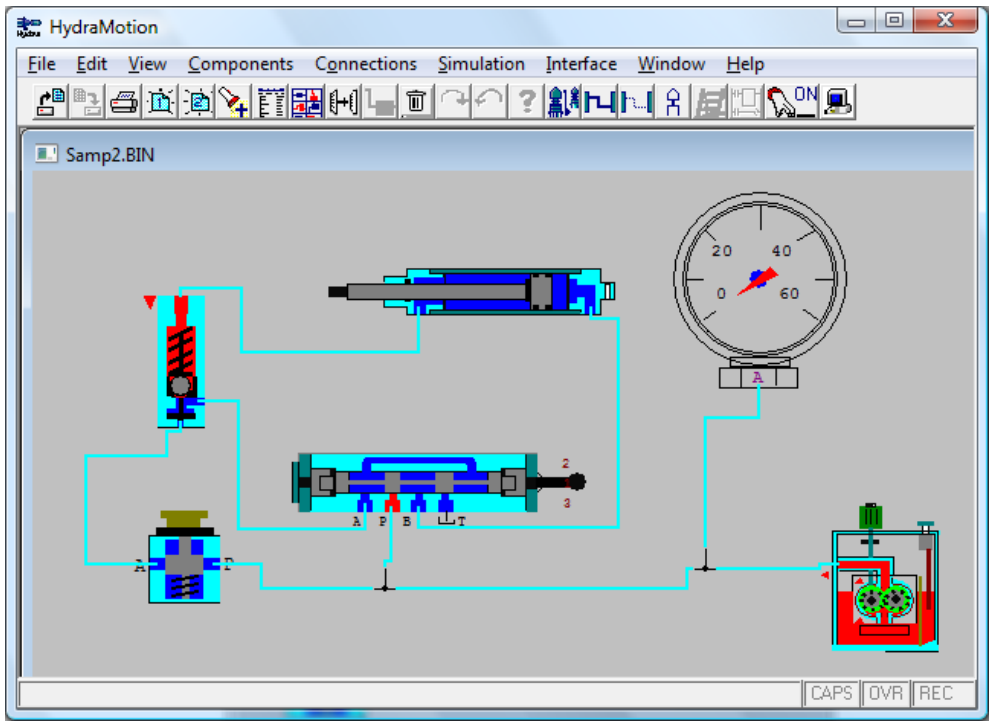
HydraMotion

SIMULATION SOFTWARE FOR HYDRAULICS



USER MANUAL

Catalog #100201 Rev. F

October 2014

intelitek

HydraMotion User Manual

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1. Introduction

HydraMotion is a simulation software package that provides an accurate working simulation of hydraulic devices and circuits. It enables students to study and understand the principles of hydraulics.

As a design tool, HydraMotion allows students to create, operate and observe a model circuit. The circuit can be printed, altered and improved as needed.

HydraMotion can be used in conjunction with the HydraFlex work panel, on which an actual circuit with working components can be assembled and operated.

2. Installation and Activation

2.1. SYSTEM REQUIREMENTS

- **Hardware requirements:**
  - Pentium 4 Dual Core with 3 GHz processor or higher, with CD drive
  - At least 512 MB RAM (1 GB for Vista)
  - A hard drive with at least 100 MB of free disk space
  - A VGA or better graphics display, minimum 256 colors
  - A Mouse or other pointing device
  - Separate RS232 ports on the PC-for each hardware device which uses an RS232 port (or USB ports with RS232 – USB adapter)
- **Software requirements:**
  - One of the following Windows 32 or 64 bit operating systems:
  - Windows XP Professional
  - Windows Vista (Home Premium/Business/Ultimate editions)
  - Windows 7 (Home Premium/Professional/Enterprise/Ultimate editions)
  - Windows 8/8 Pro/8 Enterprise
  - Windows 8.1/8.1 Pro/8.1 Enterprise

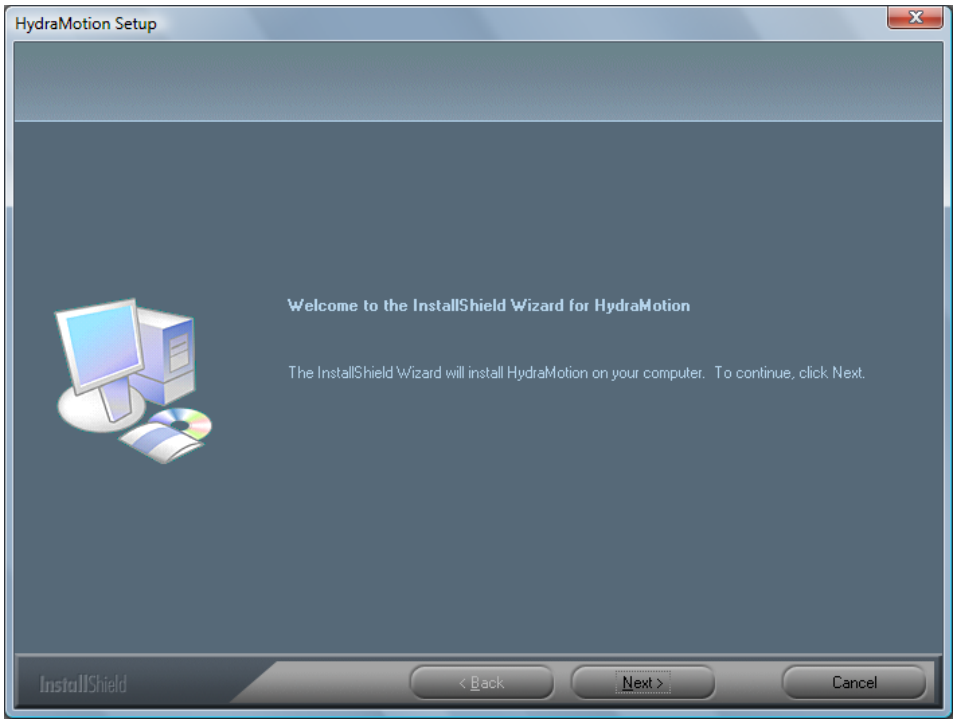
2.2. INSTALLING THE SOFTWARE

This section describes how to install the HydraMotion software. You can obtain your license from intelitek's website at the end of the installation.

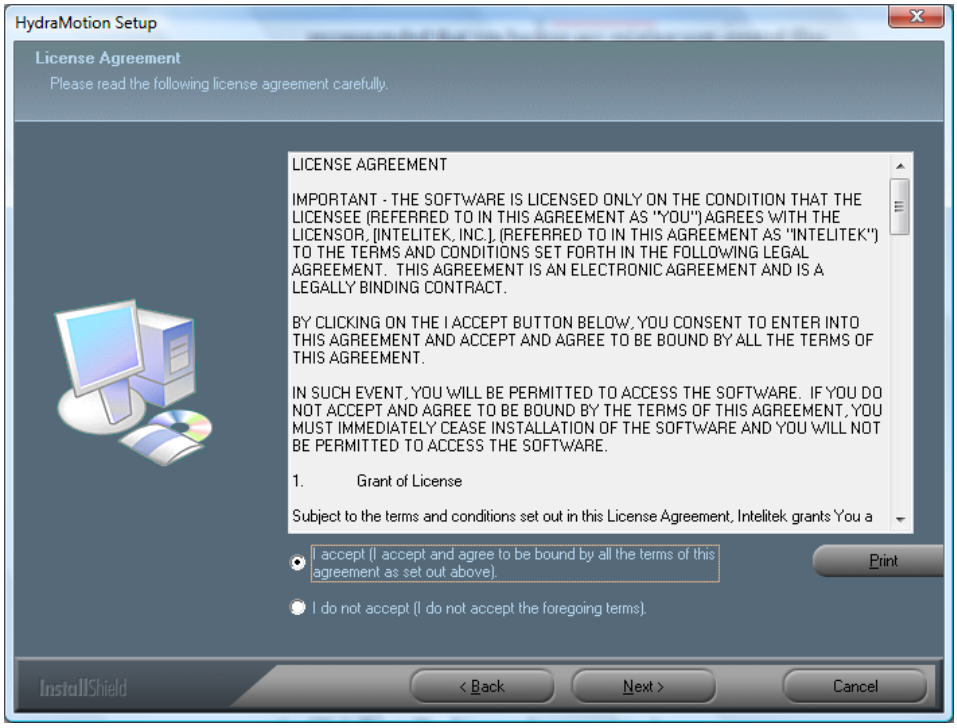
See the Intelitek Software Licensing Guide supplied on your installation CD for other methods of registration.

