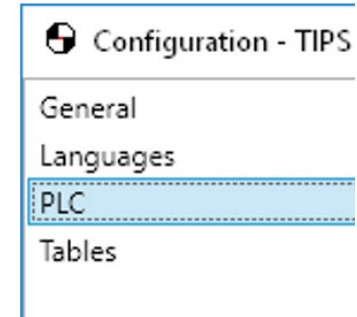


Configuration of the MovePins Software

The configuration window consists of a menu and the active screen. Several configuration screens can be accessed from the Configuration menu. They are shown in Figure 1 and discussed further in this document. Each configuration screen selected from the menu allows you to make various changes to the MovePins software. The changes are typically noticed upon saving the changes, but some changes require you to restart the application for them to take effect. Some of these items are unavailable to customers unless you have administrator mode enabled.

All of the information that can be found in the Configuration screens can be viewed in the Settings.xml file found in the same directory as the MovePins EXE.

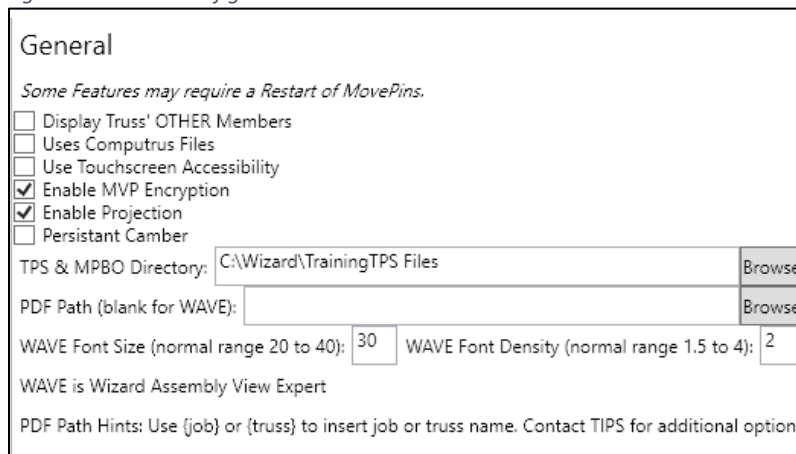
Figure 1: Configuration Menu



General

The General Configuration screen is shown in Figure 3.

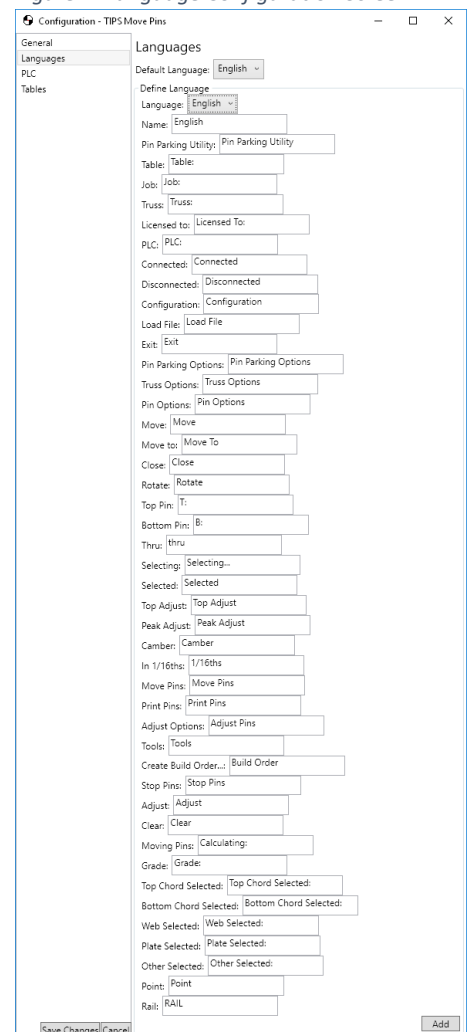
Figure 3: General Configuration Screen



Language

The Language Configuration screen allows you to select which language you want to use (English or Spanish) for the MovePins software. It also provides the ability to add additional languages that can be chosen at a later time.

