PAC Network for EH Sequence Position Control

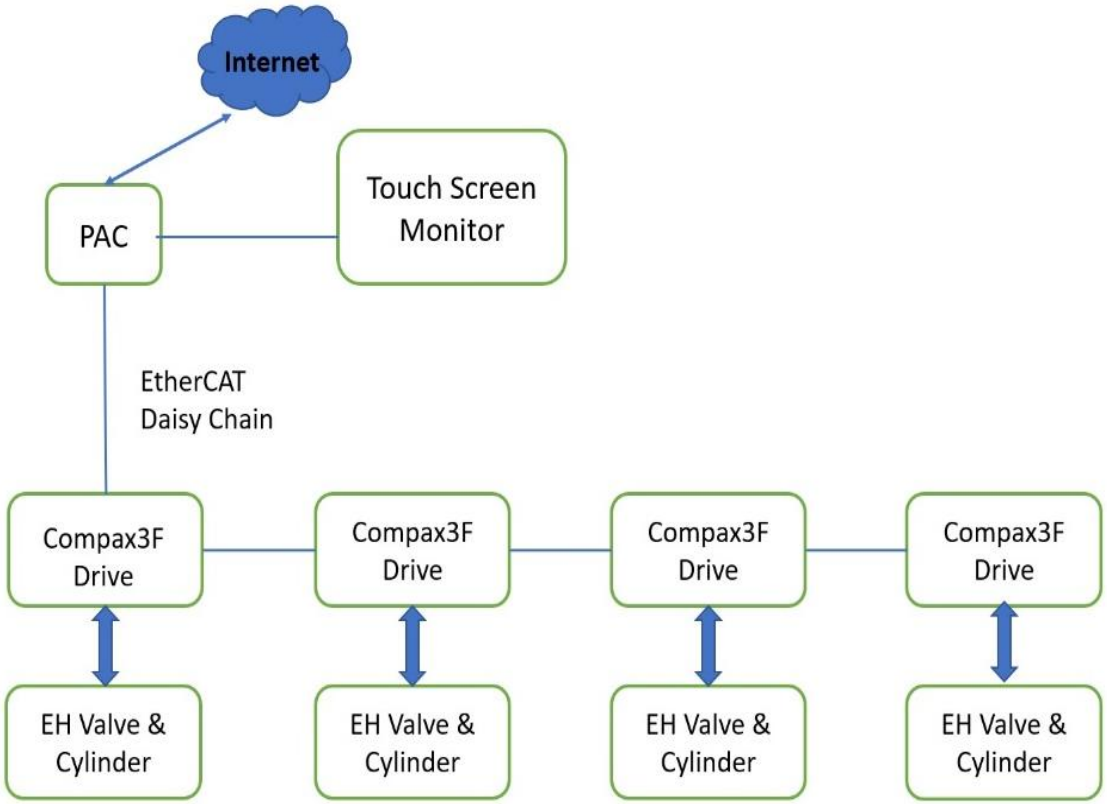
Introduction

- The

Objectives

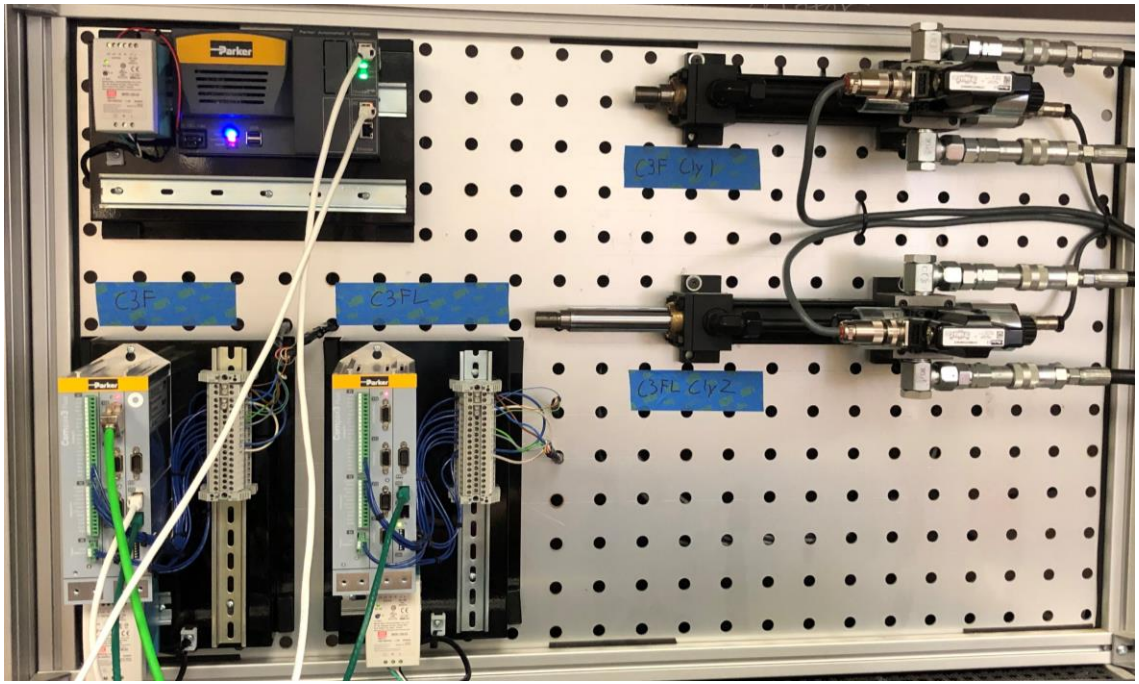
- Double cylinder hydraulic system is the basic hardware part of this Remote Hydraulic Lab System. It includes two Parker hydraulic servo systems and a Parker automation controller (PAC).
- The double cylinder hydraulic system allows user to control the cylinder movements by programing PAC following IEC61131-3 standards. Human machine interface can also be programed in PAC visualization environment.