To install the software, do the following:

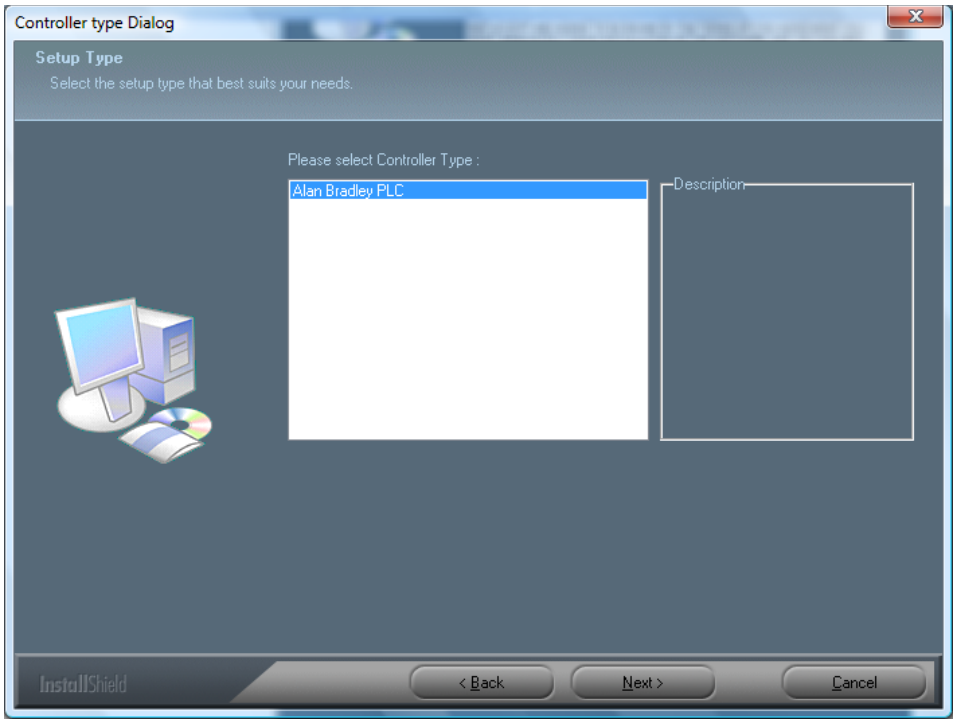
1. Start Windows.
2. Close any open applications before you begin the installation. If you are about to reinstall the software or install a newer version to an existing HydraMotion directory, it is recommended that you backup any existing user-created files before you begin the installation. It is also recommended that you remove the previous HydraMotion installation by means of the Uninstall utility included with the software.
3. Insert the CD into the CD-ROM drive. The installation should begin automatically. If it does not, run **HydraMotionSetup.exe** from the CD-ROM **\Install** folder. The welcome screen is shown.



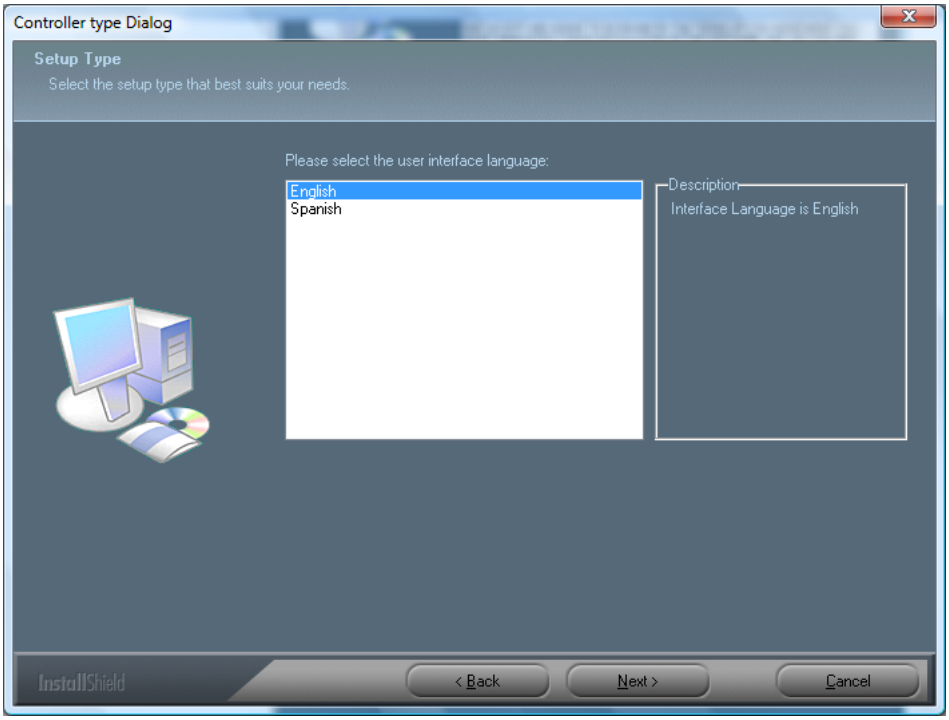
4. Click **Next.** The License Agreement is shown.



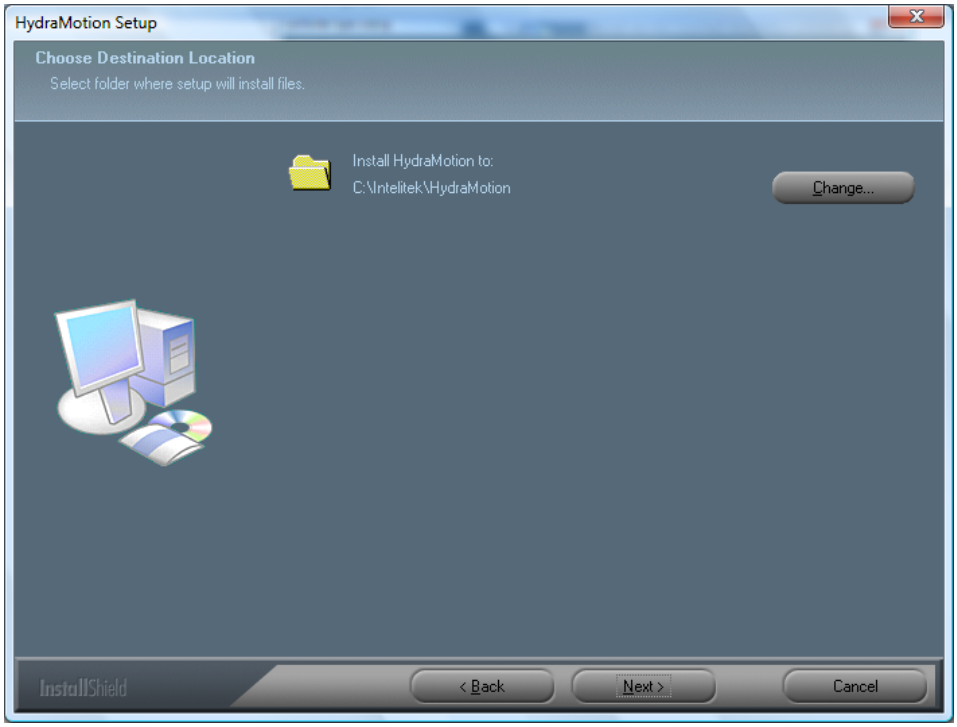
5. Check **I accept** and click **Next**. The Setup Type screen is shown.



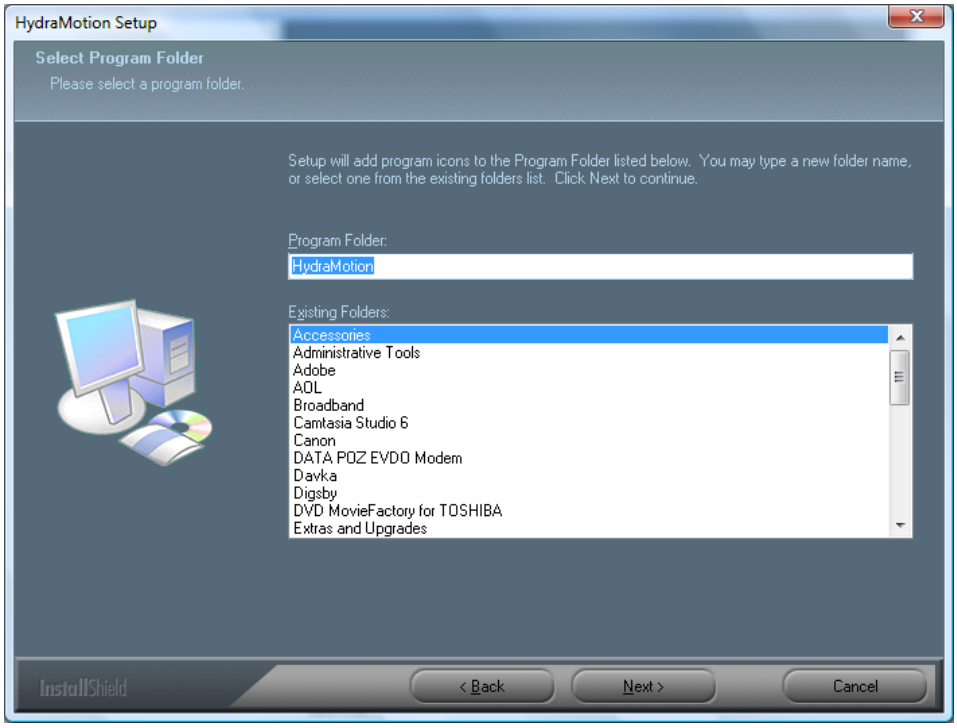
6. Select the **Controller Type** and click **Next**. The Interface Language is screen is shown.



