

**Title:** TP100 Application Note

**Product(s):** TP100

Doc. No. AN.TP100.01

## 1 Setup

### 1.1 Hardware

#### 1.1.1 MP3300iec-RBT

RBT allows use of controller kinematics such as delta robots.

#### 1.1.2 Any Servopacks with HWBB and EDM signals

Required for Machine Safety.

#### 1.1.3 TP100 with JB001/A junction box with cable to connect TP100 and junction box

### 1.2 Software

#### 1.2.1 Latest MotionWorksIEC

[https://www.yaskawa.com/products/motion/machine-controllers/software-tools/motionworks-iec/-/content/\\_32b77949-e618-4aa6-a9d4-6454a55a6ea6\\_DownloadSoftware](https://www.yaskawa.com/products/motion/machine-controllers/software-tools/motionworks-iec/-/content/_32b77949-e618-4aa6-a9d4-6454a55a6ea6_DownloadSoftware)

#### 1.2.2 Latest firmware

[https://www.yaskawa.com/products/motion/machine-controllers/software-tools/controller-firmware/-/content/\\_b5712426-3224-459d-b7c1-68f05387aedb\\_DownloadFirmware](https://www.yaskawa.com/products/motion/machine-controllers/software-tools/controller-firmware/-/content/_b5712426-3224-459d-b7c1-68f05387aedb_DownloadFirmware)

#### 1.2.3 Latest Toolboxes

<https://www.yaskawa.com/products/motion/machine-controllers/software-tools/application-code-toolboxes>

#### 1.2.4 Example Project

TP100\_example\_setup.zwt

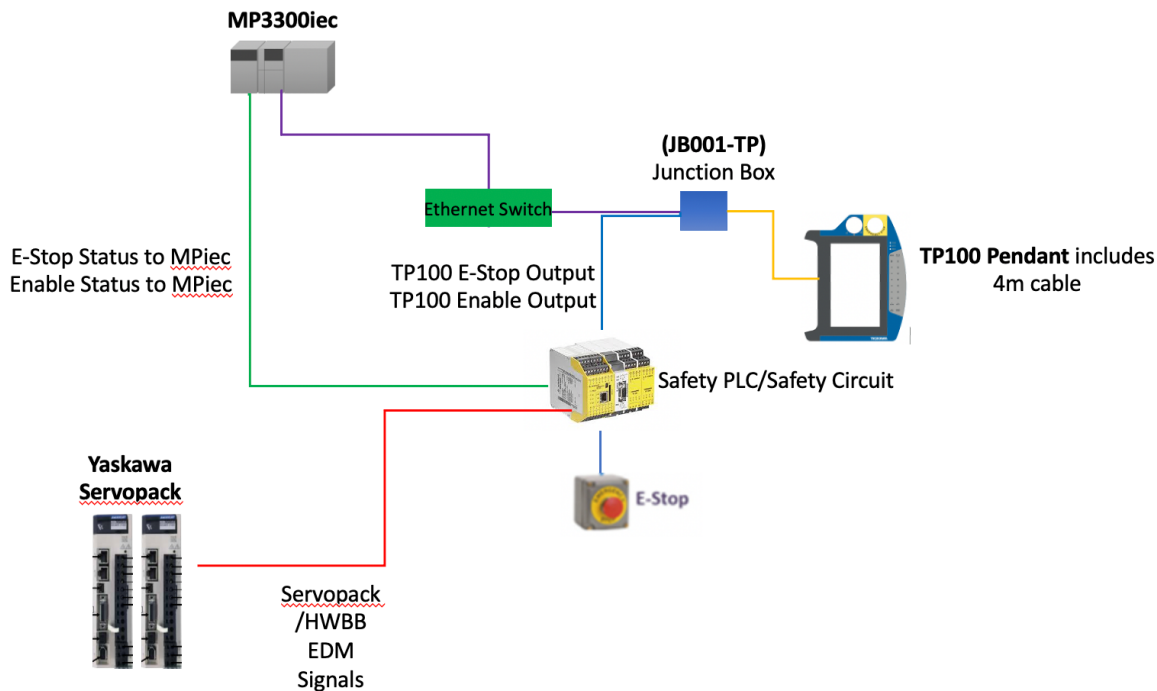
The sample project shows how to setup MotionWorksIEC project to use TP100 with multiple groups. It uses a local group and a remote group.

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### 1.3 Example System Layout



*A risk assessment for the application should be done to determine the necessary safety components.*

#### MP3300iec

- Implements Pendant Driver function block to control TP100.
- Monitors status of E-Stop, Enable through Y\_GroupInputs function block. Status is displayed on TP100.
- Note, that MP3300iec does not use TP100 E-Stop and Enable to control Servopack /HWBB. This needs to be done by Safety Relay or Safety PLC.

#### Safety Relay or Safety PLC

- Uses TP100 E-Stop, Enable to control Servopack /HWBB.
- E-Stop, Enable safety signals status need to feedback to MP3300iec via digital Inputs, or Safety PLC communication.

