2.4: Desktop WIFI Edit Connections

- Follow the on-screen prompts

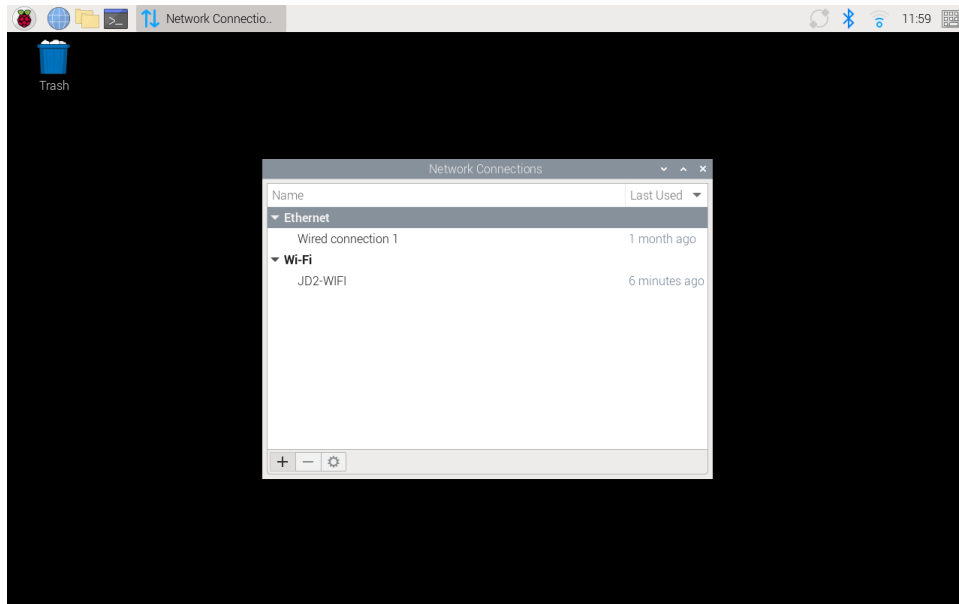


Figure 2.5: Desktop WIFI Dialog

2.3 Pump Settings

Menu

User

Network

Spindle

Pump

Tuning

About

OSS

Pump Settings

Motor On Delay (s)	1.500
Motor Off Delay (s)	1.500
Valve Interlock Delay (ms)	50
Motor Idle Off Delay (s)	180.000

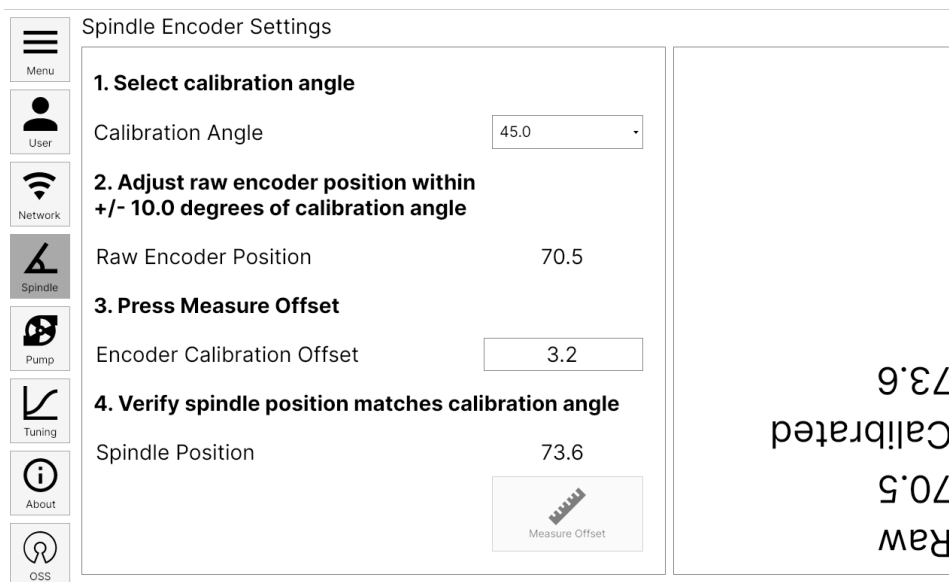
Figure 2.6: Pump Settings

Pump Settings

Setting	Description
Motor On Delay	Seconds to wait for the pump to start before allowing ram motion
Motor Off Delay	Seconds to wait for the pump to stop before allowing another action
Valve Interlock Delay	Milliseconds between commanding valve extend and valve retract
Motor Idle Off Delay	Seconds to wait before turning off the pump automatically if no ram movement

2.4 Spindle Settings

The spindle encoder can have a software applied offset. Follow the on-screen instructions to install and calibrate the spindle encoder.