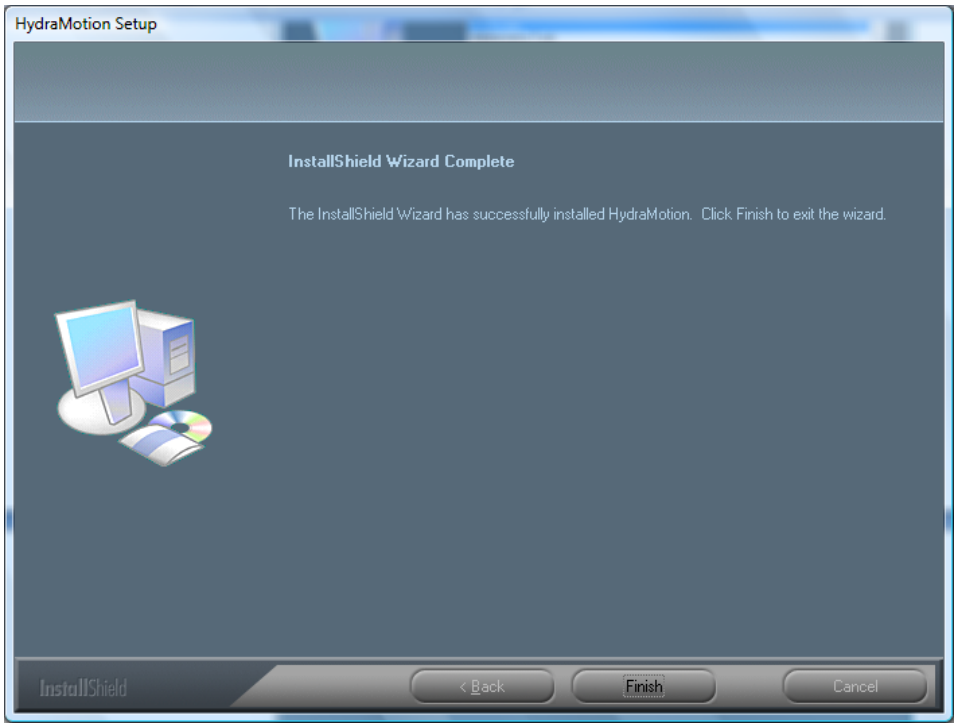
7. Choose your desired language and click **Next.** The Choose Destination Location screen is shown. By default, the software is installed to the folder C:\Intelitek\HydraMotion. During the installation process you have the option to change this. It is **not** recommended that you do so.



8. **Click Next.** The Select Program Folder screen is shown.

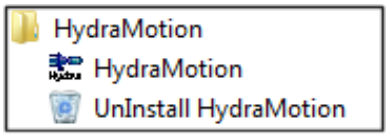


9. Click **Next.** The Setup Status screen is shown. When the status bar completes the InstallShield Wizard Complete screen is shown.



10. Click **Finish** to exit the InstallShield Wizard.

    When the installation is complete, the HydraMotion icons will appear.



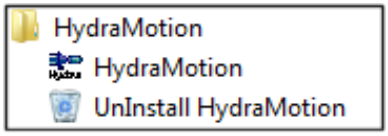
2.3. UNINSTALLING THE SOFTWARE

This section describes how to uninstall your software. Before you uninstall the software, you should backup any existing user-created program and position files.

> ***Note:*** *If required, before you uninstall the software you can return your license to Intelitek (and retrieve it later). For further details refer to the Intelitek Software Licensing Guide supplied on your installation CD.*

To uninstall HydraMotion, do the following:

1. From your windows **Start** menu, select **All Programs | HydraMotion** A popup menu is displayed.

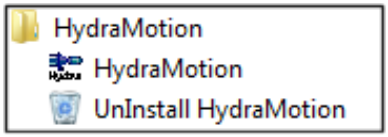


2. Select **Uninstall HydraMotion** to remove your HydraMotion software components and follow the instructions that appear on the screen.

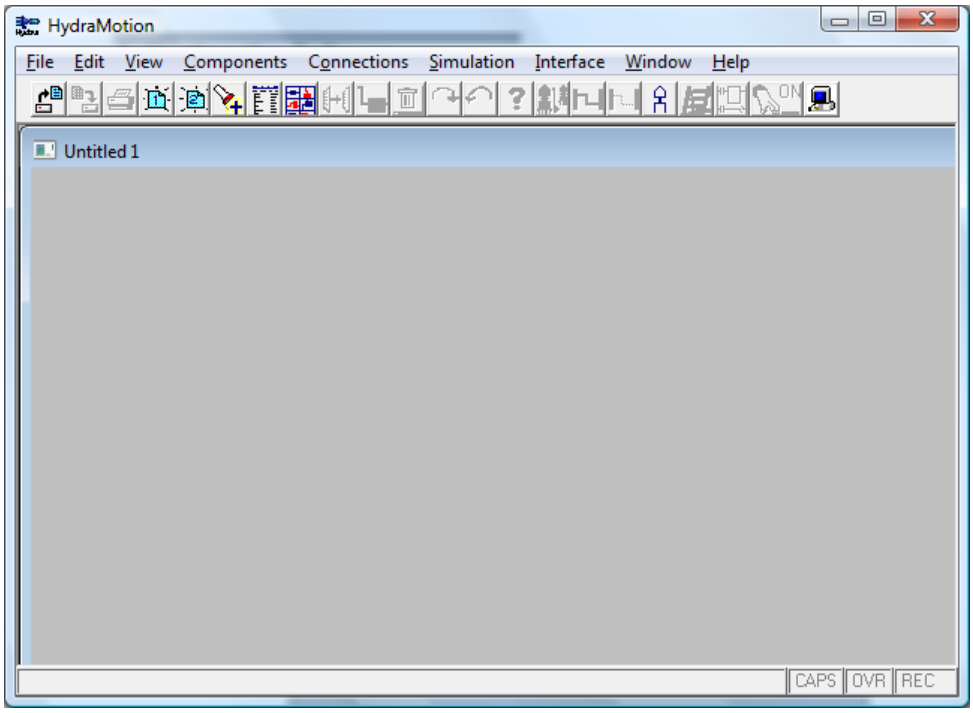
2.4. ACTIVATING THE SOFTWARE

To start HydraMotion, do the following:

1. If you will be using HydraMotion with a HydraFlex panel, make sure that all hardware has been properly set up and connected according to the installation procedures detailed in the user manuals.
2. Turn on the computer and all other connected hardware.
3. From your Windows **Start** menu, select **All Programs | HydraMotion**. The following popup menu is displayed.



4. Select **HydraMotion**. The HydraMotion application window is displayed.



2.5. QUITTING THE SOFTWARE

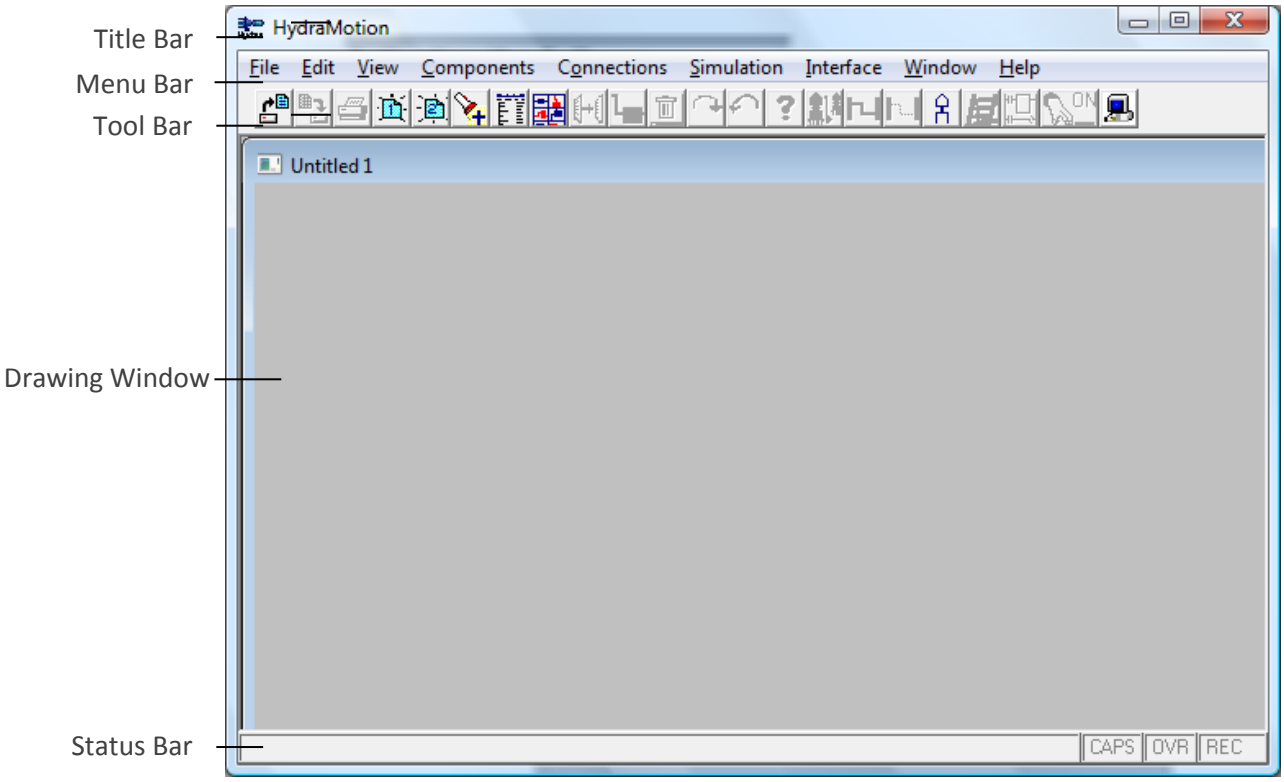
To quit HydraMotion, use any of the standard Windows methods for closing a program:

1. In HydraMotion, select **File | Exit**.
2. Double Click the Control-Menu box in the Title Bar.

3. Overview

3.1. THE HYDRAMOTION WINDOW

The elements of the main HydraMotion window are shown in the following diagram:



Title Bar	Contains the usual Windows controls for sizing and closing the application screen as well as an additional option enabling you to display the interface on top at all times.
Menu Bar	Contains menus with HydraMotion commands. Some commands are accessible from the tool bar (buttons), while some are accessible only in the menus.
Tool Bar	Contain buttons that represent the most frequently used functions and commands. Button availability varies according to the currently active screen or mode, or the selected component.
Drawing Area	Screen area used for designing and displaying circuits

Status Bar	Displays, at the bottom of the screen, information regarding the HydraMotion software, modes of operation, current activity, and so on. When you position the mouse over an icon, a description of the icon appears in the status bar.

