

# Horizontal Carousel Controller HCB Installation Guide

July 10, 2024



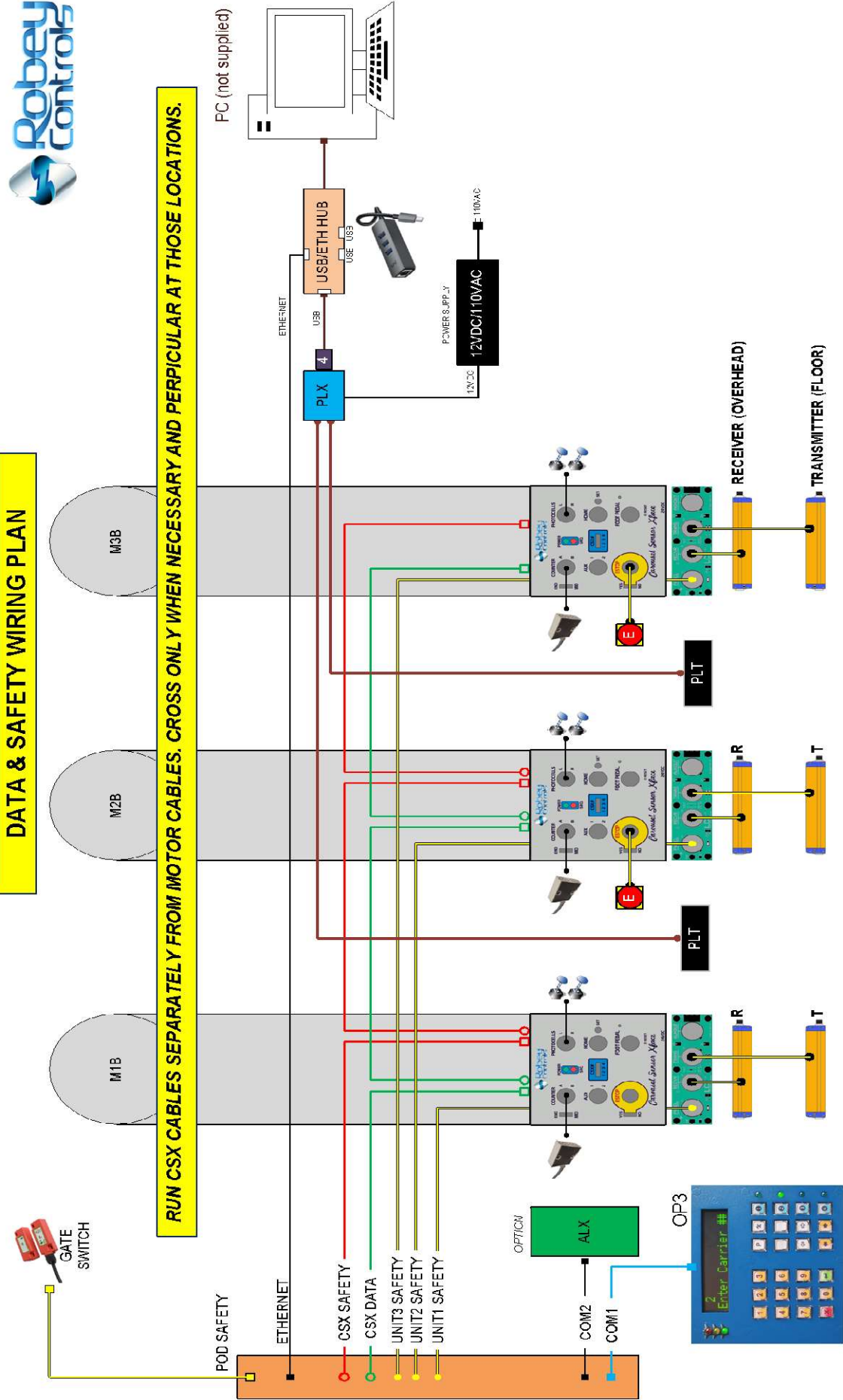
# Contents

System Diagram.....	3
Introduction .....	4
Overview .....	5
Mounting the Control panel.....	6
Warnings & Tips .....	7
Motor Wiring.....	8
Setting the Motor Overload protection .....	10
Carousel Sensor Interface (CSX).....	12
Connections for the CSX.....	13
Counter Assembly .....	15
Setup Configuration .....	19
Parameter Settings.....	21
ADJUST STOPPING RAMPS .....	25
AUTO-TEACH RAMPS (EXPERIMENTAL).....	27
OP3 HMI OVERVIEW .....	28
Setting the Carrier number (OP3) .....	31
OPC HMI OVERVIEW .....	33
Setting the Carrier number (OPC) .....	35
ESTOP SYSTEM.....	37
HOST COMPUTER SETTINGS .....	38
PARTPIC .....	38
PPG.....	39
NOVA.....	42
RCB PARAMETER SET 1.01 (2023) .....	43
RCB PARAMETER SET 2.02 (APRIL 2024) .....	47



**DATA & SAFETY WIRING PLAN**

**RUN CSX CABLES SEPARATELY FROM MOTOR CABLES. CROSS ONLY WHEN NECESSARY AND PERPICULAR AT THOSE LOCATIONS.**



<p><b>ETHERNET CABLE</b> CAT5, RJ45 8P8C, STP</p> <p><b>INTERFACE CABLE TO OP3</b> CAT5, RJ45 8P8C, STP</p> <p><b>M12-5M/M12-5F CABLE</b></p> <p><b>USB/RS485 ADAPTER</b></p>	<p><b>DATA CABLE TO CSX</b> CAT5, RJ45 8P8C, STP <i>DO NOT RUN WITH MOTOR CABLE!</i></p> <p><b>SAFETY CABLE TO CSX</b> CAT5, RJ45 8P8C, STP <i>DO NOT RUN WITH MOTOR CABLE!</i></p>	<p><b>ESTOP BUTTON</b> M12-8 CABLE</p> <p><b>OPTION</b> AMAZON ECHO XFACE CAT5, RJ45, 8P8C, STP</p> <p><b>ALX</b></p>	<p><b>OPTION</b> HMI, OP3D CAT5, RJ45 8P8C, STP</p> <p><b>CSX</b> CAROUSEL SENSOR XFACE</p> <p><b>LCX</b> LT CURTAIN XFACE BOARD</p> <p><b>PLT</b> Pick Light Tower</p>	<p><b>RCB CNTRL PANEL</b> WALL MOUNT 2' x 3' x 8" 460VAC3~</p>
---	---	---	---	--

## Introduction

This document is intended to aid the trained technician to install Robey Controls control 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
- Review the Wiring Diagram for the machine controller before getting started

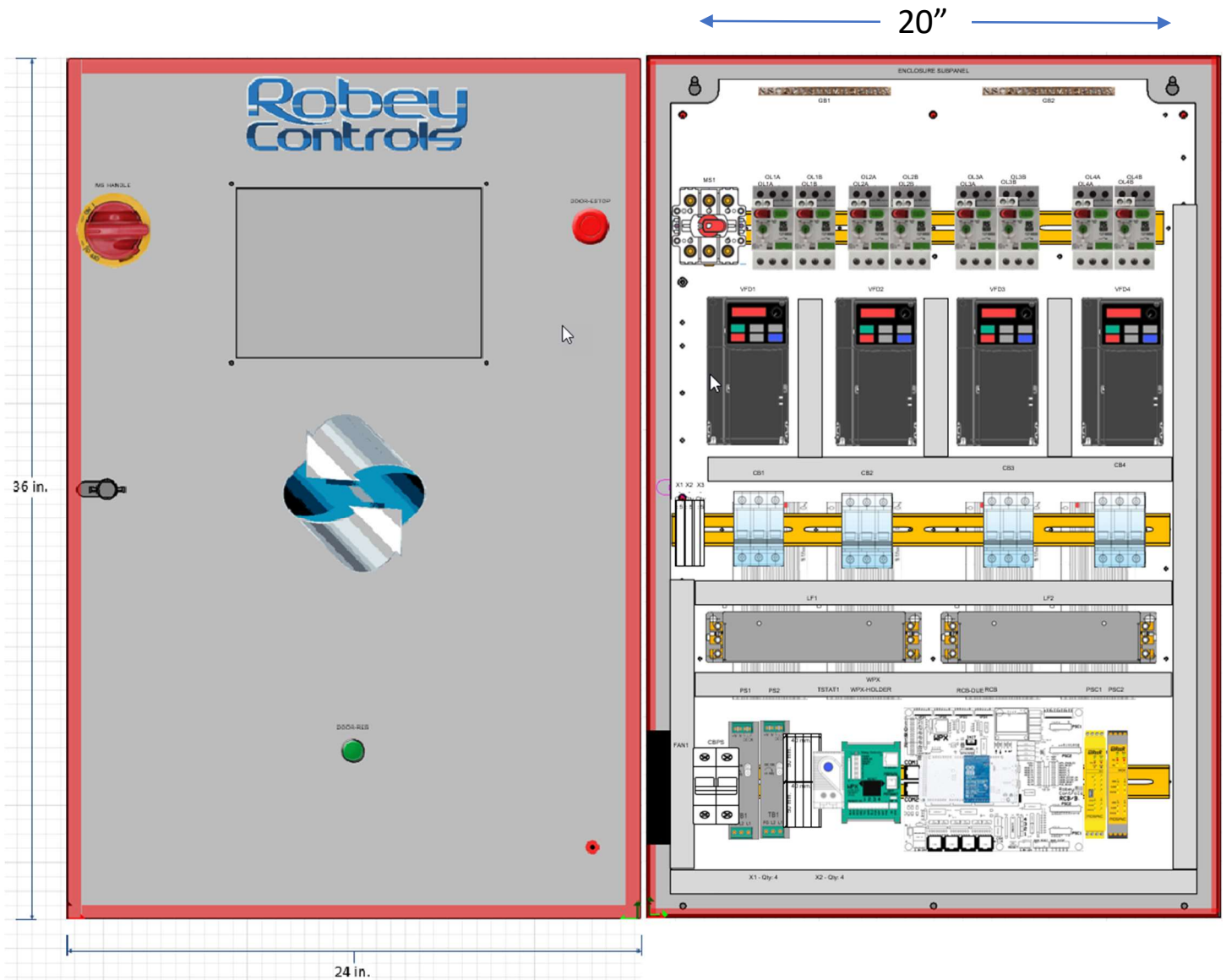
## Overview

The Horizontal Carousel Control panel using Robey Controls processor board RCB is named HCB. It is a modern and advanced controller capable of numerous features including:

- a. Single wall-mount control panel to support up-to four (4) carousels.
  - i. Enclosure is 24x36x8inches (See Fig 1)
- b. Supports single- or dual-drive carousels (one or two motors per carousel)
- c. Employs modern Variable Frequency Drives (VFD's) and 3~ AC motors on the carousels.
- d. Emulates legacy Host interface protocols from
  - i. Raymond Corp RCC1
  - ii. Remstar Int'l RCC2
  - iii. Kardex-Remstar T88
- e. Includes two (2) COM channels employing:
  - i. RS485 interfaces
  - ii. External power for equipment such as our OP3 HMI
  - iii. common 8P8C cables (aka Ethernet cables)
  - iv. RS232/RS485 converters are available from Robey Controls for legacy RS232 connections
- f. Ethernet interface option
- g. Includes support features for interfaces to optional Robey Controls Pick Light Tower (PLT)
- h. Includes support for a 2-channel Estop button string
- i. Includes peripheral options for the carousels such as
  - i. ALEXA interface for voice controlled carousel move commands
  - ii. Count sensors for various carousel brands
  - iii. Photocells (up-to two pairs per carousel)
  - iv. Home sensor (automatically sets Carrier #1 during initialization and operation)
  - v. Foot pedal
  - vi. Light Curtains
  - vii. Gate switches

## Mounting the Control panel

The control panel is 24" wide and is typically hung on a wall. Set two anchor bolts/screws in the wall separated by 20" to suspend the top. Leave them loose so that you can lift and place the control panel onto them. Tighten the screws after paying extra careful attention to the right screw area where many low-voltage cables are located.



Secure the lower (3) mounting locations using suitable anchor screws.

*Finally, check to be sure that the panel has not been 'twisted' by installation on a non-flat surface.*

*The door should open and close properly.*

*If not, loosen and shim the panel/screws accordingly.*

## Warnings & Tips

- j. **DO NOT** haphazardly connect Ethernet cable to any RJ45 socket that accepts it! The HCB control makes use of RJ45 connector sockets and 8Pin 8Conductor cables with RJ45 plugs commonly known as CAT5 cable or Ethernet cable for data comm and other non-ethernet purposes. Be careful, as the majority of the RJ45 sockets in our control are NOT INTENDED FOR ETHERNET connections and damage may occur to the RCB control or the customer's LAN when an Ethernet cable is connected improperly to one of these RJ45 sockets.
- k. **DO NOT** run the DATA cables for the Carousel Sensor Interfaces in the same wire channels as the motor cables as interference (EMI) is likely to occur and cause challenging problems with operation. When these cables must pass each-other, do so perpendicularly and/or with some separation distance.
- l. **DO NOT** run a single feed for a dual-drive carousel and split it at the carousel for each motor. The OEM may have done this in the past but it is incorrect and should be updated when controls are replaced. A single feed for dual-drive motors may cause motor failure as the current cannot be detected and disconnected properly.
- m. **DO NOT** use force to tighten the M12 connectors. Finess over force is the way to go with these connectors. Sometimes, turning counter-clockwise until you hear/feel them click into position is helpful. Never use pliers for these connectors – they are designed for finger-tight connections.
- n. **DO** pay careful attention when adjusting PARAMETERS, as some of them include fractional fields where for example the value of 2.0 is entered as 20. If you are not sure of any parameter setting, contact us for help before changing.
- o. **DO** pay careful attention when running the cables, especially the cables with RJ45 connectors. If the locking tab on the connector gets snagged and breaks off, you may need to pull another cable. Put some tape around the tab when pulling so it can't get snagged on anything!
- p. **DO** use shielded cable (STP) for all data cables external to the RCB control, including the interface cables to the Carousel Junction Boxes, the interface cable to the OP3 HMI and the interface cable(s) to a Host Computer.
- q. **DO** employ VFD CABLE for the motor connections back to the panel, and utilize our metal CABLE GLANDS for the shield connections on both motor and control panel ends. Follow the connection guidelines on the following page to avoid troublesome and challenging problems with operation.





## Motor Wiring

Proper termination of the motor's shielded VFD cable is essential for best operating results and equipment longevity. Proper termination on both ends of the cable is imperative.

- Carefully strip the motor cable as shown below in Fig A. The metal braided jacket should be exposed enough to contact the cable-gland fingers as shown in Figure E (gold braid reference)
- Note that once the cable is inserted, It cannot be removed or rotated without damaging it or the cable-gland, so practice stripping the cable on a scrap piece before making the final insertion.
- We found that some electrical tape at the end of the braid helps hold it intact while pushing through the gland, as shown in Fig A..
- After the cable has been properly stripped and inserted, tighten the clamping nut at the top to secure the cable from movement, as shown in Fig C.
- Connect both the DRAIN wire and the GREEN wire to the GND terminal bus bar in the HCB control cabinet as shown in Fig B.

