

WEINTEK LABS., INC.

# iR-PU01-P CAM

## Electronic CAM Demonstration

Demo Project

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# 1. Overview & Operation

## Overview

This demo project explains how to use CODESYS and iR-PU01-P's CAM feature to achieve synchronized motion control.

For users who use cMT-CTRL01 as a controller, open this file:

iR\_PU01\_CAM\_Demo\_CTRL01

For users who use a cMT Series HMI model as a controller, open this file:

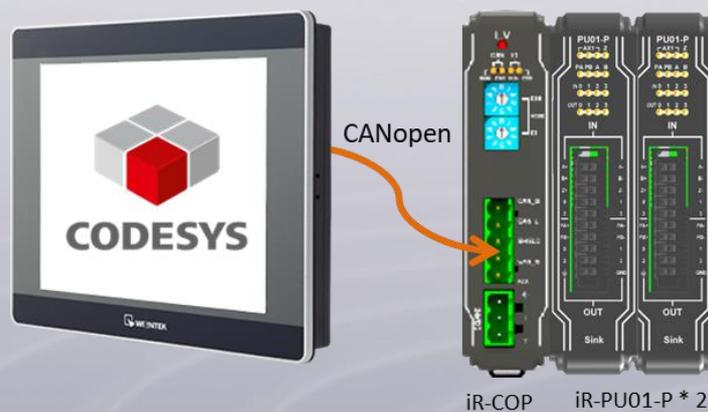
iR\_PU01\_CAM\_Demo\_HMI

## Operation

cMT-CTRL01 :

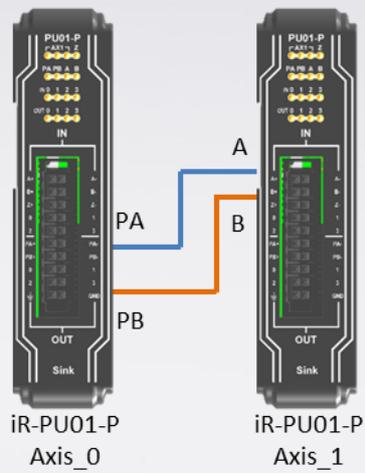


cMT-HMI :



## iR-PU01-P CAM

iR-PU01-P Wiring:



Axis\_0: Master axis that performs velocity control.

Axis\_1: Slave axis that follows the movement of the master axis to perform CAM motion.

## **2. CODESYS Settings**

### **Adding iR-PU01-P**

#### **cMT-CTRL01:**

[iBus] -> [Add Device] -> [Miscellaneous] -> [iR-PU01-P]

Add 2 iR-PU01-P.

#### **cMT Series HMI:**

Add [CANbus]:

[Device] -> [Add Device] -> [Fieldbusses] -> [CANbus]

Baudrate setting must be identical to that of iR-COP.

Add [CANopen\_Manager]:

[CANbus] -> [Add Device] -> [Fieldbusses] -> [CANopen] ->

[CANopen\_Manager]

Add [iR-COP]:

[CANopen\_Manager] -> [Add Device] -> [Fieldbusses] -> [CANopen] ->

[Remote Device] -> [iR-COP]

## Setting iR-PU01-P and CAM parameters

### Axis\_0 Pulse Setting:

Pulse Output Method: The output method of Axis\_0 must be the same as the input method of Axis\_1.

### Axis\_1 Pulse Setting:

Pulse Input Method: Set the 4<sup>th</sup> bit to 1 (master axis) and the input method of Axis\_1 must be the same as the output method of Axis\_0.

Master axis encoder settings: The following parameters should not be 0.