- The hydraulic servo systems can achieve closed-loop control to the cylinders. The servo systems support jogging control, positioning control, and velocity control. They can also feedback running status of the cylinders to the upper computer.
- The communication between hydraulic servo systems and PAC is established on EtherCAT principle.

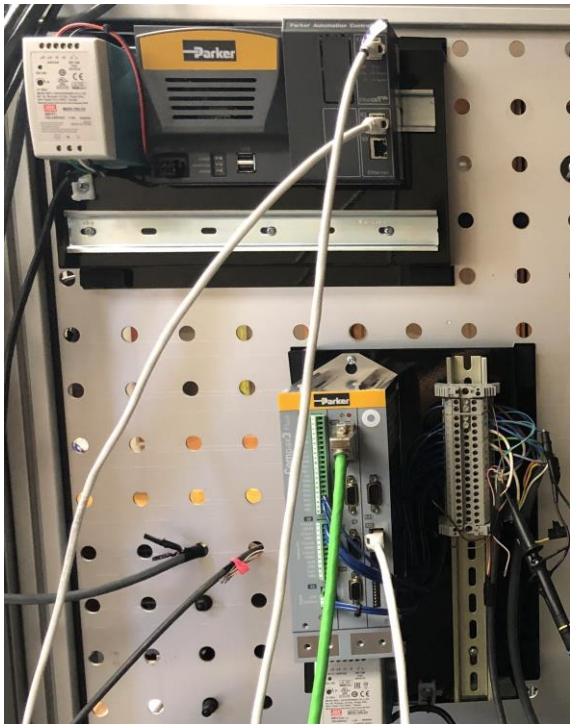
System Overview



An Automated Electro-Hydraulic Motion Control System
with PAC controller and Four Stations

