

# PLT

## PICK LIGHT TOWER

### TECH GUIDE



# Contents

Introduction .....	3
Terminology.....	4
Features.....	6
Dimensions.....	8
Overview .....	9
Warnings & Tips .....	11
Startup.....	12
Installing the PLT .....	14
Interfacing to a HOST Computer .....	16
Power Supply .....	19
Servicing the PLT .....	20
Host Computer Systems.....	23
ROBEY CONTROLS PARTPIC / OPC.....	24
Device Options PLT.....	25
PPG SOFTWARE.....	29
NOVA SOFTWARE .....	34

## Introduction

This document is intended to aid the trained technician to install Robey Controls Batch Light Display systems.

**PLEASE**

- Follow all industry rules for safe work on Electrical and mechanical systems. When you are not sure what you are doing, stop and seek qualified help!
- Read this entire document before getting started

# Terminology

## PLT

Pick-Light Tower.

Also referred to as: Tower, Light-Tower

## DEVICE

Storage system. Carousel, static-shelving, etc

## T-Slot fasteners

T-slot nuts are specialized fasteners that fit into the T-slots of the extrusion. They are used to attach the extrusion to the mounting area and also other components such as brackets, panels, and accessories.



## M12 Connector

The M12 connector is a circular connector with a 12-mm locking thread that is used primarily in factory automation applications for actuators and sensors.



## Transaction

Used here, a TRANSACTION refers to a command sent from the HOST computer that causes the PLT to show a display (numbers or text) and then await confirmation. In the example image, the host has sent a transaction for POSITION 3 and QUANTITY 25 and requested that it point to the LEFT:



In this example, PartPic sent a transaction using "Grid Mode" to indicate POS:2 DEP:3 and QTY:15 from the RIGHT carousel.



## LENS

The translucent acrylic cover panel over the LEDs.

## Features

- a. **PLT**  
Pick Light Tower used for indication of the picking/storing positions on Horizontal Carousels.
- b. **INTERFACE PROTOCOL**  
Emulates Rem\* Pick-to-light interface protocol (BLI, VHI)
- c. **LED Technology**  
The PLT uses full-color LED display panels to produce a LED grid 32 dots wide to the full height of the carousels. The PLT is available in several heights due to its modular design concept.
- d. **Carousel Status indication**  
When used with Robey Controls PartPic software...  
The PLT has a reserved area at the base that displays the Present and Next carrier numbers for the adjacent carousels. It also has a Traffic Light display at the top that shows the carousel status and also any potential errors codes that may occur from time to time.
- e. **Modular design**  
The PLT is delivered with modular segments of LED panels each measuring 256mm (10.08in) in height.
- f. **Rugged housing**  
An anodized Aluminum extrusion is cut-to-length and delivered in one piece. A 'foot' angle is provided to anchor the PLT to the floor. Two screws using T-Slot fasteners are provided to secure the top.
- g. **ESTOP Buttons**  
The tower extrusion has two options for optional mounting of an ESTOP Button; side or face. When FACE mounted, the PLT has setup provisions to 'block' that area of the display.
- h. **Factory assembled and Fully tested**  
The PLT is quick and easy to install and is plug-n-play ready for connection to the host interface (PLX).
- i. **DC Power**  
The PLT is powered by an AC/DC desktop power supply which normally is placed nearby the computer workstation. This means that an AC power drop in the ceiling above the towers is no longer required. The power supply carries electrical certifications for most countries and offers a convenient ON/OFF switch.
- j. **COM or WiFi**  
The PLT can be interfaced to a host computer via a USB COM port or WiFi connection.
- k. **SETUP Utility**  
The PLT can be field configured using Robey Control OPC software (purchased separately).
- l. **Resolution**  
The PLT uses a dot matrix display with a 4mm resolution and can indicate any position on the carousel's carrier at that resolution.

**m. Side**

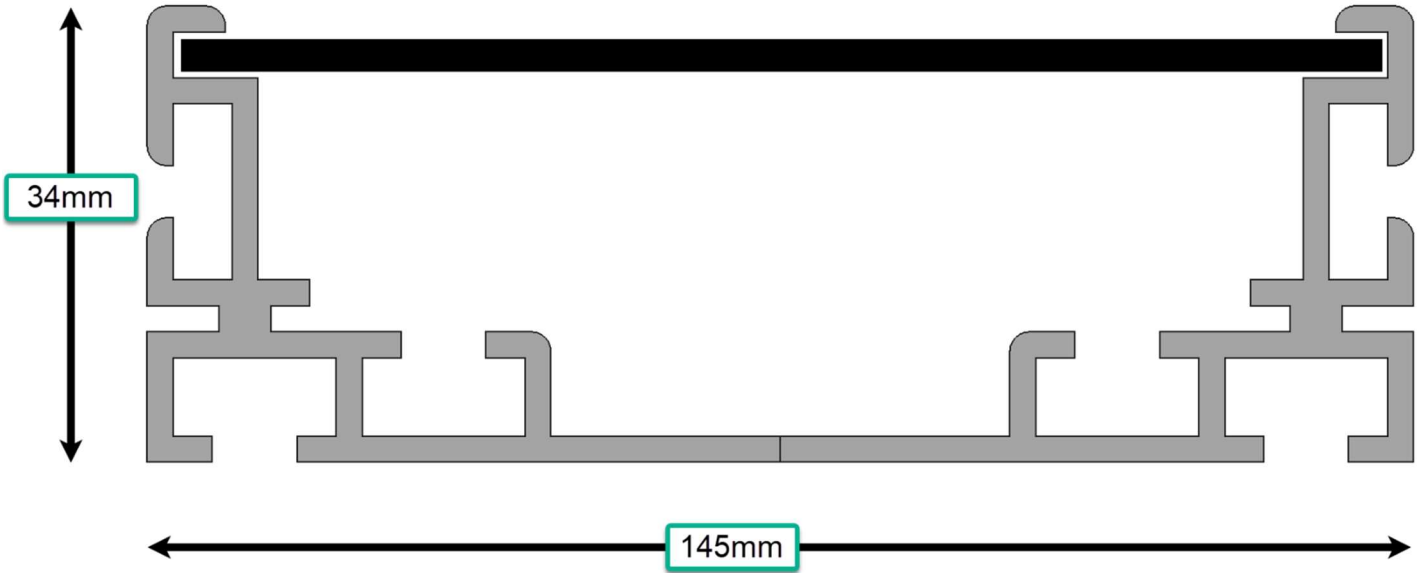
The PLT can indicate locations to the LEFT and/or RIGHT side.

**n. GRID Mode**

The PLT can operate in GRID or normal LOCATION mode.

## Dimensions

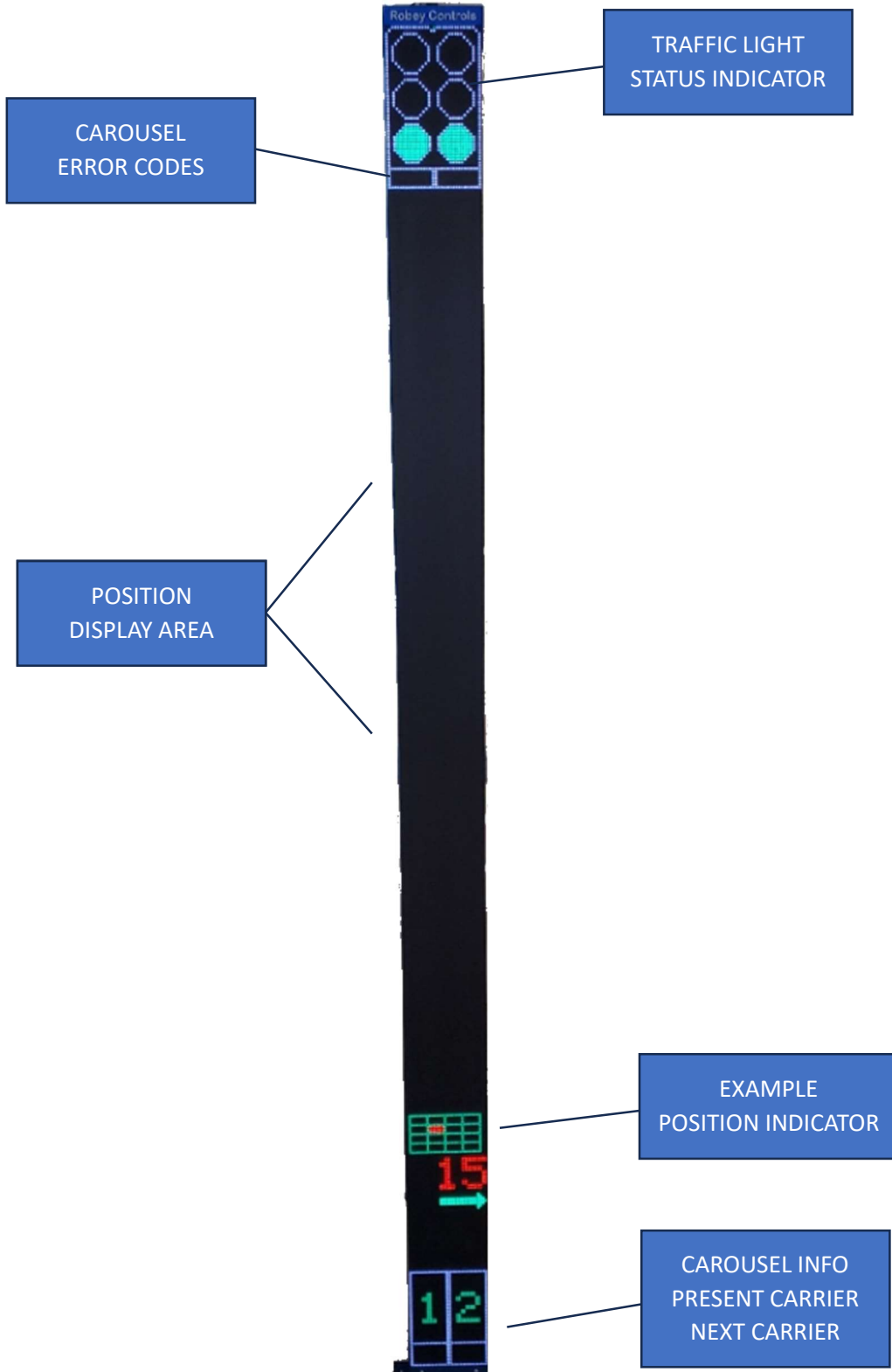
The Pick Light Tower is available in different height options. The width and depth are shown below:



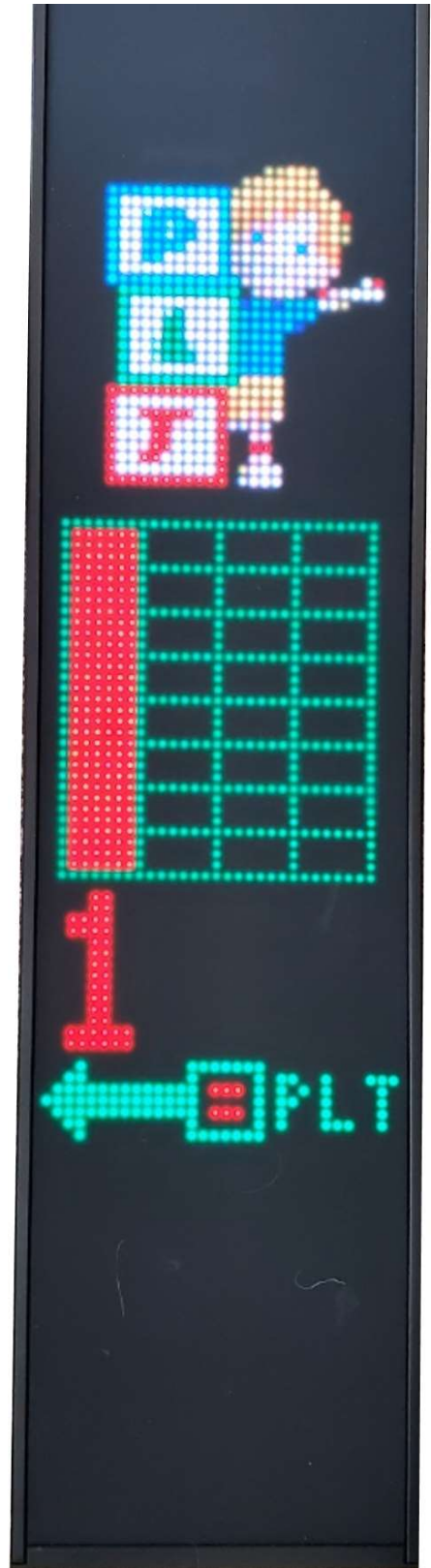
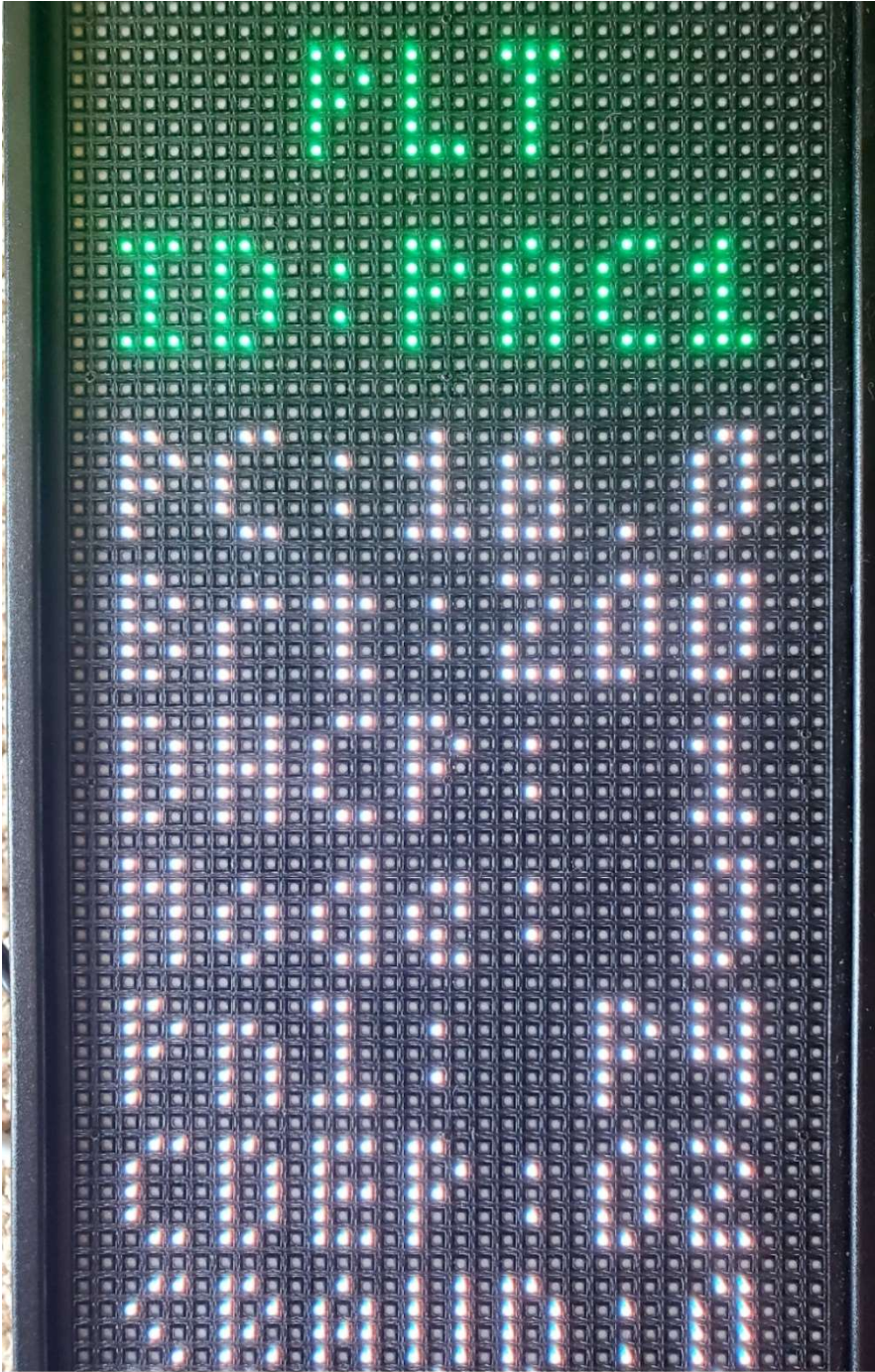


# Overview

The Pick Light Tower (PLT) is a display column used for showing picking levels, positions and quantities on Horizontal Carousels. It is controlled by the host inventory control system and therefore may operate differently depending on that software's capabilities.



The PLT includes a full 32-bit wide array of color LEDs from top to bottom. The system can show graphics and auto-sizes numeric displays to give the largest possible font size. The PLT can point to carousels on either the LEFT or RIGHT side. The LED array is covered by a black acrylic lens to provide high contrast between off and on states.