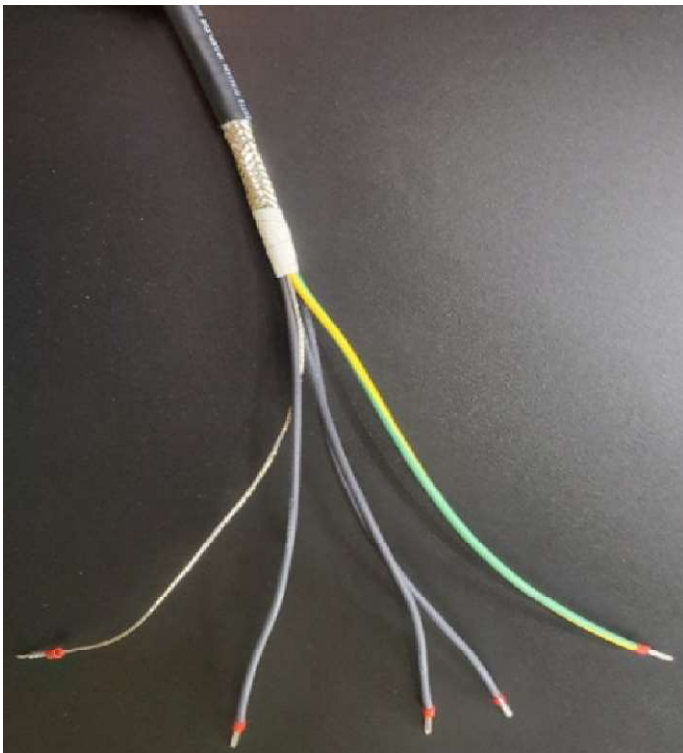
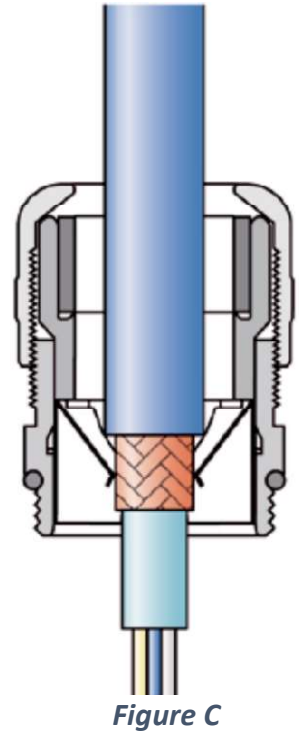


Figure A

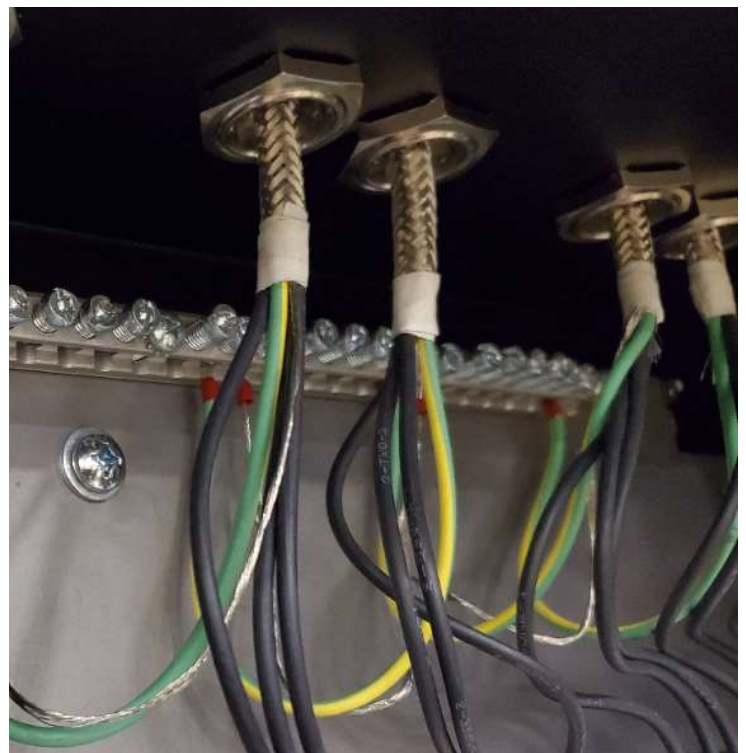


Figure B



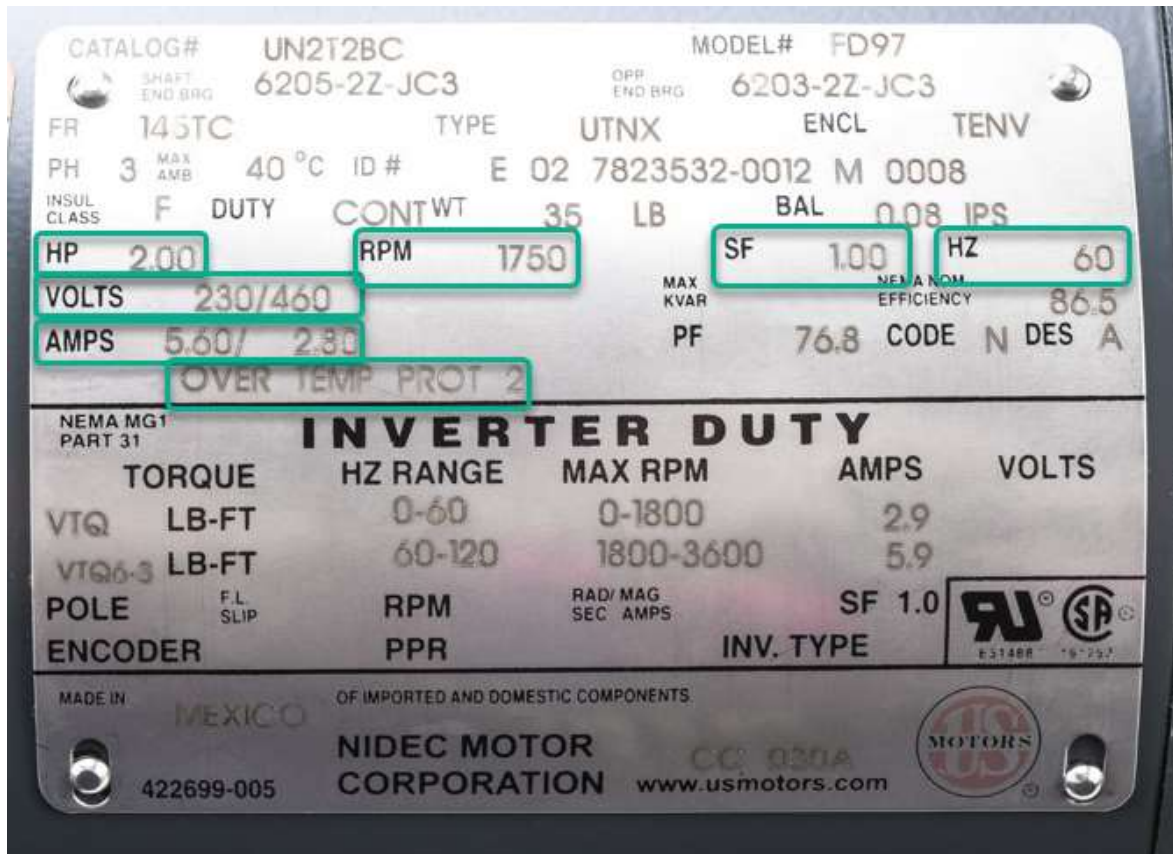
The motor cable connection should be terminated in a similar manner as the control panel's termination.

1. Carefully strip the motor cable as shown below in Fig A on the previous page. The metal braided jacket should be exposed enough to contact the cable-gland fingers as shown in Figure E (gold braid reference)
2. Note that once the cable is inserted, It cannot be removed or rotated without damaging it or the cable-gland, so practice stripping the cable on a scrap piece before making the final insertion.
3. We found that some electrical tape at the end of the braid helps hold it intact while pushing through the gland, as shown in Fig A..
4. After the cable has been properly stripped and inserted, tighten the clamping nut at the top to secure the cable from movement, as shown in Fig C.
5. Connect both the DRAIN wire to the motor's GND screw and the GREEN wire to the GREEN wire from the motor. Of a GRN wire does not exist, connect the DRAIN and the cable's GRN to the motor frame screw like shown below:



## Setting the Motor Overload protection

1. Obtain the FLA rating for each motor in the system by checking the dataplate on the motor. Best way is to get a picture of each dataplate. Here's an example of the fields of value to us:



2. For each carousel, set the motor parameters according to the motor dataplate as follows:
  - P220 Motor Voltage
    - The control panel is delivered in either 208V or 460V configuration
    - 208V versions use 230V motor wiring
    - 460V versions use 460V motor wiring
    - Check the Control dataplate to determine if it is 208/460
    - Check the motor VOLTS to be sure it can support the configured voltage
    - Check the motor wiring (delta/Wye) to determine if it is wired 230/460
    - Set the parameter accordingly
    - Example above:* Either 230 or 460
  - P221 Motor Frequency
    - Set the parameter according to the motor frequency specification
    - This is usually 60Hz but maybe be 50Hz in countries outside USA
    - Example above:* 60

- P222 Motor FLA (MFLA)
  - If SF < 1.15 then  $X = \text{FLA} * 1.15$
  - If SF  $\geq$  1.15 then  $X = \text{FLA} * 1.25$
  - If SF is unknown  $X = \text{FLA} * 1.15$

Single-Drive: MFLA = X  
 Dual-Drive: MFLA = X \* 2

Example above:

460V, Dual-drive carousel, SF=1.00

$$X = 2.80 * 1.15 = 3.22$$

$$\text{MFLA} = 3.22 * 2 = \mathbf{6.44}$$

Single-drive: No further action required

Dual-drive: Set the overload relay dials for the motor protection level X as determined above. In this example, each overload relay would be set to **3.22**

- P223 Motor KW (MKW)
  - Set the parameter to the motor's KW rating
  - If only HP is available, then use the formula below to get kW
  - $\text{kW} = \text{HP} / 1.341$

Example above

$$\text{Single motor: MKW} = 2.00 / 1.341 = \mathbf{1.5}$$

$$\text{Dual motor: MKW} = 2.00 / 1.341 = \mathbf{1.5 * 2 = 3.0}$$

- P224 Motor RPM (MRPM)
  - Set the parameter to the motor's RPM rating
  - Example above:* 1750

## Carousel Sensor Interface (CSX)

The Carousel Sensor Interface (CSX) is an intelligent (computerized) connection point for all the typical sensors required to control the carousel including:

- COUNTER
  - DUAL sensor using quadrature counting
  - Counts carriers as they pass
  - Stop the carousel at a specific position
- PHOTOCELLS
  - for stopping the carousel in the event of PRODUCT hanging over the carrier edge tool far
- FOOR PEDAL
  - for manual rotation control LEFT & RIGHT
- HOME SENSOR
  - Will reset the carrier number to a value defined in the Parameters when detected
  - Typically this is used to confirm that the carrier count matches the actual machine
  - Helpful in applications with frequent power outages or when the carousels have moved without power
- ESTOP BUTTON
  - Option connection point for a lighted ESTOP button
- AUX
  - Auxiliary inputs for various special applications

Mounting the CSX should consider these basic rules:

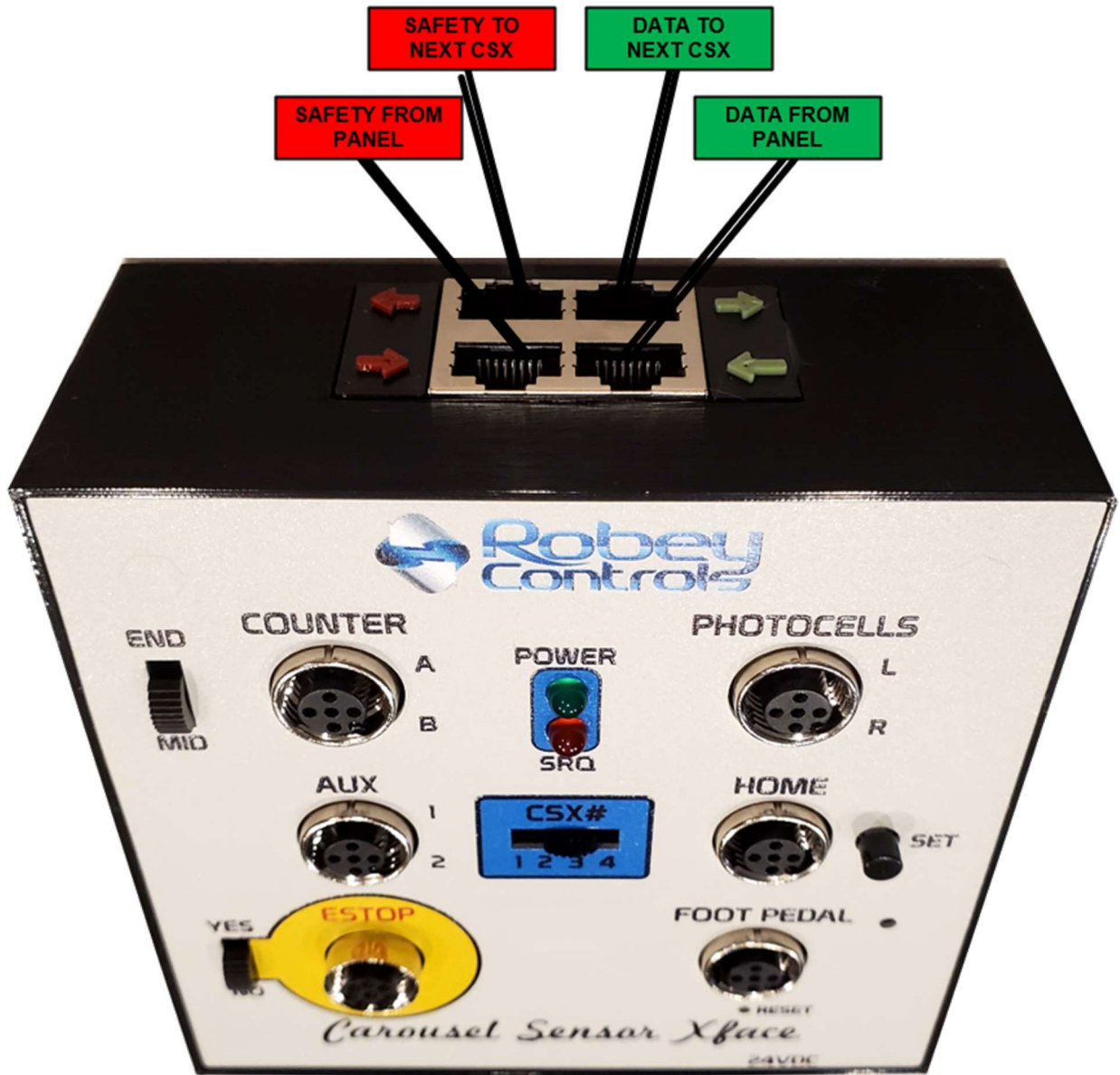
- (1) CSX per carousel
- CSX located at “picking end” of carousel where users interact with the machine
- CSX located with a DRIVE SPROCKET on the machine; i.e. not the idler wheel found on single-drive carousels
- CSX mounted on top of the carousel
- CSX mounted away from high-voltage cables and other EMI generating equipment

### Operating principle

The CSX contains a microprocessor used for various purposes. It manages the counting for the control system and reports only when a carrier number has changed. Reporting back to the master RCB control is accomplished by SERVICE REQUEST (SRQ) signals. When the CSX needs attention, it raises its SRQ and the RCB then contacts it and get aa status update automatically. This action is shown on the RED SRQ LED on the CSX as well as the RED SRQQ..SRQ4 LEDS on the RCB. This LED should blink quickly whenever it needs service. It the LED stays on it means that the RCB has not detected the request for service for some reason.