System Overview





The Setup with PAC Controller and Two EH Station

Hardware

Name	Component Type	Part #
Parker Automation Controller (PAC)	System controller	PAC320-CWE21-31
Compax 3F	Compact servo drive	C3F001D2F12 I31 T40 M12
DF Plus	Servo valve	D1FPE50FB9NB00 20
Parker HMI	HMI display	XPR06VT-2P3
Parker Series 3L	Hydraulic cylinder with position sensor	01.50 F3LLUS23A 12.000
Parker H-Pak	Hydraulic power supply	H1B2 7T10P0X13909/13

Software

- **PAC Integrated Development Environment (IDE)**
  - **Devices Management**
  - **Open PLC(IEC61131-3)**
  - **Visualization(WebVisualization)**
- **Parker Servo Manager**
  - **Hydraulic Servo Drive Configuration**
  - **Link CODESYS Program**
- **CODESYS**
  - **Hydraulic Servo Drive Programming**

System Programming and Configuration

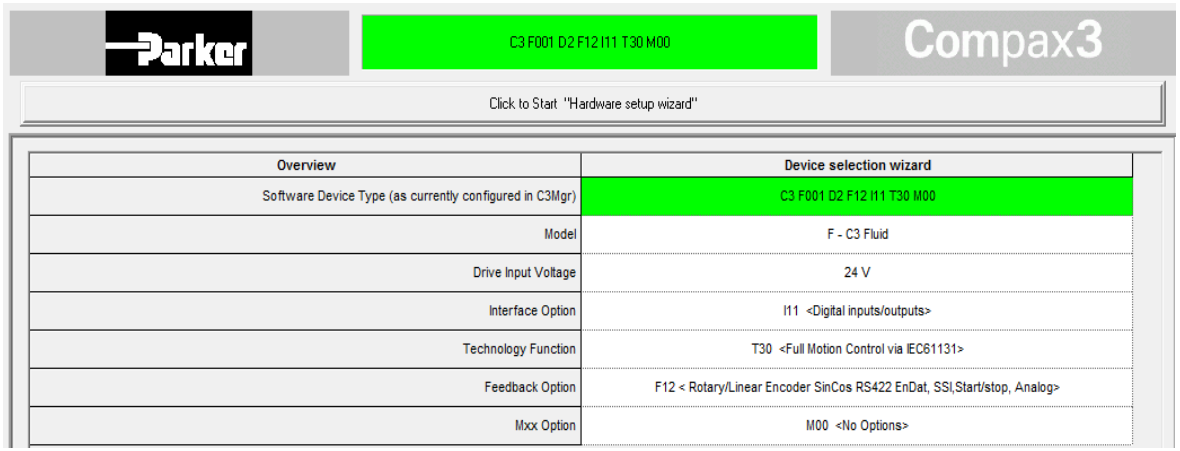
- **Master**
  - **Start PAC IDE**
  - **Install devices and set EtherCAT network parameters at PAC**
  - **Write open PLC and visualization program at PAC**
- **Slave**
  - **Configure Compax3F**
  - **Set EtherCAT parameters at Compax3F**
  - **Program Compax3F by using CODESYS**