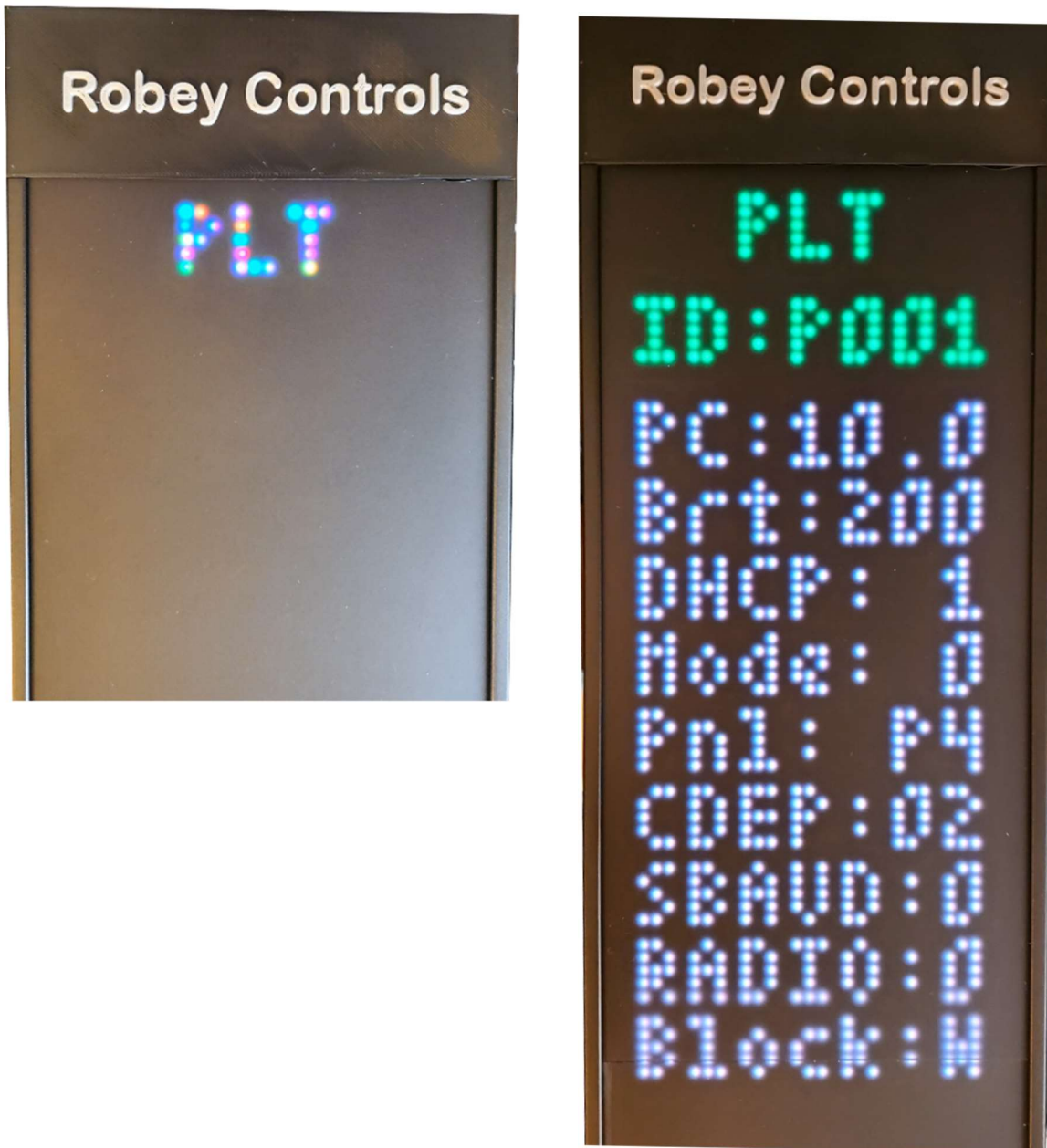
## Warnings & Tips

**DO NOT** install the PLT too close to the carousel's rotating carriers so it could be struck by overhanging totes or product.

**DO** use the Power Supply and Interface that was included in your system. Do not use any other Power Supply.

## Startup

The PLT starts up showing "PLT" followed by some helpful configuration setting information at the top of the Tower:



PC     Panel Count (Number of LED panels installed on this tower)  
Brt:    Present brightness level  
DHCP:   Automatic IP on or off  
Mode:   PLT Mode (Dual or LEFT or RIGHT)  
Pnl:    Panel size in mm  
CDEP:   Internal use  
SBAUD:  Serial baud rate setting  
RADIO:  Internal WiFi/BlueTooth radio setting  
Block:  System blocker (reserved space) enable 'Y' or not 'N'

The PLT then reports the firmware version and Build date:



## Installing the PLT

The PLT is factory assembled and ready to be connected installed with minimal effort. Follow these simple steps to install the PLT:

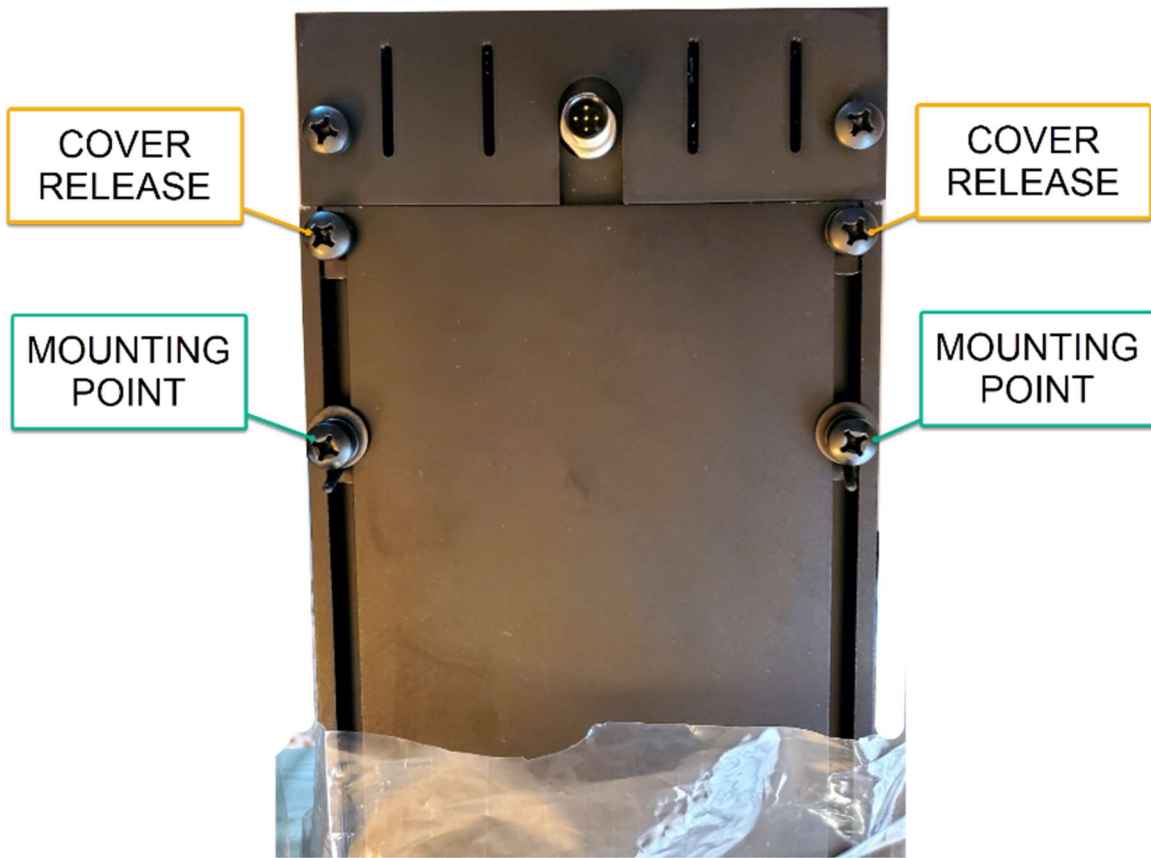
1. Attach the Foot to the base of the tower by preparing the FOOT with (4) T-slot fasteners as shown below. Keep the screws loose for now so it can slide easily up into the PLT extrusion slots:



2. Slide the foot assembly into the extrusion from the base as shown below and secure the (4) screws. Anchor to the floor as required for the application. Using the center hole allows the PLT to pivot on its base.



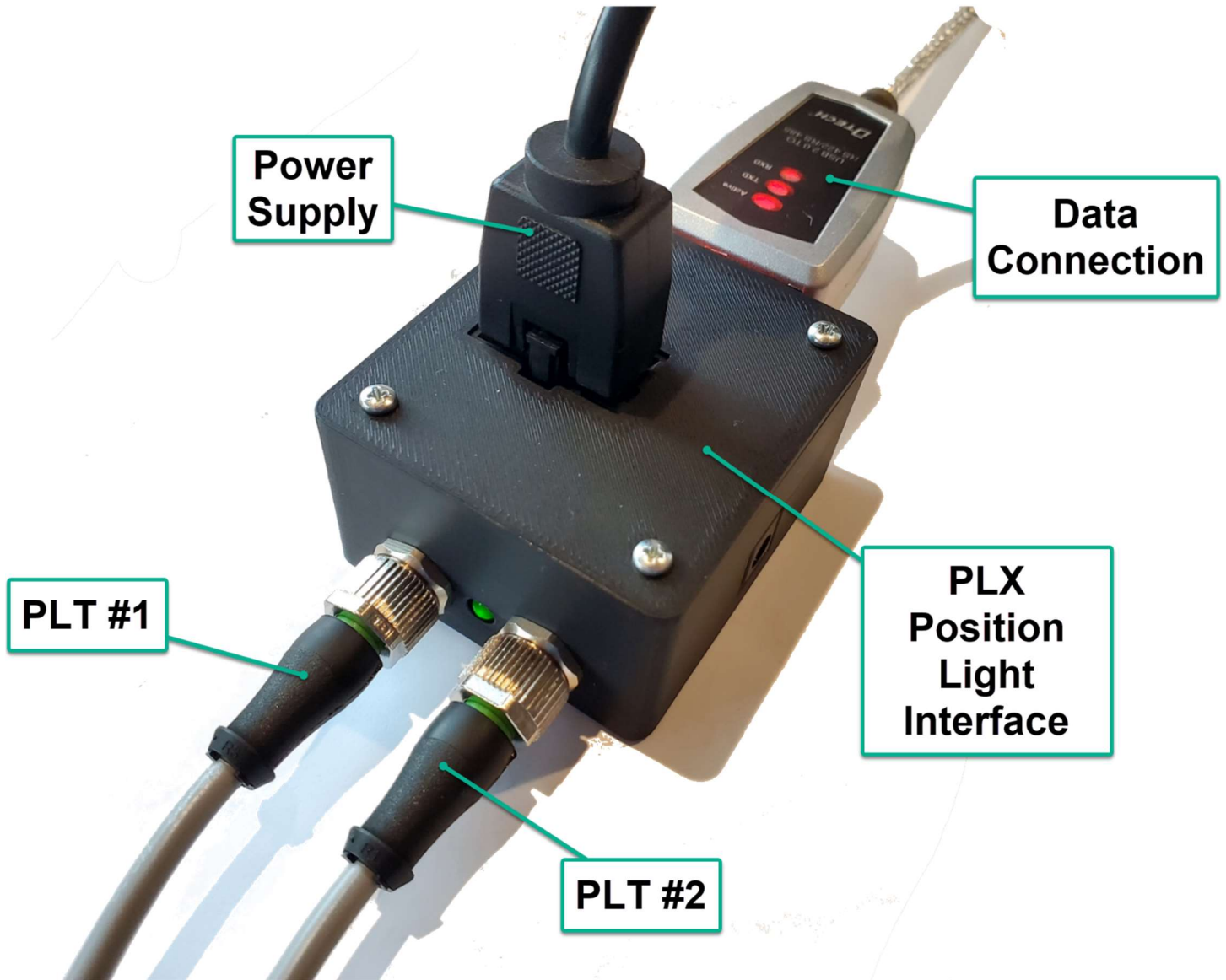
3. Secure the PLT at the top using the (2) MOUNTING POINTS provided:



4. If an ESTOP button is installed on the PLT, consider additional bracing behind the area where it is pushed to prevent the PLT from bending/flexing.

