



University
of Idaho

Fanuc ROS2 Driver

Using Ethernet/IP

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- Undergraduate at University of Idaho studying Computer Science and Robotics
- Research Assistant at the Center for Intelligent Industrial Robotics
- ROS2 Driver we are developing using Ethernet/IP

Project



- At the University we have been collecting various robots
- Communicate with our FANUC Robots
- Using our own software

4 Layer System

- Layer 1: FANUC Ethernet/IP Driver
- Layer 2: Python Ethernet/IP Driver
- Layer 3: Python API
- Layer 4: ROS2 Package



Project Goals

The Project



- Easier way to communicate with industrial robots
- Using a high level language
- Works on a variety of robots
- Avoid vendor lock-in
- Focus on ease of use and accessibility

ROS2 Video Demo

- Language: Python
- ROS2 Humble
- OS: Linux (Pop! OS 22.04)
- Robot: CRX10iA/L
- Action servers / Goals / Feedback







FANUC Ethernet/IP Driver

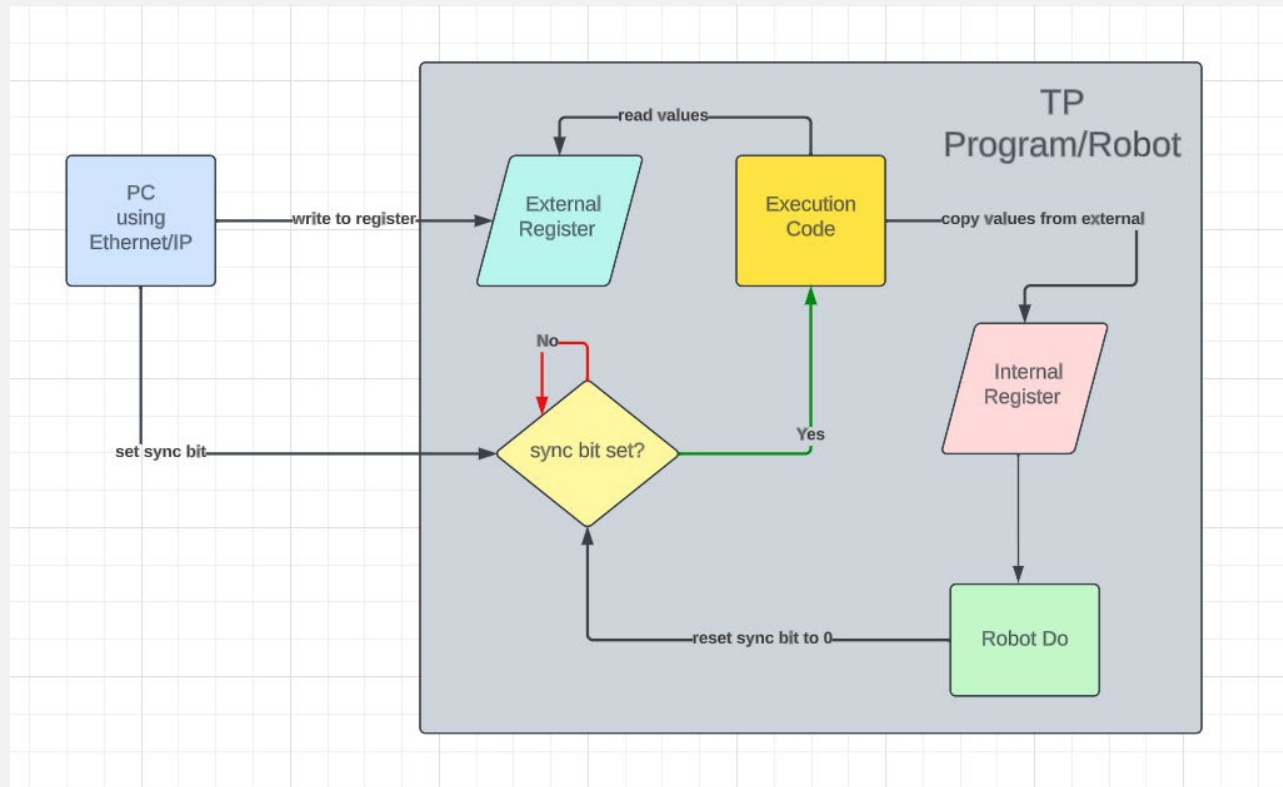
Layer 1

- Written for the FANUC TP language
- Works with 30 series controllers and FANUC robots with the Ethernet/IP driver
- Consists of foreground and background programs
- Compatible with RoboGuide Simulator