3.2. FILE MENU

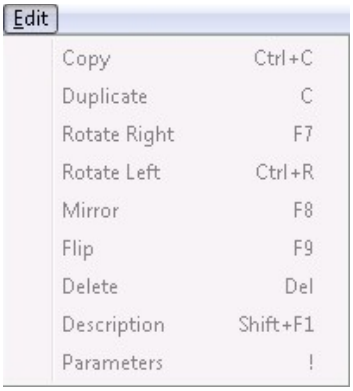
The File menu contains the usual Windows functions which allow you to load, save and print files containing hydraulic circuit diagrams and connections, and to exit the software.

Only one file can be opened and edited at a time; however you may open a second window to create and edit a second file.

New [Ctrl]+N	Opens a new, untitled file.
Open [Ctrl]+O	Opens an existing file.
Save [Ctrl]+S	Saves the currently active file.
Save As...	Saves the currently active file under a new file name.
Print [Ctrl]+P	Prints the currently active file.
Delete...	Deletes a previously saved file.
Exit	Quits HydraMotion. If changes have been made to a file, but not yet saved, a warning message will be displayed.

For more information on file management, see Chapter 8.

3.3. EDIT MENU

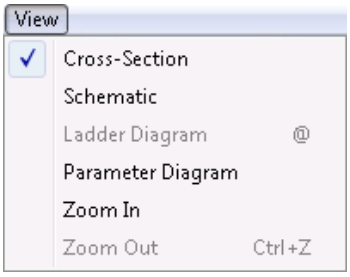


The Edit menu contains usual Windows functions found in most drawing programs. These allow you to edit cross section and schematic diagrams.

	Copy [Ctrl]+C	Copies a selected component to the clipboard as a regular drawing object. It can then be pasted into any other program.
	**Duplicate**	Makes a copy of the selected component.
	**Rotate Right F7**	Rotates the selected component 90° to the right.
	**Rotate Left**	Rotates the selected component 90° to the left.
	**Mirror F8**	Reverses the selected component horizontally, so the left becomes right and vice-versa.
	**Flip F9**	Reverses the selected component vertically, so the top becomes the bottom and vice-versa.
	**Delete [Del]**	Deletes the selected component.
	**Parameters !**	Sets values for selected components. This option is only available for those components which have variable parameters.

For more information on editing functions see Chapter 4.

3.4. VIEW MENU

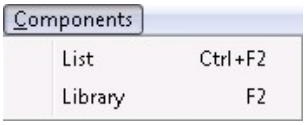


The view menu contains the commands for the viewing modes available in HydraMotion.

	**Cross Section**	Displays a cross section view of each component.
	**Schematic**	Displays the components in standard schematic form.
	**Ladder Diagram**	Opens a schematic control flow chart for electro-hydraulic circuits.
	**Parameter Diagram**	Opens a dialog to monitor pressure and flow during circuit operation.
	**Zoom In**	Magnifies the current view.
	**Zoom Out [Ctrl]+Z**	Returns the view to normal.

For more information on viewing see Chapter 6.

3.5. COMPONENTS MENU

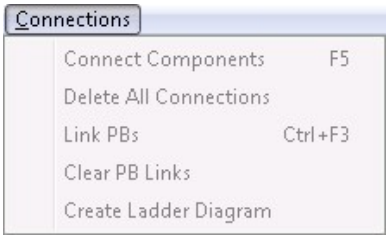


The Components menu contains the commands for selecting the HydraMotion Component List and Library.

	**List [Ctrl]+F2**	Opens a list of the HydraMotion components organized by category.
	**Library F2**	Opens a graphic library of the HydraMotion components and devices.

For more information on selecting components see Chapter 4.

3.6. CONNECTIONS MENU



The Connections menu contains the commands for connecting components in HydraMotion.

	**Connect Components F5**	Selects the Connect Components view.
	**Delete All Connections**	Deletes all connections in the circuit.
	Link PBs	Links two or more push button switches together.

Clear PB Links	Disconnects any PB links in the circuit.
Create Ladder Diagram	Creates or edits a ladder diagram for electro-hydraulic simulations.

For more information on making connections see Chapter 5.

3.7. SIMULATION MENU

The Simulation menu contains the commands for simulating a pneumatic circuit, and individual components in HydraMotion.

Circuit	Selects the HydraMotion simulation feature. *Simulation is available only when the Cross- Section display mode is active.*
Component	Activates the simulation of a component.

For more information on simulation modes see Chapter 7.

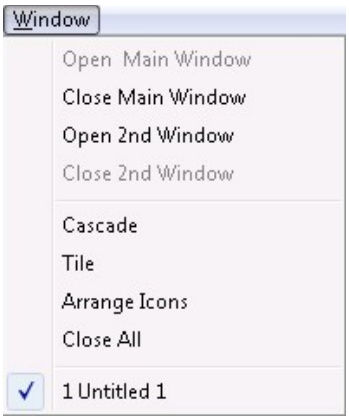
3.8. INTERFACE MENU

The interface menu contains the commands for online software operation.

Setup #	Configures the hardware and software for online operation.
Display I/Os	Provides graphic tracking of the inputs and outputs during online operation.
COM Test	Tests communication between the hardware and software.

For more information about on line operation, see Chapter 9.

3.9. WINDOW MENU



The Window menu defines how the windows containing circuit diagrams are displayed on the screen.

Open Main Window — Opens a new main window.

Close Main Window — Closes the main window if it is open.

Open 2nd Window — Opens a new second window.

Close 2nd Window — Closes the second window, if it is open.

Cascade — The usual Windows control for resizing and layering open windows so that each title bar is visible.

Tile — The usual Windows control for resizing and arranging the open windows by size.

Arrange Icons — The usual Windows control for realigning the icons of programs that have been minimized.

Close All — Closes all open windows that are used for program editing.

The Cascade or Tile setting remains in effect until changed.

3.10. HELP MENU

The Help menu contains commands for viewing the software version information as well as the software licensing options.

About	Opens the About HydraMotion dialog box containing the current software version information.
Registration	Opens the License window enabling you to see your license status. In order to see the Registration dialog box, you need to run the application as an administrator. This enables you to perform various registration options, such as obtaining and retrieving your software license from Intelitek's web site, e-mail, fax or phone.

4. Components

The Components menu allows you to select components and include text in your circuit diagrams.

You can perform the following functions on components which have been placed in the drawing area:

- Move
- Flip
- Delete
- Rotate
- Resize
- Copy

4.1. SELECTING COMPONENTS

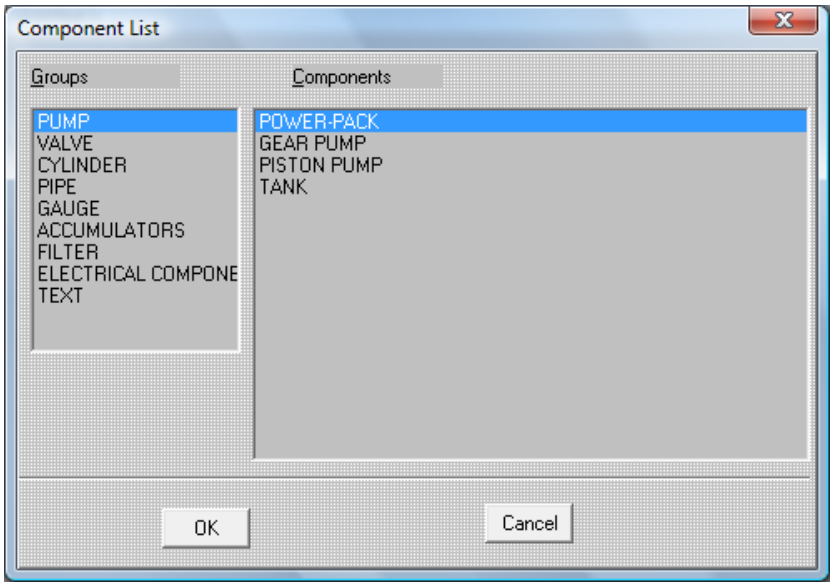
To view and place components in a circuit diagram, use either of the following:

Component List dialog

Components Library

4.1.1. The Component List

Select **Components | List** or click the Component List button. The component list dialog box opens.



To place components from the list into the drawing area, do the following:

1. Select a category from the Groups list.

   (If you double click on one of the category names, the component library (graphic display) appears.)

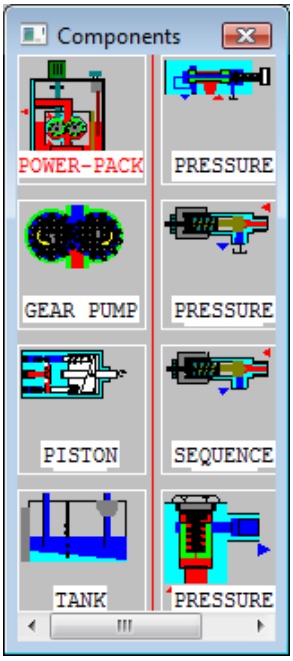
2. Select a components list.

3. Click **OK.**
4. Click on the drawing area. The component appears at the point where you click on the drawing area.
5. When you have finished placing the components in the drawing area, click **Cancel.**

4.1.2. The Component Library

Select **Components | Library**, or click the Component Library button.

The Components window opens.



The components are shown either in cross section or as schematics depending upon the currently active display mode.

You can move and resize the Components window, if necessary. You may need to use the horizontal scroll bar at the bottom of the window to find the component.

To place components from the library into the drawing window do the following:

1. Click on the picture of the component you want to use.
2. Click on the drawing area. The component appears at the point where you click on the drawing area.

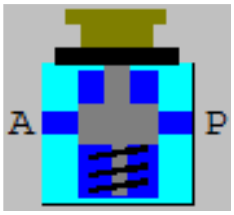
   The placement does not have to be exact; you can move components after you have placed them in the drawing area.
3. When you are finished placing the components in the drawing area, click anywhere in the drawing area to close the Component Library.