Spindle Encoder Settings

1. Select calibration angle

Calibration Angle 45.0

2. Adjust raw encoder position within +/- 10.0 degrees of calibration angle

Raw Encoder Position 70.5

3. Press Measure Offset

Encoder Calibration Offset 3.2

4. Verify spindle position matches calibration angle

Spindle Position 73.6

Measure Offset

Raw 70.5
Calibrated 73.6

Figure 2.7: Spindle Settings

Workspaces

3.1 Single Bend



Figure 3.1: Single Bend Workspace Icon

The single bend workspace is used to quickly make one bend without creating a part file. It is still possible to use the technical data tables for springback compensation values.

3.1.1 Single Page

Perform a single bend.

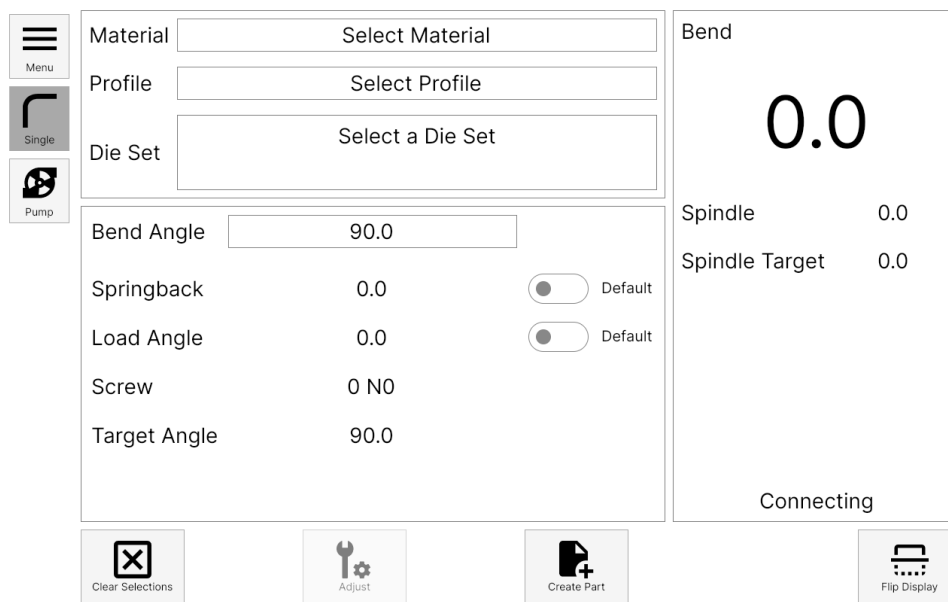
The interface for the Single Bend workspace. On the left is a vertical sidebar with three icons: a menu icon (three horizontal lines), a single bend icon (L-shape), and a pump icon (circular arrow). The main area is divided into two columns. The left column contains input fields for "Material" (with a "Select Material" button), "Profile" (with a "Select Profile" button), and "Die Set" (with a "Select a Die Set" button). Below these are fields for "Bend Angle" (90.0), "Springback" (0.0 with a "Default" toggle), "Load Angle" (0.0 with a "Default" toggle), "Screw" (0 NO), and "Target Angle" (90.0). The right column shows a large "Bend" value of "0.0", followed by "Spindle" (0.0) and "Spindle Target" (0.0). At the bottom of the right column is a "Connecting" status. At the very bottom are four buttons: "Clear Selections" (with an X icon), "Adjust" (with a wrench and gear icon), "Create Part" (with a document and plus icon), and "Flip Display" (with a monitor icon).

Figure 3.2: Single Bend Workspace

3.1.2 Pump Page

Select the pump button to toggle the pump motor power state manually.

3.2 Part Mode

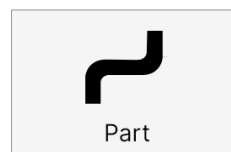


Figure 3.3: Part Bend Workspace Icon

The part bend workspace is used make whole parts with multiple bends.