- 2<sup>nd</sup> additional position encoder resolution – encoder increments

- 2<sup>nd</sup> additional position encoder resolution – motor revolution

- 2<sup>nd</sup> additional gear ratio – motor shaft revolutions

- 2<sup>nd</sup> additional gear ratio – driving shaft revolutions

- 2<sup>nd</sup> additional feed constant – feed

- 2<sup>nd</sup> additional feed constant – driving shft revolutions

### Axis\_1 CAM Table Setting:

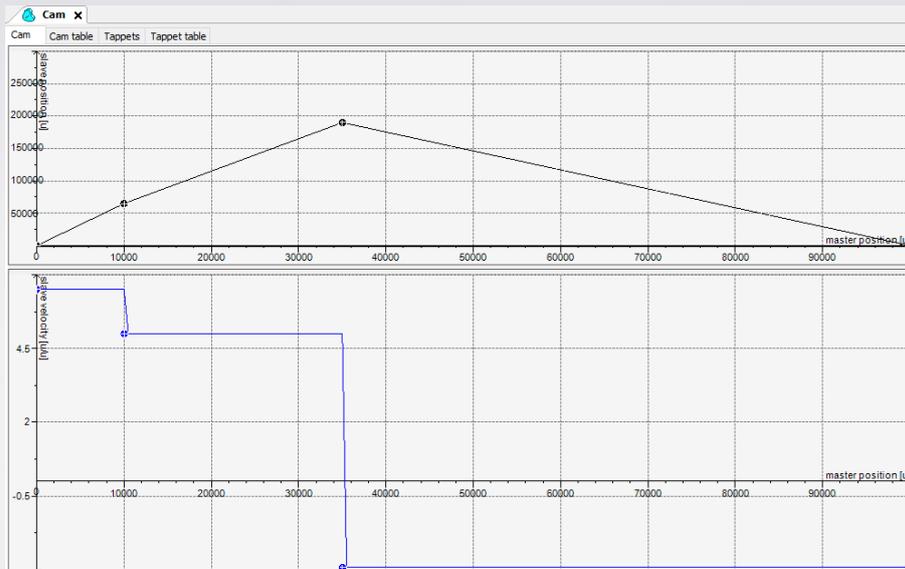
Before editing the CAM table, please enable the CAM features in CODESYS Softmotion, and then define the X, Y coordinates of the points in the CAM table.

Find the CAM table in CAM\_table project.

In the CAM table define the X, Y coordinates of the points.

Cam x											
Cam	Cam table	Tappets	Tappet table								
	X	Y	V	A	J	Segme...	min(Po...	max(P...	max( V...	max( A...	
	0	0	6.5	0	0						
+						Line	0	65000	6.5	0	
+	10000	65000	5	0	0						
+						Line	65000	190000	5	0	
+	35000	190000	-2.9230...	0	0						
+						Line	0	190000	2.9230...	0	
	100000	0	-2.9230...	0	0						

The points are linked to form the cam profile.



Fill in these iR-PU01-P parameters:

X-coordinate: (CAM Table 0 – X(Master) point1~50)

Y-coordinate: (CAM Table 0 – Y(Slave) point0~50)

Velocity: (CAM Table 0 – V point 0~50)

Acceleration rate: (CAM Table 0 – A point 0~50)