## Connections for the CSX

Be sure to connect the right cable to the right ports as shown below:



**POWER**

This LED indicates that the CSX has power.

**SRQ**

Service Request LED. This LED should blink during normal operation service requests.

**END**

Set to END for the last CSX on the data cable

**MID**

Set to MID for CSX nodes in the middle of the data cable

**YES**

Set to YES if an ESTOP button is connected to this CSX

**NO**

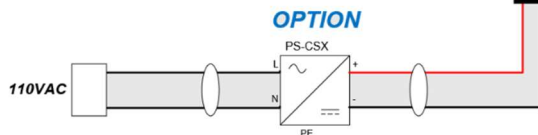
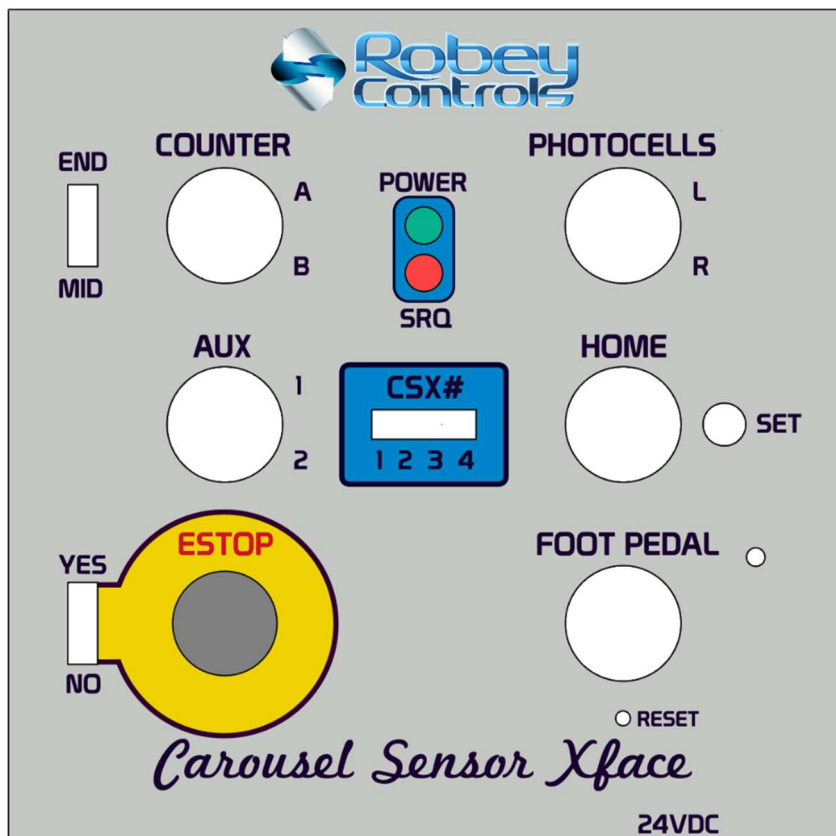
Set to NO is an ESTOP button is not connected to this CSX

**SET**

Press this button during installation of the HOME sensor, while it is aimed at its target reflector, to set the sensor's range properly.

**CSX#**

Each CSX must have a unique node number. Set to 1,2,3 or 4. Never have the same CSX# on a common data cable



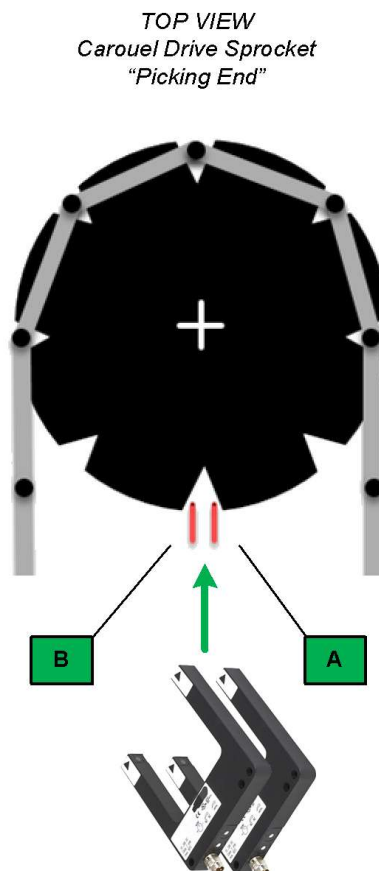
*AUX power supply is required when CSX bus load exceeds typical loading conditions. Contact Robey Controls for further information.*



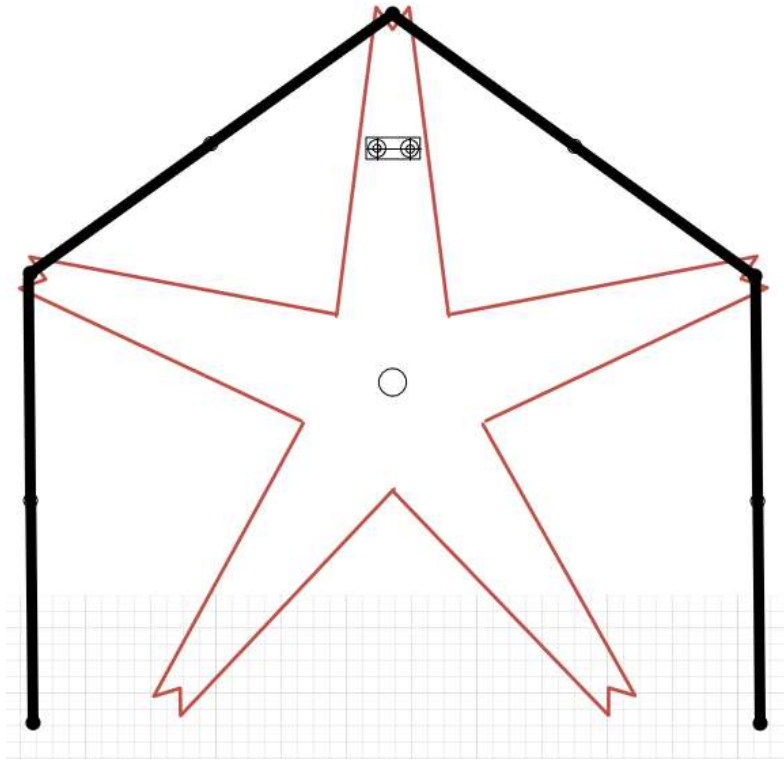
## Counter Assembly

- r. Unpack the control components, check for damage, and set aside until called for.
- s. Mount the control panel to a wall panel nearby the service power-entry disconnect point and close to the carousels. Make sure that the wall is flat otherwise the control panel will twist and distort the door. When the wall is not flat, shim as necessary.
- t. Run the motor VFD cable between each motor and the RCB control panel. Terminate both ends paying careful attention to the shielding connections.
- u. Run the Carousel Junction Box cables (8P8C STP cables) between the carousel picking end and the RCB control panel. You need one cable per carousel junction box and the cables should be routed as far away from the motor cables as possible, or in a separate cable conduit.
- v. Mount the photocells at the picking position along with the floor-reflectors to prevent carousel movement when a container or product is not fully stored on the carrier.
- w. Mount the Counter in one of several positions depending on the carousel manufacturer brand.

Remstar or Kardex-Remstar brand uses Dual-Fork sensors and bracketry supplied by Robey Controls. Alternatively, Robey Controls can employ the Remstar Dual-prox sensors with a special adapter cable when desired.



Diamond-Pheonix brand uses the Dual-Prox sensors supplied by Robey Controls and field-made bracketry. In this case, only (1) stop position per carrier is possible.





*Robey Controls Dual-Fork counter with standard bracketry*



*Robey Controls Dual-Fork counter with extended bracketry*

The counter input on CSX expects (2) sensors to sense the sprocket on the carousel. This produces a quadrature output signal providing reliable counting in either direction. The (2) sensors are connected in various ways depending on the type as shown in the examples below:



DUAL-FORK OPTION



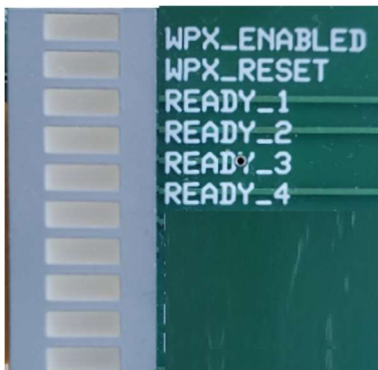
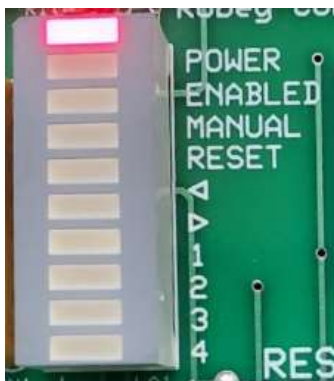
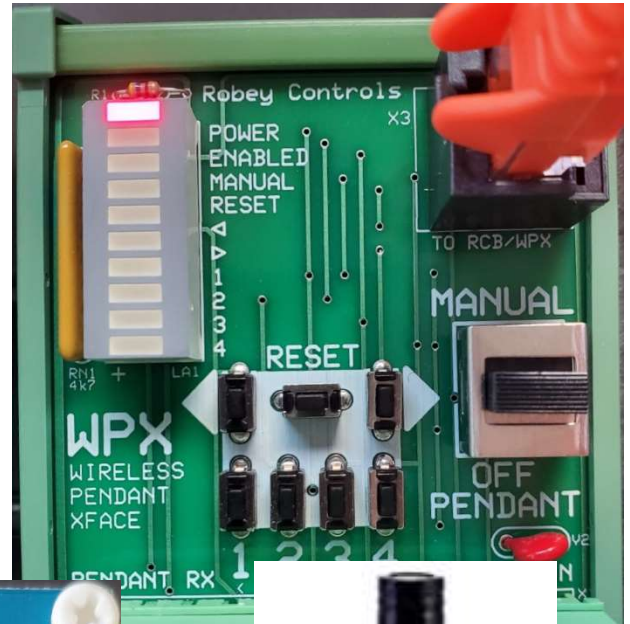
DUAL-PROX OPTION

## Setup Configuration

Before using the WPX< make sure it is ENABLED with the WPX ENABLE parameter. Switch it OFF again after using.

Optional Service tools are available to aid in Service and Setup procedures.

1. The WPX Interface is a small PCB mounted to the left side of the RCB. It provides the ability to manually control the carousels in SLOW service mode speed.
2. Several diagnostic feedback displays are available while using the WPX interface, including LED bar indicators on both the WPX and the RCB and an oLED text display on the RCB.
3. The WPX Wireless pendant is a hand-held transmitter that works in conjunction with the WPX Interface mentioned above. This allows freedom to move away from the control panel while having all the same control buttons available.



#### 4. ESTABLISH PROPER ROTATION DIRECTION

Move each device using one of the possible methods shown below along with a flow-chart on the following page(s):

##### i. Optional WPX interface



**MANUAL**  
**OFF**  
**PENDANT**



- 1) Make sure the control is READY to operate (Green button is lit)
- 2) Make sure the carousels are CLEAR TO ROTATE, free of all installation obstructions and personnel.
- 3) Place the control in WPX mode by sliding the WPX switch UP to the MANUAL position.
- 4) The Control should respond by showing error code e080
- 5) Depress one of the device buttons 1,2,3,4 along with the LEFT button.
- 6) The selected carousel should rotate LEFT slowly
  - a. If it runs too fast, reduce the SERVICE SPEED parameter
  - b. If it runs in the wrong direction, swap two phases to the motor(s)
  - c. If it seems to bind and you have a dual-drive carousel, as if the motors are turning against each-other, swap any two phases on one of the motors and try again.
- 7) After the RUN LEFT test above has been completed, try the RIGHT arrow for running in the opposite direction.

##### ii. Optional WPX wireless pendant



- 1) Make sure the control is READY to operate (Green button is lit)
- 2) Make sure the carousels are CLEAR TO ROTATE, free of all installation obstructions and personnel.
- 3) Place the control in WPX mode by sliding the WPX switch DOWN to the PENDANT position.
- 4) Release the wireless Pendant's Estop button by twisting it until it pops out.
- 5) Press the START button on the wireless Pendant
- 6) The Control should respond by showing error code e080 when ready
- 7) Depress one of the device buttons 1,2,3,4 along with the LEFT button.
- 8) The selected carousel should rotate LEFT slowly
  - a. If it runs too fast, adjust the SERVICE SPEED down
  - b. If it runs in the wrong direction, swap two phases to the motor(s)
  - c. If it seems to bind and you have a dual-drive carousel, as if the motors are turning against each-other, swap any two phases on one of the motors and try again.
- 9) After the RUN LEFT test above has been completed, Depress the device selector button and try the RIGHT arrow for running in the opposite direction.



## Parameter Settings

There are dozens of Operating Parameters that must be set for proper and/or desired operation. Each carousel has its own set of operating parameters as listed at the end of this guide. *There is a single parameter set for the GLOBAL SYSTEM parameters (Parameters 900+) and this section is available within the parameter set of Device 1 only.*

Below is the suggested order for setting the control for initial operation:

<u>Param#</u>	<u>Description</u>
220	Set the MOTOR VOLTAGE
221	Set the Motor Frequency (Usually this is set to '1' for 60Hz operation in the USA)
222	Set the Motor Full Load Current. Refer to the motor data-plate to find the FLA value
223	Set the Motor kW rating. Refer to the motor data-plate to find the kW value
224	Set the Motor RPM. Refer to the motor data-plate to find the RPM value

Repeat the steps above for ALL devices in the system!