4.2. MANIPULATING COMPONENTS

Once you have placed components in the drawing area, you can manipulate and arrange them.

To select a component, simply click on it.

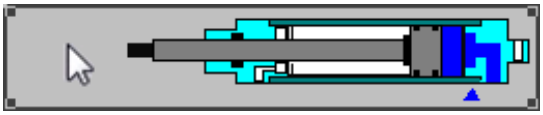
A frame with handles is drawn around the selected component.



4.2.1. **Moving Components**

To move a component, do the following:

1. Click on the component. A frame will be drawn around it.
2. Click and drag the component to the desired location.



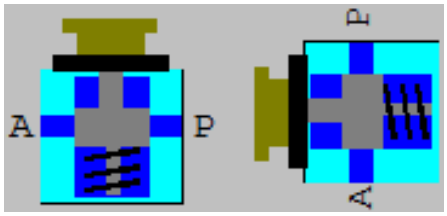
4.2.2. **Rotating Components**

To rotate a component, do the following:

1. Click on the component. A frame will be drawn around it.
2. Select **Edit | Rotate Right** or **Edit | Rotate Left**.

   OR

3. Select the Rotate Right, or Rotate Left button.
4. The component is rotated 90° to the right or left.



4.2.3. Flipping Components

To flip a component, do the following:

1. Click on the component. A frame appears around the component.
2. Select **Edit | Flip** OR click on the Flip button.

The component is flipped over. The top and bottom sides are reversed.

4.2.4. Mirroring Components

To mirror a component, do the following:

1. Click on the component. A frame appears around the component.
2. Select **Edit | Mirror** OR click on the Mirror Button.

The component is mirrored. The left and right sides are reversed.

4.2.5. Resizing Components

To resize a component, do the following:

1. Click on the component. A frame appears around the component.
2. Place the mouse on one of the frame handles.

   The cursor changes to a double arrow.
3. Click and drag the handle to readjust the size of the component.

   OR
4. Use the + and - keys to resize the selected component.

4.2.6. Copying Components

To copy a component in the circuit diagram, do the following:

1. Click on the component. A frame appears around the component.
2. Select **Edit | Duplicate**, or click the Duplicate button.

A copy of the component appears on top of the original component. The duplicate component is now selected, and can be manipulated.

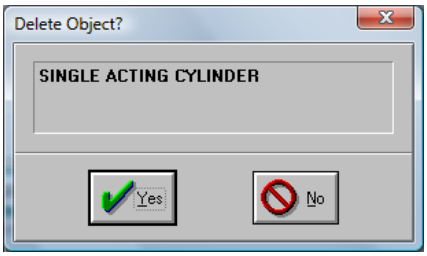
You can orient, move, or resize the copied component as needed.

The **File | Copy** command places the selected component on the Windows clipboard. This allows you to be paste a component into another application as a graphic object. *It does not make a copy of the component in the circuit diagram.*

4.2.7. Deleting Components

To delete a component, do the following:

1. Select the component you want to delete.
2. Select **Edit | Delete**, or click on the Delete Object button; you are prompted to confirm.

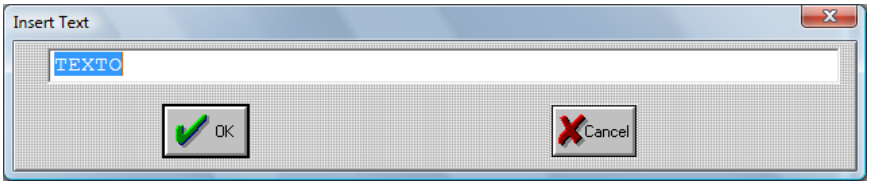


3. Click **Yes** to delete the component.

4.2.8. Adding Text

HydraMotion allows you to add text to your circuit drawings. To add text, do the following:

1. Select either the Components List or the Components Library.
2. Select the **Text** object, in the list or library.
3. Place the text object anywhere in the drawing area.
4. Close the list or library.
5. Select the text object, if not already selected.
6. To enter text in the Input Text dialog box do one of the following:
   - Press [Enter].
   - Double click on the text object.
7. Replace “TEXTO” with the text you want to appear in the circuit diagram.



8. Click **OK**.

9. The text will be displayed in the drawing window.
10. The text now appears as an object in the diagram. You can manipulate it in the same way as any component. Text cannot be flipped horizontally or vertically.

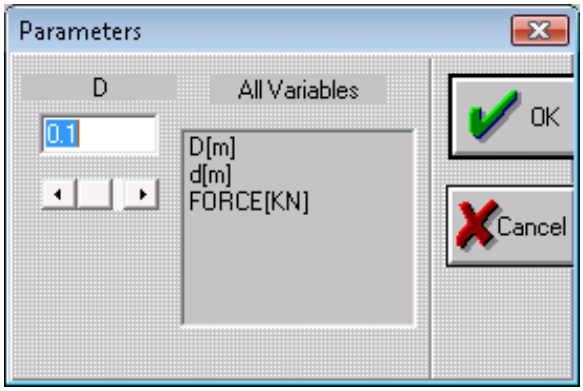
4.3. COMPONENT PARAMETERS

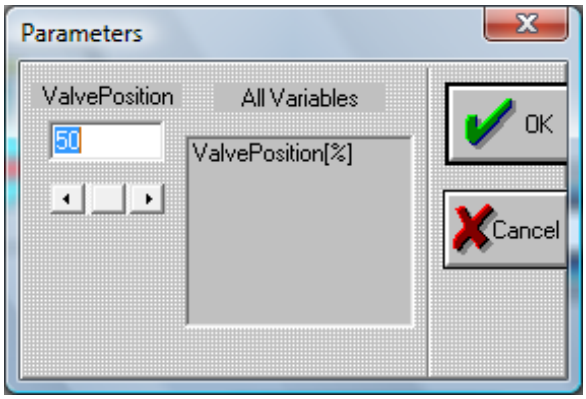
4.3.1. Editing Component Parameters

HydraMotion allows you to set values for a number of components. To set the component parameters do the following:

1. Select the component whose parameters you want to view or change.
2. Select **Edit | Parameters,** or click on the Component Parameters button, the Input Parameter dialog box opens.

   If more than one variable appears in the list, select the one you want to view or change.
3. The current value of the selected variable is displayed. You can change this value by typing a new value, or by selecting a value by means of the scroll bar under the field.
4. Click **OK**.





5. Connections

Components and devices are connected on the screen by means of colored lines which represent pneumatic and electrical connections.

Once components are connected, they cannot be rotated, flipped, or resized; they can however, be moved or deleted.

Deleting a connected component will also delete all lines connected to it.

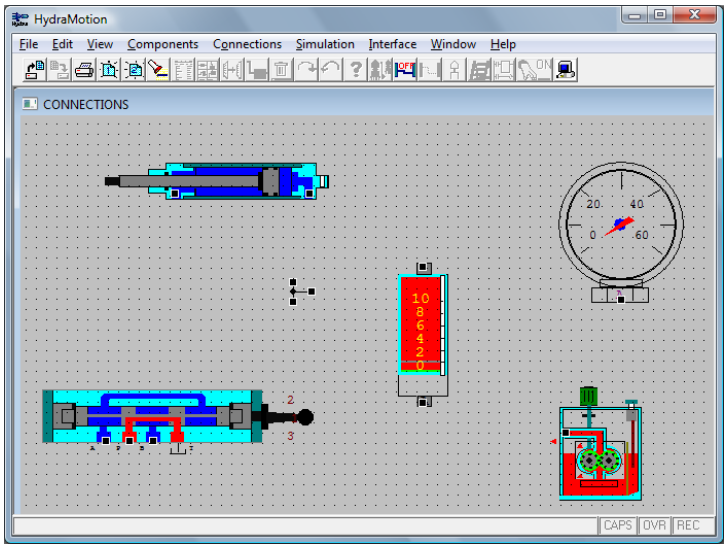
5.1. CONNECTING COMPONENTS

5.1.1. Making Pneumatic Connections

To connect components do the following:

1. Select **Connections | Connect Components**, or click the Connect Components button.

   A grid of dots appears in the drawing area, indicating that components can now be connected. In addition, black boxes with white borders appear at component ports where connections can be made.

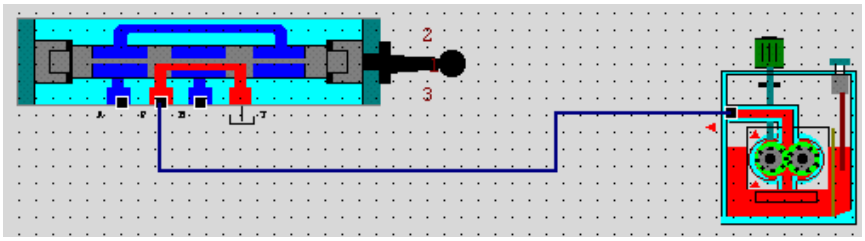


2. Point the mouse on an available port. The border turns green, indicating a connection can be made.

3. Click the mouse, a blue arrow appears indicating the first port has been selected.

   Optional: you may route the connection between an inlet and an outlet by clicking the mouse to make right angle turns along the route. A red line will mark the path as you create it. *You can use this option to route lines around a component.*

4. Bring the cursor to the second port. The border turns green.
5. Click the mouse, a light blue line now connects the two components.



5.1.2. Making Electro-Pneumatic Connections

Connecting electronic components is similar to connecting the pneumatic components.