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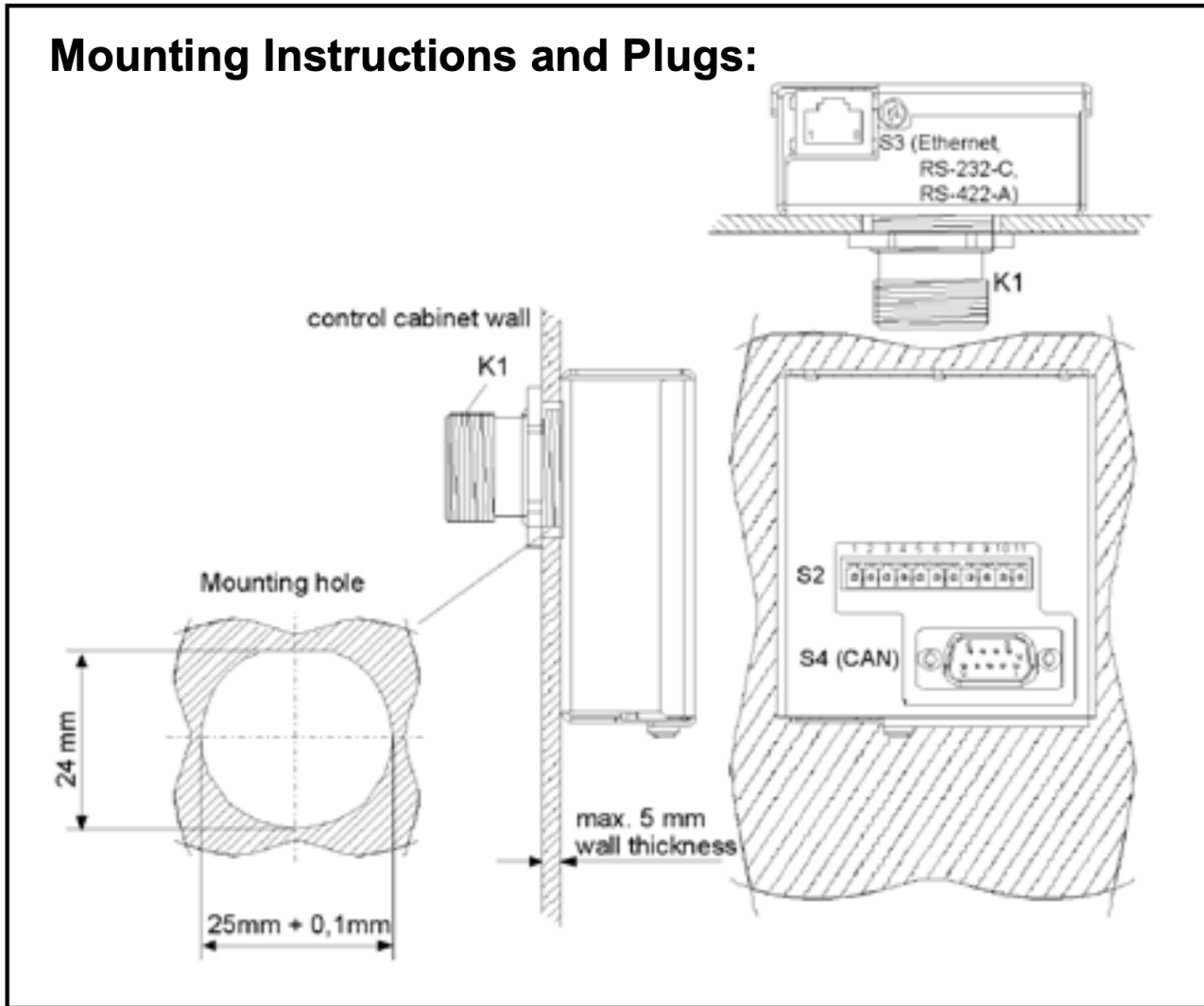
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## 2 Wiring

### 2.1 JB001-TP Junction Box

The JB001-TP junction box provides access to the TP100 signals. Mounting example is shown below.

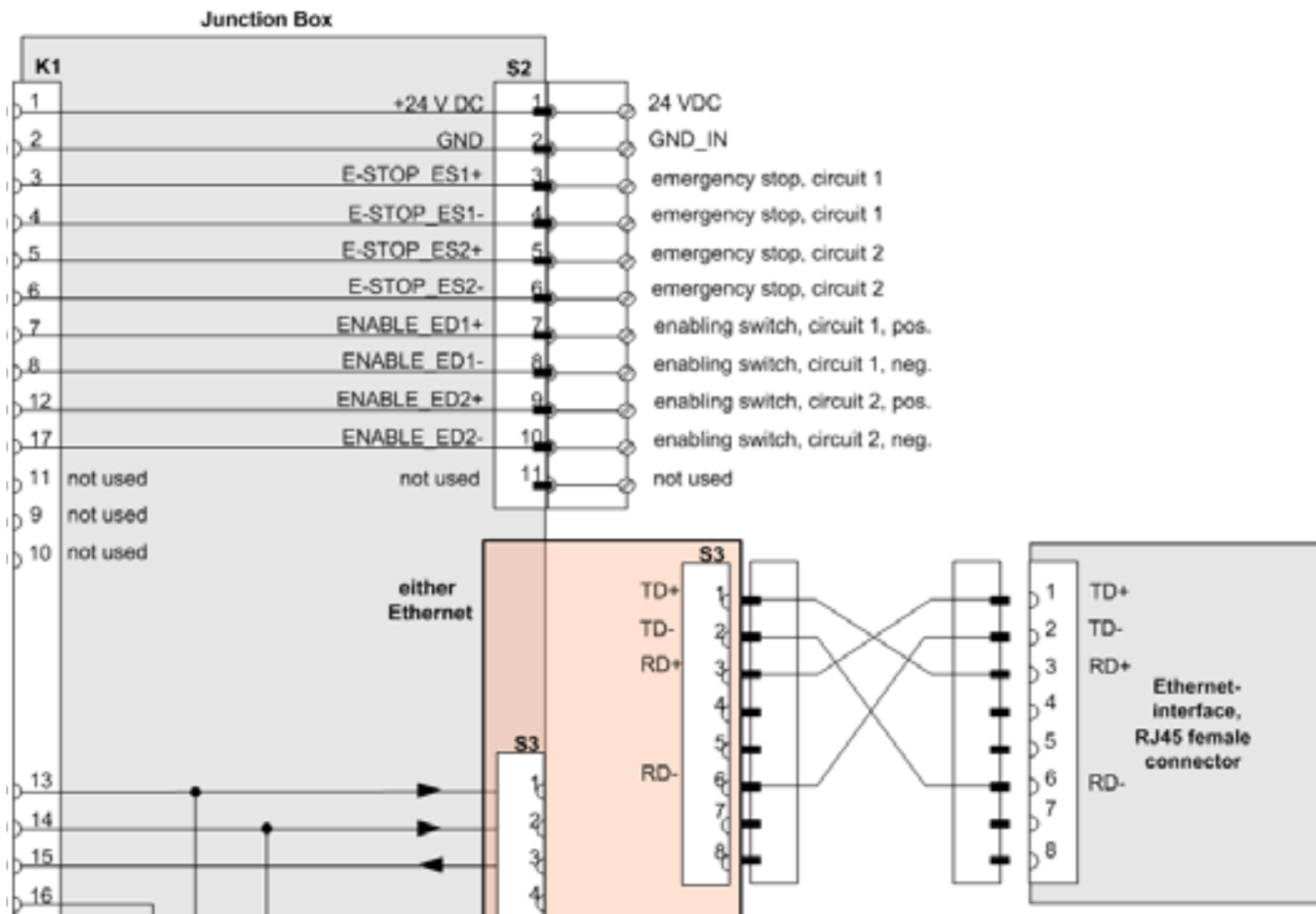


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The following is an example wiring setup that just uses the signals required.