**Remember to set Overload Relay dials to match the motor's FLA data-plate when supplied.**

Once completed, you may try to TUNE the motors once during first installation using Param 970 set to '1'. The AUTO-TUNE should then start upon exit from the Parameter settings procedure and complete on its own.

Once the motor has been setup and tuned from the above steps, the following parameters should be set next.

**Set these parameters on ALL SYSTEMS:**

100	Set the TOTAL carrier count for each machine
101	Set the 'flags between carriers'. Usually this is '2' or '3' supporting 2- or 3-pitch carousels It is simply the number of gaps/flags/notches between carriers.

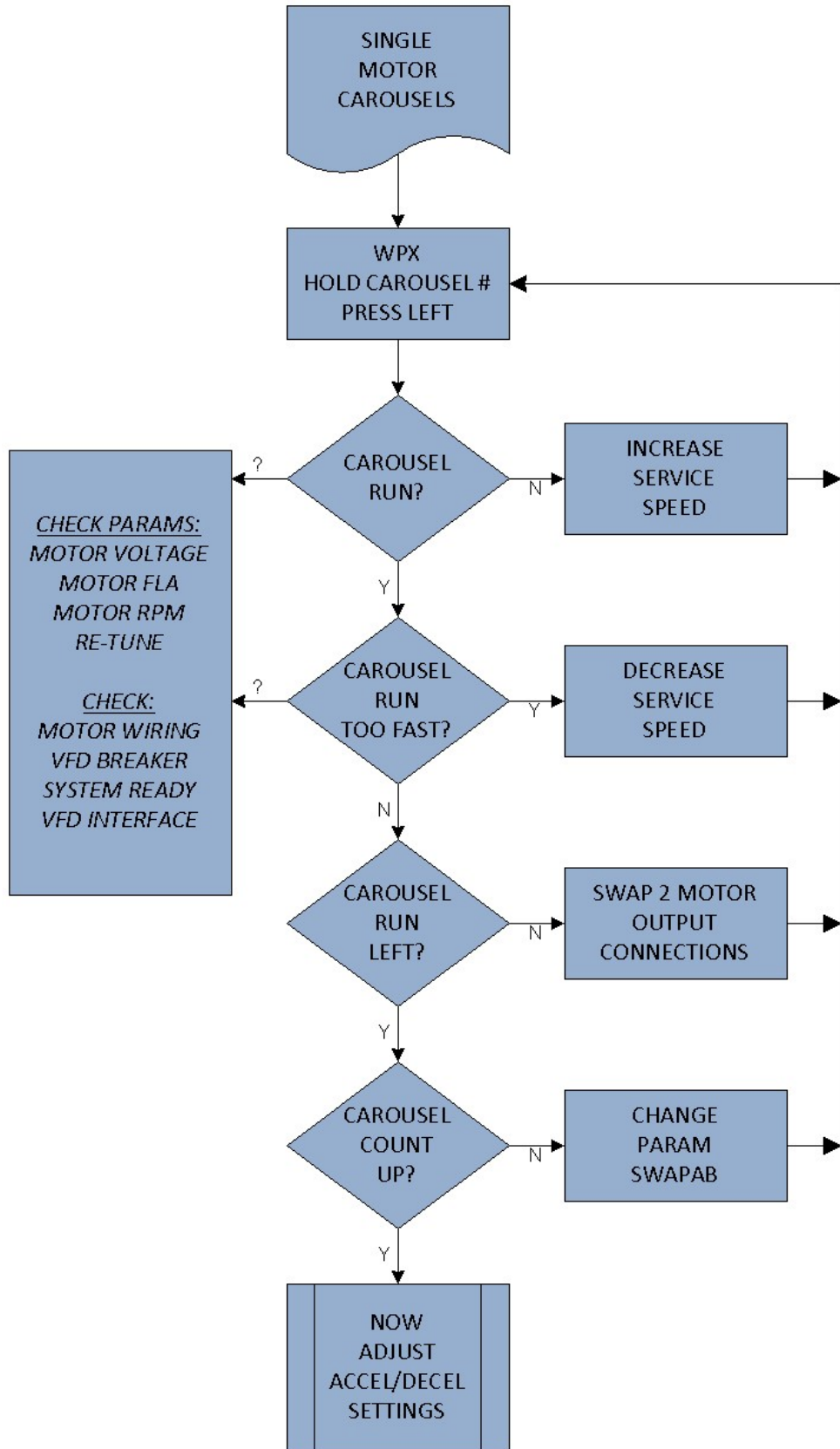
**Set these parameters to define the motor accel/decel:**

230	Set the FAST (top) speed for the motor. 0=0% and 60=100% of speed.	DEF:	40
231	Set the SLOW (creep) speed for the motor. 0=0% and 60=100% of speed	DEF:	4
232	Set the SERVICE speed for the motor. This speed should be very slow!	DEF:	4
233	Set the ACCEL time for the motor, start with the factory default settings	DEF:	2.0
234	Set the DECEL time for the motor, start with the factory default settings	DEF:	2.0

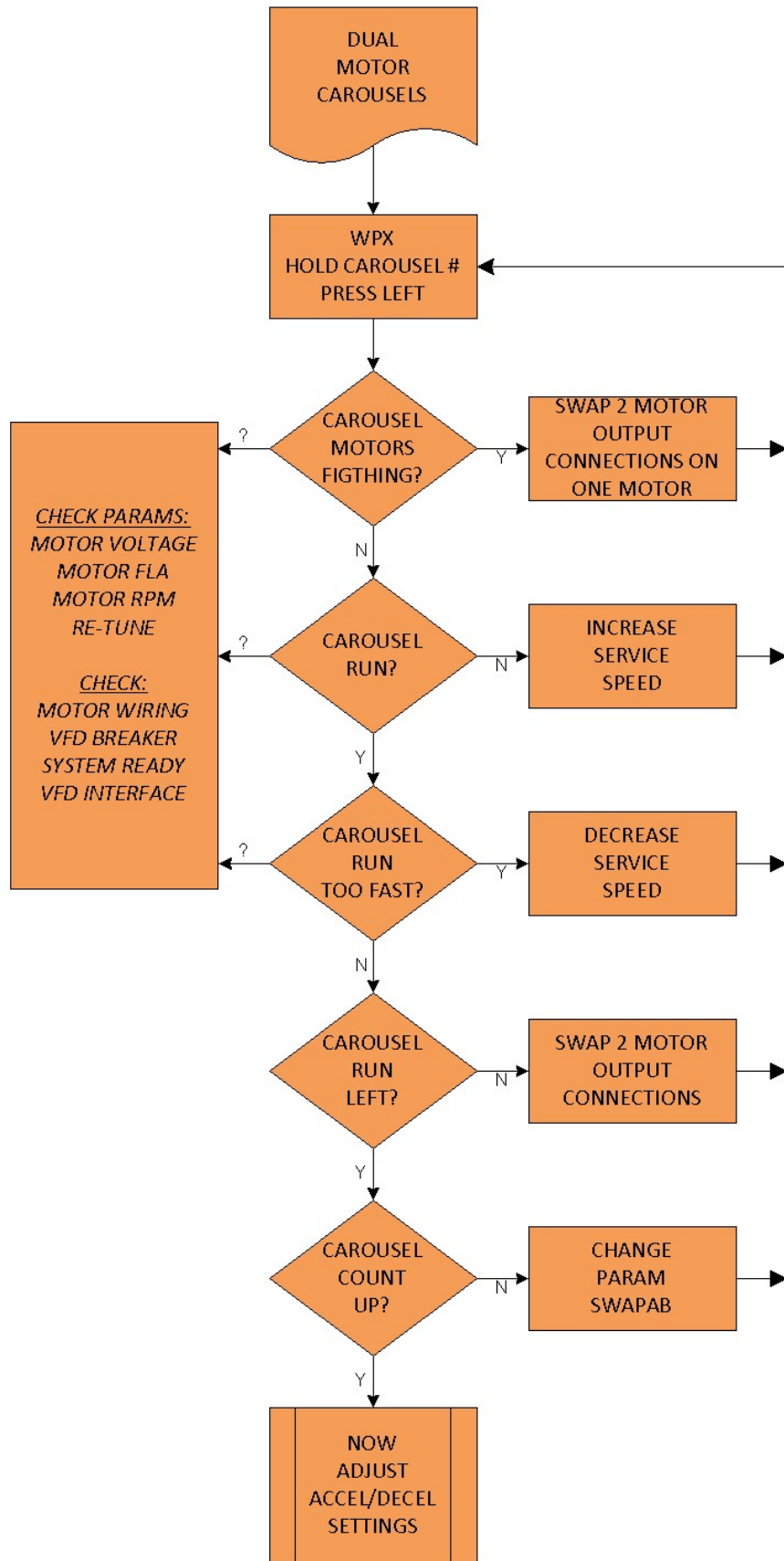
*The above group of parameters, especially the DECEL time parameter, may need to be adjusted numerous times, in conjunction with running to a destination, until they are set for the smoothest and best operation to reach the final stop target without over shooting. Suggestion: On older carousels, be gentle with them and set the FAST top speed <= 40Hz.*

**Use the flow chart on the following page to set the parameters for smoothest operation!**

# Initial Startup Check



**LEFT:** Forward. Clockwise as seen from a top view



**LEFT:** Forward. Clockwise as seen from a top view

*Set these parameters on systems including the optional PICK LIGHT TOWER (PLT):*

102	Set the Total (Max) Shelf level count
103	Set the Total (Max) Position count
104	Set the Total (Max) Depth count
300	Set the PLT SIDE to '1' for LEFT or '2' for RIGHT
301	Select the GRID operating mode Off/ON
302..305	Set the ip address for the PLT
310..333	Set the vertical position for the shelves, up-to the max setting you defined above
340..387	Set the POS/DEP values for each shelf level, up-to the max setting defined above

*Set these parameters on systems including the optional HOME SENSOR:*

205	Set the type of HOME sensor installed
207	Set the function for the right Foot-pedal universal input to '1' for HOME sensor

## ADJUST STOPPING RAMPS

This text accompanies the flow-chart on the following page.

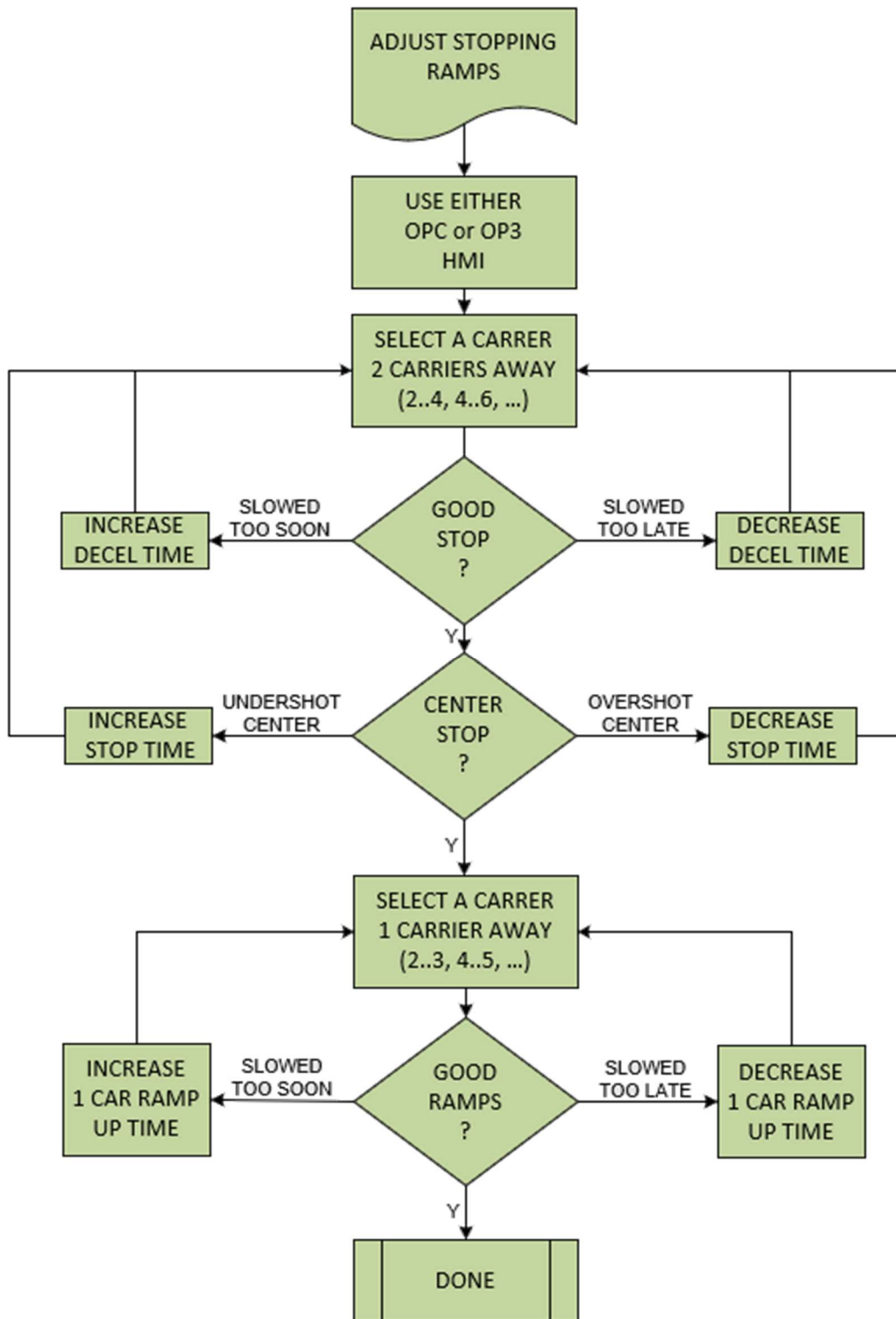
Execute a 'move to carrier' command using one of the HMI options available. Do not use the WPX or WPX Pendant for this procedure as this method only supports SERVICE SPEED run control.

- a. Make sure the control is READY to operate (Green button is lit)
  - b. Make sure the carousels are CLEAR TO ROTATE, free of all installation obstructions and all personnel.
  - c. Make sure that the control is in operating mode by sliding the WPX switch to the CENTER (Off) position.
  - d. Make sure you have set a reasonable SLOW SPEED for the machine, one that faithfully moves the carousel very slowly (creeping).
5. Parameters affecting and/or utilized during this procedure. Changes to any of these parameters may require adjustment of other associated parameters.