3.2.1 Browse Page

Organize parts in folders, create new parts, or load existing parts.

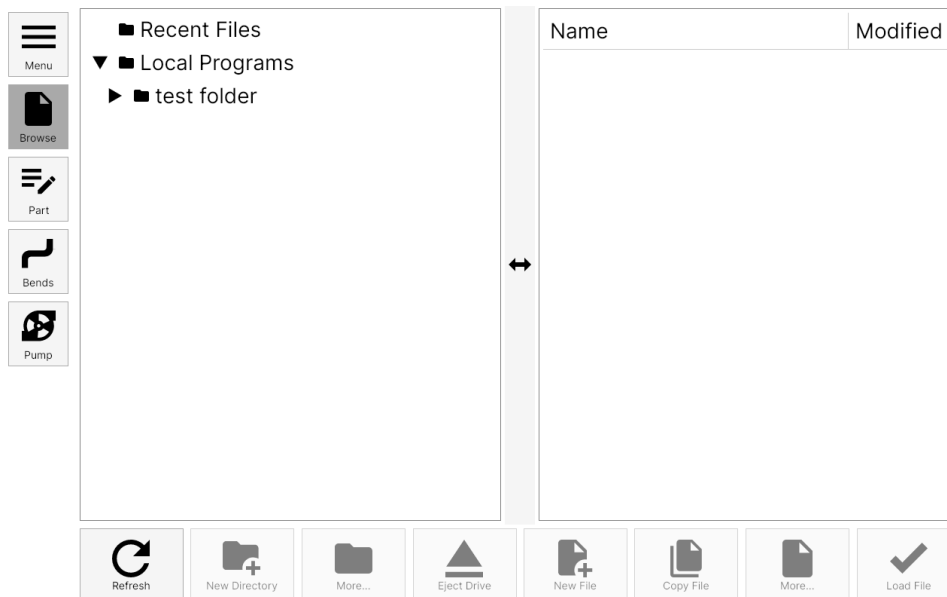


Figure 3.4: Part Bend Workspace Browse Page

3.2.2 Part Page

The part page shows a summary of the part, material, profile, and bends.

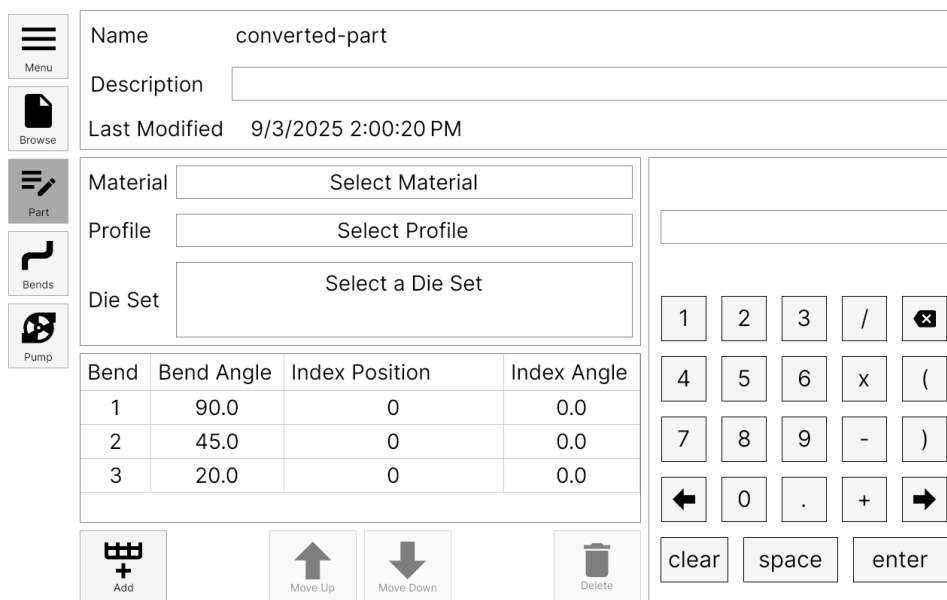


Figure 3.5: Part Bend Workspace Part Page

3.2.3 Bends Page

The bends page shows the current bend, allows selecting the active bend, and is where bending is performed.

converted-part

Menu

Browse

Part

Bends

Pump

Die Set Select a Die Set

Bend Angle 90.0

Index Position 0

Index Angle 0.0

Springback 0.0 Default

Load Angle 0.0 Default

Screw 0 N0

Target Angle 90.0

Note

Bend

1 / 3

73.6

Spindle 73.6

Spindle Target 90.0

Idle

Adjust

Flip Display

Figure 3.6: Part Bend Workspace Bends Page

3.2.4 Pump Page

Select the pump button to toggle the pump motor power state manually.