To connect electronic components do the following:

1. Select **Connections | Connect Components**, or click the Connect Components button.

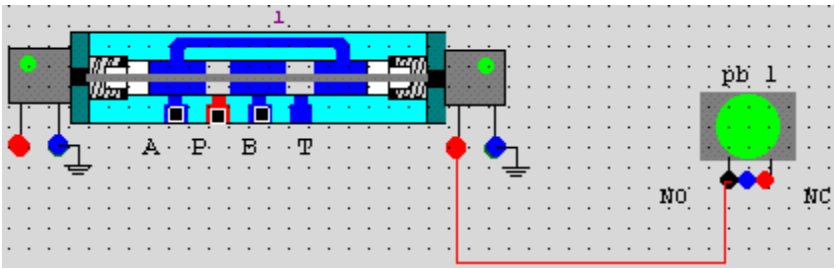
   Electronic components have colored circles to indicate their sockets. Red sockets are live. Blue sockets are ground.

   On switches and relays, red sockets are **normally closed,** black sockets are **normally open,** and blue sockets are **common.**

2. Point the mouse on the first socket, the socket turns green indicating a connection can be made.
3. Click the mouse. A light blue arrow now appears, indicating a socket has been selected.
4. Bring the mouse to the second socket. The socket turns green.

   The path will be indicated by an aqua line as you drag the mouse to the second port.

   Optional: you may route the connection between sockets. Click the mouse to make right angle turns along the path. Aqua-colored lines mark the path as you create it. *You can use this option to route lines around a component.*



5. Click the mouse. The line turns red, indicating the connection has been made.

5.1.3. Deleting one Connection

To delete a connection do the following:

1. Point the mouse on the line you want to delete. *Do not click*. The connection will blink and change color.
2. Press [Del], the connection will be deleted.

5.1.4. Deleting All Connections

To delete all of the connections do either of the following:

- Select **Connections | Delete All Connections**.
  OR
- Click on the Delete All Connections button.

All connections are deleted.

5.1.5. Erasing an incomplete Connection

To erase a partially complete connection, press [Del].

The line is deleted.

5.1.6. Changing the Second Port of a Connection

To change an existing connection, do the following:

1. Place the mouse on the line you want to delete. The connection will blink and change color.
2. Click on the line you want to change.
3. The line changes color. The second port is disconnected while the first port remains selected.
4. Click on the port you want for the new connection.

   The new connection is displayed.

5.1.7. Exiting the Connections Window

To exit the Connections window, do either of the following:

- Click on the Close Connections button.

  OR
- Press [Esc].

The dot grid disappears and you can perform other operations on you circuit diagram.

5.2. LINKING PUSH BUTTONS

For safety reasons, a hydraulic circuit may require simultaneous (two handed) operation of two push buttons. Since you can only click one button at a time, the push button link option allows you to simulate simultaneous, two-handed, activation of the push buttons.

Push button links can be made only when the Cross-Section display mode is active. These links cannot be made when the Connections or Schematic mode is active. The links can, however, be removed when any display mode is active.

To link two push buttons, do the following:

1. Select **Connections | Link PBs**.

   You are prompted to select the **master** push button. The master is the push button which controls both push buttons.

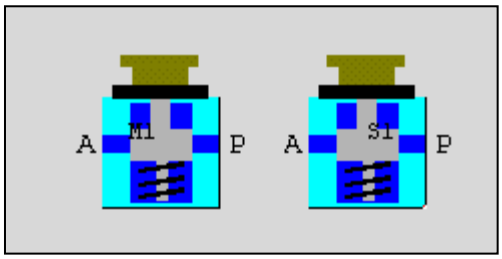
2. Click on the PB that you want to serve as the master.

   The letter M is now displayed inside the component.

   You are prompted to select the **slave** push button. The slave is the push button which is controlled by the master.

3. Click on the push button that you want to serve as the slave.

The push buttons are now a linked pair, as indicated by an identical digit (e.g., M1 and S1)



When you activate the master push button, the slave button is also activated. However, the slave push button remains operable on its own.

5.2.1. Disconnecting One Pair of Linked Push Buttons

To disconnect the links between a selected pair of push buttons do the following:

1. Select **Connections | Link PBs.** Lines appear showing all pairs of linked push buttons.
2. Place the mouse on the line you want to delete. *Do not click.*
3. Press [Del], the connection will be deleted.

5.2.2. Disconnecting All Push Button Links

To disconnect the links between all push buttons select **Connections | Clear PB links**.

All push button links are removed.

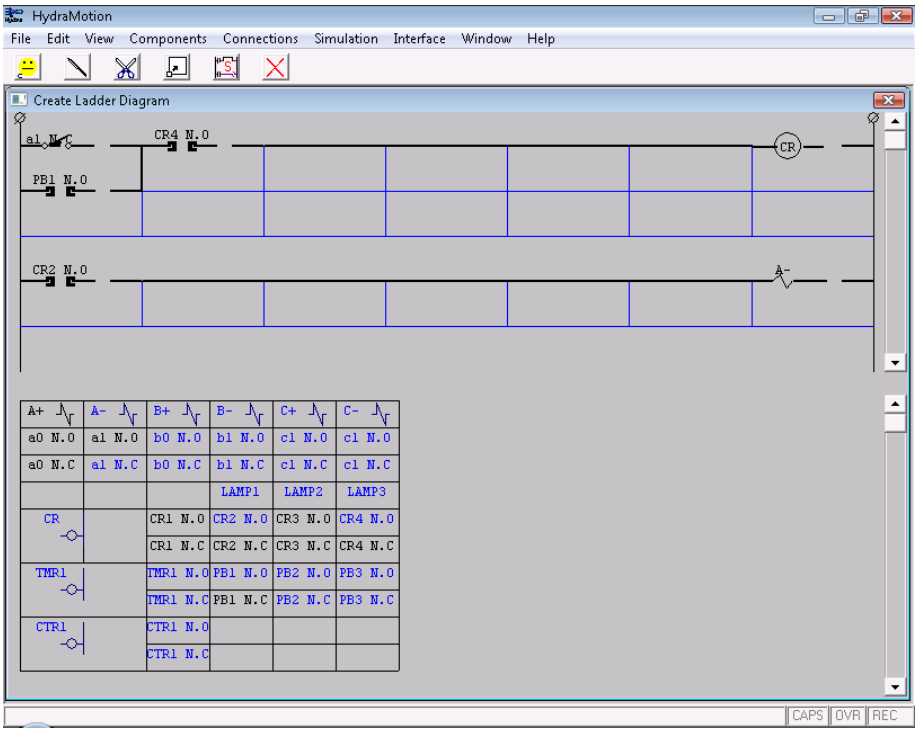
5.3. LADDER DIAGRAMS

5.3.1. Creating a Ladder Diagram

You can make **electro**-hydraulic connections by means of a ladder diagram.

To create a ladder diagram, do either of the following:

- Click on the Edit Ladder Diagram button.
  OR
- Select **Connections | Create ladder Diagram**. The Create Ladder Diagram window opens.



5.3.2. Creating a Circuit from a Ladder Diagram

The Create Ladder window has two parts. The top half shows the ladder diagram, the bottom half shows a table of electro-hydraulic components. (Components whose names appear in **black** have been placed in the drawing area and can be connected in a circuit).

To connect components by means of the ladder diagram, do the following:

1. Click on a black component in the table.

   The cell will turn white, and the cursor changes to a boxed +.

2. Click on the ladder diagram rung where you want to place the component.

   The component now appears in the ladder diagram

   Use the buttons at the top of the window to make, change or delete the connections.

Checks the connections.

If a connection or component turns red the connection is faulty. If nothing happens, the connection is OK.

Even though the connections test is successful the actual components on the panel may not be properly connected.

Connects Components. When selected, the cursor turns into a wand.

Black lines indicate a connection. Click on the blue lines to turn them black (connect).

Deletes components or connections. When selected, the cursor turns into a wire cutting tool.

Place the cursor on the connection or component you want to delete, and click.

Moves a rung in the ladder diagram down one line. When selected, the cursor turns into a shaded square.

Place the cursor on the rung you want to move, and click. The rung moves down one line.

Saves the connections made in the ladder diagram and exits to the main window.

All connections make in the ladder diagram now appear in the circuit diagram.

Closes the Create Ladder Diagram window without saving the new connections.

Any connections made in the ladder diagram will not appear in the circuit diagram.

6. Views

The View menu allows you to select the manner in which the components are displayed. Two basic display modes are available:

- Cross-Section
- Schematic

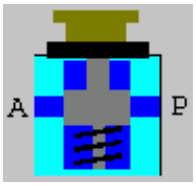
The Zoom In and Zoom Out options can be used when either display mode is active.

In addition, the view menu allows you to display two types of diagrams:

- Ladder Diagram
- Parameter Diagram

6.1. CROSS SECTION DISPLAY

The Cross-Section display mode provides a cross-section illustration of the components, as shown in the picture below. The different colors allow you to see the different elements of each component.



The cross-section allows you to observe the following:

- Operation of the circuit and components.
- Simulated hydraulic pressure flowing through the connections and its effect on the various components.
- The component's reactions to changes in pressure.

6.1.1. **Activating the Cross-Section Display Mode**

To display the Cross-Section mode, do either of the following:

- Select **View | Cross-Section**

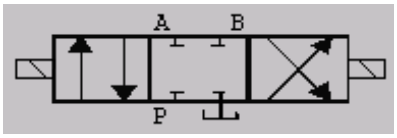
  OR

- Click on the Cross Section Button

6.2. SCHEMATIC DISPLAY

The Schematic option displays the components in standard schematic form, as shown in the picture below. This display mode is useful for observing and analyzing components in a pneumatic circuit or complex system.

The Schematic display mode is for viewing purposes only. Simulation or connections cannot be performed in this mode.