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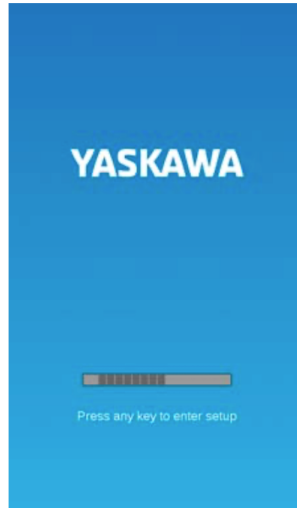
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## 3 TP100 Configuration

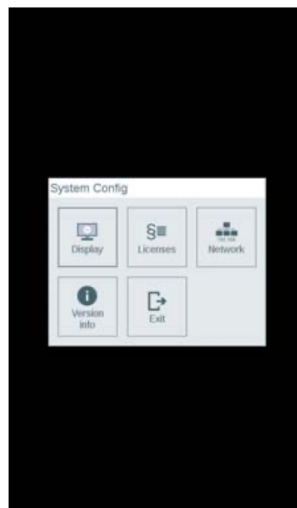
### 3.1 Set TP100 IP address

1. Turn ON the power supply to the pendant.



The "Press any key to enter setup" message will be displayed on the screen during the booting process.

2. Press a membrane key on the booting screen.  
The System Config Dialog Box will be displayed.



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### 3. Select the **Network** Option.

The Network Dialog Box will be displayed.



### 4. Select the **Ethernet 0** Option.

The Ethernet 0 Dialog Box will be displayed.



### 5. Set the IP address of the TP100.

### 6. Tap the **OK** Button after entering the IP address.

### 7. On the Network Dialog Box, select the **Back** Option.

The setting will be saved, and the Network Dialog Box will be displayed.

### 8. On the Network Dialog Box, select the **Back** Option.

The System Config Dialog Box will be displayed.

### 9. On the System Config Dialog Box, select the **Exit** Option.

The pendant application will start.

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### 3.2 Set MPiec IP address

Set the IP address of the controller to which the TP100 will be connected.

1. From the main menu, select **General - Settings**.
2. On the Settings Screen, tap **Controller IP Address** - Configuration.



3. Under **Drivers**, tap the  Button.

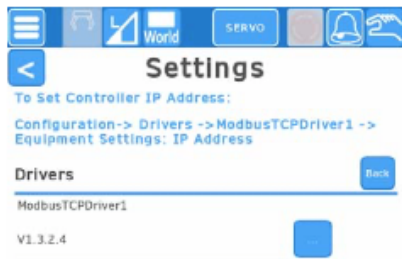


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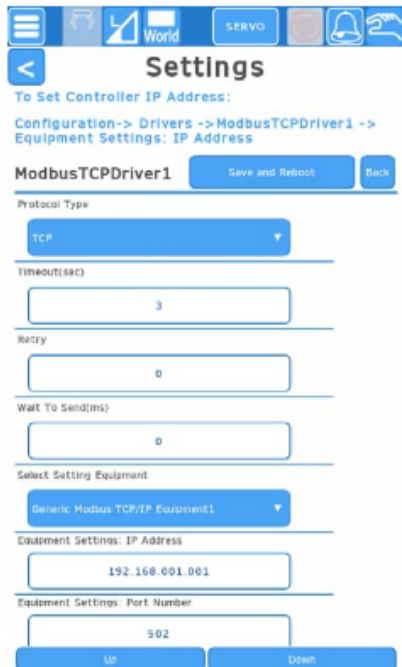
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4. On the Drivers Screen, Under **ModbusTCPDriver1**, tap the  Button.



5. On the ModbusTCPDriver1 Screen, for **Equipment Settings: IP Address**, enter the IP address of the controller.



6. Tap the **Save and Reboot** Button.  
7. Restart the TP100.



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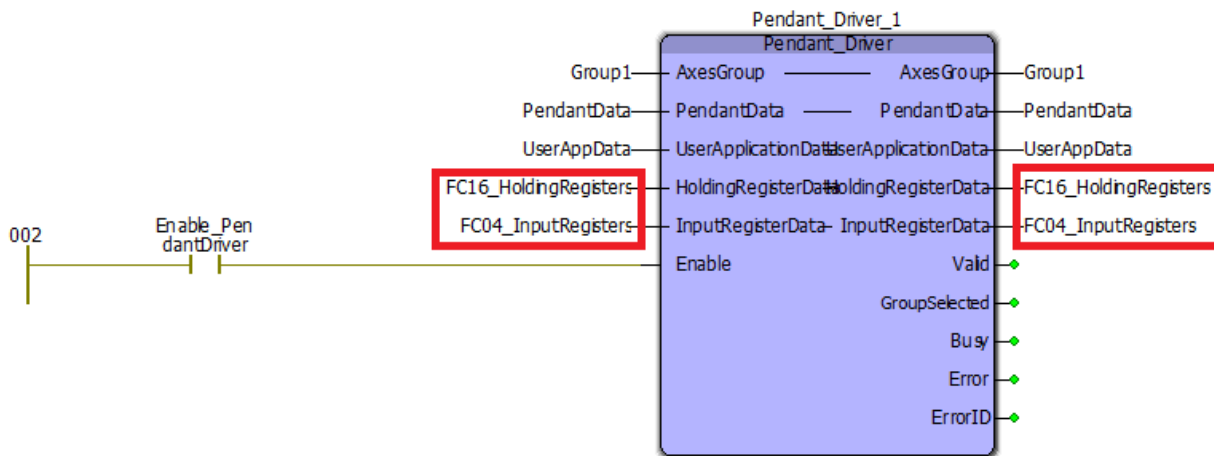
### 3.3 Create Modbus variables

In global variables create following:

- FC16 registers space
  - Datatype HoldingRegisters\_ByteArray
  - Its address is 0.015 offset from the start of FC16 registers. In this example, FC16 registers start at MB3.483328.  $MB3.483328 + 0.015 = MB3.498328$ .
- FC04 register space
  - Datatype InputRegisters\_ByteArray
  - Its address is 15000 offset from start of FC04 register. In this example, FC04 starts at QB73792.  $QB73792 + 15000 = QB88792$ .