3.3 Library

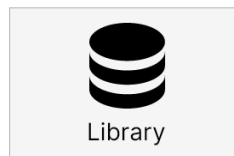


Figure 3.7: Library Workspace Icon

The Library workspace is for adding and editing technical data.

3.3.1 Die Set Page

All standard manufactured die sets are installed into the machine database. Favorite die sets that are used frequently to speed up selection when operating the machine.

▼ Filter Empty Favorite ☐

Part Number

CLR Angle

Shape Units

Part Number	Description	CLR	Angle	Favorite
308198	M50 1 1/2" Pipe (1.9OD 5.5CLR 180DEG)	5.5	180	<input type="checkbox"/>
308199	M50 1 1/2" Pipe (1.9OD 6.0CLR 180DEG)	6.0	180	<input type="checkbox"/>
308200	M50 1 1/2" Pipe (1.9OD 6.5CLR 180DEG)	6.5	180	<input type="checkbox"/>
308201	M50 1 1/2" Pipe (1.9OD 7.0CLR 180DEG)	7.0	180	<input type="checkbox"/>
308202	M50 1 1/2" Pipe (1.9OD 7.5CLR 180DEG)	7.5	180	<input type="checkbox"/>
321425	M50 1 1/2" Pipe (1.9OD 8.0CLR 180DEG)	8.0	180	<input type="checkbox"/>

Figure 3.8: Library Workspace Die Set Page

Die Set Edit and Entry Page

The die set profile and fixed parameters can be adjusted.

Edit Die Set Favorite ☐

Description M50 1 1/2" Pipe (5.5CLR 180DEG)

Part Number Nominal Size

CLR Angle

Screw Position Screw Nut

Shape Units OD

Figure 3.9: Library Workspace Die Set Edit Page

3.3.2 Materials Page

Manage materials available for selection. Typical materials from standard vendors are included from the factory.

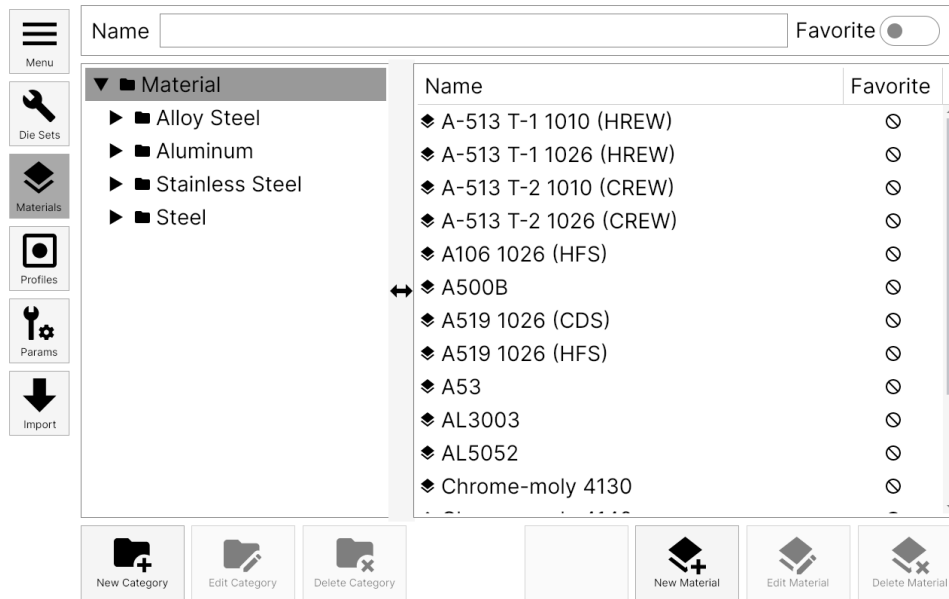


Figure 3.10: Library Workspace Materials Page

Material Edit and Entry Page

A material can be categorized or renamed by editing.