Compax3F Servo Drive

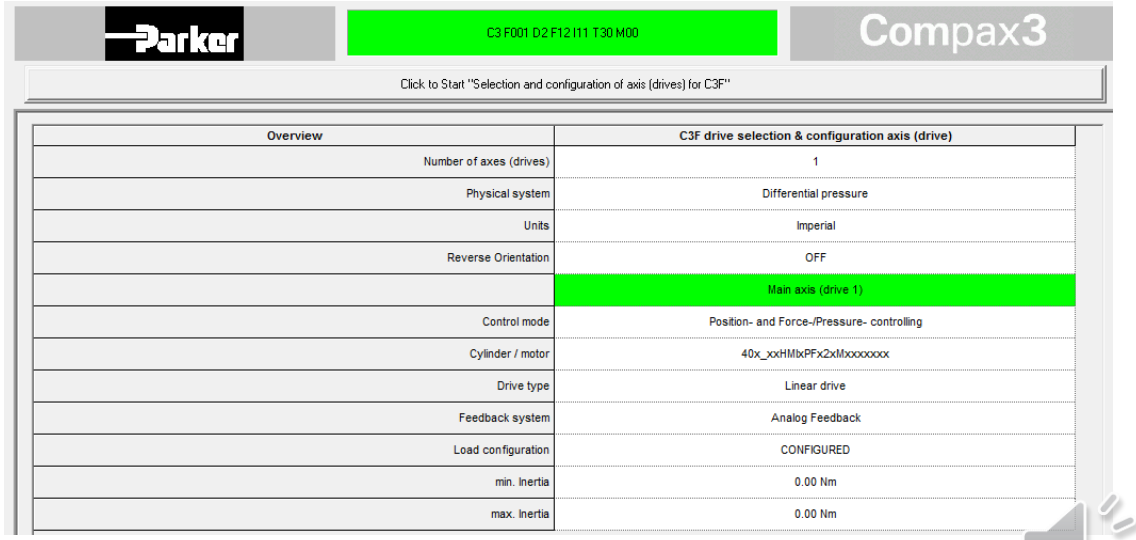
- **Can be used for velocity, position, force and pressure controls.**
- **Configured in the Parker Servo Manager**
- **Monitor all the status of Hydraulic Cylind**
- **Set hardware and software limits**

- **Uses a programming system based on the standard IEC61131-3, which can support function blocks, instruction lists, and structured text.**