Figure 2: Language Configuration Screen

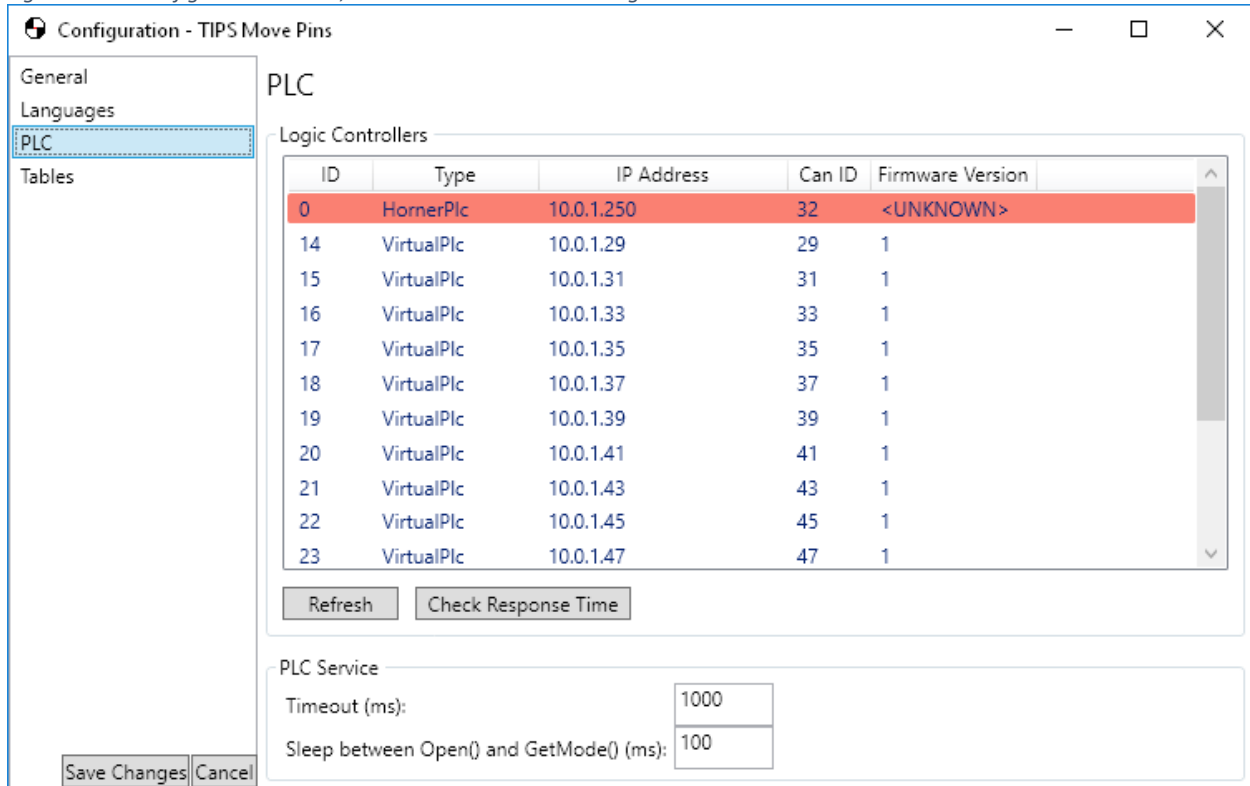


PLC

The PLC Configuration screen is only available when logged in as an administrator. It allows a user to look at the list of PLCs that MovePins communicates to, see the speed in which communication to the table is happening, change the timeout value for communications with controllers, and set the sleep time on startup between when communication is opened and when the initial call to get the PLCs mode is requested.

PLC List

Figure 4: PLC Configuration Screen, With PLC Not Communicating in Red



This list shows all of the PLCs that are receiving communication. This information is provided by the Settings file. The list displays the ID of the PLC, what type of PLC it is, the IP Address, the CAN ID, and what firmware version the PLC is running. Currently, the only available PLCs that can be used are Horner PLCs and the Virtual PLC. The Virtual PLC is used to run the software without a physical table connected.