P230	FAST SPEED	TOP TRAVEL SPEED
P231	SLOW SPEED	SLOW (CREEP) SPEED TO FIND TARGET
P233	ACCELERATION TIME	TIME FROM ZERO TO FULL SPEED
P234	DECELERATION TIME	TIME FROM FULL SPEED TO ZERO/CREEP
P235	1 CARRIER RAMP-UP TIME	TIME TO RAMP UP WHEN MOVING 1 CARRIER DISTANCE
P237	STOP TIME	DELAY DURING CREEP TO CENTER COUNTER ON TARGET

*Note: Depending on the firmware version, the P###'s may vary*

6. Using either the OP3 keypad or the OPC software
- a. Select the desired device using the Device Selector buttons. The LED will illuminate to indicate the selected device.
  - b. Alternate between Car2 and Car4 by pressing 2 ENTER ... 4 ENTER
  - c. Observe the travel condition for the device as it runs and stops
    - ii. Goal is to have the carousel reach full speed in 1 carrier
    - iii. Goal is to decelerate gradually and smoothly on last carrier to stop
  - a. Adjust the "motor start/stop ramp" parameters from the previous step until you obtain:
    - i. Desired top end rotation speed
    - ii. Smooth acceleration
    - iii. Smooth deceleration
    - iv. Minimal 'creep' time near the end of the move while seeking stop
    - v. Accurate (non overshooting) stopping
  - e. Before adjusting the decel rate with the chart on next page, make sure that the accel time is set so that the machine reaches full speed on the first carrier. For example, a move from carrier #1 to #5 should be at full speed just as it reaches carrier #2.



**GOOD STOP:** The deceleration from full travel speed to creeping occurs over one carrier and finishes slightly before the target “creep to center” stop.

**CENTER STOP:** The machines creeps to the approximate center of the counter target and stops.

**GOOD RAMPS:** The machine accelerates to about midway between carriers and then decelerates the rest of the way ending in a GOOD STOP.

***Minimal slow (creep) time on all moves is best!***



## AUTO-TEACH RAMPS (EXPERIMENTAL)

A new function that is not field proven is available for automatically setting the RAMP rates and delay times. If you can accept that it may not work 100% and would like to give it a try:

1. Enter the carrier programming setup function:



2. Press 'P' to select SPECIUAL FUNCTION mode



3. Enter '10' for the special TEACH RAMPS function option



4. **CAROUSEL WILL NOW MOVE!**

Wait for the carousel to perform some measurements.

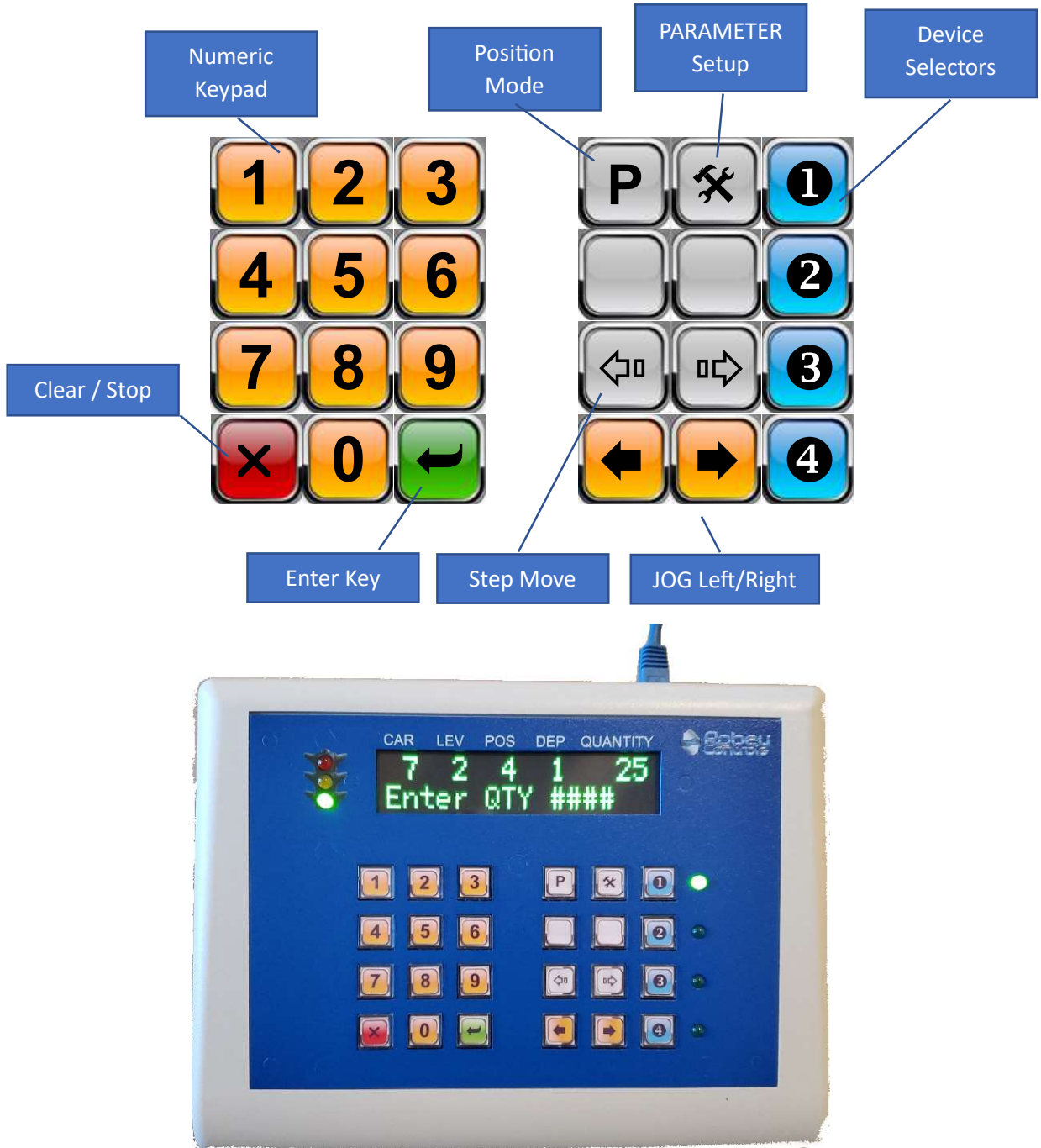
5. If successful, the display will end with:



6. Please report your findings, good or bad, to Robey Controls so that we can continue to develop this feature or release it as non-experimental.

# OP3 HMI OVERVIEW

The OP3 HMI is a 24-key controller capable of commanding the HCB control and configuring the system. The HMI includes a 2x16 oLED display, a Traffic Light status indicator, four (4) Device Selector buttons with LED indicators, a plastic table-top housing and a single-cable interface to the HCB control panel COM port. The HMI displays System Error codes and error descriptions and allows the carousels to be re-started after safety interruptions occur.



i. Key Functions

1. Numeric Keypad

- a. Used to enter carrier selections and other setup data

2. Clear/Stop key

- a. Clear display
- b. Interrupt travel
- c. Other abort functions



3. Enter Key

- a. Confirm data entries
- b. ReStart the carousel after system interruptions



4. Position Mode

- a. Used to define which location entry mode is active



5. Setup key

- a. Used to enter the Parameter setup routine
- b. See the full Parameter list at the end of this document



6. Device Selectors

- a. Used to select one of the carousels



7. Step Move

- a. Used to move multiple carriers with a single button press
- b. Works with the Parameters LEFT/RIGHT STEP VALUE



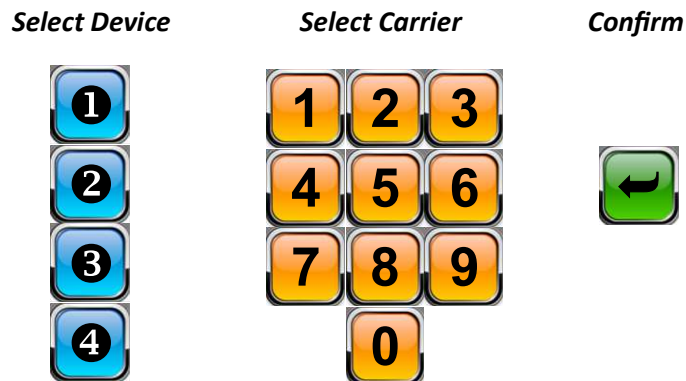
8. JOG Left/Right

- a. Hold to run the selected carousel
- b. Release to stop at the next stop position








ii. Selecting a Carrier number:

1. If not already selected, use the buttons 1..4 on the right to select the desired device.
2. Enter the desired carrier number using the number keypad 0..9
3. Confirm the selection by pressing the Green enter key



4. When access to location information (LEVEL, POSITION, DEPTH or QUANTITY) is desired for manual locating or the PLT display, the OP3 can be placed in an entry mode for the additional fields by using the 'P' button. Note: PLT control is only possible when the control is also managing the PLT (not when the PC is managing the PLT)

- |   |   |
|---|---|
|  CCC                         | <b>Carrier only mode</b>                                  |
|  CCC + LL                   | <b>Carrier + Level mode</b>                               |
|  CCC + LL + PP             | <b>Carrier + Level + Position mode</b>                    |
|  CCC + LL + PP + DD        | <b>Carrier + Level + Position + Depth mode</b>            |
|  CCC + LL + PP + DD + QQQQ | <b>Carrier + Level + Position + Depth + Quantity mode</b> |

## Setting the Carrier number (OP3)

There are many possible configurations for the COUNTER so it is very important to ensure that your parameters are set properly before placing the machine into operation. Some of these options include:

- LightON vs LightOFF sensors
- Sensor sensing sprocket air gaps vs sprocket steel
- Sensor mounted in BA vs AB position

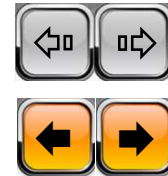
The counter has (2) sensors incorporated in it, no matter which style is incorporated:

- iii. After setting the parameters properly, to SET CARRIER NUMBER to the corresponding value, a button sequence is required as follows:



1. The display will then provide a field to enter the actual carrier number for the selected carousel.
2. While in this mode, other keys can be used to position the carousels as follows:

- a. Move to next counter flag
- b. Move until key release



- a. Place the carousel at the desired stop position with the counter having both sensors fully engaged to the target (either the air gap or a steel zone).
  - i. **BA**
  - ii. **11**
  - iii. Both A/B should both be on
  - iv. If not:
    - 1) adjust the COUNT SENSOR TYPE (LightON, DarkON) Parameter
    - 2) or
    - 3) Adjust the N/O, N/C switch on the sensor itself if available
  
- b. Now move the carousel FWD (clock-wise as viewed from top of carousel) so that only one sensor is activated.
  - i. **01**
  - ii. B should be off and A should stay on
  - iii. If opposite:
    - 1) Adjust the SWAP COUNT SIGNALS Parameter
  
- c. Now move the carousel FWD again so that both sensors are off target
  - i. **00**
  - ii. Both B and A should be off
  
- d. Now you should be able to use the STEP NEXT arrows to 'step' the carousel between targets.
  - i. Press & release the LEFT arrow.
    - 1) **01**
    - 2) The carousel should rotate to the next target and activate A
  - ii. Press & release the RIGHT arrow.
    - 1) **10**
    - 2) The carousel should rotate to the next target and activate B
  - iii. **11**
    - 1) Both sensors should be off while the counter is in between targets
  
- e. Finally use the STEP arrows to place the carrier in the desired stop position
  - i. SET NEW CARRIER NUMBER in the field and press VALIDATE to confirm.
  
- f. Note: To fine-tune the position, you can move the sensor a few inches left/right of the mounting location bracket.

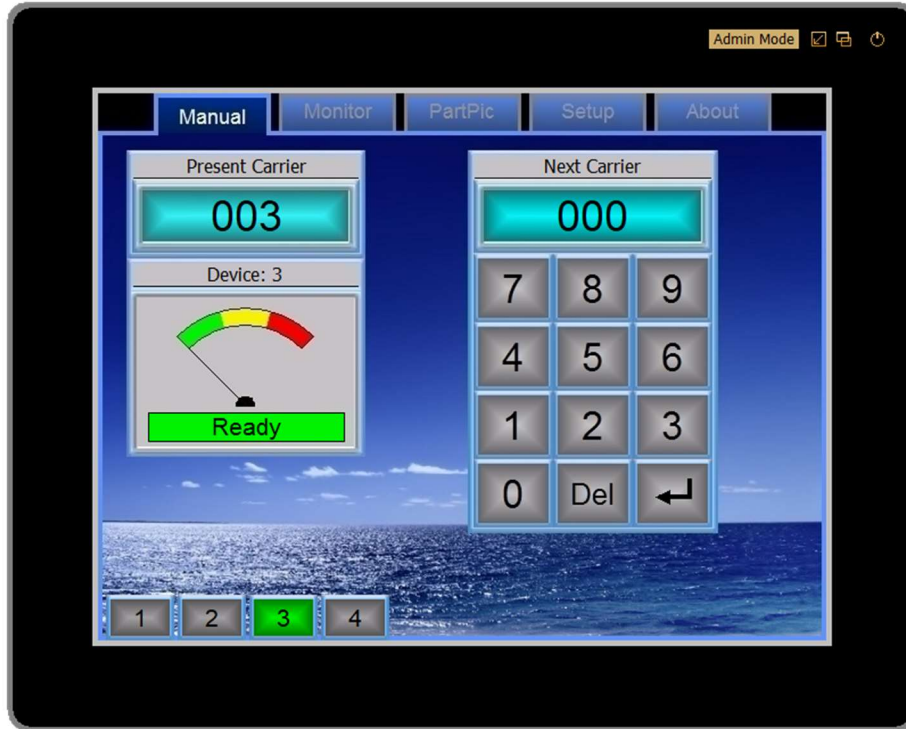
*TIP:: Using the dual counter allows the carrier to stop in multiple positions. If the carousel has (2) sprocket gaps per carrier (2-pitch) then the carrier can stop in (2) positions. If the carousel has (3) sprocket gaps per carrier (3-pitch) then the carrier can stop in (3) positions. If the carrier has only (1) 'gap' target per carrier (some carousels) then only (1) stop position per carrier is possible.*

*To fine tune the stop within the possible stopping positions is possible by moving the counter itself from the mounted position.*



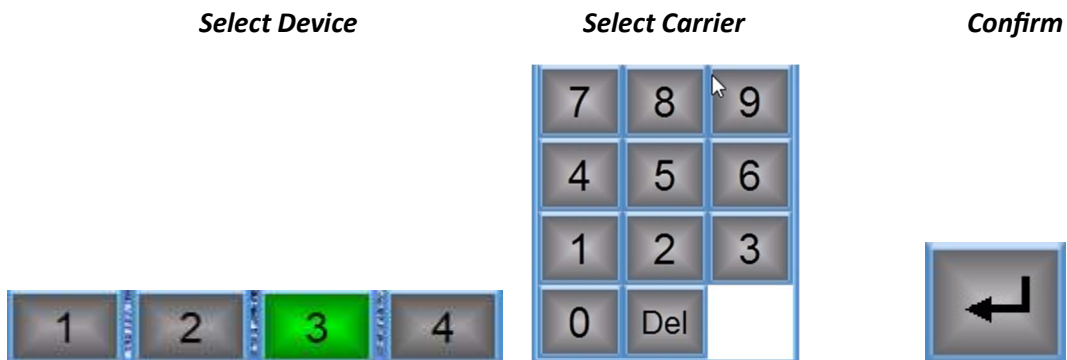
## OPC HMI OVERVIEW

The OPC is a Soft-HMI panel application running on a Windows based PC. It has been designed for use with Touch-Panel monitors and provides both USER carousel control and TECH Setup capabilities.