Compax3F Configuration

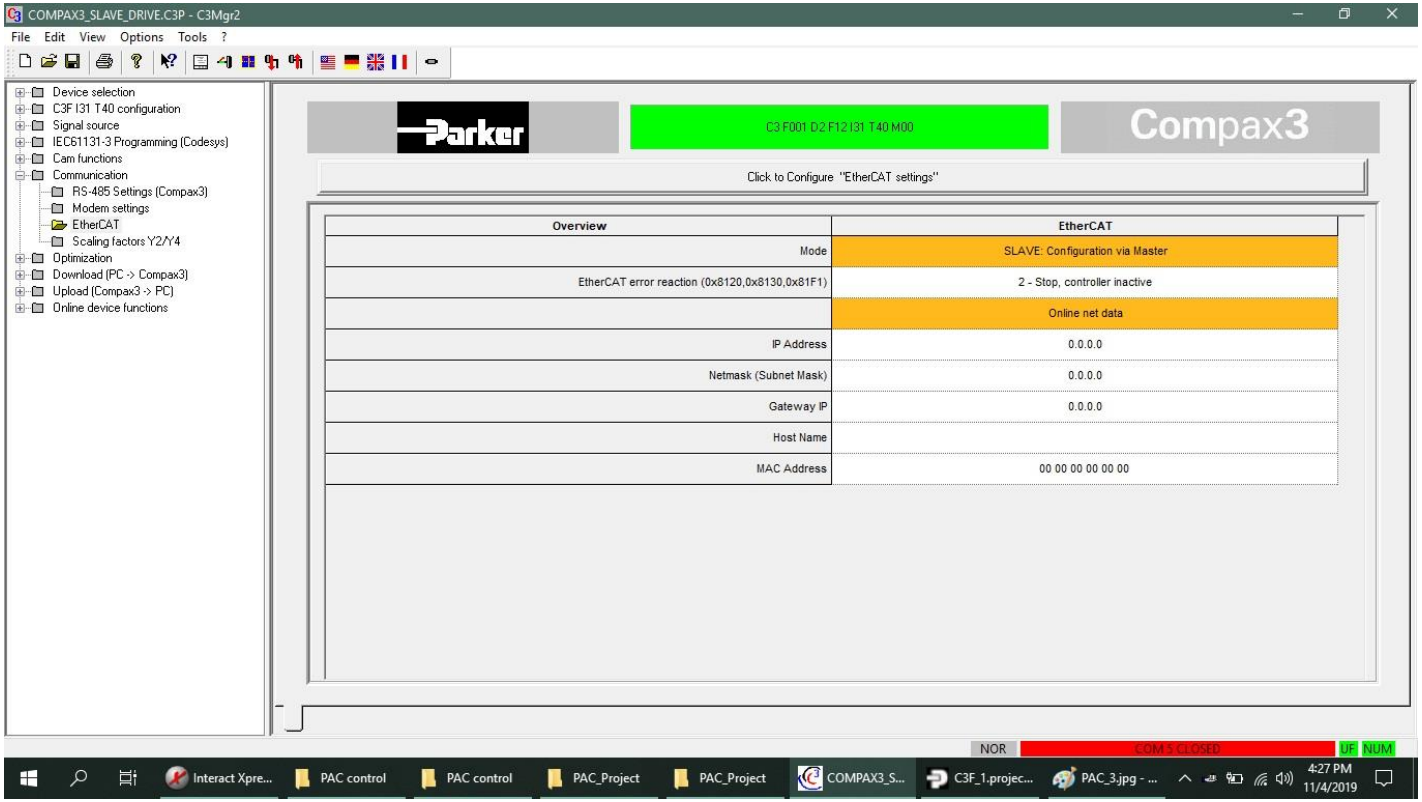


Overview	Device selection wizard
Software Device Type (as currently configured in C3Mgr)	C3 F001 D2 F12 I11 T30 M00
Model	F - C3 Fluid
Drive Input Voltage	24 V
Interface Option	I11 <Digital inputs/outputs>
Technology Function	T30 <Full Motion Control via IEC61131>
Feedback Option	F12 < Rotary/Linear Encoder SinCos RS422 EnDat, SSI,Start/stop, Analog>
Mxx Option	M00 <No Options>



Overview	C3F drive selection & configuration axis (drive)
Number of axes (drives)	1
Physical system	Differential pressure
Units	Imperial
Reverse Orientation	OFF
	Main axis (drive 1)
Control mode	Position- and Force-/Pressure- controlling
Cylinder / motor	40x_xxHMIxPFx2xMxxxxxxx
Drive type	Linear drive
Feedback system	Analog Feedback
Load configuration	CONFIGURED
min. Inertia	0.00 Nm
max. Inertia	0.00 Nm