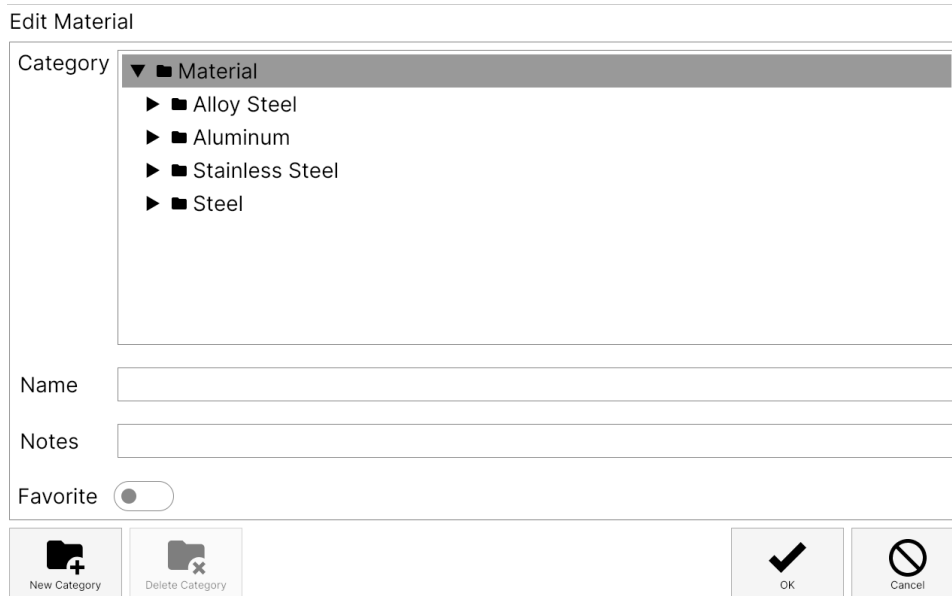


Figure 3.11: Library Workspace Material Edit Page

3.3.3 Profiles Page

Manage material profiles available for selection. Typical profiles from standard vendors are included from the factory.

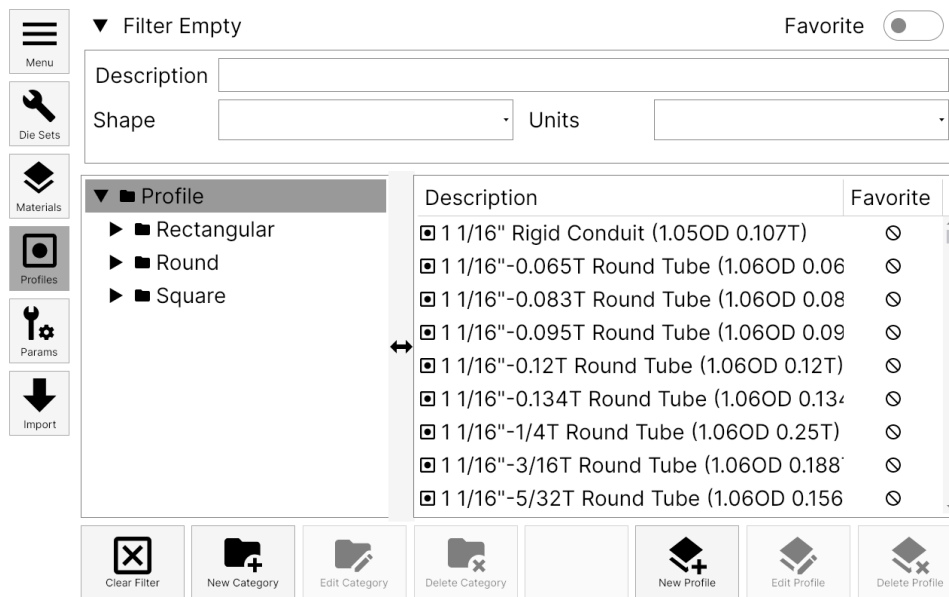


Figure 3.12: Library Workspace Profiles Page

Profile Edit and Entry Page

A profile can be categorized or renamed by editing.