## Interfacing to a HOST Computer

The PLT modules communicate to a HOST computer over an RS485 bus via a USB to RS485 adapter and the PLX (Position Light Interface) module show below. It is intended to be placed on or near the PC workstation:



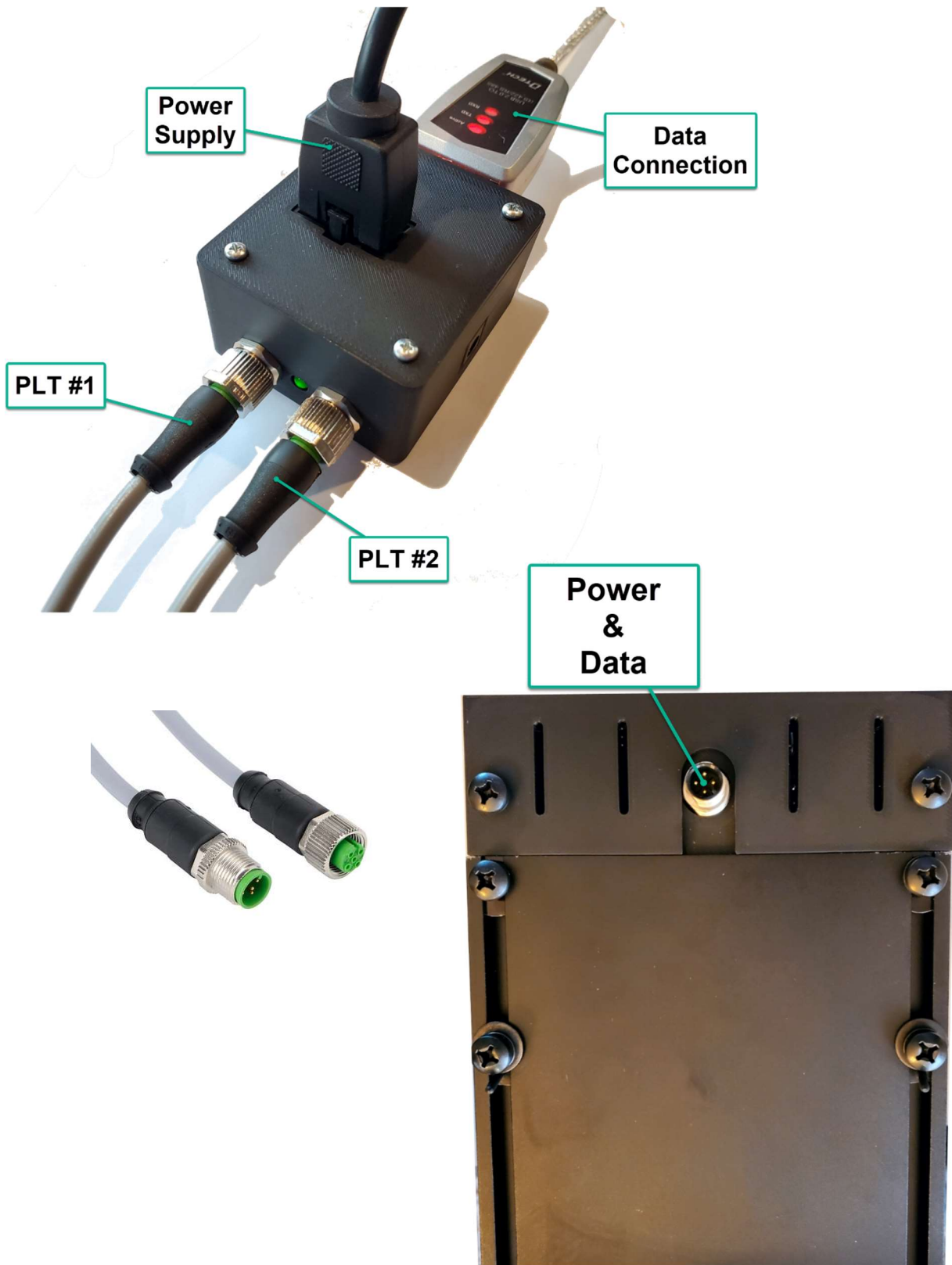


Connect the system as follows:

1. Connect the USB/RS485 adapter to the PLX module as shown below. The M12 connectors are identical so you can use either one or both if you are feeding (2) PLTs.



2. Connect the POWER supply and M12 communication cable(s) to the PLT(s) as shown below using the supplied M12 cable(s). The connection cable plugs into the top-rear of the PLT as shown below:



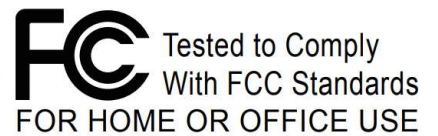
## Power Supply

The power supply input must be connected to an AC Power source from 90..264VAC and 47..63Hz. The IEC 320-C14 International power socket allows various plugs to be used for Country specific outlets.



### FEATURES

- Certified IEC 62368-1 & CB 60950-1
- Meet USA EISA 2007
- Meet Energy Efficiency DOE Level VI
- Meet Code of Conduct Version 5 Tier 2
- High Reliability
- Low Profile
- Over Current Protection
- Over Temperature Protection
- Over Voltage Protection
- With PFC Circuit



The Power Supply rated output is 24VDC / 11AMPS

The Power Supply has an onboard POWER SWITCH to conveniently switch power off and on.