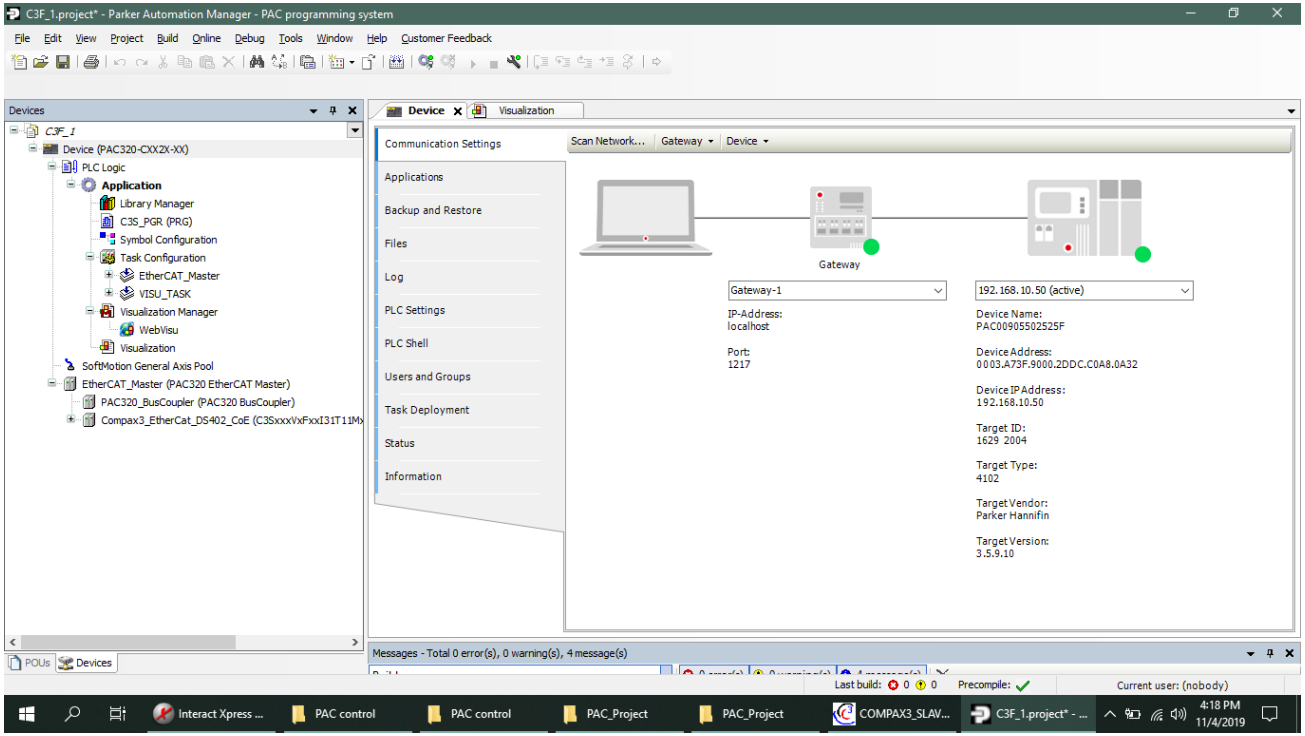
Compax3F Configuration



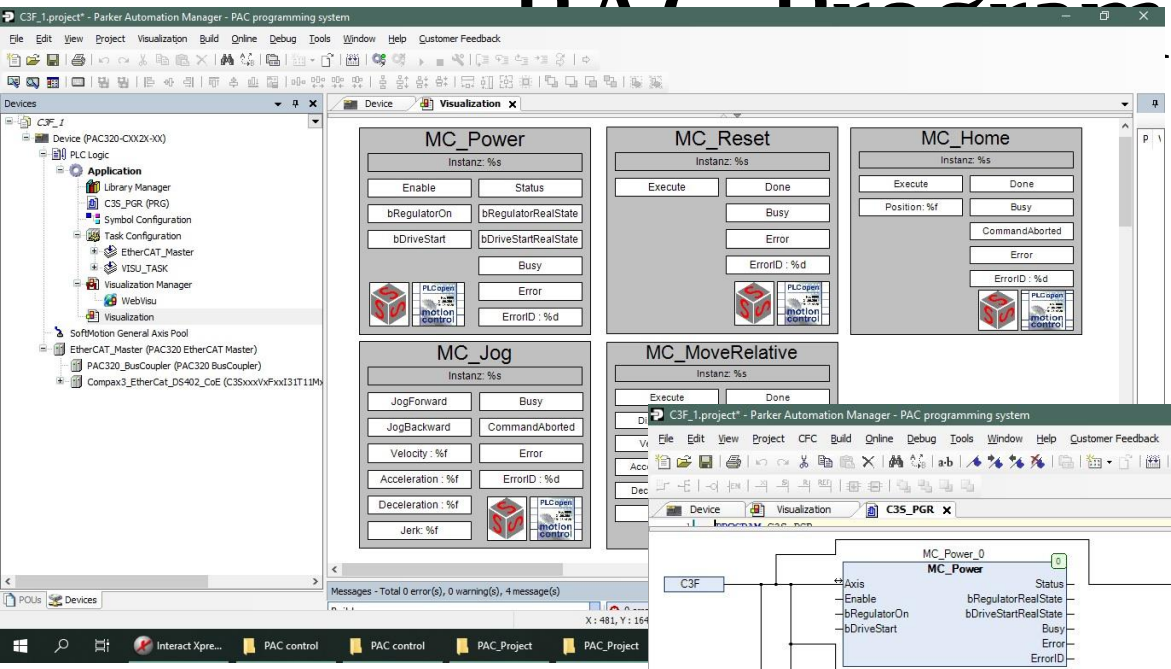
Parker Automation Controller (PAC)