Edit Profile

Category
Rigid Conduit

Description
1 1/16" Rigid Conduit (1.05OD 0.107T)

Nominal Size
1 1/16" Rigid Conduit
Favorite
☐

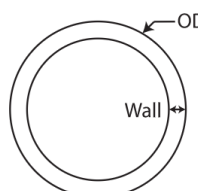
Shape
Round

Units
IN

OD
1.05

Wall Thickness
0.107

ID
0.836



☐ OK

☐ Cancel

Figure 3.13: Library Workspace Profile Edit Page

3.3.4 Params Page

Manage parameters that are specific to a material, profile, and die set group. Settings such as springback table entries are found using test bends.

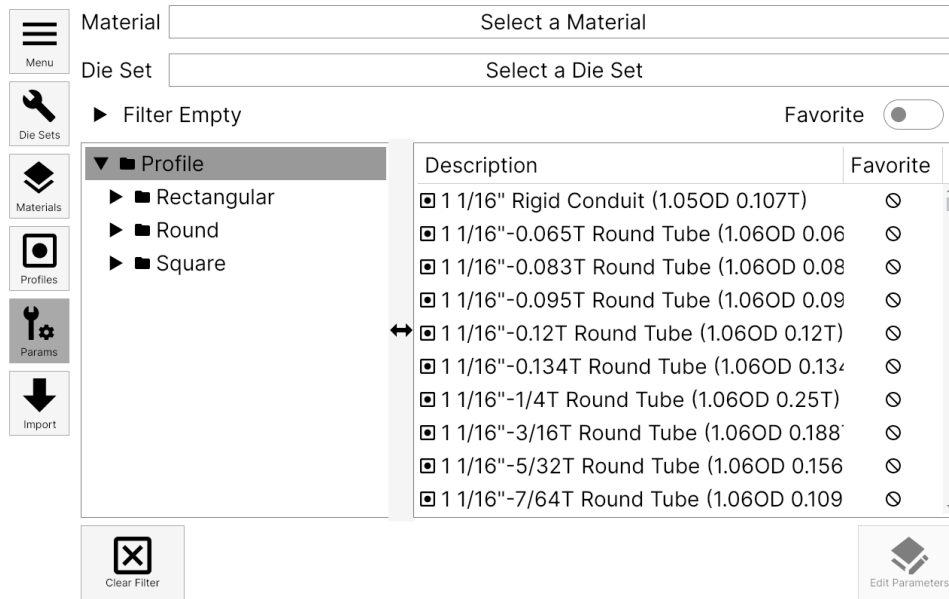


Figure 3.14: Library Workspace Params Page

Parameter Edit and Entry Page

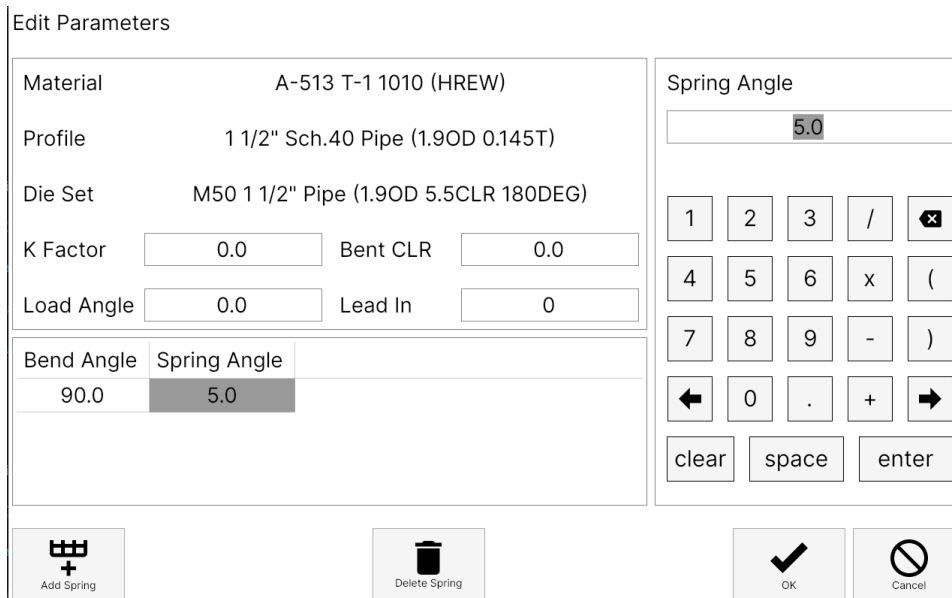


Figure 3.15: Library Workspace Parameter Edit Page

3.4 Calculator

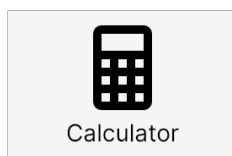


Figure 3.16: Calculator Workspace Icon

A basic calculator is included. It can support basic formulas and mixed fractions.