UserAppData	UserApplicatio...	VAR_GLO...				
Modbus FC#05 Qty: 512 Coils, Address Range: %B73728 - %B73791 (* Modify Variable Names, Not Group Name. *)						
Modbus FC#03,06,16 Qty: 10000 Registers, Address Range: %MB3.483328 - %MB3.503327 (* Modify Variable Names, Not Group Name. *)						
FC16_HoldingRegisters	HoldingRegist...	VAR_GLO...			%MB3.498328	
Modbus FC#02 Qty: 512 Inputs, Address Range: %QB73728 - %QB73791 (* Modify Variable Names, Not Group Name. *)						
Modbus FC#04 Qty: 10000 Input Registers, Address Range: %QB73792 - %QB93791 (* Modify Variable Names, Not Group Name. *)						
FC04_InputRegisters	InputRegisters...	VAR_GLO...			%QB88792	
<SF2300> - Machine Safety Module - 1 (* Modify Variable Names, Not Group Name. *)						

These are used by the Pendant\_Driver function block that handles TP100 logic.



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### 4 Hardware Configuration

#### 4.1 Enable Controller as Modbus Slave

The screenshot displays the configuration interface for a Yaskawa TP100 controller. On the left, a tree view shows the project structure, with 'Modbus/TCP' highlighted under 'EtherNet/IP'. The main window shows the 'Modbus/TCP' configuration for resource 'MP3300ec'. The 'Enable Controller as a Modbus Slave' checkbox is checked. Below it, 'Add Holding Registers Outputs' and 'Use %M for bidirectional Holding Registers' are also checked. The 'I/O Task Assignment' table is as follows:

Server Block	I/O Task
Coils	FastTask
Registers	FastTask
Inputs	FastTask
Input Registers	FastTask

The 'Output state when PLC stops' section has 'Retain last state' selected. The 'Manufacturer' is set to 'Yaskawa' and the 'Resource' is 'MP3300ec'. The 'Configure Controller as Modbus Master' section contains an empty table for 'Modbus/TCP Devices'.

Check the Use %M for bidirectional Holding Registers and Add Holding Registers Outputs boxes.

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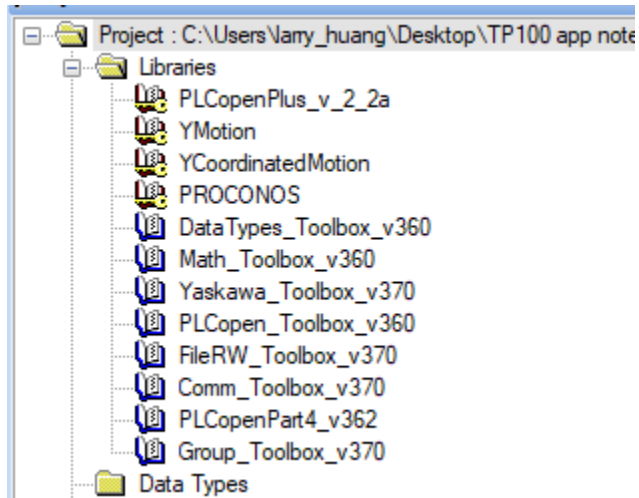
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## 5 MotionWorksIEC Project Configuration

See example project TP100\_example\_setup.zwt.

### 5.1 Add libraries



Most of these should automatically be added when saving a group in hardware config. The following may need to be added manually:

- Firmware library PROCONOS
- FileRW\_Toolbox
- Comm\_Toolbox
- Group\_Toolbox

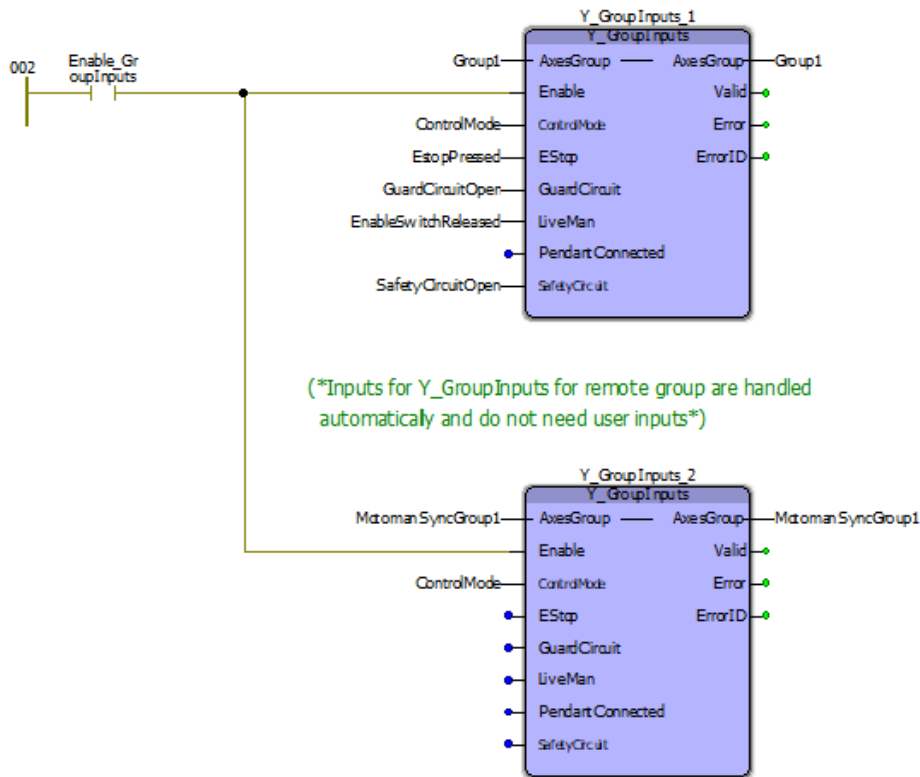
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### 6 Y\_GroupInputs

Y\_GroupInputs is a function that takes safety signal inputs and stores it into the AxesGroup structure. So, other function blocks can use it, including user apps. These inputs are stored in AxesGroup.Input.



Motion functions look at AxesGroup.Inputs to check the safety bits or else it gives an error. For Y\_GroupInputs FB, a FALSE input means signal is ok. For example, EStop input = TRUE would block motion functions from executing.