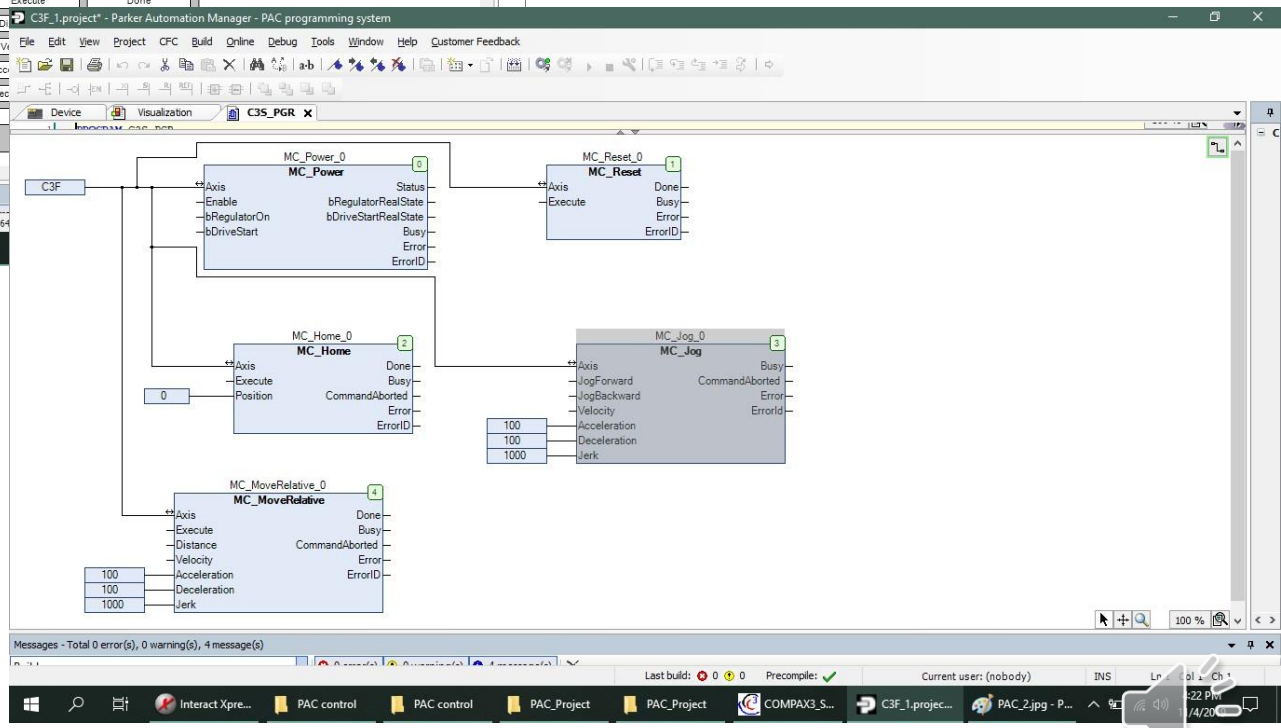
- Parker Automation Controller (PAC) provides advanced logic, signal handling, multi-axis motion control
- IEC61131-3 programming
- Visualization(Web)

