Robot Arm documentation

Sensors:

ABB Integrated Force Control sensors allow robots to operate with the dexterity of the human hand [link](https://trends.directindustry.com/abb-robotics/project-30265-138629.html)

A picture containing cable, connector

Description automatically generated

Communication protocols (field bus):

The Common Industrial Protocol (CIP) family:

Managed by ODVA, CIP is a protocol that integrates control services, communication services, and routing capabilities based on Ethernet networks and the Internet. Each protocol differs from the physical link, data link, and network layer being used (see our previous post on the Communication protocols structure).

<https://blog.robotiq.com/bid/32559/What-Are-The-Communication-Protocols-Used-In-Industrial-Robotics>

EtherNet/IP: Ethernet Industrial Protocol is built on standard TCP/IP (IEEE 802.3) and communications use existing network infrastructure. Ethernet physical layer technology is used along TCP and UDP ports (44818 and 2222). Its main advantage comes from the inerrant progress of physical Ethernet, from 10 Mbits/s to 10/100 Mbits/s to 1 Gbits/s and more. EtherNet/IP also ensures Internet and enterprise connectivity for remote control.

ControlNet: Built on its own physical and data link layer, ControlNet uses a single media link with (inexpensive) RG-6 coaxial cables and bus. It features a 5­Mbits/s speed, upload/download of data, P2P communication, and up to 99 nodes.

DeviceNet: Uses Controller Area Network (CAN-bus) as a backbone for physical and data link layer. CAN-bus consists of a host processor, a controller, and a transceiver linked by 2 twisted pair cables. Bit rates go from 1 Mbit/s at 40 m to 20 Kbit/s at 1200 m. DeviceNet uses the master/slave mode; it can have up to 64 nodes and the physical network can provide power to the devices (with limited consumption).