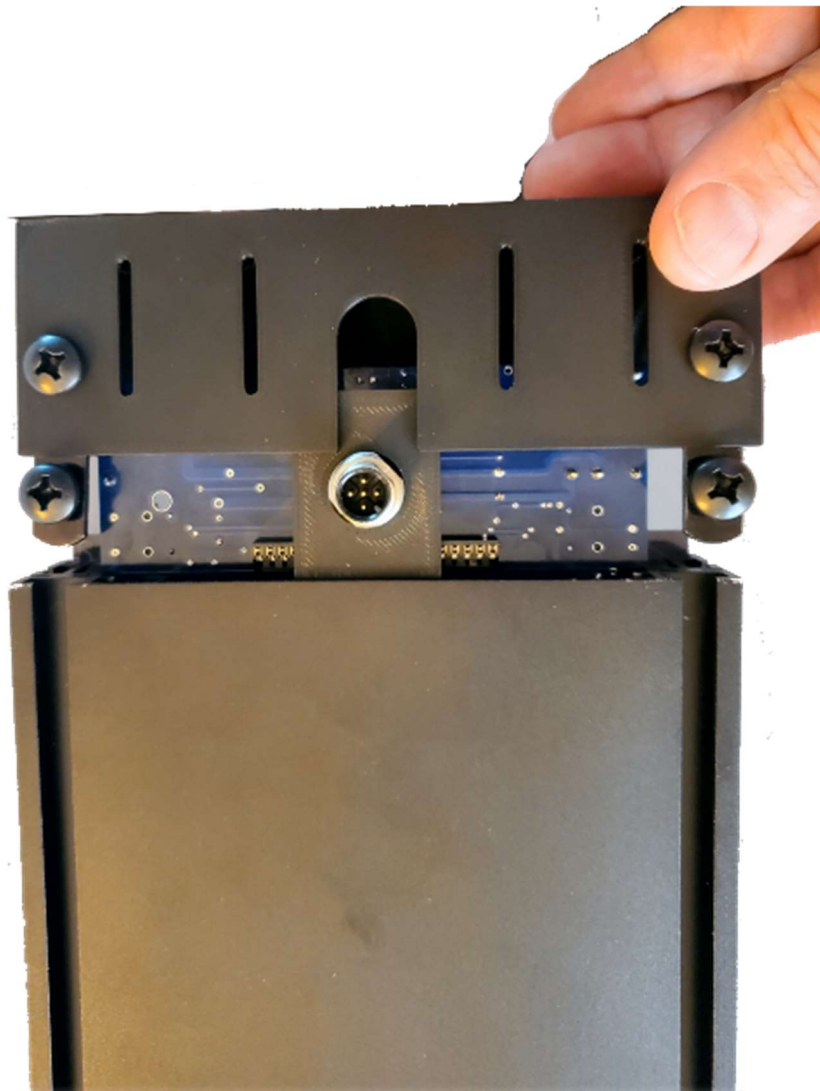


**NEVER USE ANY OTHER POWER SUPPLY FOR THE SYSTEM!**

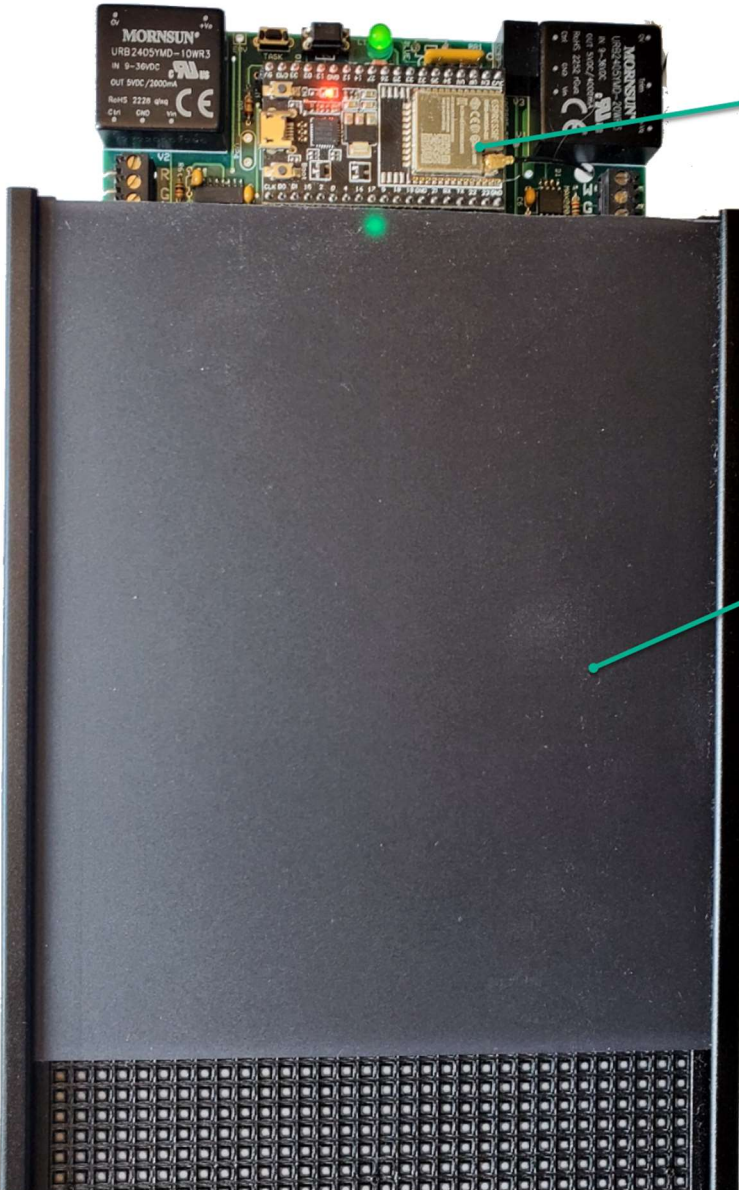
## Servicing the PLT

The PLT is enclosed from top to bottom by an aluminum extrusion and an acrylic cover. Typically, the top lens is short enough to remove for access to the “brain” at the head of the tower, but the other cover slides in place and usually can’t be removed without lowering the tower to a horizontal position

To access the PLT electronics, remove the top cover by loosening the two set screws and sliding upwards as shown below:



With the cover removed, the control module is exposed as shown below

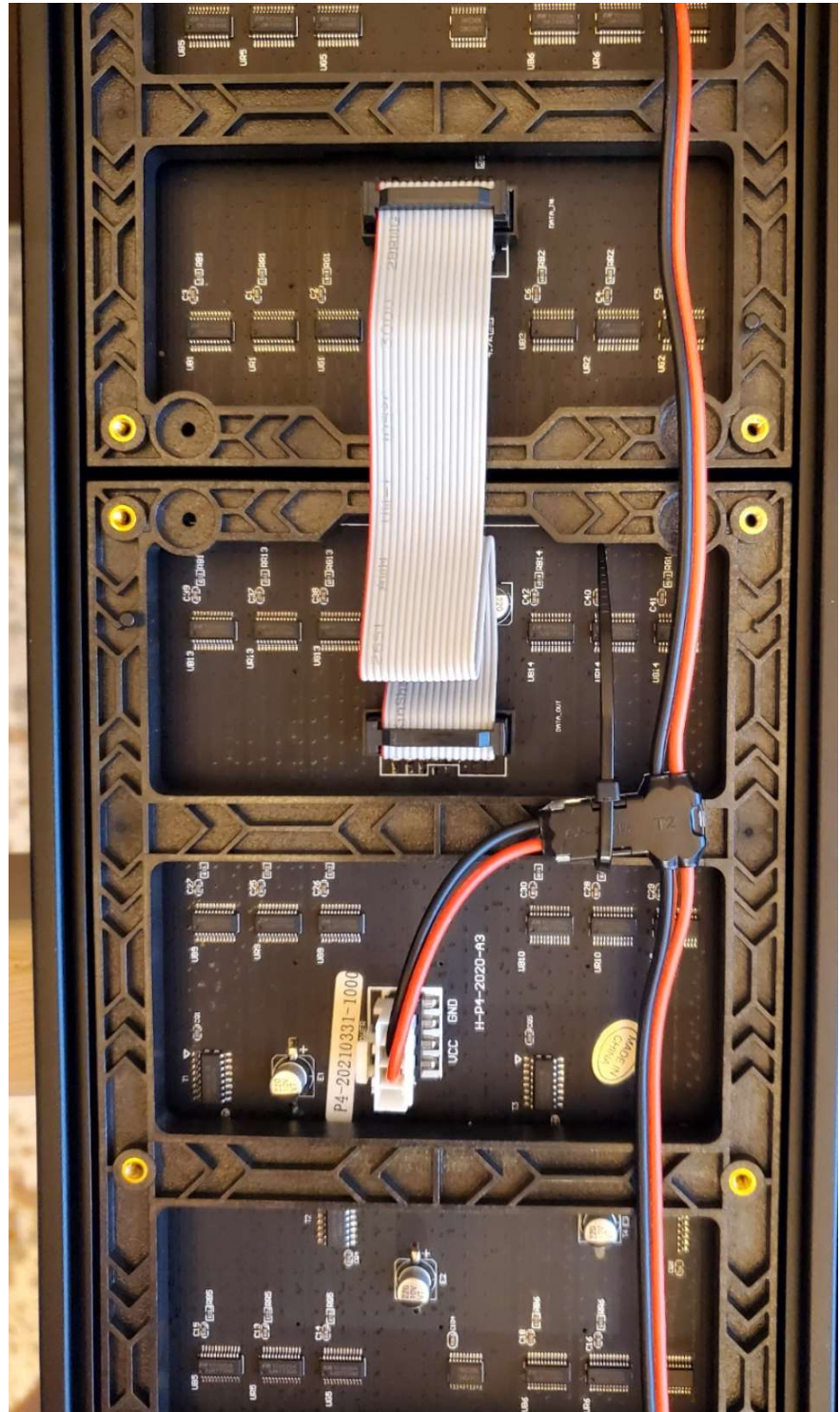


PLT  
CONTROL  
MODULE

SHORT COVER  
SECTION AT  
TOP OF TOWER

If there is/are problems with any of the LED module panels, remove the lens cover to expose them. Caution, usually the panels are held in place by the lens and may fall out if the lens is removed while in the vertical position. Often, removing the large lens section is impossible due to the ceiling barrier so we recommend lowering the tower to the ground for service.

The LED grids are stacked and inter-connected as shown below. When a problem with a display occurs, first check for a loose connection on the ribbon cable or power feed. If the module still has a problem, swap it out.