3.4.1 Calculator Page

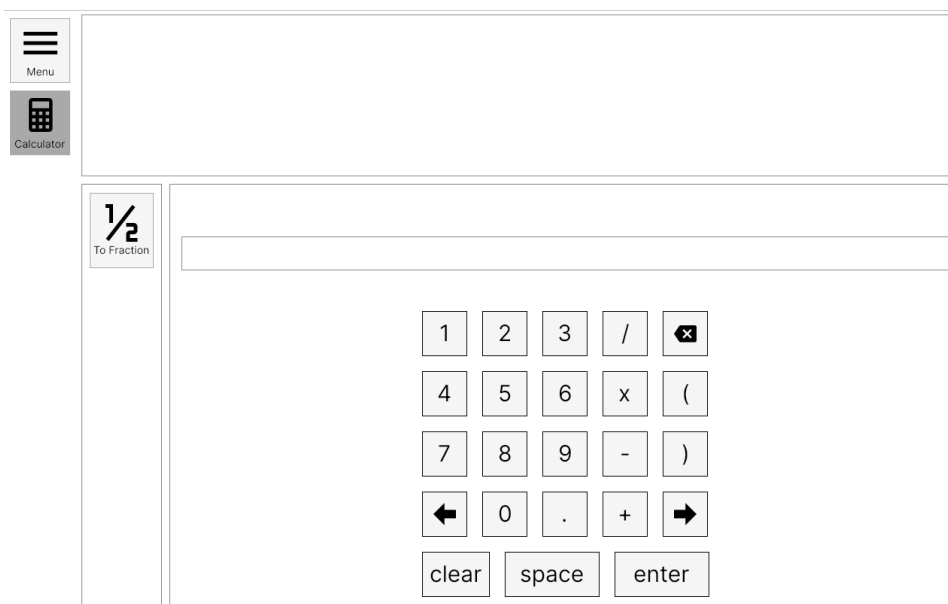


Figure 3.17: Calculator Workspace Calculator Page

3.5 Diagnostics

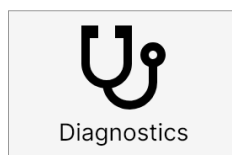


Figure 3.18: Diagnostic Workspace Icon

The diagnostics workspace has basic and advanced tools to help technical support resolve issues with a machine.

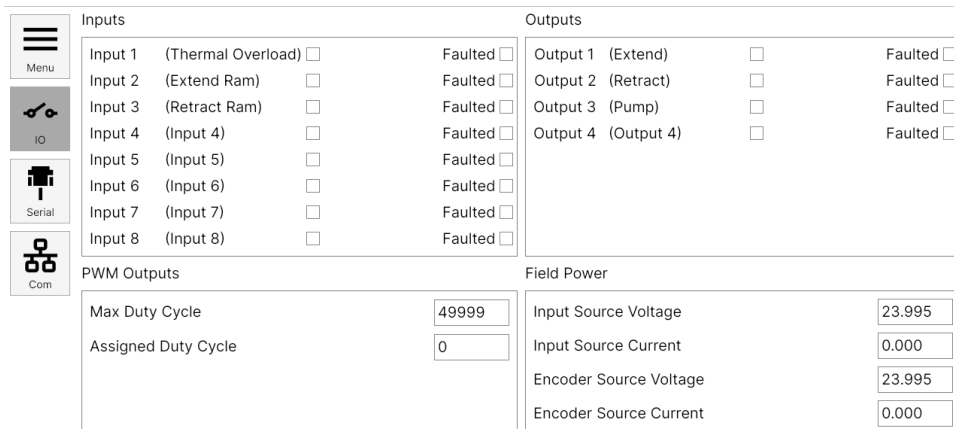
Note

Not all pages are described here.

They are reserved for advanced usage by a trained technician.

3.5.1 IO Page

View status of IO and machine sensors.