For local groups, the safety signal status (Estop, GuardCircuit, LiveMan, SafetyCircuit) is fed by user into Y\_GroupInputs. For remote groups, the safety signals are written automatically by MS\_Driver, so they do not need to be fed into Y\_GroupInputs. See example above.

ControlMode indicates that the AxesGroup is in play or teach mode. TRUE = Teach, FALSE = Play. In play mode, users can use MC\_Movexxx functions, but not Y\_GroupJog functions. In teach mode, users can use Y\_GroupJogxxx functions but not MC\_Movexxx functions.

In the sample project, see the IO POU to see how these inputs are set. Shown below is the Estop signal.

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(\*This example uses LIO-02 card as for feedback for use in Y\_GroupInputs for Mechatrolink groups\*)



## 7 Servo on using TP100

Group must be in “teach” mode to use TP100. Which means `Y_GroupInputs.ControlMode = TRUE`. (See TP100 manual section 6.2.5)

- Set ControlMode input for `Y_GroupInputs` to TRUE. This must be done to use any TP100 functionality
- Release Enable switch (it should set `Y_GroupInputs.LiveMan = TRUE` for local groups)
- Press servo button on TP100. Servo button should turn orange
- Press and hold enable switch (it should set `Y_GroupInputs.LiveMan = FALSE` for local groups)

### 7.1 Jogging with remote groups

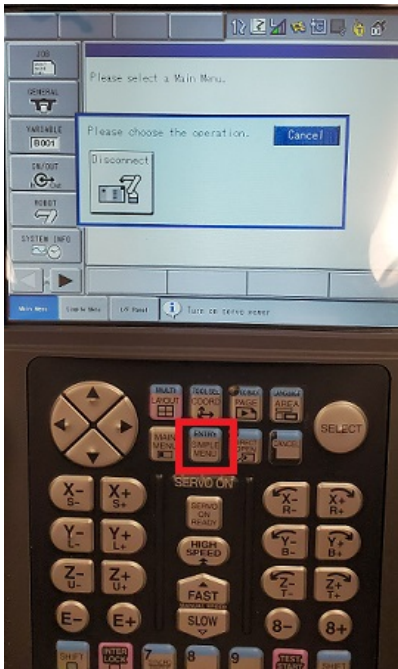
Jogging with remote groups is slightly different than local groups.

It requires that the programming pendant be turned off. This can be done by holding the SIMPLE MENU membrane button until a popup shows to disconnect pendant. This must be done or else the jog functions will generate alarms since it violates single point of control safety spec.

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For remote groups, the Enable switch is on the back of the programming pendant. This must be held closed to servo on. Unfortunately, there is no external output to override this to use an external enable switch without some extra wiring and setup on the safety logical circuit.

## 8 Normal operation

Normal operation means “play” mode for the group. Which means `Y_GroupInputs.ControlMode = FALSE`.

- Set `ControlMode` input for `Y_GroupInputs` to `FALSE`
- Execute `Y_GroupPower` with `PowerState` input = `TRUE` to servo on

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## 9 TP100 Screen Descriptions

### 9.1 Welcome Screen

The Welcome screen displays system status information.

#### Controller Diagnostics

- Heart Beat: Increments when connected to pendant is connected to a controller.
- Is Connected: Indicates "Yes" when pendant is connected to a controller.
- Group Active: Axes group is active and pendant connection is okay.

#### Group Information

- Name: Name of axes group (AXES\_GROUP\_REF).
- Selected: Pendant driver is running on controller and axes group name is valid.

The screenshot displays the 'Welcome' screen of the TP100 application. At the top, there is a navigation bar with icons for a menu, a robot, a graph, 'World', 'SERVO', a bell, and a hand. Below the navigation bar, the title 'Welcome' is centered. A dropdown menu shows 'English'. The 'Controller Diagnostics' section contains three rows: 'Heart Beat' with a value of 221, 'Is Connected' with 'YES', and 'Group Active' with 'YES'. Below this is a greyed-out 'Acknowledge Disconnect' button. The 'Enter Group Information' section has a 'Name' field containing 'delta' and a 'Selected' field containing 'YES'.

Controller Diagnostics	
Heart Beat	221
Is Connected	YES
Group Active	YES

Enter Group Information	
Name	delta
Selected	YES

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## 9.2 Screen Header



The header is present on every screen.

### Menu Icon



Allows navigation to other screens on pendant.

### Tool Number Indicator



Indicates Tool Number in use.

### Jog Speed Indicator



Indicates Jog Speed in use.

### Coordinate System Indicator

Joint



World





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Tool



User



### Servo Indicator

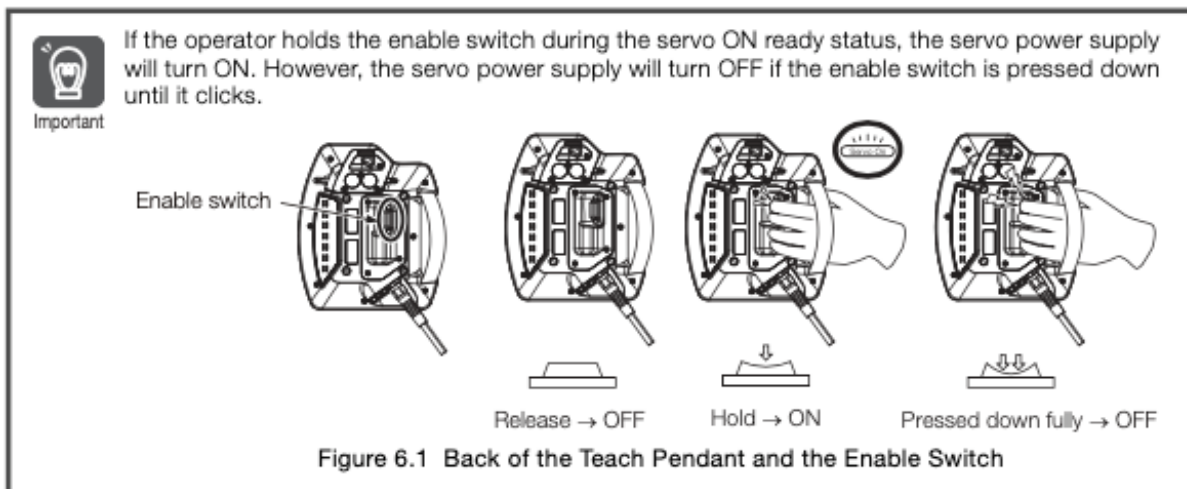
Servo Off



Servo On Ready: Orange (Requires pressing SERVO membrane button to set Servo On Ready Status)



Servo On: Green (Requires using Enable switch on TP100.)