## Host Computer Systems

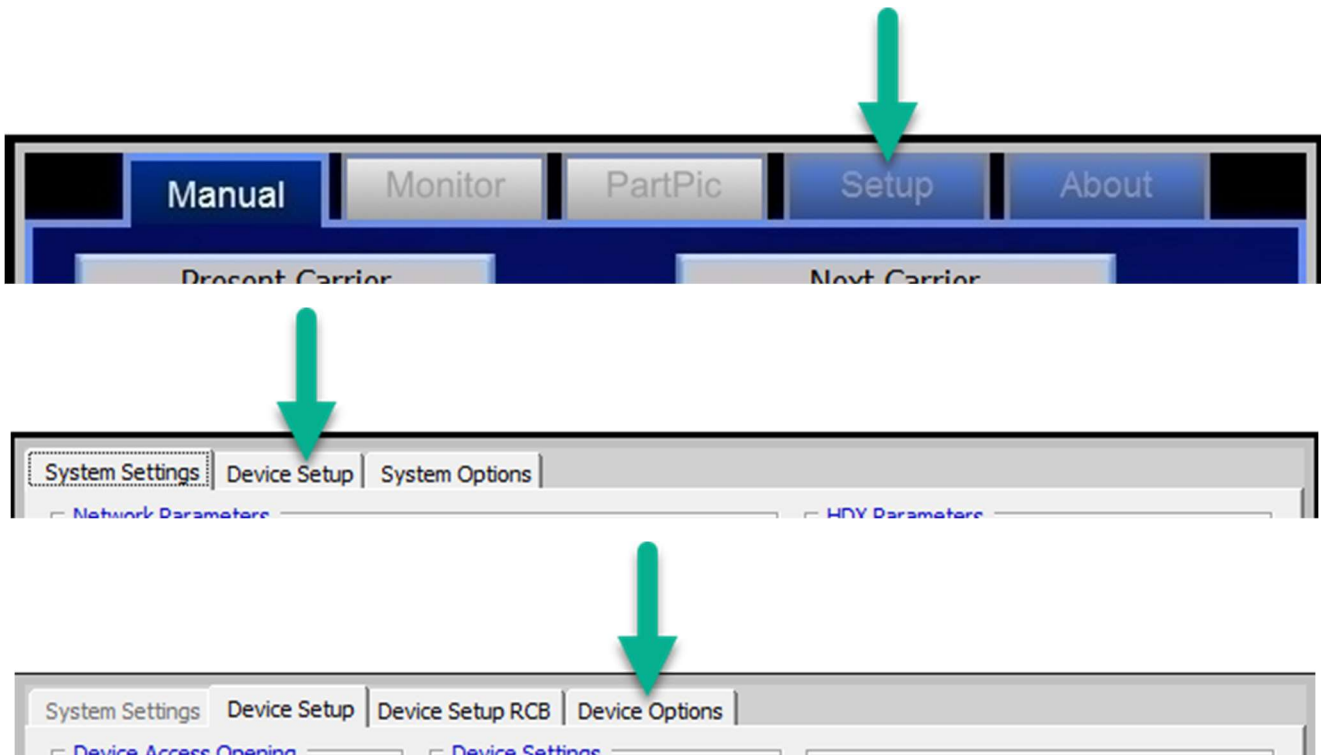
After the PLT is properly interfaced to the PC workstation and configured using OPC SETUP or other means, it can be bound (logically attached) to a storage device according to the OEM's specific methods.

You should always use Robey Controls OPC software SETUP page to configure the PLT, even if you are not using it as the inventory control system. Therefore, start with the next section for setup and then proceed to the appropriate pages for help with other inventory control software systems.

## ROBEY CONTROLS PARTPIC / OPC

- PLT uses a COM port from the PC for the RS485 PLX interface
- (1) COM port per (2) PLT recommended
- It is possible in some cases, using a T-COUPLER, to support (3) PLT on a single PLX/COM port
- OPC discovers online PLT devices automatically during the SCAN function
- Use a separate COM port from Batch Station lights (e.g. BLD or BLI)
- Use a separate address range from all Pick Light Towers if using the same COM channel

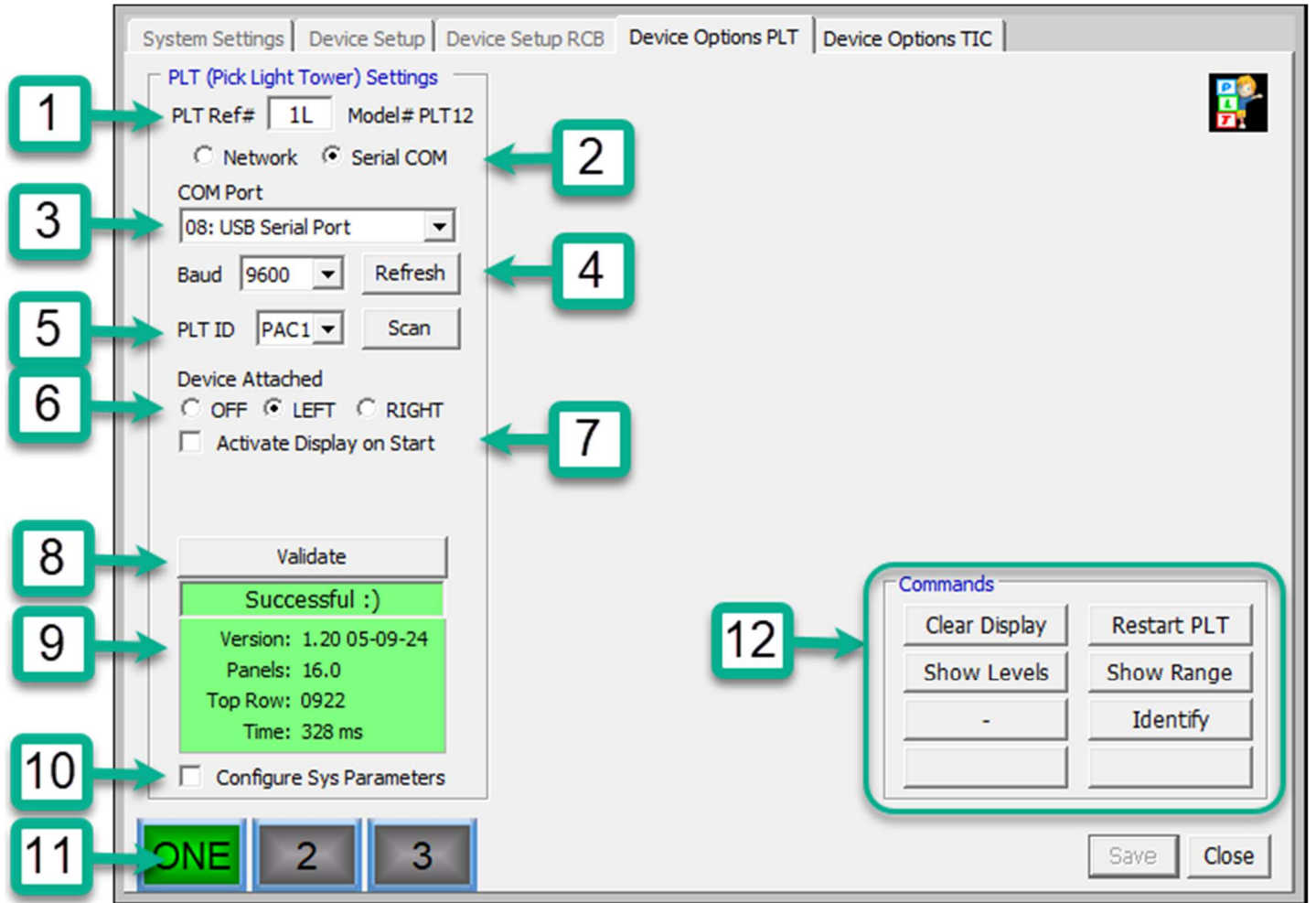
To reach the PLT SETUP page within OPC software, step through the menu tabs as shown below:





Device Options PLT

The PLT SETUP page can be used to configure the PLT devices for the application. Once configured, the PLT can be 'Attached' to a specific DEVICE (carousel) within the system.