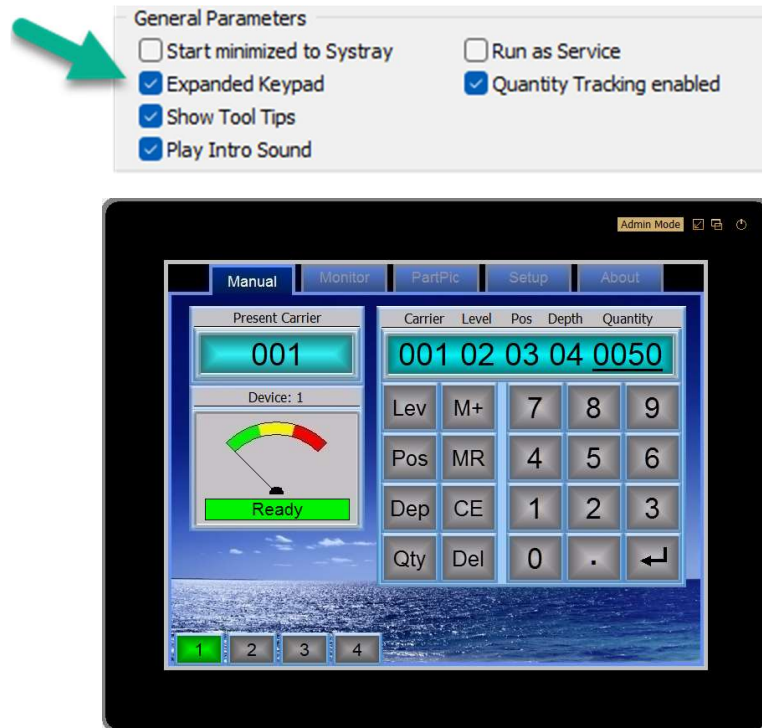


i. Selecting a Carrier number is simple with the OPC Soft-HMI:

1. If not already selected, use the buttons 1..4 on the bottom to select the desired device.
2. Enter the desired carrier number using the number keypad 0..9 on the right.
3. Confirm the selection by pressing the enter key



- i. When access to the location information LEVEL, POSITION, DEPTH or QUANTITY is desired, the OPC Soft-HMI can be placed in an entry mode for the additional fields by using the 'Extended Keyboard' option found in the SETUP section.

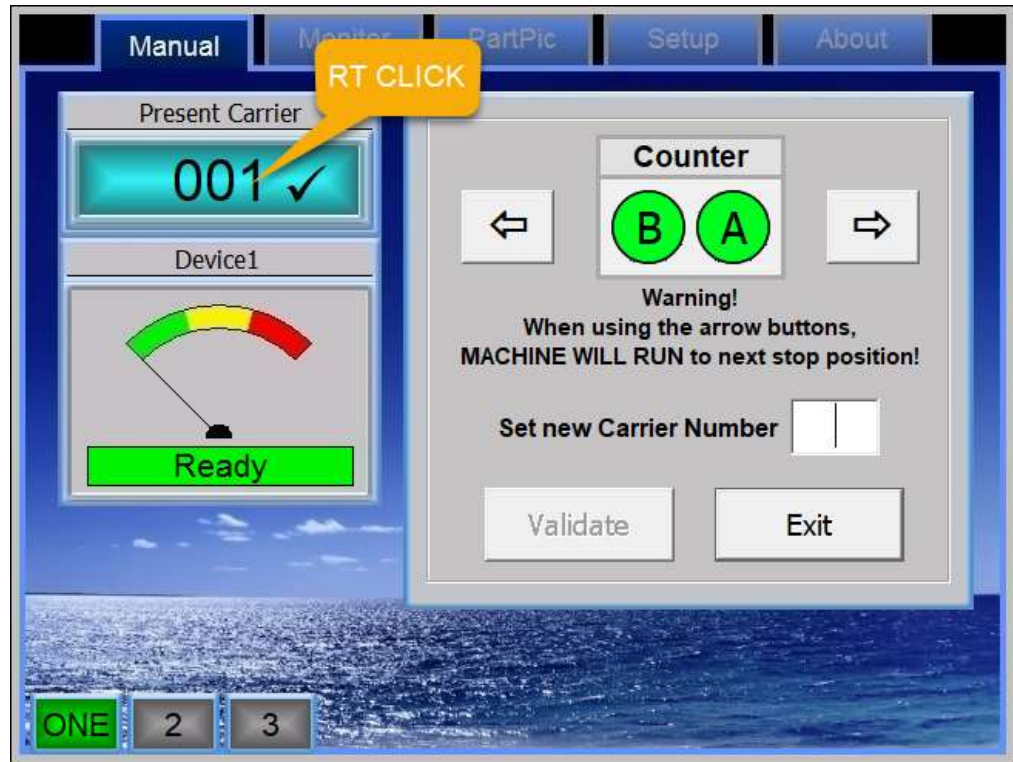


- ii. To access the SYSTEM PARAMETERS, the SETUP TAB can be pressed. The system will ask for the TECH PASSWORD and then open up the SERVICE MENUS. The Parameter page is found by clicking DeviceSetup and then DeviceSetupRCB. The complete parameter list is shown on the following pages.



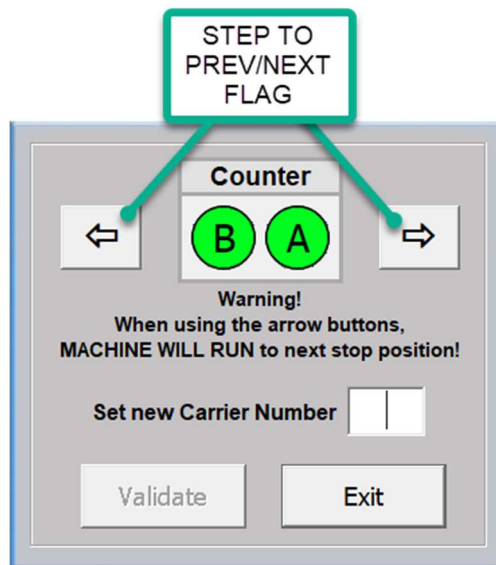
## Setting the Carrier number (OPC)

To **SET CARRIER NUMBER** to the corresponding value, from within the MANUAL page of OPC software, Right-Click on the Present Carrier field as shown below. Note: The system must be ready to run in order to access this option:



The software will then provide a field to enter the actual carrier number for the selected carousel 'Set new Carrier Number'.

To position the carousel at the possible stopping position while in this mode, there are STEP NEXT buttons provided:



- g. Place the carousel at the desired stop position with the counter having both sensors fully engaged to the target (either the air gap or a steel zone).
  - i. **BA**
  - ii. Both A/B should both be illuminated
  - iii. If not:
    - 1) adjust the COUNT SENSOR TYPE (LightON, DarkON) Parameter
    - 2) or
    - 3) Adjust the N/O, N/C switch on the sensor itself if available
  
- h. Now move the carousel FWD (clock-wise as viewed from top of carousel) so that only one sensor is activated.
  - i. **BA**
  - ii. B should be off and A should stay illuminated
  - iii. If opposite:
    - 1) Adjust the SWAP COUNT SIGNALS Parameter
  
- i. Now move the carousel FWD again so that both sensors are off target
  - i. **BA**
  - ii. Both B and A should be off
  
- j. Now you should be able to use the STEP NEXT arrows to 'step' the carousel between targets.
  - i. Press & release the LEFT arrow.
    - 1) **BA**
    - 2) The carousel should rotate to the next target and illuminate A
  - ii. Press & release the RIGHT arrow.
    - 1) **BA**
    - 2) The carousel should rotate to the next target and illuminate B
  - iii. **BA**
    - 1) Both sensors should be off while the counter is in between targets
  
- k. Finally use the STEP arrows to place the carrier in the desired stop position
  - i. SET NEW CARRIER NUMBER in the field and press VALIDATE to confirm.
  
- l. Note: To fine-tune the position, you can move the sensor a few inches left/right of the mounting location.

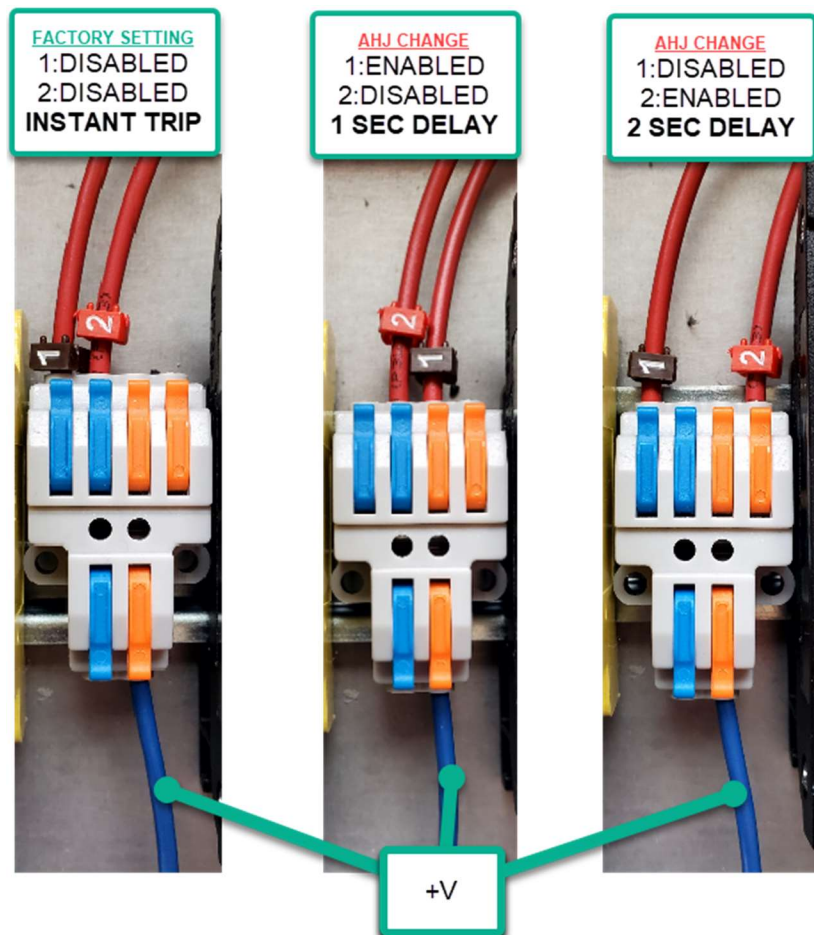
## ESTOP SYSTEM

The Robey Controls factory default setting for the Estop system and Safety Controller is configured to “remove power” from the drives upon activation of emergency stopping devices. This is according to rules from long-standing Industry Safety Standards. In this mode, since the carousel motors are generally not equipped with physical motor brakes, the carousels will “coast to stop” when the emergency devices are activated.

When this is not acceptable and an official **Authority Having Jurisdiction** (AHJ) over the Employer’s Safety Policies is considered/consulted, the default configuration can be changed as follows:

The Programmable Safety Controller (PSC) has two input selection options to add a time delay before removing power from the drives. This can be field enabled under AHJ supervision to delay the trip by either 1 or 2 seconds.

The control provides two configuration wires marked ‘1’ and ‘2’, with ‘1’ representing the 1 second input and ‘2’ representing the 2 second input. When these inputs are charged with +V (+24V) the PSC will enable the delay circuit accordingly. See below example for the three wiring options:



**If this delay is enabled for the site, then the AHJ and TECH can also adjust the DYNAMIC BRAKING DECELERATION rate that will occur during this delay time by adjusting Parameter “ESTOP DECEL TIME”. Note that ESTOP DECEL TIME is available for each device in the system and can/must be set for each/every device separately.**

**!!! ALWAYS TEST ALL SAFETY DEVICES DAILY AND BEFORE LEAVING THE SITE AFTER ANY SERVICE TO THE CONTROL SYSTEM !!!**

## HOST COMPUTER SETTINGS

The RMC can be connected to controlling Host computers to receive move and other status commands. Below are some Parameter setting tips to simplify this feature:

### PARTPIC

- Use a dedicated/isolated Network from the customer's enterprise LAN or WAN
- Use the Ethernet channel for the controller
- Use DHCP or STATIC IP settings, depending on the customer's IT requirements

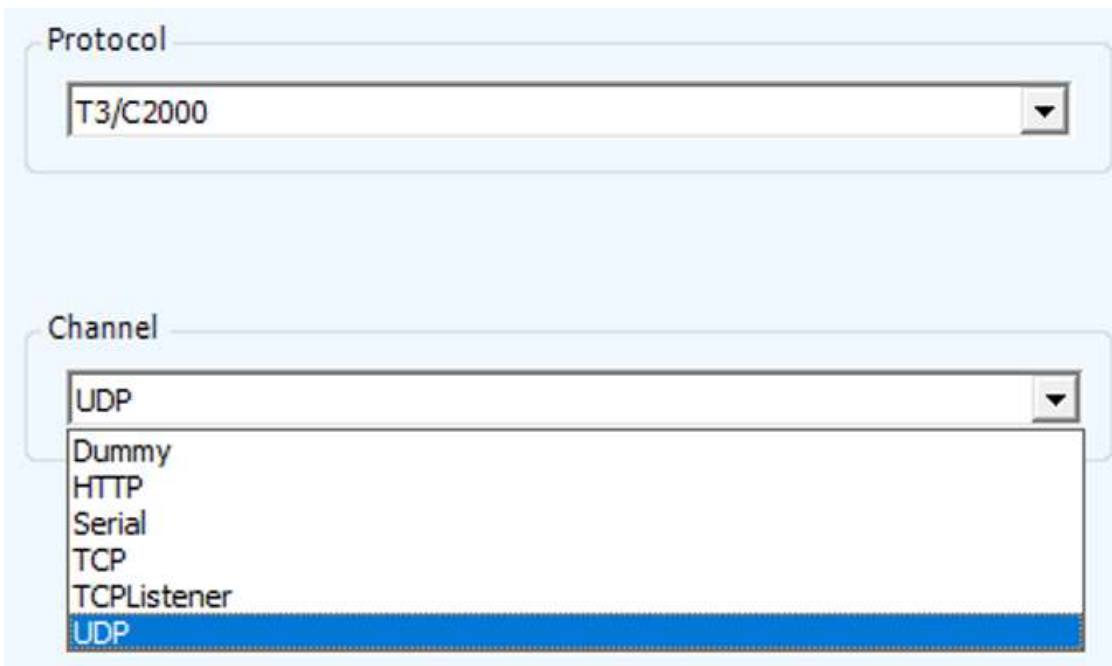
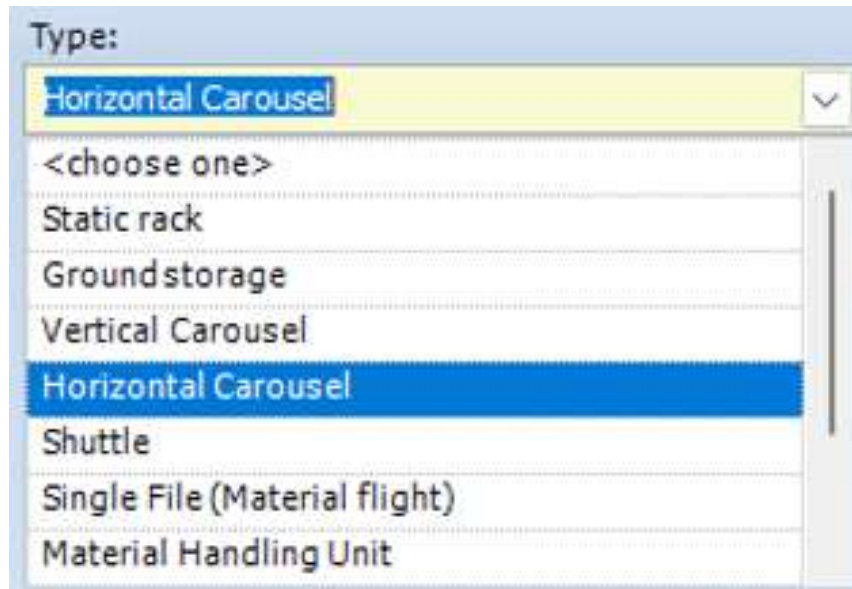
The screenshot displays the 'Device Setup RCB' configuration window. The interface is divided into several sections:

- Device Access Opening:** Dev# 1, Device ID 1.
- Device Name & Button Label:** Device1, ONE.
- Field Size [\*=default]:** Carrier (3), Position (2), To-Position (2), Depth (2), Level / Height (2), Quantity (4), Alpha Display (20).
- Device Settings:** Carrier (16), Position (12), Depth (8), Shelf (10), Pos. Indicators (0-99) (0), Scan Position Indicators button.
- Device Type:** Horizontal.
- Control Type:** Control RCB [UDP/IP].
- Control IP Address:** 192 . 168 . 0 . 160.
- Assigned NIC IP:** 192.168.0.156.
- Communication Settings:** NIC (Intel(R) Wi-Fi 6E AX211 160MHz), Refresh button, IP (192.168.0.156), Check button, Communication OK status, Get #1 button.

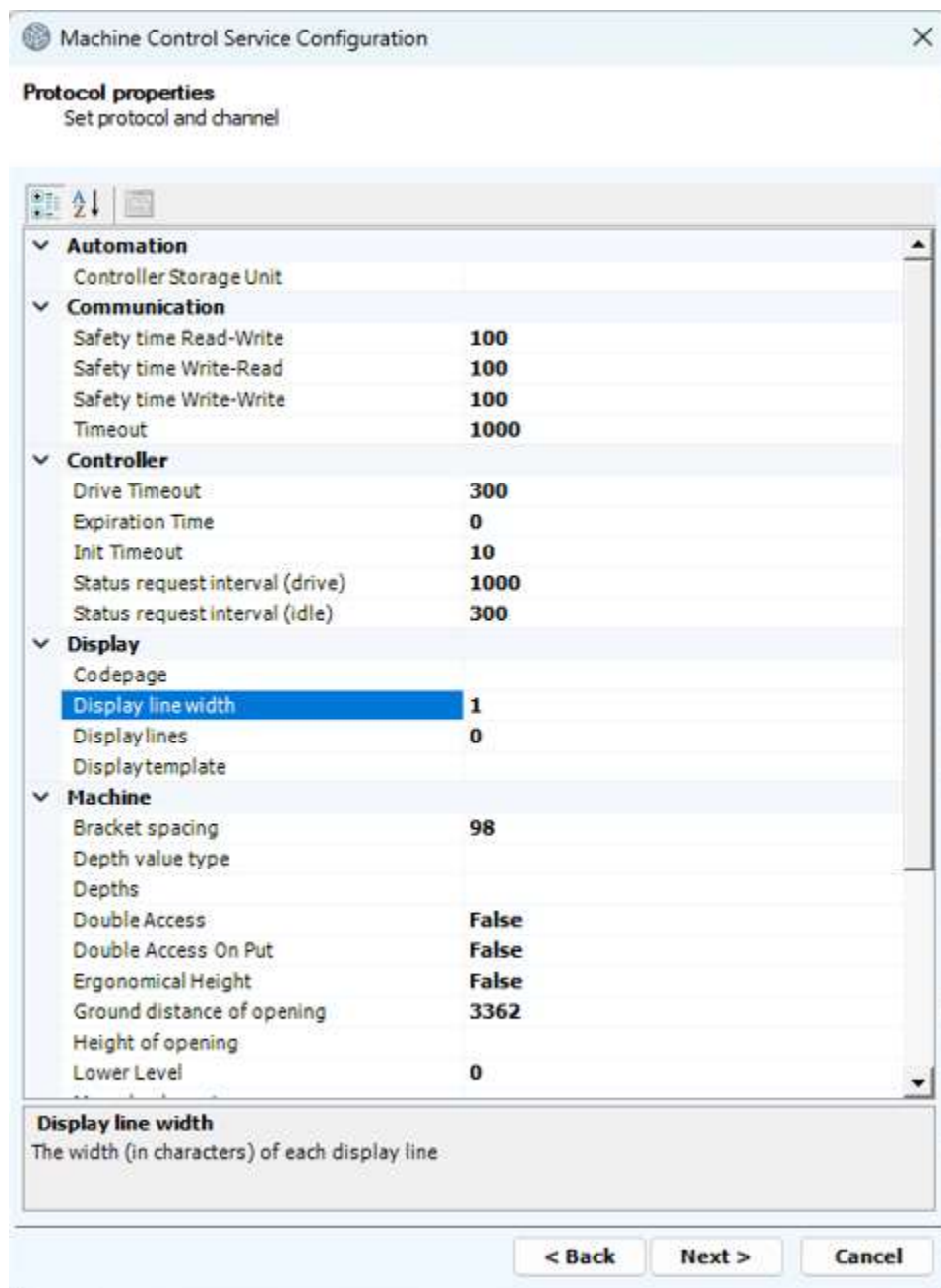
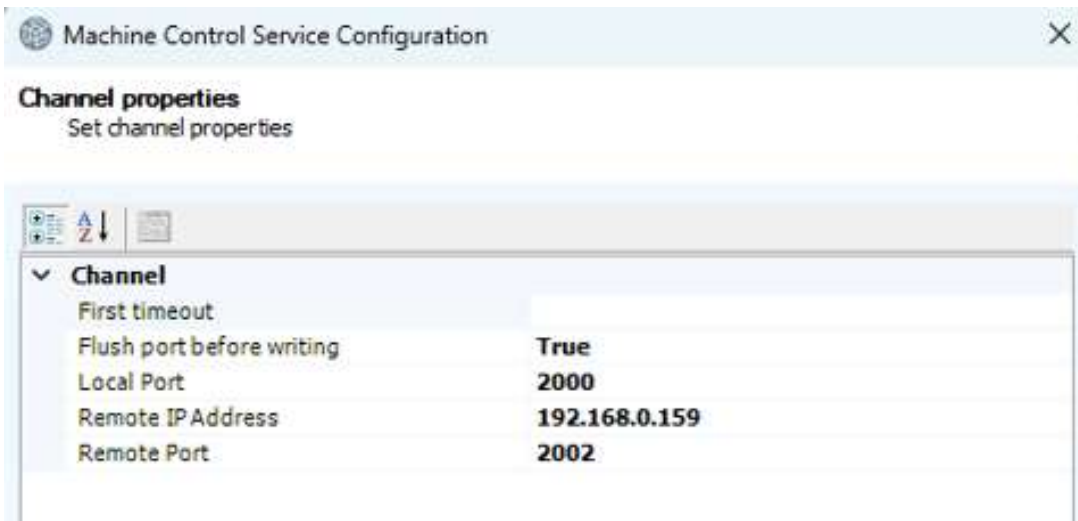
At the bottom, there are buttons for 'ONE', '2', '3', 'Default', 'Para Copy', 'Para Paste', 'Save', and 'Close'.



- Use a dedicated/isolated Network from the customer’s enterprise LAN or WAN
- Use the Ethernet channel for the controller
- Use Ethernet PORT 2002 for the controller
- Use DHCP or STATIC IP settings, depending on the customer’s IT requirements
- Use T3/C2000 Protocol
- Use Remote Port 2002









## NOVA

- Use an RS232/485 converter for the PC (available from Robey Controls)
- Use a COM port on the controller, suggest COM2
- Set the COM port MODE to use RCC2 interface protocol, set that also in NOVA configuration
- Set the COM port to match NOVA's baud rate and frame

## RCB PARAMETER SET 1.01 (2023)

Parameter	Min	Max	Description
1	0	1	Device ONLINE (0=Offline, 1=Online)
2	0	0	RCB Firmware Version (Read Only)
3	0	0	RCB GPIO Version (0=48 A=65 B=66 C=67 D=68 E=69 F=70 G=71 ...)
5	0	99	Set carrier number
10	0	3	Language (0=English, 1=German, 2=French, 3=Spanish)
11	0	4	Entry mode:0=C, 1=C+L, 2=C+L+P, 3=C+L+P+D, 4=C+L+P+D+Q
12	0	20	LEFT Step value
13	0	20	RIGHT Step value
14	0	1	Position indicator on start or stop (0=Start, 1=Stop)
100	1	99	Total Carriers
101	1	3	Flags between carriers
102	0	24	Total Shelves
103	0	99	Total Positions
104	0	99	Total Depths
110	1	4	HOST Device ID## (READ ONLY)
120	0	4	RCC1 host emulation carrier offset (x100)
200	0	1	Swap Count signals (0=Off, 1=On)
201	0	1	Swap Direction command (0=Off, 1=On)
202	1	9	Number of counter flags before target for slow period start
203	0	1	Counter style (0=Dual-Prox, 1=Single-Prox)
204	0	1	Count sensor type (0=Light ON, 1=Dark On)
205	0	1	Home sensor type (0=Light ON, 1=Dark On)
206	0	99	Pedal LEFT function (0=LEFT, 1=CONFIRM, 2=DOOR CLOSED, 99=Dis
207	0	99	Pedal RIGHT function (0=RIGHT, 1=HOME, 99=Disabled)
208	0	1	JOG button lock (0=OFF, 1=LOCKED)
209	0	99	Photocell LEFT Input mode (0=Photocell, 99=Disabled)
210	0	99	Photocell RIGHT Input mode (0=Photocell, 99=Disabled)
220	0	1	Motor Voltage (0=230V, 1=460V)
221	0	1	Motor Frequency (0=50Hz, 1=60Hz)
222	1	150	Motor FLA (x0.1)
223	1	75	Motor kW (x0.1)
224	1	4000	Motor RPM
225	0	1	!Motor AutoTune (0=OFF, 1=ON)
230	1	60	Motor FAST speed (Hz)
231	1	60	Motor SLOW speed (Hz)
232	1	50	Motor Acceleration time (x0.1)
233	1	50	Motor Deceleration time (x0.1)
234	0	50	Slow time delay x0.1 (aka 'TARGET-1 DELAY')
235	0	50	Stop time delay x0.1 (aka 'TARGET DELAY')
236	1	60	Motor SERVICE speed (Hz)

300	0	2	PLT Side (0=OFF, 1=LEFT, 2=RIGHT)
301	0	1	PLT Grid mode (0=OFF, 1=ON)
302	0	255	PLT IP address ____ .xxx.xxx.xxx
303	0	255	PLT IP address xxx. ____ .xxx.xxx
304	0	255	PLT IP address xxx.xxx. ____ .xxx
305	0	255	PLT IP address xxx.xxx.xxx. ____
310	0	9999	PLT Shelf 1 level (mm)
311	0	9999	PLT Shelf 2 level (mm)
312	0	9999	PLT Shelf 3 level (mm)
313	0	9999	PLT Shelf 4 level (mm)
314	0	9999	PLT Shelf 5 level (mm)
315	0	9999	PLT Shelf 6 level (mm)
316	0	9999	PLT Shelf 7 level (mm)
317	0	9999	PLT Shelf 8 level (mm)
318	0	9999	PLT Shelf 9 level (mm)
319	0	9999	PLT Shelf 10 level (mm)
320	0	9999	PLT Shelf 11 level (mm)
321	0	9999	PLT Shelf 12 level (mm)
322	0	9999	PLT Shelf 13 level (mm)
323	0	9999	PLT Shelf 14 level (mm)
324	0	9999	PLT Shelf 15 level (mm)
325	0	9999	PLT Shelf 16 level (mm)
326	0	9999	PLT Shelf 17 level (mm)
327	0	9999	PLT Shelf 18 level (mm)
328	0	9999	PLT Shelf 19 level (mm)
329	0	9999	PLT Shelf 20 level (mm)
330	0	9999	PLT Shelf 21 level (mm)
331	0	9999	PLT Shelf 22 level (mm)
332	0	9999	PLT Shelf 23 level (mm)
333	0	9999	PLT Shelf 24 level (mm)
340	0	99	PLT Shelf 1 Position count
341	0	99	PLT Shelf 1 Depth count
342	0	99	PLT Shelf 2 Position count
343	0	99	PLT Shelf 2 Depth count
344	0	99	PLT Shelf 3 Position count
345	0	99	PLT Shelf 3 Depth count
346	0	99	PLT Shelf 4 Position count
347	0	99	PLT Shelf 4 Depth count
348	0	99	PLT Shelf 5 Position count
349	0	99	PLT Shelf 5 Depth count
350	0	99	PLT Shelf 6 Position count
351	0	99	PLT Shelf 6 Depth count
352	0	99	PLT Shelf 7 Position count
353	0	99	PLT Shelf 7 Depth count