Once servo power supply is turned ON in manual (teach) mode, jog operations can be performed.

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## Alarm Indicator

A user can navigate the Alarm screen by pressing on this indicator

Alarm is Active



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## System Mode

Manual/Teach Mode: Jog operations are allowed.



Auto/Play Mode: Jog operations are not allowed.



## 9.3 Status Bar

Group Name	Group Active	Alarm/ Error ID	Reset Alarm/ Error
delta	YES	0	

The Status Bar is common to all Teach Pendant screens.

- Group Name : name of axis group (AXES\_GROUP\_REF) on the controller
- Group Active : the group's enable status (YES: enabled, NO: disabled)
- Alarm/Error ID : shows code for any active alarm or error
- Reset Alarm/Error: use this button to clear any active alarm/error

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## 9.4 System State



**Servo Off**

This area of the screen displays the following system states.

- Initalizing
- Idle
- Running
- Servo Off
- Fatal Fault

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### 9.5 Main Screen

The screenshot shows the 'Teach Pendant - Main' interface. At the top, there is a navigation bar with icons for Home, World, SERVO, and Alarm. Below this, the 'Teach Pendant - Main' title is displayed. A table shows the current group information: Group Name (delta), Group Active (YES), and Alarm/Error ID (0). A 'Reset Alarm/Error' button is also present. The main status area displays 'Idle' in green text. Below this is a 'Hardware Status' section with a list of signals and their current states, each with a corresponding green button.

Group Name	Group Active	Alarm/Error ID	Reset Alarm/Error
delta	YES	0	Reset Alarm/Error

Idle

#### Hardware Status

E-Stop Circuit	OK
Guard Circuit	OK
Safety Circuit	OK
Enable Switch	PRESSED
System Mode	TEACH
Pendant Connection	CONNECTED
Servo On	YES

Indicates status of the following hardware signals

- E-Stop Circuit
- Guard Circuit
- Safety Circuit
- Enable Switch
- System Mode
- Pendant Connection
- Servo On Status

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### 9.6 Jogging



#### Jog Settings

- Mode: Change coordinate systems, e.g. World, Joint, Tool, User Frame.
- Speed: Change jog speed
- User Frame: Selected User Frame
- Tool: Selected Tool Number

#### Jog Controls

- Jog Buttons: Label changes when selected mode changes
- TCP Current (mm/deg): Shows current TCP feedback positions
- Axis Current (deg): Shows current Joint feedback positions
- "Jog to Home" Button: Press and hold to jog to set home position. (Remote Groups only)
- "Teach Screen >" Button: Navigate to the teach screen

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### 9.7 Teaching

Teach Point Settings				
Teach Point List	<input type="text" value="0"/>	<input type="text"/>		
Teach Point	<input type="text" value="3"/>	<input type="text"/>		
<input type="button" value="Clear"/>	<input type="button" value="Invalidd"/>	Part Frame# <input type="text" value="0"/>	Tool# <input type="text" value="0"/>	
	TCP Teach (mm/deg)	TCP Current (mm/deg)		Axis Current (deg)
X	<input type="text" value="*****"/>	<input type="text" value="111.138"/>	A1	<input type="text" value="-67.591"/>
Y	<input type="text" value="*****"/>	<input type="text" value="-274.290"/>	A2	<input type="text" value="8.304"/>
Z	<input type="text" value="*****"/>	<input type="text" value="255.840"/>	A3	<input type="text" value="22.568"/>
Rx	<input type="text" value="*****"/>	<input type="text" value="176.042"/>	A4	<input type="text" value="1.321"/>
Ry	<input type="text" value="*****"/>	<input type="text" value="0.274"/>	A5	<input type="text" value="-108.023"/>
Rz	<input type="text" value="*****"/>	<input type="text" value="-135.178"/>	A6	<input type="text" value="292.790"/>
			A7	<input type="text" value="0.000"/>
<input type="button" value="Servo-Off"/>		<input type="button" value="Invalid Point"/>	<input type="button" value="Invalid Point"/>	<input type="button" value="Jog Screen &gt;"/>
				<input type="button" value="Save Teach Point Data"/>

### Teach Point Settings

- Teach Point List ID#: Use to select a teach point list
- Teach Point ID #: Use to select a particular teach point in a teach point list
- Teach Point List Name : Label for a teach point list
- Teach Point Name: Label for a teach point
- Clear Button: Use to invalidate a selected teach point
- Valid Indicator: Shows if a teach point is valid (green) or invalid (red)
- User Frame #: Displays user frame utilized when teaching point
- Tool #: Displays tool number utilized when teaching point

### Numeric Displays

- TCP Teach (mm/deg) : Stored TCP values for the valid and selected teach point; fields are not editable
- TCP Current (mm/deg): Current TCP position values; fields are not editable
- Axis Current (deg): Current Axis position values; fields are not editable

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## Teach Button

- When pressed, it instructs controller to store current TCP and Axis positions (i.e. the taught position).
- This button is enabled when all axes are served on; it is disabled otherwise.

## Go to Point Button

- When pressed, it jogs to the selected teach point.
- This button is enabled when the selected teach point does not match the current TCP position; it is disabled otherwise.
- Note that the "Go to Point" operation is not supported when "Joint" jog mode is selected.

## Edit Button

- When pressed, it enables edit controls for currently selected teach point.
- This button is enabled when a valid teach point is selected; it is disabled otherwise.

## Jog Screen >

- When pressed, it navigates to the jog screen.

## At Taught Position Indicator

- Indicates sets when "Jog to Point" operation completes.