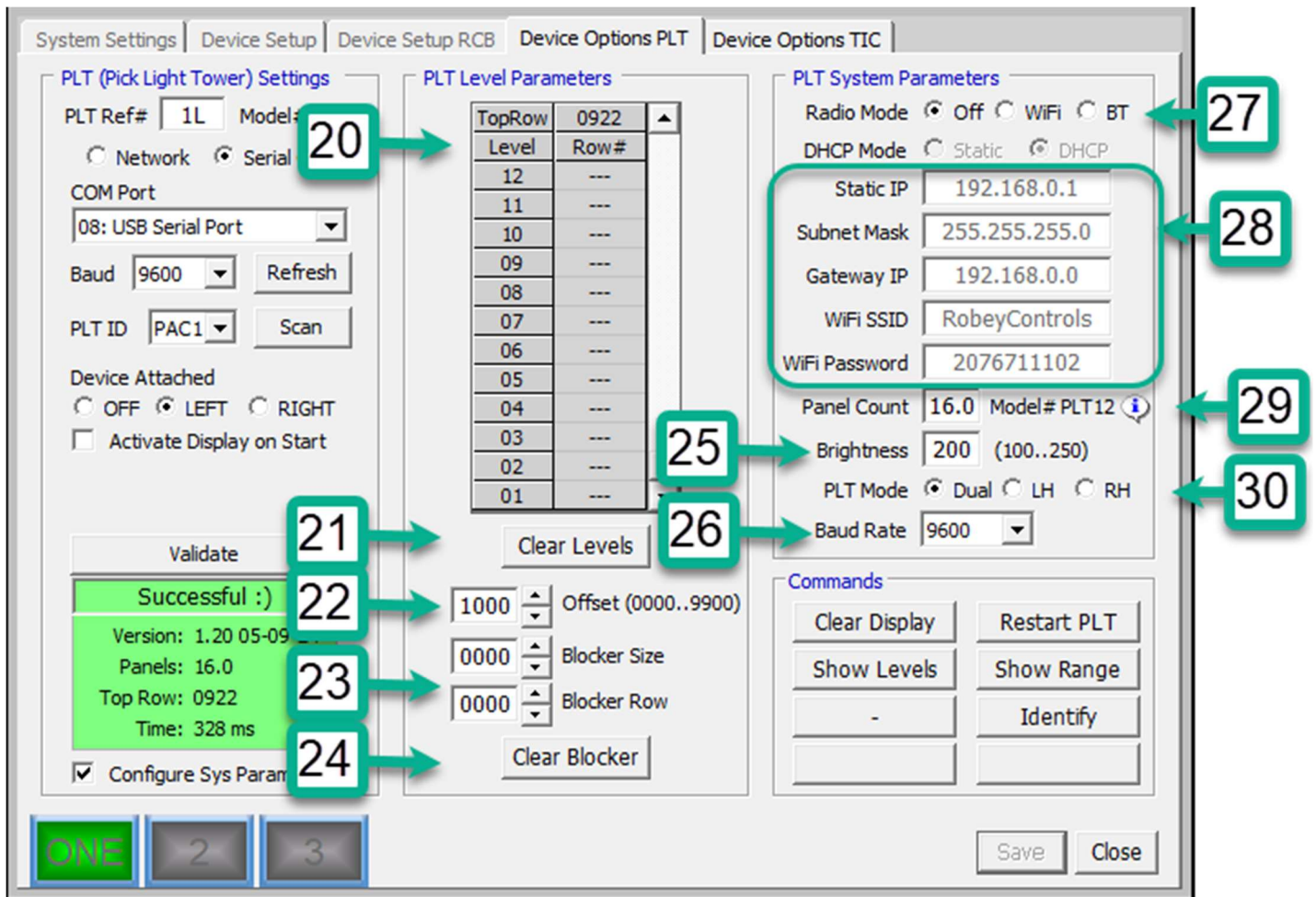


REF#	Definition	Purpose
1	PLT Reference #  Model#	Typically used to identify the Towers with a logical name. When multiple towers are present, labeling them as 1L and 1R, 2L and 2R may help to associate them with the proper Device (carousel). This indicates the PLT Model number (the height reference for the Tower) See Model List table on following page.
2	Network / Serial COM	This defines the physical interface for the PLT. Network (WiFi) or Serial (COM) are available options.
3	COM Port	When using "Serial COM", this field is used to select the PC COM Port that is connected to the RS485 interface and PLX module.
4	Baud Refresh	When using "Serial COM", this field is used to select the PC COM Port. This field is used to select the BAUD rate and must match the PLT baud rate setting. Used to re-scan the available PC COM port list

5	PLT ID Scan	This is a unique (FACTORY-ASSIGNED) address identifier for the PLT It is used to allow multiple PLTs to co-exist on the same COM channel. This is used to DISCOVER PLT ID's existing online within the COM channel. See pic on a following page.
6	Device Attached OFF LEFT RIGHT	This is used to associate (i.e Attach or Bind) the selected PLT to the Device The PLT is not attached to the selected Device The PLT is attached on the LEFT side of the selected Device The PLT is attached on the RIGHT side of the selected Device <b>Note: This parameter only applicable when using Robey Controls PartPic software!</b>
7	Activate Display on Start	Determines WHEN the PLT activates. When this is selected, the PLT will show the transaction information when the Device starts. When not selected, the PLT will show the transaction information when the Device stops. <b>Note: This parameter only applicable when using Robey Controls PartPic software!</b>
8	Validate	This is used to confirm the connection with the PLT and upload it's configuration.
9	Status display	This shows system status information
10	Configure Sys Params	This select box is enabled if the selected PLT validates properly. It enables the configuration fields for the PLT (see following page).
11	Device Selectors	These buttons are used to select the Device being configured
12	Clear Display Show Levels Restart PLT Show Range Identify	Blanks the display are on the PLT If LEVELS are enabled, this button will show their placement Resets the PLT (similar to a power cycle) When LEVELS are disabled, Shows the start/end of the address space on the PLT Causes online PLTs to show their PLT ID. See following page

Model	PCount	Height
PLT?	04.0	- 20.5
PLT6	09.0	2364mm ( 93.10"
PLT7	10.0	2620mm (103.15"
PLT8	11.5	3004mm (118.27"
PLT9	12.5	3260mm (128.35"
PLT10	14.0	3644mm (143.46"
PLT12	16.0	4248mm (167.24"

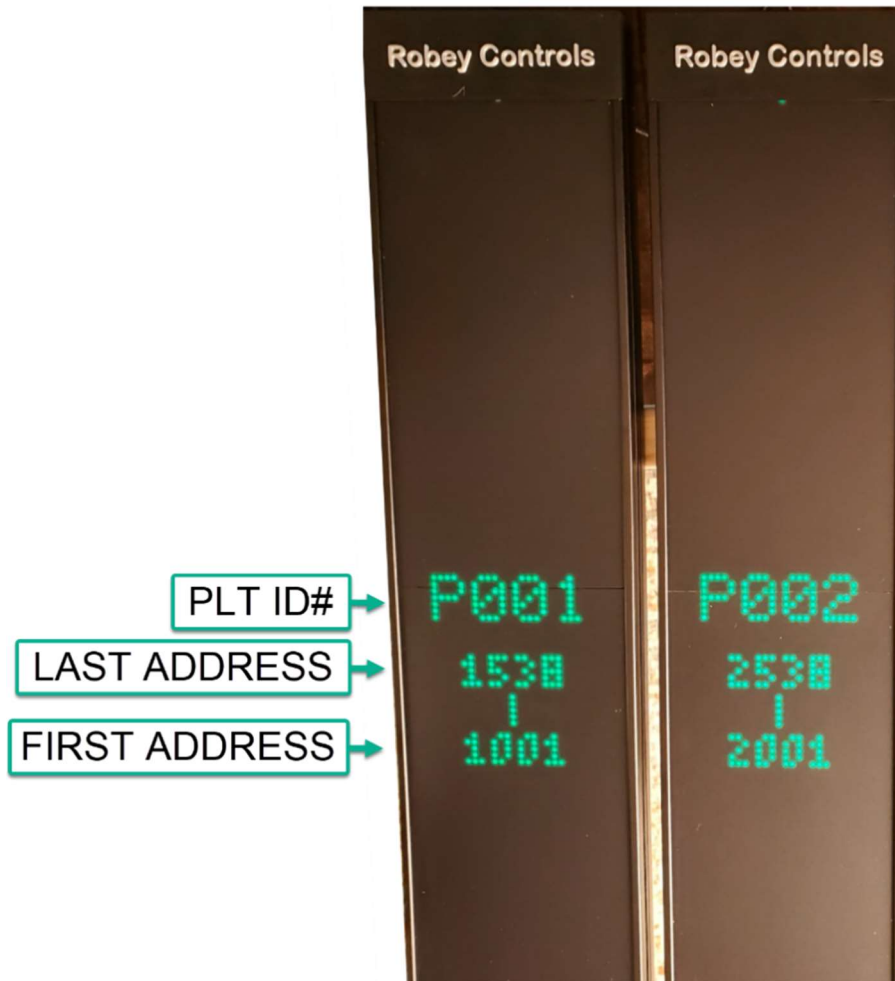
### PLT MODEL LIST



REF#	Definition	Purpose
20	LEVEL TABLE	This (optional) table is used to assign the Row# (vertical height) to a Level number. The PLT likely has hundreds of Rows of LEDs spanning the display area with a 4mm pitch. Typically, the host computer uses Level references matching the shelves on the carousel. Align the LEVEL with the ROW# for proper setup.
21	Clear Levels	This is used to erase the entire LEVEL TABLE. When the LEVEL TABLE is not used, the HOST must be able to send transactions using the ROW# as the LEVEL. This typically means that the host has to make it's own cross-reference between SHELF and ROW.
22	Offset	This is used to create a starting offset for the Address range on the PLT. Each PLT on the same COM port must have a unique address range! Typically, customers use 1000 and 2000 to refer to the towers when used in this mode.
23	Blocker Size Blocker Row	The HEIGHT of a restricted display zone on the PLT. The starting ROW# of a restricted display zone on the PLT. This is typically used when a face-mounted ESTOP button is installed.
24	Clear Blocker	This is a convenient button to clear the blocker fields completely.
25	Brightness	Display intensity, between 100..250 with 100 as the dimmest and 250 as the brightest.
26	Baud Rate	When the PLT is used in "Serial" mode, this is the data rate for the channel.
27	Radio mode	This is the operating state for the PLT's onboard radio supporting WiFi or Bluetooth.
28	Static ip...	These are the Network Settings
29	Panel Count	This is the number of display panels installed on the PLT tower.
30	PLT Mode	This is only important when the PLT is using Robey Controls PartPic software and stands-alone with a single Device.

## IDENTIFY / SCAN

The OPC setup page IDENTIFY button will cause all online PLT's to show their unique PLT ID# (aka P-code) as shown below. This should be the first step in the configuration process so that you can be sure you are configuring the correct PLT.



You can share a COM port with other Robey Controls lights if you avoid address conflicts.

All Devices on the same COM port must use a unique Address.

The PLT family offer an ADDRESS OFFSET for this purpose.

For example: BLD uses range 0001..0008, PLT#1 uses 1001..1250, PLT#2 uses 2001..1250

*\*PLT always needs a separate Power Supply from BLD\**

The screenshot displays the 'Kardex Power Pick System - Admin' application window. The main menu includes 'Application', 'Management', 'Order', 'Storage', 'Reporting', 'Tools', and 'Help'. The interface is divided into several sections:

- Startup:** Contains 'Startup' and 'Exit' buttons.
- Warehouse Management:** The main workspace, featuring a tree view on the left and a configuration panel on the right.
- Tree View:** Shows a hierarchy: Warehouses (MyWarehouse) > Areas > Peripherals (BLD, PLT) > Stations (LAPTOP-MH1Q) > Storage Unit (RMC1, RMC2, RMC3) > Zones.
- Peripheral Details:** A form for configuring the selected peripheral (PLT). Fields include:
  - Peripheral Name: PLT
  - Peripheral Type: Light Indicator (selected from a dropdown)
  - Description: (empty text box)
  - Warehouse Name: MyWarehouse (selected from a dropdown)
- Configuration Parameters:** A section with a 'Configuration Wizard' button and a text area containing the following configuration string:

```
ProtocolType\=RemstarPL;Modules\=1:N:10,2:N:20,3:N:100,4:N:600,5:N:920;DisplayLineWidth\=8  
\;Baud\=115200;EndPoint\=COM3
```
- Right Panel:** A vertical toolbar with buttons for:
  - New Peripheral
  - Rename Peripheral
  - Save Peripheral
  - Delete Peripheral
  - Cancel

The Windows taskbar at the bottom shows the system tray with a notification: 'Peripheral BLD successfully updated', the date and time 'Sunday, March 3, 2024 6:13:33 PM', and a yellow warning message: 'Server LAPTOP-MH1QUFA6 is not licensed - it will stop working on 3/9/2024. 5.3.0.29098'.