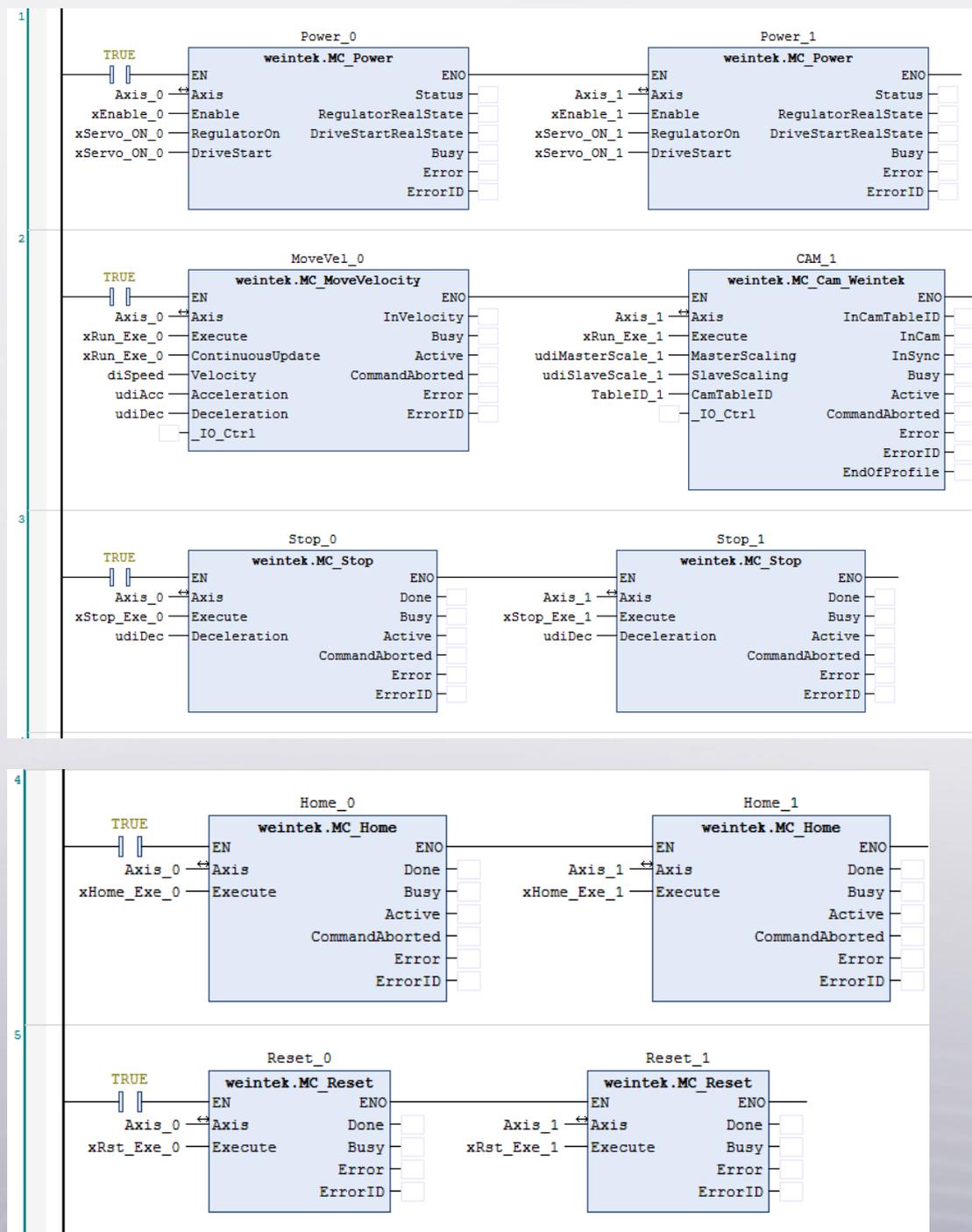
Module Parameters	Parameter	Type	Value	Default Value
Module I/O Mapping Status Information	<input checked="" type="checkbox"/> M3-CAM Motion -Moving Average Size	USINT	0	0
	<input checked="" type="checkbox"/> M3-CAM Motion -MasterOffset	DINT	0	0
	<input checked="" type="checkbox"/> M3-CAM Motion -SlaveOffset	DINT	0	0
	<input checked="" type="checkbox"/> M3-CAM Motion -StartMode(Slave Start Direction)	USINT	0	0
	<input checked="" type="checkbox"/> M3-CAM Motion -EngageMode(Master)	USINT	0	0
	<input checked="" type="checkbox"/> M3-CAM Motion -EngagePosition(Master)	DINT	0	0
	<input checked="" type="checkbox"/> M3-CAM Motion -EngageDirection(Master)	USINT	0	0
	<input checked="" type="checkbox"/> M3-CAM Table 0 -Mode	USINT	0	0
	<input checked="" type="checkbox"/> M3-CAM Table 0 -Periodic	USINT	1	1
	<input checked="" type="checkbox"/> M3-CAM Table 0 -MasterAbsolute	USINT	0	0
	<input checked="" type="checkbox"/> M3-CAM Table 0 -SlaveAbsolute	USINT	0	0
	<input checked="" type="checkbox"/> M3-CAM Table 0 -Transition Direction(Slave)	USINT	0	0
	<input checked="" type="checkbox"/> M3-CAM Table 0 --X(Master) point 01	UDINT	10000	0
	<input checked="" type="checkbox"/> M3-CAM Table 0 --X(Master) point 02	UDINT	35000	0
	<input checked="" type="checkbox"/> M3-CAM Table 0 --X(Master) point 03	UDINT	100000	0
	<input checked="" type="checkbox"/> M3-CAM Table 0 --X(Master) point 04	UDINT	0	0