## Save Teach Point Data Button

- Navigates to save data screen for writing teach points to controller flash



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### 9.8 Editing Teach Points

**Edit Teach Point Instructions**

1) Edit teach point positions  
2) Go to Point to verify TCP Teach position  
3) Teach to confirm new position  
\* Cancel to disregard new position

	TCP Teach	TCP Current		Axis Current
X	2548.646	2548.646	A1	2548.646
Y	-1234.666	-1234.666	A2	-1234.666
Z	1342.711	1342.711	A3	1342.711
Rx	1023.515	1023.515	A4	1023.515
Ry	-522.077	-522.077	A5	-522.077
Rz	-824.975	-824.975	A6	-824.975
			A7	0.000

Not at Point
Go to Point
Cancel

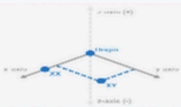
- The numeric displays in the "TCP Teach (mm/deg)" column are editable.
- The Teach button is enabled only when the system has been jogged to the position entered in the "TCP Teach (mm/deg)" column.
- The Teach button will teach the points and return to the previous screen (i.e. the screen that was used to navigate to the Edit screen).
- The Cancel button will return to the previous screen without editing the original values in the "TCP Teach (mm/deg)" column.

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### 9.9 User Frame Configuration

Active User Frame		
UF No.	<input type="text" value="0"/>	<input type="button" value="Clear Active User Frame"/>
Frame Name	<input type="text"/>	
User Frame Data		
UF No.	<input type="text" value="3"/>	<input type="button" value="Activate Selected User Frame"/>
Name [10 characters]	<input type="text"/>	
UF Status	<input type="button" value="Disabled"/>	<input type="button" value="Enable"/> <input type="button" value="Disable"/>
Origin	XX	XY
X <input type="text" value="22.145"/>	X <input type="text" value="-39.111"/>	X <input type="text" value="-39.000"/>
Y <input type="text" value="-278.770"/>	Y <input type="text" value="-278.333"/>	Y <input type="text" value="-356.000"/>
Z <input type="text" value="218.888"/>	Z <input type="text" value="218.000"/>	Z <input type="text" value="218.000"/>
<input type="button" value="Move Origin"/>	<input type="button" value="Servo Off"/>	<input type="button" value="Move XY"/>
<input type="button" value="Copy Current TCP"/>	<input type="button" value="Copy Current TCP"/>	<input type="button" value="Copy Current TCP"/>
<p>To create a User Frame (UF), select (1) Origin, (2) XX, and (3) XY then teach each of their positions. From these taught positions the Z direction will be calculated.</p> <p>To get a more accurate result, use a pointer tool. Invalid User Frames cannot be set as the active User Frame.</p> 		<input type="button" value="Save All User Frame Data To File"/>

#### Active User Frame

- Displays the current active user frame.
- Clear Active User Frame will set UF No. to -1 and current active part offsets to 0 inside AXES\_GROUP\_REF on MPiec.

#### User Frame Data

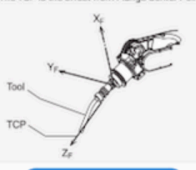
- Changing UF No. selects the User Frame number.
- Activate Selected User Frame button will set User Frame using values in Origin, XX, XY points.
- Enable button allows editing of User Frame Values.
- When Disabled, TP100 allows editing of User Frame Values, but values are not sent to MPiec.
- Origin, XX, YY values can be entered to define User Frame.
- Move Origin/Move XX, Move XY buttons will execute a jog function to the Origin/XX/XY defined for the User Frame.
- Copy Current TCP button will copy the TCP position in world space (includes Rx Ry Rz which is not shown on pendant screen) to the MPiec.
- Save All User Frame Data to File button navigates to window to save data to MPiec flash.

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### 9.10 Tool Configuration

Active Tool		
Tool No.	<input type="text" value="0"/>	<input type="button" value="Clear Active Tool"/>
Tool Name	<input type="text"/>	
Tool Data		
Tool No.	<input type="text" value="1"/>	<input type="button" value="Activate Selected Tool"/>
Tool Name [10 characters]	<input type="text" value="rrrr"/>	
Tool Status	<input type="button" value="Enabled"/>	<input type="button" value="Enable"/> <input type="button" value="Disable"/>
Tool Mass	Tool Offsets	Orientation of Tool Tip
Mass <input type="text" value="15.000"/>	X <input type="text" value="9.000"/>	Rx <input type="text" value="0.000"/>
	Y <input type="text" value="236.200"/>	Ry <input type="text" value="-180.000"/>
	Z <input type="text" value="1000.569"/>	Rz <input type="text" value="180.000"/>
Center of Gravity	Moment of Inertia	<small>The TCP is the offset from Flange Center Point</small> 
Xg <input type="text" value="0.120"/>	Ix <input type="text" value="4.000"/>	
Yg <input type="text" value="13.000"/>	Iy <input type="text" value="0.500"/>	
Zg <input type="text" value="0.000"/>	Iz <input type="text" value="6.000"/>	
<input type="button" value="Save All Tool Data To File"/>		

#### Active Tool

- Displays active tool number.
- Clear Active Tool button will set Active Tool no. to -1 and sets all current active tool offsets to 0 inside AXES\_GROUP\_REF on MPiec.

#### Tool Data

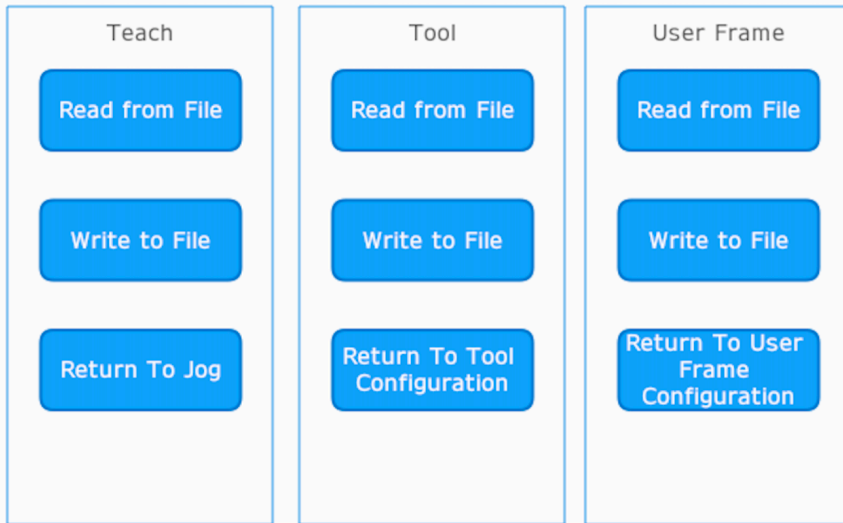
- Changing Tool No. selects the tool number.
- Pressing Activate Selected Tool button activates the currently selected tool and sends the tool definition to the MPiec controller. Tool Status must be Enabled by pressing the Enable button.
- If Tool Status is Disabled, changes made on pendant screens are not sent to the MPiec.
- Tool Mass, Tool Offsets, Orientation, Center of Gravity, and Moment of Inertia values define the tool.
- Save All Tool Data to File button saves the definitions of all tool numbers to MPiec flash.