Machine Control Service Configuration

**Basic**  
Set protocol and channel

Protocol  
Remstar Pick-Lights

Channel  
Serial

< Back   Next >   Cancel

Machine Control Service Configuration

### Channel properties

Set channel properties

▼ Channel	
Baud rate	9600
Data bits	8
Flush port before writing	False
Parity	N
Serial port	COM6
Stop bits	2

**Baud rate**  
The baud rate of the connection. Entered values will be adjusted to possible values automatically.

< Back   Next >   Cancel

Be sure to configure PPG's "Modules" section according to their instructions. In this example below, we set:

SHELF #1 to LED ROW 0010  
SHELF #2 to LED ROW 0020  
SHELF #3 to LED ROW 0100  
SHELF #4 to LED ROW 0600  
SHELF #5 to LED ROW 0920



**Index:** The shelf number, usually from bottom to top.  
**Type:** Typically 'N' for a non-confirming device.  
**ID:Height:** The coinciding LED ROW number for the Shelf number.

The image shows a screenshot of the "Machine Control Service Configuration" window. The window title is "Machine Control Service Configuration" with a close button (X) in the top right corner. Below the title bar, there is a section for "Protocol properties" with the text "Set protocol and channel" and "For TCP standard port is 4000". Below this, there is a list of expandable/collapsible sections: "Communication", "Controller", "Display", "MCS", "Protocol" (which is expanded), and "Trace". Under the "Protocol" section, there are several properties: "AsynchronousMode" with value "1", "InitializationMode" with value "1", "Modules" with value "1:N:10,2:N:20,3:N:100,4:N:600,5:N:920" (this value is highlighted with a green box), "Show Welcome Message" with value "False", and "Sum Module". Below the "Protocol" section, there is a "Modules" section with a detailed explanation of the format: "A list of all connected modules: Index:Type:ID:[Height], separated by comma. Index is the number of the module, type can be 'N' or 'C', where 'N' means that a confirmation is not possible at the module. The ID is the device id of the module. If only modules with confirmation are used and the ID equals the index, the list can be entered like this: '1,2,3,...' This will be expanded internally to '1:C:1,2:C:2,3:C:3,...'. This is also valid: '1,2:N,3:C:5,4:N:4' (note: Picklight at position 3 has hardware ID 5 here !). The optional [Height] setting is for using the Pick-Lights as Pick-Tree and represents the minimum shelf height to use the Pick-Light." At the bottom of the window, there are three buttons: "< Back", "Next >", and "Cancel".



Machine Control Service Configuration

End Point  
COM3/Serial

Text

Mode: Lamp1 On  
Index: 1  
Depth:   
Quantity:

Show

**✔ Communication was successful**

```
Check Communication Client <-> MCS
09:28:05.256 CreateSession .....OK
09:28:05.272 Linking to device .....OK
09:28:05.287 Connect with device PLT .....OK
09:28:05.287 Detected device type PickLight .....OK
09:28:05.319 First event nr=0, type=MCSChangedEvent, delay= 31ms .....OK
Check Communication MCS <-> Device
09:28:05.319 MCS PLT is in state Initializing
09:28:07.038 MCS PLT is in state WaitFirstStatus OK
09:28:07.064 MCS PLT is in state Processing OK
```

< Back Finish Cancel

When configuring Nova for use with PLTs, there are two Nova configuration settings to be aware of:

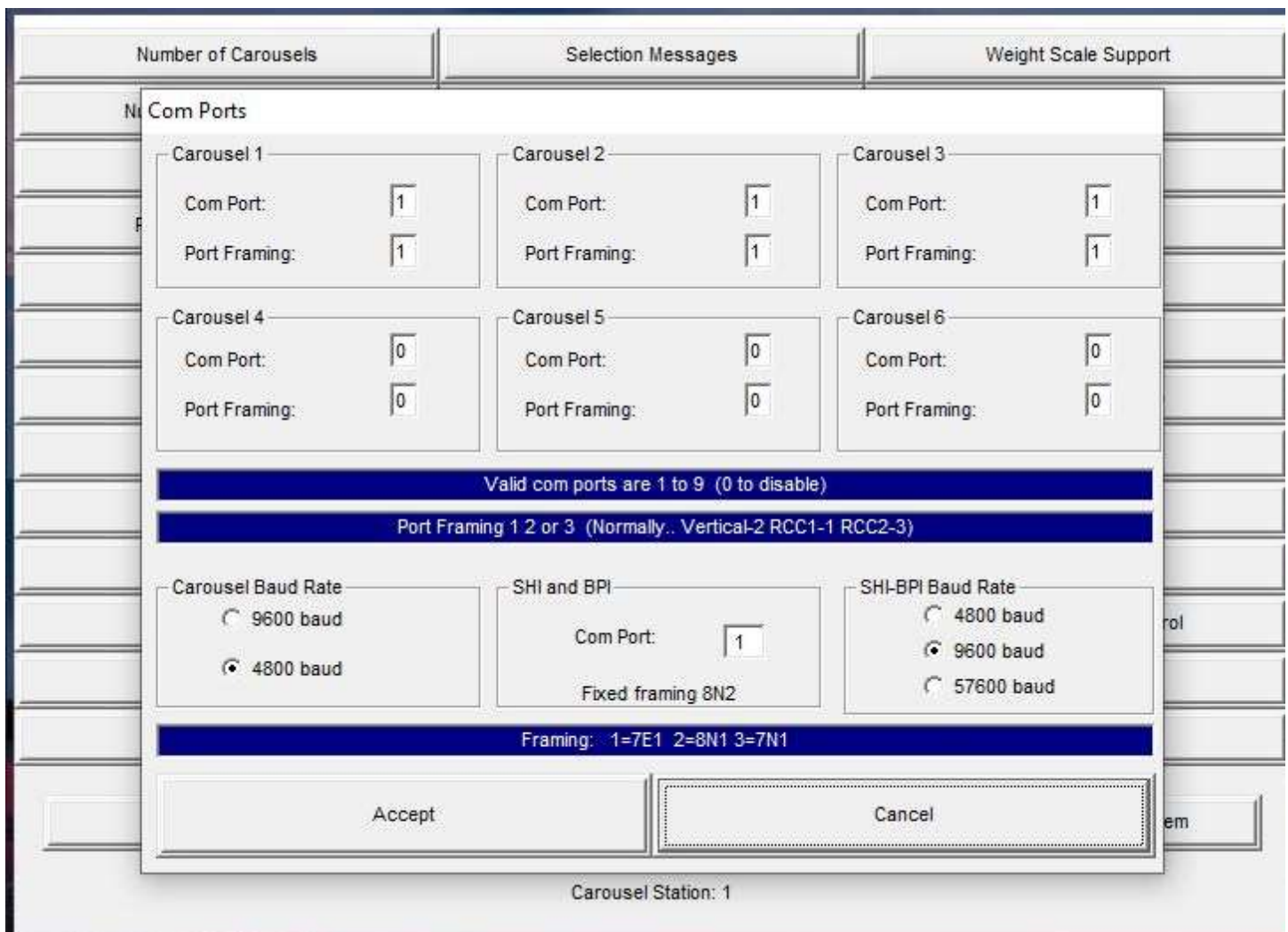
COM Port:

Nova’s “SHI and BPI” COM port setting should indicate the COM port being monitored by the “display manager” software (DMS) and it is the DMS that will be set to the COM port of the PLTs. The DMS is responsible for directing Nova’s single COM port signal to (potentially) multiple PLT COM ports. Instructions for the use of the DMS are beyond the scope of this document. Contact Hart Software Inc. for details.

Manufacturer:

Nova’s “Shelf Height Indicators” manufacturer setting should be set to “Remstar”.

When using PLTs and or BLDs in a Nova environment, we recommend you contact Hart Software Inc. for assistance. Hart Software in collaboration with Robey Controls will ensure the proper configuration for the specific requirements of your application.



## SHELF HEIGHT INDICATORS

### SHI Manufacturer

- Raymond  White  
 Remstar  IPTI-12

### SHI start at

- Start at 0  
 Start at 1

### Partition on SHI

- Include Partition  
 Omit Partition  
Raymond SHIs only

### SHI Levels

- Carousel 1 levels   
Carousel 2 levels   
Carousel 3 levels   
Carousel 4 levels   
Carousel 5 levels   
Carousel 6 levels

### Space between part and qty

- Force space  
 Do not force space  
Raymond SHIs only

Base addresses and left and right are required  
for Remstar SHI only. Base address + level =  
address of the SHI (level+1 if levels start at zero).  
Base addresses should be 100 200 300 etc.

Accept

Cancel