Inputs			Outputs		
Input 1	(Thermal Overload)	<input type="checkbox"/> Faulted <input type="checkbox"/>	Output 1	(Extend)	<input type="checkbox"/> Faulted <input type="checkbox"/>
Input 2	(Extend Ram)	<input type="checkbox"/> Faulted <input type="checkbox"/>	Output 2	(Retract)	<input type="checkbox"/> Faulted <input type="checkbox"/>
Input 3	(Retract Ram)	<input type="checkbox"/> Faulted <input type="checkbox"/>	Output 3	(Pump)	<input type="checkbox"/> Faulted <input type="checkbox"/>
Input 4	(Input 4)	<input type="checkbox"/> Faulted <input type="checkbox"/>	Output 4	(Output 4)	<input type="checkbox"/> Faulted <input type="checkbox"/>
Input 5	(Input 5)	<input type="checkbox"/> Faulted <input type="checkbox"/>			
Input 6	(Input 6)	<input type="checkbox"/> Faulted <input type="checkbox"/>			
Input 7	(Input 7)	<input type="checkbox"/> Faulted <input type="checkbox"/>			
Input 8	(Input 8)	<input type="checkbox"/> Faulted <input type="checkbox"/>			

PWM Outputs		Field Power	
Max Duty Cycle	<input type="text" value="49999"/>	Input Source Voltage	<input type="text" value="23.995"/>
Assigned Duty Cycle	<input type="text" value="0"/>	Input Source Current	<input type="text" value="0.000"/>
		Encoder Source Voltage	<input type="text" value="23.995"/>
		Encoder Source Current	<input type="text" value="0.000"/>

Figure 3.19: Diagnostics Workspace IO Page

3.6 Power Controls



Figure 3.20: Power Workspace Icon

3.6.1 Power Page

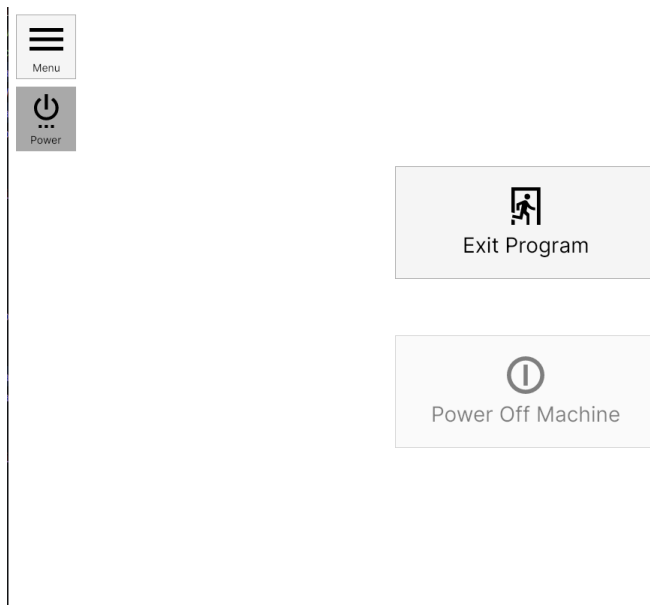


Figure 3.21: Power Workspace

3.6.2 Exiting the Program

1. Select the **Exit Program** button.

3.6.3 Powering off the Machine

1. Select the **Power Off Machine** button.
2. When the screen goes black, turn off the power disconnect.

3.6.4 Power Cycling the Machine

The machine has large capacitors in the power supply. If you are power cycling the machine:

1. Shutdown the machine normally.
2. Wait for the LED indicator light to extinguish.
3. Wait 20 seconds.
4. Power the machine on normally.

3.7 Adjustment Dialog

Bend Angle	90.0
Measured Angle	<input type="text" value="90.0"/>
Springback	6.0
Adjusted	6.0

Global Parameters

Screw Position	<input type="text" value="0"/>
Screw Nut	<input type="text" value="0"/>
Load Angle	<input type="text" value="0.0"/>

Bend Angle	Spring Angle	
90.0	6.0	

1

2

3

/

✕

4

5

6

x

(

7

8

9

-

)

←

0

.


+


→


clear


space


enter

Add Spring

Adjust Spring

Delete Spring

Adjust Bend

Adjust Part


Close

Figure 3.22: Adjust Dialog

The adjust dialog is a quick way to update springback entries and die set parameters without navigating through the library workspace.

You can measure the appropriate springback angle to apply to the bend angle using the **Adjust Spring** button.