**Title:** TP100 Application Note

**Product(s):** TP100

Doc. No. AN.TP100.01

## 9.11 File Management



### Teach/Tool/User Frame

Teach Points, User Frame, Tool data from MPiec Pendant\_Driver UserApplicationData are stored and read from a file in MPiec flash memory located in /user/data/.

- Tool file name: MyTools.TOL
- User frame file name: MyUserFrames.FS
- Teach point file name: MyTeachPoints.TPL

MyTools.TOL and MyUserFrames.FS can be read as a CSV file while MyTeachPoints.TPL is a binary file

## Title: TP100 Application Note

Product(s): TP100

Doc. No. AN.TP100.01

### 9.12 Home Setting

Teach Pendant - Home Settings

Group Name	Group Active	Alarm/Error ID	Reset Alarm/Error
delta	YES	0	Reset Alarm/Error

Idle

Set Current Position as Home	Set Home Offsets	Set Current Joint Position
A1 1028.299	A1 0.000	A1 0.000
A2 -75.894	A2 0.000	A2 0.000
A3 122.471	A3 0.000	A3 0.000
A4 26.275	A4 0.000	A4 0.000
A5 22.127	A5 0.000	A5 0.000
A6 -34.580	A6 0.000	A6 0.000
A7 0.000	A7 0.000	A7 0.000
A8 0.000	A8 0.000	A8 0.000

Buttons: Set Current Position as Home, Get Current Home Offsets, Set Home Offsets, Set Current Joint Position, ?

*Note: The units for each column (deg, pulses) will be interpreted accordingly by the MPiec controller when the group is a Mechatrolink (Local) group.*

#### Set Current Position as Home:

This function sets the current axis position of each axis in the axes group to the home position (axis position zero). It is assumed that the user has moved all axes to the home position prior to setting as home. The current feedback position is shown for each axis in this column. The feedback position for each axis will change to zero after Set Current Position as Home.

#### Set Home Offsets

- *Get Current Home Offsets* button

The current axis offsets **stored on the controller** can be read using the "**Get Current Home Offsets**" function. These offsets can be edited, or written without editing, to the controller using the "**Set Home Offsets**" function.

**Title:** TP100 Application Note

**Product(s):** TP100

Doc. No. AN.TP100.01

- *Set Home offsets* button

This function sets the axis offsets for each axis in the axes group. For local hosted groups, units are in user units. For remote hosted groups, units are in counts.

## **Set Current Joint Position**

- *Set Current Joint Position* button

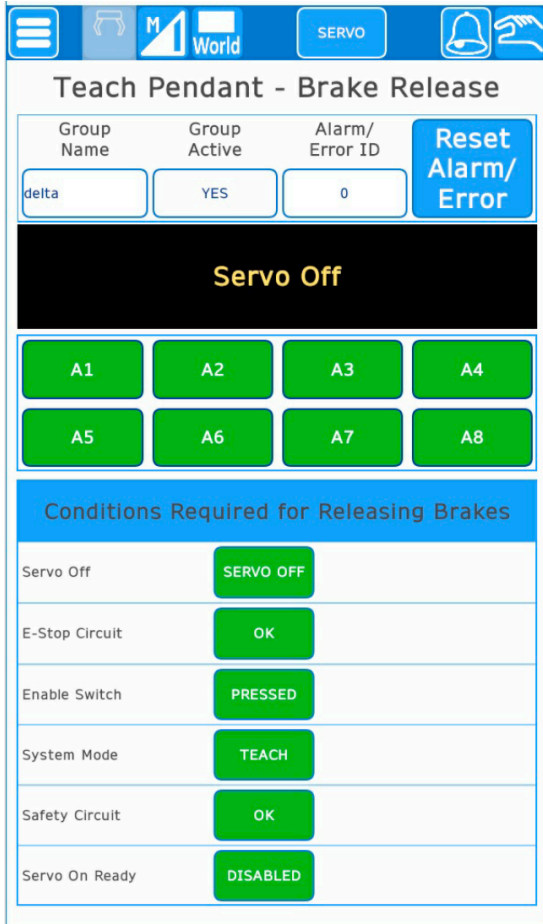
This function sets the current axis position of each axis in the axes group to the positions shown in this column. The current axis feedback position is shown in Column 1. These axis feedback positions will change to the set positions after Set Current Joint Position. Supported for Mechatrolink (Local) groups only.

## Title: TP100 Application Note

Product(s): TP100

Doc. No. AN.TP100.01

### 9.13 Brake Release



Group Name	Group Active	Alarm/Error ID	Reset Alarm/Error
delta	YES	0	Reset Alarm/Error

**Servo Off**

A1 A2 A3 A4  
A5 A6 A7 A8

#### Conditions Required for Releasing Brakes

Servo Off	SERVO OFF
E-Stop Circuit	OK
Enable Switch	PRESSED
System Mode	TEACH
Safety Circuit	OK
Servo On Ready	DISABLED

Buttons A1-A7 release brakes for axes A1-A7.

#### Conditions Required for Releasing Brakes

- All conditions for releasing brakes are required to be Green. (To exit Servo On Ready, the E-Stop must be pressed first.)
- User must hold Enable switch AND be pressing the axis button (A1, etc) at the same time for brake to be released
- If user lets go of Enable OR axis button, brakes re engage

**Title:** TP100 Application Note

**Product(s):** TP100

Doc. No. AN.TP100.01

## 9.14 Alarms/Errors

The screenshot shows the 'Teach Pendant - Alarms/Errors' interface. At the top, there is a navigation bar with icons for menu, home, M, World, SERVO, and a bell icon. Below the navigation bar, the title 'Teach Pendant - Alarms/Errors' is displayed. The main content is a table with the following data:

	ID	Description
Group Error Class	0	See Alarm/Error Code Descriptions in User Documentation
Group Error	0	
Function Error	9252	
Axis Error Class	0	
Axis Alarm	0	
Controller Alarm	0	

At the bottom of the screen, there is a blue button labeled 'Reset Alarm/Error'.

The Alarms/Errors screen displays the ID and description of any active alarm/error.