6.2.1. Activating the Schematic Display Mode

To display the Schematic Mode, do either of the following:

- Select **View | Schematic**

  OR

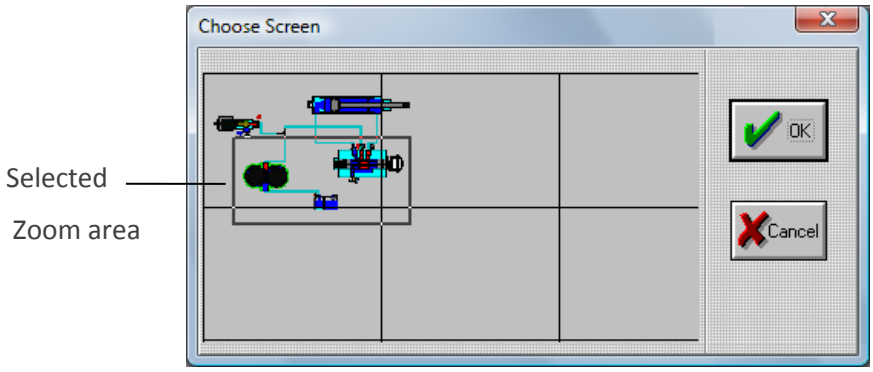
- Click on the Cross-Section button

6.2.2. Zoom In

To zoom in do the following:

1. Select **View | Zoom In**, or Click on the Zoom in Picture button.

   The Choose Screen dialog box opens.



2. A rectangle is attached to the cursor. Move the rectangle to select the part of the screen you want to enlarge, and click the mouse.

6.2.3. Zoom Out

To Zoom out, do the following:

- Select **View | Zoom Out**

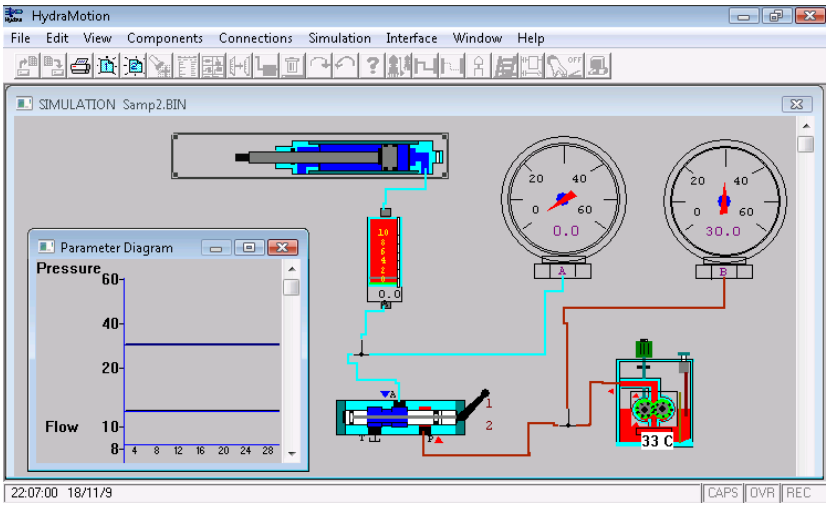
OR

- Click on the Zoom Out Picture button.

The circuit diagram returns to its normal view.

6.3. PARAMETER DIAGRAM

The parameter diagram monitors pressure and flow during circuit operation. The parameter diagram provides the user with a graphical view of pressure and flow in a hydraulic circuit.



6.3.1. **Activating the Parameter Diagram**

To view the time diagram, do one of the following:

- Select **View | Parameter Diagram**

  OR

- Click on the Monitoring button

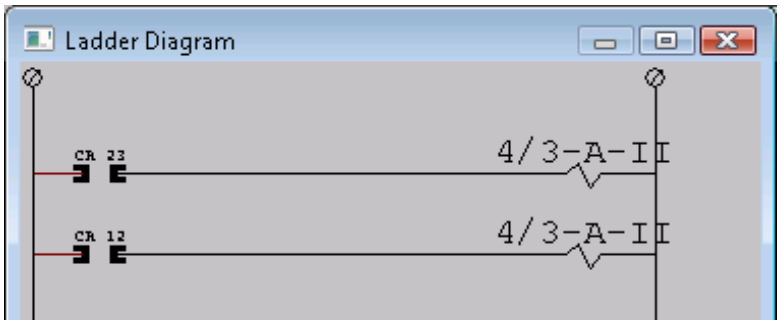
6.4. LADDER DIAGRAM DISPLAY

A ladder diagram is a schematic control flow chart for electro-hydraulic circuits. It is automatically generated by the software according to electrical connections you make in the diagram.

6.4.1. **Displaying the Ladder Diagram**

To display the ladder diagram of the circuit diagram in the currently active window, do either of the following:

- Select **View | Ladder Diagram**
  OR
- Click on the Display Ladder Diagram button. The Ladder Diagram window opens.



6.4.2. **Closing the Ladder Diagram**

To close the ladder diagram, click on the Exit Ladder Diagram button, or use any standard Windows method for closing a window.

7. Simulation

The simulation mode allows you to observe the operation of a component working independently or as part of a whole circuit.

Simulation is available only when the Cross-Section display mode is in effect.

7.1. SINGLE COMPONENT SIMULATION

You can simulate the operation of a single component in four ways:

- **Automatic step by step**. This simulation displays continuously changing states of the selected component.
- **Automatic continuous**. This simulation will show continuous operation of the selected component.
- **Manual step by step**. This simulation shows each state of the selected component one at a time. You must continuously click the component to display each state.
- **Manual continuous**. This simulation will show the continuous operation of the selected component. You must continuously click the component to make the simulation progress.

The automatic continuous and manual continuous options are not available for all components.

7.1.1. Simulating a Component Automatically

To automatically simulate a single component, do the following:

1. Select the component you want to simulate.
2. Select **Simulation | Component** and then select one of the two automatic simulation modes.

Clicking the tool bar button activates the Single Component simulation Auto Stepped mode.

7.1.2. Simulating a Component Manually

To manually simulate a single component, do the following:

1. Select the component.
2. Select **Simulation | Component** and then select one of the two manual simulation modes.
3. Click on component to change the state or progress of the component.

7.1.3. Stopping the Simulation of Single Components

Exit the simulation mode to make changes in the circuit diagram.

To stop the component simulation, click on Exit from Single Component Simulation button.

The normal viewing mode is resumed.

7.2. CIRCUIT SIMULATION

HydraMotion allows you to simulate the operation of an entire circuit.

To view the simulation of an entire circuit, do one of the following:

- Select **Simulation | Circuit.**

  OR

- Click on the Simulate Circuit button.

Once you are in the simulation mode, you can click on any push button that is in the diagram to see how they will affect the hydraulic circuit.

7.2.1. Stopping the Circuit Simulation

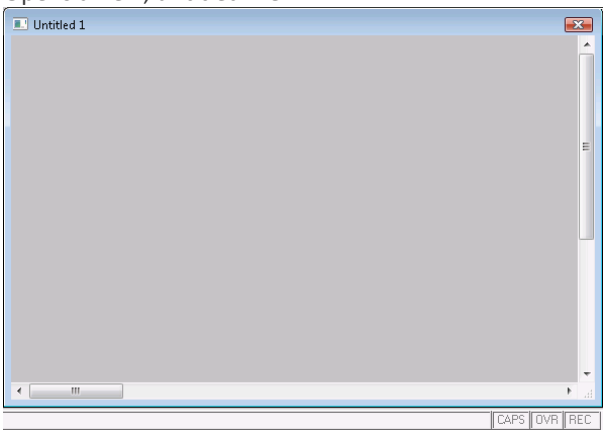
To stop the circuit simulation, click on the Exit from Simulate Circuit button.

The normal viewing mode is resumed.

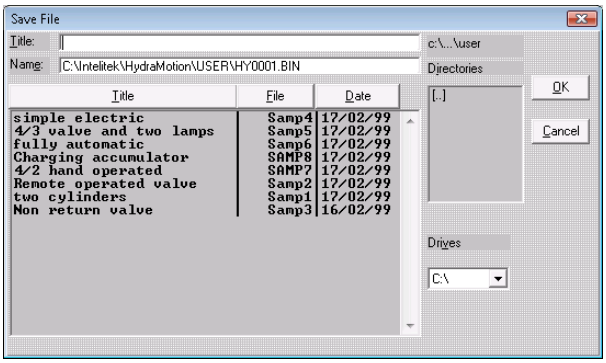
8. File Management

HydraMotion files are managed through the standard Windows file tools, found in the File menu.

New [Ctrl]+N	Opens a new, untitled file.



Open [Ctrl]+O	Opens a dialog box for selecting an existing circuit diagram file.
Save [Ctrl]+S	Saves the currently active file. If the file is untitled, a dialog box opens for defining the file name. By default the system provides a file name (e.g., HY0012.BIN). You may give the file any title you want.



Save As

Saves the currently active file under a new file name.

The Save File dialog box opens. Enter a new name in the **Title** field. By default the system provides a file name (e.g., HY0012.BIN).

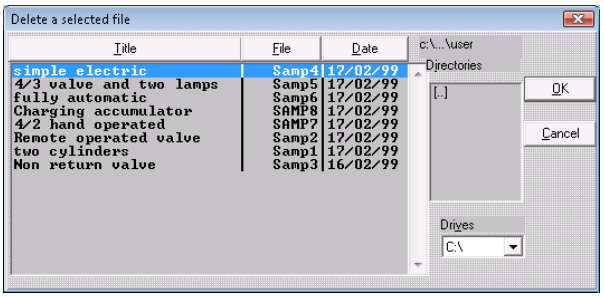
Print [Ctrl]+P

Prints the currently active file.

Delete...

Opens a dialog box with a list of previously saved files.

Choose a file that you want to delete and click OK.



.

Exit

Quits HydraMotion.

If changes have been made to a file, but not yet saved, a warning message is displayed.