Along with the above information, a user is also able to see which PLCs are not communicating, and whether or not a PLC is in RUN mode. In the screen shot, one PLC is highlighted in red. This PLC is currently not communicating with the system. The list is always displayed in this order:

1. Disconnected PLCs
2. PLCs that are not in RUN mode
3. Connected PLCs
4. All other PLCs in ascending order by PLC ID

The ID is nothing more than a unique identifier for each individual PLC. ID requirements:

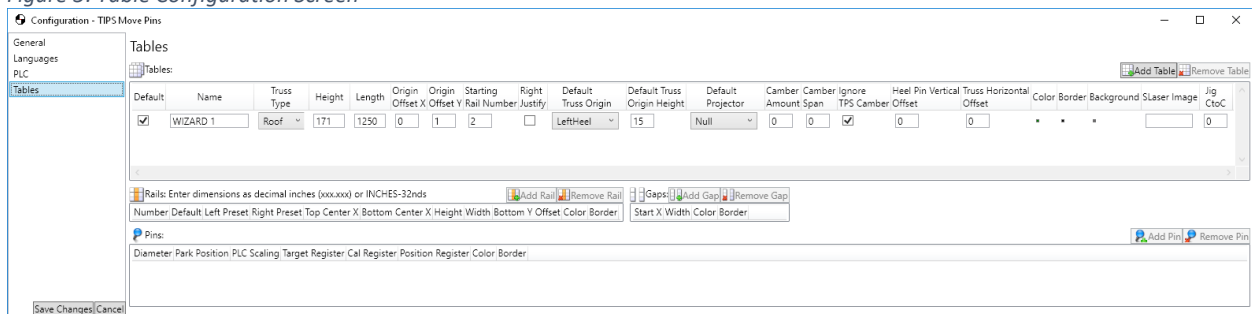
- Must be a positive whole number.
- Must be unique from every other PLC in the system. No PLC can share an ID with another.
- Can be any number meeting the previous requirements and do not have to follow a certain sequence.
- Example: On a table with 3 PLCs, the IDs of those PLCs could be 3, 50, and 122. All three of these numbers are unique, they are positive, and are all whole numbers.

Lastly, communication to the PLCs can be refreshed at any time. Attempting a refresh will first disconnect any connected PLCs and attempt to connect to the list again. This action is typically used to bring connectivity back to the PLCs after hardware networking troubleshooting has been done.

Tables

The Tables Configuration screen allows users to add, remove, and modify table setups. The screen allows a user to choose what colors they want various aspects of the table (background, rails, pins, etc.), the dimensions of a table, how to handle camber, and various other bits of information about the tables.

Figure 5: Table Configuration Screen



Rail Numbering

Each table can determine where they want to start the numbering for each rail. In most cases, rail numbers will start at 1, but they can start at whichever number a user would like. Along with the rail number a Label can be provided for each rail. If a rail label is provided, that information will show up in the MovePins software by default. If no rail label exists, the number will be used instead.

Editing Rails

Just like with everything else in the table configuration, rails can be added/modified/removed. A rail that is set as the Default rail will be where truss drawings will be snapped to on initial load. There are various bits of information for each rail that determine how the rail is shown on the screen. Things like the X location, height, bottom Y offset, and colors determine how the software draws the rails on the screen.

Figure 6: Rails

Rails: Enter dimensions as decimal inches (xxx.xxx) or INCHES-32nds												Add Rail	Remove Rail
Number	Default	Left Preset	Right Preset	Top Center X	Bottom Center X	Height	Width	Bottom Y	Offset	Color	Border		
2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	29.34	29.26	165	1	6.5		□	▪		
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	51.21	51.29	165	1	6.5		□	▪		
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	73.08	73.32	165	1	6.5		□	▪		
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	95.19	95.14	165	1	6.5		□	▪		
6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	117.19	117.16	165	1	6.5		□	▪		

Gaps

Gaps are visual indicators that show where there are gaps within the table. These gaps can be used for walkways or equipment that moves the truss up and off the table.