PAC Configuration

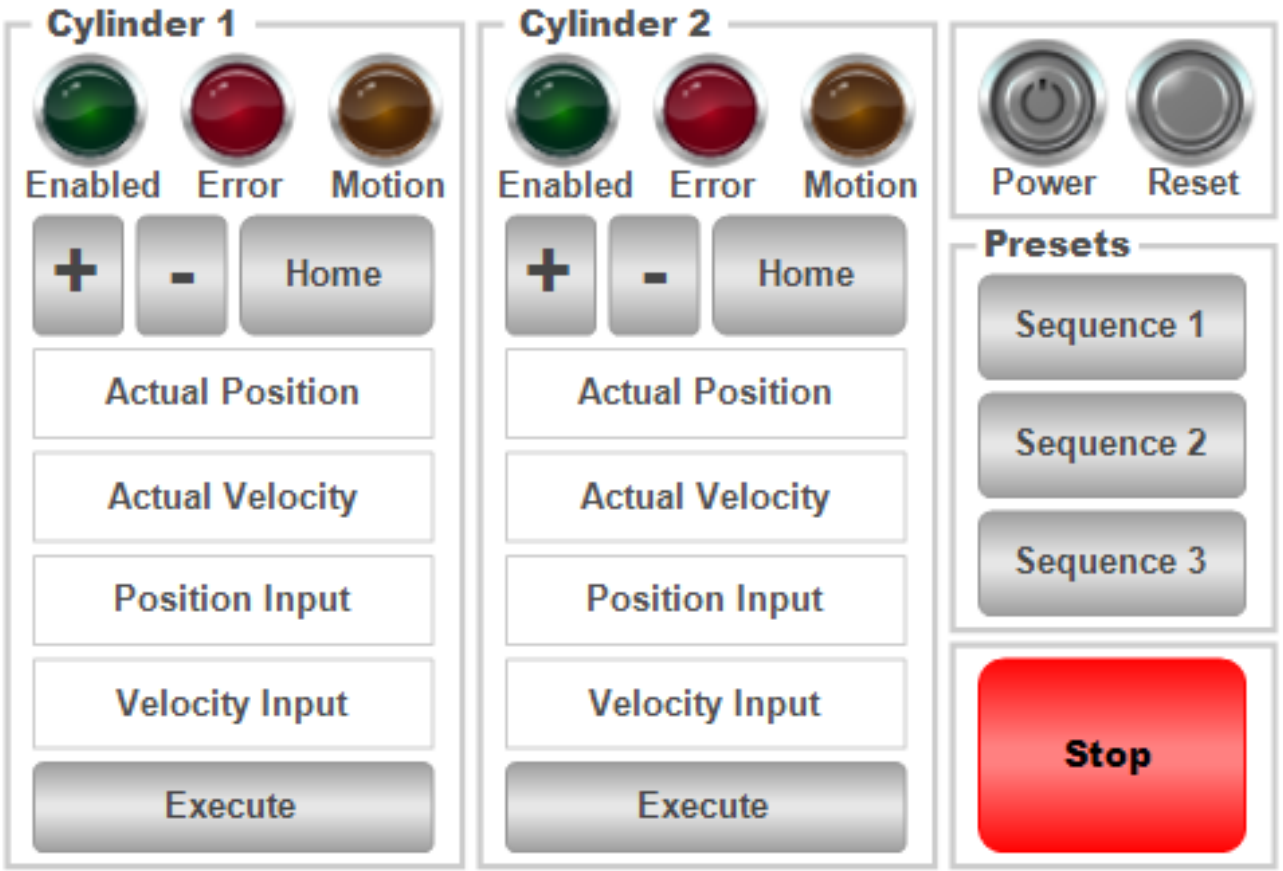


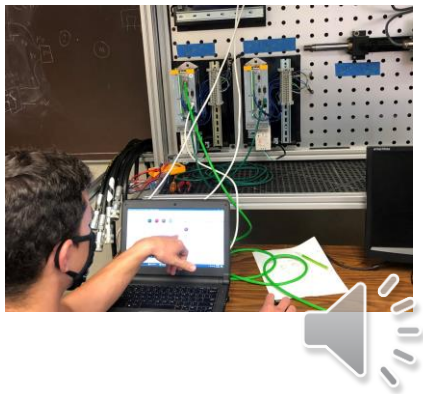
PAC Programming





PAC Integrated HMI Function





PAC Networked Control System