9. System Setup

9.1. PROGRAM WINDOWS

The Window menu contains Windows commands for the display of the program windows.

Open Main Window

Opens a new main window.

This command functions the same as **File | New.**

Close Main Window

Closes the active main window. If changes have been made, but not yet saved, a warning message will be displayed.

The button toggles between open and close. It opens a window if one is not currently active, and closes a window if one is currently active.

Open 2nd Window

Opens a new second window.

The second window will open under the main window. It functions in the same way as the main window. It can be moved and resized.

Only the main and 2nd windows can be open at the same time in HydraMotion.

Close 2nd Window

Closes the active second window. If changes have been made, but not yet saved, a warning message will be displayed.

The button toggles between open and close. It opens a window if one is not currently active, and closes a window if one is currently active.

Cascade

The usual Windows control for resizing and layering open windows so that each bar is visible.

Tile

The usual Windows control for resizing and arranging the open windows by size.

Arrange Icons

The usual windows control for realigning the icons of programs that have been minimized.

Close All

Closes all open windows that are used for program editing.

The Cascade or Tile setting remains in effect until changed.

9.2. ON-LINE OPERATION

HydraMotion can be used to control actual electro-pneumatic circuits and to provide graphic tracking of the HydraFlex laboratory panels.

The CIC Unit (PLC Micrologix) is required for the software-hardware interface. *Refer to the documentation provided with the panel and the CIC Unit (PLC MicroLogix) for installation instructions.*

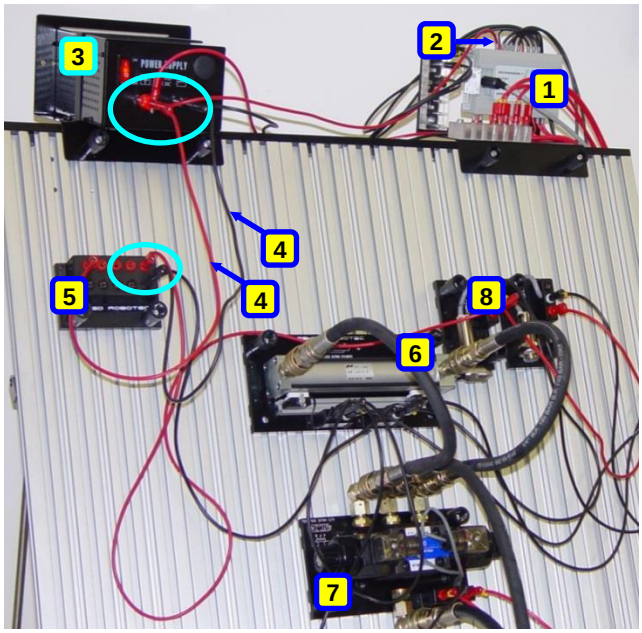
For information on how to configure the PneuMotion software when working in online operation, see:

- Configuring the Software for Online Operation (PLC MicroLogix)

9.2.1. Configuring the Software for Online Operation (PLC MicroLogix)

To configure the software for on-line operation, do the following:

1. Make sure the computer, the panel; the PLC Micrologix and the power supply are all properly connected, as shown in the example below.



1 PLC MicroLogix

2 PLC to Power Supply Cable

3 Power Supply Connections

4 Power Supply Cables (Red and Black) to Electrical Distributer

5 Electrical Distributer

6 Double Acting Cylinder with Magnetic Sensors

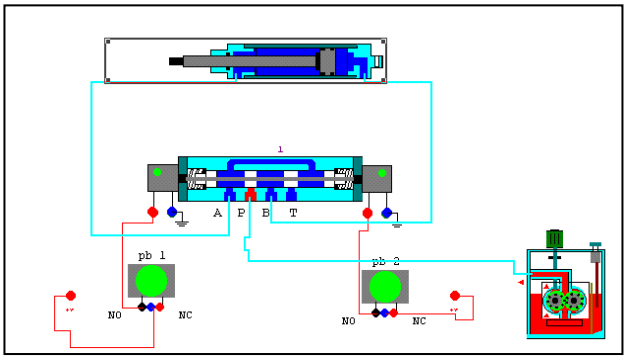
7 4/3 Sol-sol Control Valve

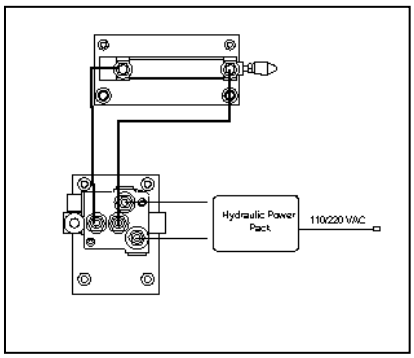
8 Inductive Proximity

PLC MicroLogix Connected to Power Supply and Panel

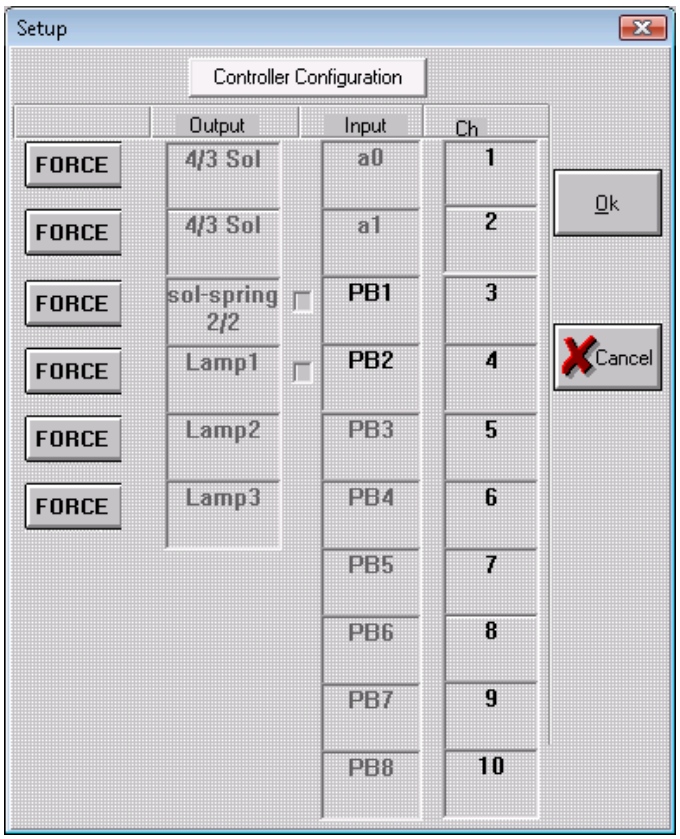
2. Use HydraMotion to load or draw an electro-hydraulic circuit, which is (or will be) assembled on the HydraFlex panel.

   The figures below show an example of the same circuit drawn in HydraMotion and when set up on the HydraFlex panel.





3. Select **Interface | Setup**. The Setup dialog box opens. This box allows you to select the components that are controlled and tracked by the software.

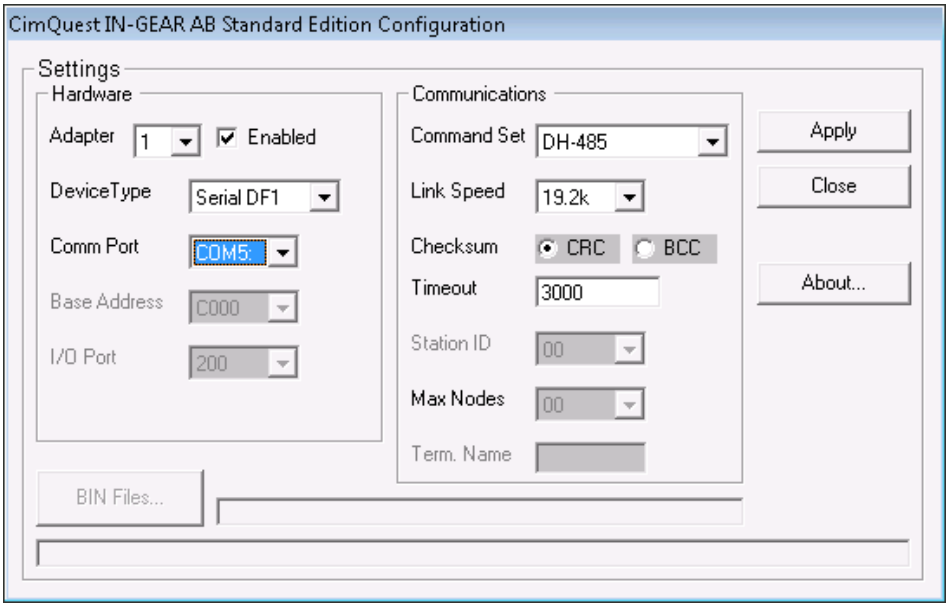


All electrical input and output connections made in the circuit diagram are available in the Setup dialog box.

4. Using the check boxes, select the components which will operate online.

Once components are selected online operation, they respond to external I/O signals only. HydraMotion graphically tracks the operation of these components (and does not simulate their operation).

5. Click the **Controller Configuration** button to connect the HydraMotion software to the PLC MicroLogix. The following configuration window is displayed.



6. From the **Comm Port** drop down list, select the required COM port and click **Apply**.
7. Click **Close**. A confirmation message is displayed.
8. Click **Yes**. A message is displayed requesting you to restart your application. Click **OK.**
9. Restart the HydraMotion application.
10. Select **Interface | COM Test** to communicate with the controller. One of the following options will appear on the status bar on the bottom right hand corner of the window:
    - REC: Indicates the HydraMotion is communicating with the PLC MicroLogix controller.
    - REC: Indicates no communication exists between the HydraMotion software and the controller. In this case check your controller configuration.