Pin Identification

On each rail is a collection of pins. A pin is what shows the perimeter of a truss once the user clicks Move Pins on the UI. Each pin has the following information assigned to it:

- Diameter – The physical diameter of the pin (also changes the visual representation in the UI)
- PLC Scaling – Defines how many counts there are per inch of movement for the gear boxes used
- Target Register – Register name used for that pin to tell the PLC where the pin should go
- Cal Register – Register used for calibrating a pin at whatever position it is in
- Position Register – The current position of the pin
 - As the PLC moves the pin to its target, the position register will continually change
- Color / Border – UI properties that define what color the pin should show up as on the screen

Pin Types

As of MovePins software version 2020.1.15.100, there are three types of pins:

- **Fixed** – A fixed pin is one that stays in one location at all times. Since its position never changes, the PLC responsible for its movement will always receive the same target position and will keep the pin from moving. This allows for fixing a pin at its location without the need for any outside interference. A fixed pin’s location is based on a table’s “Default Truss Origin Height” position.
- **Bottom** – This pin can move in either direction but will snap itself to the bottom chord of a truss member.
- **Top** – This pin, like the bottom, can move in either direction but will snap itself to the top chord of a truss member

Number of Pins Per Rail

As of MovePins software version 2020.1.15.100, a rail can have 1 to N number of pins. In earlier versions of MovePins, every rail had a top and a bottom pin. This change was made to support different table configurations that are already in the field and are driven by different software. With this change, some rails may have only one pin. These are referred to as single-pin rails.

How the Software Handles Tasks

Automated Software Updates

Starting in version 2020.0.1.15.100, the software is capable of updating its settings prior to launching the application. This is done during the bootstrapping process to ensure the Settings file is in a valid state before it is loaded by the software for consumption. This module consists of history information of what has run, a collection of scripts, and a mechanism for executing those scripts.

History of Script Usage

Every time a script executes, the fact that it executed gets stored into a text file. This file holds the history of which scripts have already run. When the application boots up, it will only run new scripts.

Execution of Scripts

Each individual script will do one thing to the settings file at a time. The result of what the script has done to the settings gets passed into the next script in the chain. After execution the unique identifier for that script gets saved as being executed.

Execution Engine

The engine that executes the scripts performs the following tasks before it starts executing scripts:

- Load the scripts that exist
- Sort the scripts in correct order: First by date created, then by the *Order* property
- Determine which scripts need to run

With the scripts that need to run, the current settings get passed into the first script, mutated, and the mutated settings get returned. After the ID is logged as being run, the result is passed into the next script where it continues the same process. After it is complete, the execution engine passes the modified settings file for the bootstrapping process to save it to disk.

Troubleshooting

Some of the pins are not moving

Check and see if any of the PLCs are showing in red. Any disconnected PLC will show up first in the list. If there is a networking issue you should see the PLC responsible for those rails in red. Once network communication is back up click the “refresh” button (or restart the application) and attempt the move again.

Some rails have pins that crash and others do not

Check the firmware version of the PLC(s) affected. This issue was resolved in version 7 of the PLC code. The firmware version is stored in a register in the controller itself and is read when the PLC configuration screen is loaded.

Communication with the table is slow

Click the “Check Response Time” in the PLC configuration screen. This will tell you how long it takes to read a register from every PLC on the table. If this is showing excessive response times you may need to restart the network switch under the table or reseal the cable at both ends between the PC and the switch. Also, make sure there are no other networking issues going on (other PLCs that aren’t communicating). At times these issues can cause slowness with the table.

Some PLCs keep getting disconnected

Check that everything is cabled properly. The PLCs have two ports that look identical but are labeled differently. The network cable from the PLC should be plugged into the “LAN” port and go to the 5-port Turck switch. If they are the same PLC(s) each time, try known-working cables with those boxes. It’s possible the physical equipment may need to be replaced. Also, check response times with the table. If you are getting consistently slow response times the network switch may need to be rebooted.