### 3. Demonstration

#### PLC\_PRG

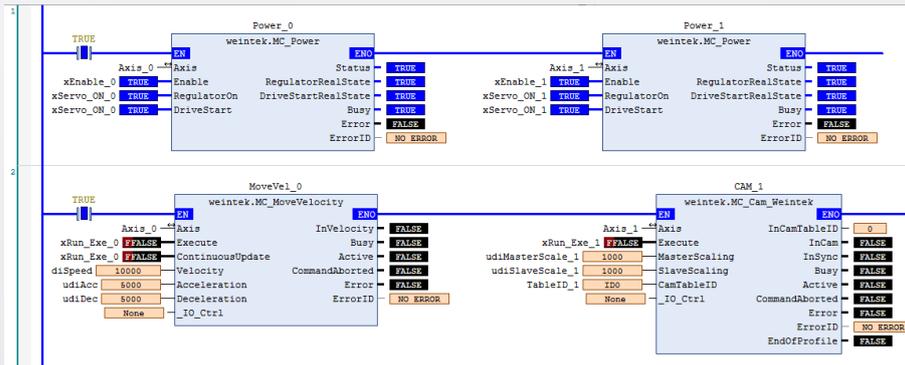
Axis\_0: MC\_MoveVelocity, Axis1: MC\_CAM\_Weintek

Number 0 in the Function Block indicates Axis\_0 and number 1 = Axis\_1.

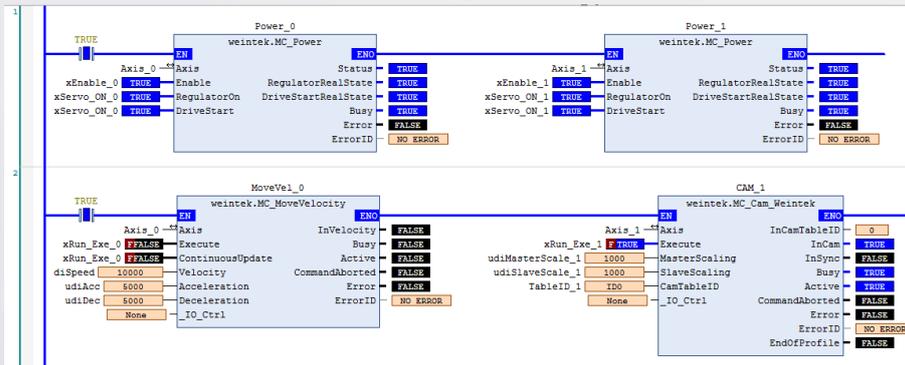


## 4. Operation

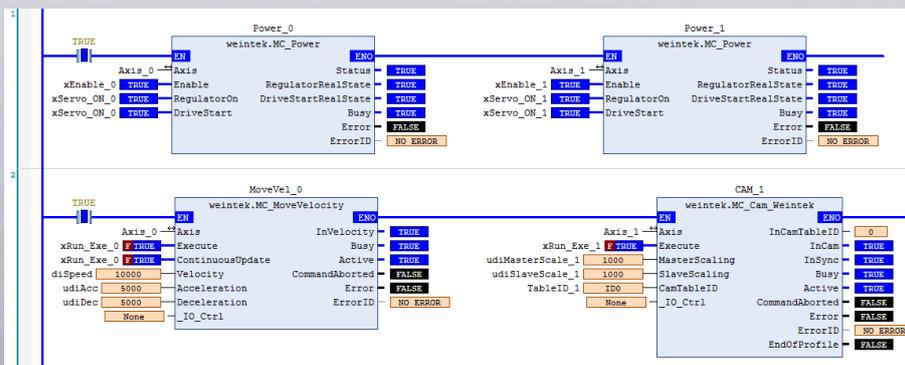
When running the program, set xEnable\_0, xEnable\_1, xServo\_ON\_0, and xServo\_ON\_1 to TRUE, and then execute Axis\_0 and Axis\_1 to perform motion control.



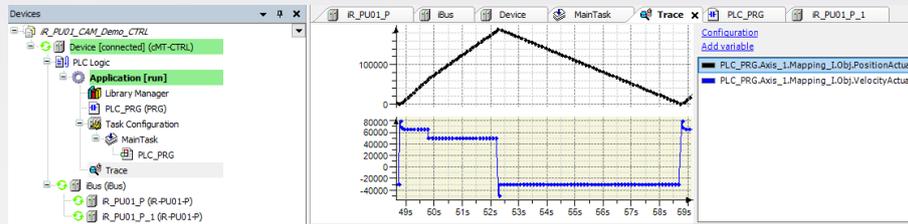
Set xRun\_Exec\_1 to TRUE to make Axis\_1 start performing CAM motion.



Following previous step, set xRun\_Exec\_0 to TRUE to make Axis\_0 start continuous movement. Axis\_1 will follow the movement of Axis\_0 according to the settings in the CAM table.



Open the Trace tab under Device to trace Axis\_1's PositionActual & VelocityActual variables and compare the position and velocity with those in the CAM table.



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