FANUC Ethernet/IP Driver

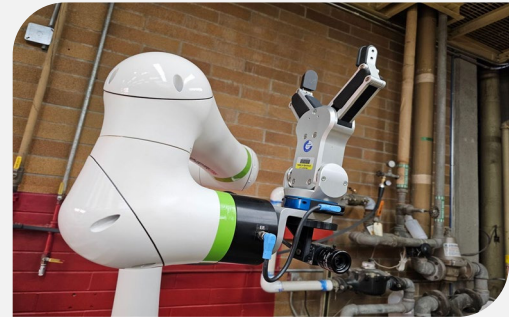
Block Diagram



Python Ethernet/IP Drivers

Layer 2

- Interprets data from robot
- Allows us to tell which registers to be written to on robot for movement and feedback
- Customizable for grippers - currently supports OnRobot & Shunk





Python API

Layer 3

- Layer between Ethernet/IP and ROS2
- Quick setup time
- Easy to use functions
- High level language that is easy to understand for controlling robots
- Extendable to other robots



ROS2 Driver

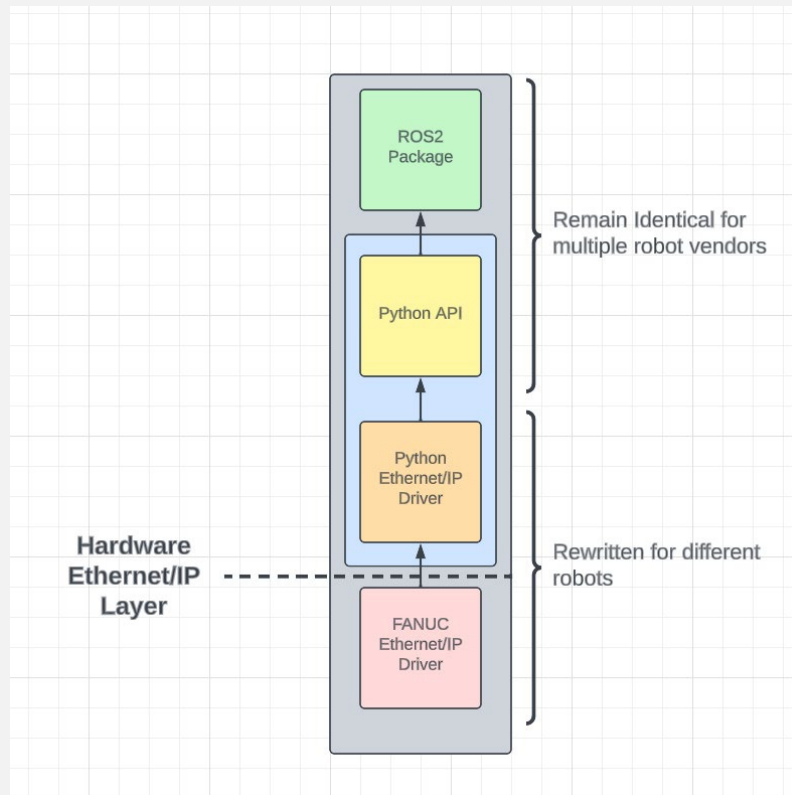
Layer 4

- Implements ROS2 architecture
- Industrial applications
- Allows creation of complex systems
- Action servers
- Callbacks
- PUB/SUB models



What this looks like

ROS2 Robotic Stack





Plans for the future

- Continue to increase functionality (Alarms!)
- More movement functionality (fine accuracy control)
- Add new modules (Grippers, custom sensors, etc...)
- Support more robots (UR, ABB, KUKA)
- Interface with Gazebo, MoveIt2



Check out our project at

<https://github.com/Uofl-CDACS>

Thank you for listening.