354	0	99	PLT Shelf 8 Position count
355	0	99	PLT Shelf 8 Depth count
356	0	99	PLT Shelf 9 Position count
357	0	99	PLT Shelf 9 Depth count
358	0	99	PLT Shelf 10 Position count
359	0	99	PLT Shelf 10 Depth count
360	0	99	PLT Shelf 11 Position count
361	0	99	PLT Shelf 11 Depth count
362	0	99	PLT Shelf 12 Position count
363	0	99	PLT Shelf 12 Depth count
364	0	99	PLT Shelf 13 Position count
365	0	99	PLT Shelf 13 Depth count
366	0	99	PLT Shelf 14 Position count
367	0	99	PLT Shelf 14 Depth count
368	0	99	PLT Shelf 15 Position count
369	0	99	PLT Shelf 15 Depth count
370	0	99	PLT Shelf 16 Position count
371	0	99	PLT Shelf 16 Depth count
372	0	99	PLT Shelf 17 Position count
373	0	99	PLT Shelf 17 Depth count
374	0	99	PLT Shelf 18 Position count
375	0	99	PLT Shelf 18 Depth count
376	0	99	PLT Shelf 19 Position count
377	0	99	PLT Shelf 19 Depth count
378	0	99	PLT Shelf 20 Position count
379	0	99	PLT Shelf 20 Depth count
380	0	99	PLT Shelf 21 Position count
381	0	99	PLT Shelf 21 Depth count
382	0	99	PLT Shelf 22 Position count
383	0	99	PLT Shelf 22 Depth count
384	0	99	PLT Shelf 23 Position count
385	0	99	PLT Shelf 23 Depth count
386	0	99	PLT Shelf 24 Position count
387	0	99	PLT Shelf 24 Depth count
899	0	1	!Factory reset DEVICE parameters (0=No, 1=Yes)

## GLOBAL PARAMETERS

900	0	1	DHCP Mode (0=Off, 1=On)
901	1	99	POD number
902	0	255	RCB Static IP address __.xxx.xxx.xxx
903	0	255	RCB Static IP address xxx. __.xxx.xxx
904	0	255	RCB Static IP address xxx.xxx. __.xxx
905	0	255	RCB Static IP address xxx.xxx.xxx. __
906	0	255	RCB Gateway IP address __.xxx.xxx.xxx
907	0	255	RCB Gateway IP address xxx. __.xxx.xxx
908	0	255	RCB Gateway IP address xxx.xxx. __.xxx
909	0	255	RCB Gateway IP address xxx.xxx.xxx. __
910	0	255	RCB Subnet mask __.xxx.xxx.xxx
911	0	255	RCB Subnet mask xxx. __.xxx.xxx
912	0	255	RCB Subnet mask xxx.xxx. __.xxx
913	0	255	RCB Subnet mask xxx.xxx.xxx. __
920	0	99	COM1 Mode:0=HMI, 1=RCC1, 2=RCC2, 3=STX, 99=DISABLED
921	0	5	COM1 Baud:0=38400, 1=19200, 2=9600, 3=4800, 4=2400, 5=1200
922	0	2	COM1 Frame:0=8/NONE/1, 1=8/ODD/1, 2=8/EVEN/1
923	0	3	COM1 Carousel Number Offset
924	0	1	COM1 STX (Simple Terminal Xface) Echo:0=Off, 1=ON
930	0	99	COM2 Mode:0=HMI, 1=RCC1, 2=RCC2, 3=STX, 99=DISABLED
931	0	5	COM2 Baud:0=38400, 1=19200, 2=9600, 3=4800, 4=2400, 5=1200
932	0	2	COM2 Frame:0=8/NONE/1, 1=8/ODD/1, 2=8/EVEN/1
933	0	3	COM2 Carousel Number Offset
934	0	1	COM2 STX (Simple Terminal Xface) Echo:0=Off, 1=ON
940	0	1	VNC Remote Access Enable (0=Off, 1=On)
941	0	1	VNC Remote Access READ ONLY (0=Off, 1=On)
942	0	1	VNC Remote Access READ/WRITE (0=Off, 1=On)
950	0	2	Beeper mode (0=Off, 1=Switches, 2=All)
951	0	99	PLT Mode:0=Device+Pointer, 1=Device only, 99=Disabled
952	0	1	WPX Interface (0=Disabled 1=Enabled)
953	0	1	WebServer (0=Off, 1=On)
960	0	10	Relay 1 out function
961	0	10	Relay 2 out function
962	0	10	Relay 3 out function
963	0	10	Relay 4 out function
970	0	1	!Motor Tune All Drives (0=OFF, 1=ON)
998	0	1	!Factory reset ALL parameters



## RCB PARAMETER SET 2.02 (APRIL 2024)

Parameter	Value	Min	Max	Description
1	1	0	1	Device ONLINE (0=Offline, 1=Online)
2	202	0	0	RCB Firmware Version (Read Only)
3	68	0	0	RCB GPIO Version (0=48 A=65 B=66 C=67 D=68 E=69 F=70 G=71 ...)
4	101	0	0	CSX Firmware Version (Read Only)
10	0	0	99	Set carrier number
11	2	0	20	LEFT Step value
12	2	0	20	RIGHT Step value
13	1	0	1	Position indicator on start or stop (0=Start, 1=Stop)
100	16	1	99	Total Carriers
101	2	1	99	Flags between carriers
102	0	0	24	Total Levels
103	0	0	99	Total Positions
104	0	0	99	Total Depths
110	1	1	4	HOST Device ID## (READ ONLY)
120	1	0	4	RCC1 host emulation carrier offset (x100)
130	5	0	20	!ESTOP decel time x0.1secs, CAUTION SEE CUSTOMER AHJ!!!
200	0	0	1	Swap ENCA/ENCB A<>B Count signals (0=off, 1=Swap)
201	0	0	1	Invert ENCA/ENCB Count signals (0=Off, 1=Invert)
202	0	0	1	Swap LEFT/RIGHT Direction command (0=off, 1=Swap)
203	0	0	1	Counter style (0=Dual-Prox, 1=Single-Prox)
204	1	1	99	Home Carrier number
205	0	0	1	Home sensor type (0=Light ON, 1=Dark On)
206	2	0	3	CSX AUX1 Input Device (0=OFF 1=ERGen 2=ERLC 3=RESET)
207	1	0	1	CSX AUX1 Input Type (0=N/O 1=N/C)
208	0	0	3	CSX AUX2 Input Device (0=OFF 1=ERGen 2=ERLC 3=RESET )
209	0	0	1	CSX AUX2 Input Type (0=N/O 1=N/C)
210	0	0	1	Foot Pedal lock (0=OFF, 1=LOCKED)
211	0	0	99	Photocell LEFT Input mode (0=Photocell, 99=Disabled)
212	0	0	99	Photocell RIGHT Input mode (0=Photocell, 99=Disabled)
213	0	0	9	CSX Error Beep count (0..9)
214	0	0	300	Auto Reset E150 (0=Off, Seconds)
220	1	0	1	Motor Voltage (0=230V, 1=460V)
221	1	0	1	Motor Frequency (0=50Hz, 1=60Hz)
222	60	1	150	Motor FLA (x0.1)
223	22	1	75	Motor kW (x0.1)
224	1800	1	4000	Motor RPM
230	20	1	60	Motor FAST speed (Hz)
231	4	1	60	Motor SLOW speed (Hz)
232	8	1	60	Motor SERVICE PENDANT speed (Hz)
233	20	1	250	Motor Acceleration time (x0.1)
234	30	1	250	Motor Deceleration time (x0.1)
235	10	0	50	Time for ramp up on one carrier move (x0.1)
236	0	0	50	Slow time delay x0.1 (aka 'TARGET-1 DELAY')
237	5	0	50	Stop time delay x0.1 (aka 'TARGET DELAY')
300	0	0	2	PLT Side (0=OFF, 1=LEFT, 2=RIGHT)
301	0	0	1	PLT Pointer control (0=OFF, 1=ON)
302	1	0	1	PLT Grid mode (0=OFF, 1=ON)
303	0	0	3	PLT Side marker color (0=Off, 1=Red, 2=Green, 3=Blue)

304	192	0	255	PLT IP address ____.xxx.xxx.xxx
305	168	0	255	PLT IP address xxx.____.xxx.xxx
306	0	0	255	PLT IP address xxx.xxx.____.xxx
307	101	0	255	PLT IP address xxx.xxx.xxx.____
310	1	0	9999	PLT Shelf 1 level
311	19	0	9999	PLT Shelf 2 level
312	38	0	9999	PLT Shelf 3 level
313	57	0	9999	PLT Shelf 4 level
314	76	0	9999	PLT Shelf 5 level
315	95	0	9999	PLT Shelf 6 level
316	114	0	9999	PLT Shelf 7 level
317	133	0	9999	PLT Shelf 8 level
318	152	0	9999	PLT Shelf 9 level
319	171	0	9999	PLT Shelf 10 level
320	191	0	9999	PLT Shelf 11 level
321	210	0	9999	PLT Shelf 12 level
322	229	0	9999	PLT Shelf 13 level
323	248	0	9999	PLT Shelf 14 level
324	267	0	9999	PLT Shelf 15 level
325	286	0	9999	PLT Shelf 16 level
326	305	0	9999	PLT Shelf 17 level
327	324	0	9999	PLT Shelf 18 level
328	343	0	9999	PLT Shelf 19 level
329	362	0	9999	PLT Shelf 20 level
330	381	0	9999	PLT Shelf 21 level
331	400	0	9999	PLT Shelf 22 level
332	419	0	9999	PLT Shelf 23 level
333	438	0	9999	PLT Shelf 24 level
340	1	0	99	PLT Shelf 1 Position count
341	1	0	99	PLT Shelf 1 Depth count
342	1	0	99	PLT Shelf 2 Position count
343	1	0	99	PLT Shelf 2 Depth count
344	1	0	99	PLT Shelf 3 Position count
345	1	0	99	PLT Shelf 3 Depth count
346	1	0	99	PLT Shelf 4 Position count
347	1	0	99	PLT Shelf 4 Depth count
348	1	0	99	PLT Shelf 5 Position count
349	1	0	99	PLT Shelf 5 Depth count
350	1	0	99	PLT Shelf 6 Position count
351	1	0	99	PLT Shelf 6 Depth count
352	1	0	99	PLT Shelf 7 Position count
353	1	0	99	PLT Shelf 7 Depth count
354	1	0	99	PLT Shelf 8 Position count
355	1	0	99	PLT Shelf 8 Depth count
356	1	0	99	PLT Shelf 9 Position count
357	1	0	99	PLT Shelf 9 Depth count
358	1	0	99	PLT Shelf 10 Position count
359	1	0	99	PLT Shelf 10 Depth count
360	1	0	99	PLT Shelf 11 Position count

361	1	0	99	PLT Shelf 11 Depth count
362	1	0	99	PLT Shelf 12 Position count
363	1	0	99	PLT Shelf 12 Depth count
364	1	0	99	PLT Shelf 13 Position count
365	1	0	99	PLT Shelf 13 Depth count
366	1	0	99	PLT Shelf 14 Position count
367	1	0	99	PLT Shelf 14 Depth count
368	1	0	99	PLT Shelf 15 Position count
369	1	0	99	PLT Shelf 15 Depth count
370	1	0	99	PLT Shelf 16 Position count
371	1	0	99	PLT Shelf 16 Depth count
372	1	0	99	PLT Shelf 17 Position count
373	1	0	99	PLT Shelf 17 Depth count
374	1	0	99	PLT Shelf 18 Position count
375	1	0	99	PLT Shelf 18 Depth count
376	1	0	99	PLT Shelf 19 Position count
377	1	0	99	PLT Shelf 19 Depth count
378	1	0	99	PLT Shelf 20 Position count
379	1	0	99	PLT Shelf 20 Depth count
380	1	0	99	PLT Shelf 21 Position count
381	1	0	99	PLT Shelf 21 Depth count
382	1	0	99	PLT Shelf 22 Position count
383	1	0	99	PLT Shelf 22 Depth count
384	1	0	99	PLT Shelf 23 Position count
385	1	0	99	PLT Shelf 23 Depth count
386	1	0	99	PLT Shelf 24 Position count
387	1	0	99	PLT Shelf 24 Depth count
400	0	0	99	Special Function 1..99 (See docs for info)
899	0	0	1	!Factory RESET ALL DEVICE parameters (0=No, 1=Yes)
900	1	0	99	DHCP Mode (0=STATIC, 1=DHCP, 99=ETHERNET DISABLED)
901	1	1	99	POD number
902	192	0	255	RCB Static IP address __.xxx.xxx.xxx
903	168	0	255	RCB Static IP address xxx.__.xxx.xxx
904	1	0	255	RCB Static IP address xxx.xxx.__.xxx
905	1	0	255	RCB Static IP address xxx.xxx.xxx.__
906	192	0	255	RCB Gateway IP address __.xxx.xxx.xxx
907	168	0	255	RCB Gateway IP address xxx.__.xxx.xxx
908	1	0	255	RCB Gateway IP address xxx.xxx.__.xxx
909	1	0	255	RCB Gateway IP address xxx.xxx.xxx.__
910	255	0	255	RCB Subnet mask __.xxx.xxx.xxx
911	255	0	255	RCB Subnet mask xxx.__.xxx.xxx
912	255	0	255	RCB Subnet mask xxx.xxx.__.xxx
913	0	0	255	RCB Subnet mask xxx.xxx.xxx.__
920	0	0	99	COM1 Mode:0=HMI, 1=RCC1, 2=RCC2, 3=STX, 4=ALX, 5=PRN, 6=T88, 7=
921	0	0	5	COM1 Baud:0=38400, 1=19200, 2=9600, 3=4800, 4=2400, 5=1200
922	1	0	2	COM1 Frame:0=8/NONE/1, 1=8/ODD/1, 2=8/EVEN/1
923	0	0	3	COM1 Carousel Number Offset
924	0	0	1	COM1 STX (Simple Terminal Xface) Echo:0=Off, 1=ON
930	7	0	99	COM2 Mode:0=HMI, 1=RCC1, 2=RCC2, 3=STX, 4=ALX, 5=PRN, 6=T88, 7=

931	2	0	5	COM2 Baud:0=38400, 1=19200, 2=9600, 3=4800, 4=2400, 5=1200
932	0	0	2	COM2 Frame:0=8/NONE/1, 1=8/ODD/1, 2=8/EVEN/1
933	0	0	3	COM2 Carousel Number Offset
934	0	0	1	COM2 STX (Simple Terminal Xface) Echo:0=Off, 1=ON
940	0	0	1	VNC Remote Access Enable (0=Off, 1=On)
941	0	0	1	VNC Remote Access READ ONLY (0=Off, 1=On)
942	0	0	1	VNC Remote Access READ/WRITE (0=Off, 1=On)
943	123	1	127	PRN string start character
944	125	1	127	PRN string end character
948	1	0	1	Auto Reset Start commands with E150 (0=No, 1=Yes)
950	0	0	2	Beeper mode (0=Off, 1=Switches, 2=All)
951	1	0	1	WPX Interface (0=Disabled 1=Enabled)
952	0	0	1	WebServer (0=Off, 1=On)
953	0	0	3	Language (0=English, 1=German, 2=French, 3=Spanish)
954	0	0	4	Entry mode:0=C, 1=C+L, 2=C+L+P, 3=C+L+P+D, 4=C+L+P+D+Q
960	0	0	10	Relay 1 out function
961	0	0	10	Relay 2 out function
962	0	0	10	Relay 3 out function
963	0	0	10	Relay 4 out function
970	0	0	1	!Motor Tune All Drives (0=OFF, 1=ON)
998	0	0	1	!Factory reset ALL parameters