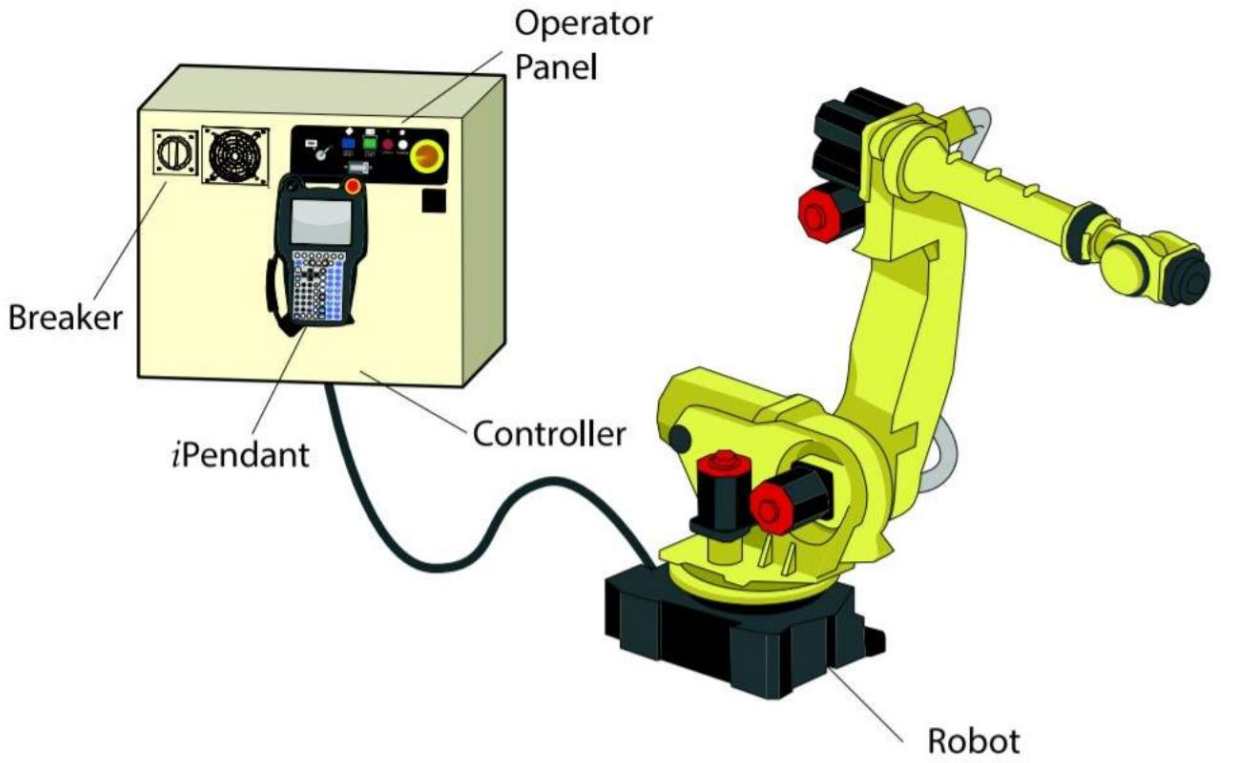
Chapter 29 Fanuc

Fanuc Robots

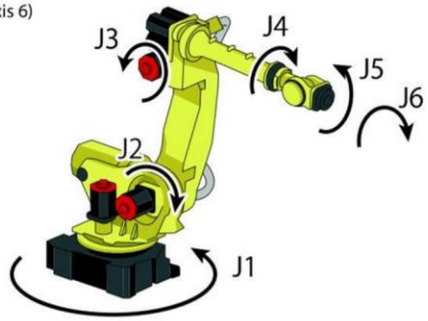
The robot shown here is a Fanuc robot. The U of Toledo is proud owners of three of these. They are for instructional purposes but can be used in industry exactly as is or with modifications based on the needs of the job. This chapter is not meant to provide a course in this robot, only a starter to acquaint students to the power and capability of these machines.



The Fanuc Robot above is a mechanical unit with six servo motors. The axes are labelled in the picture below:

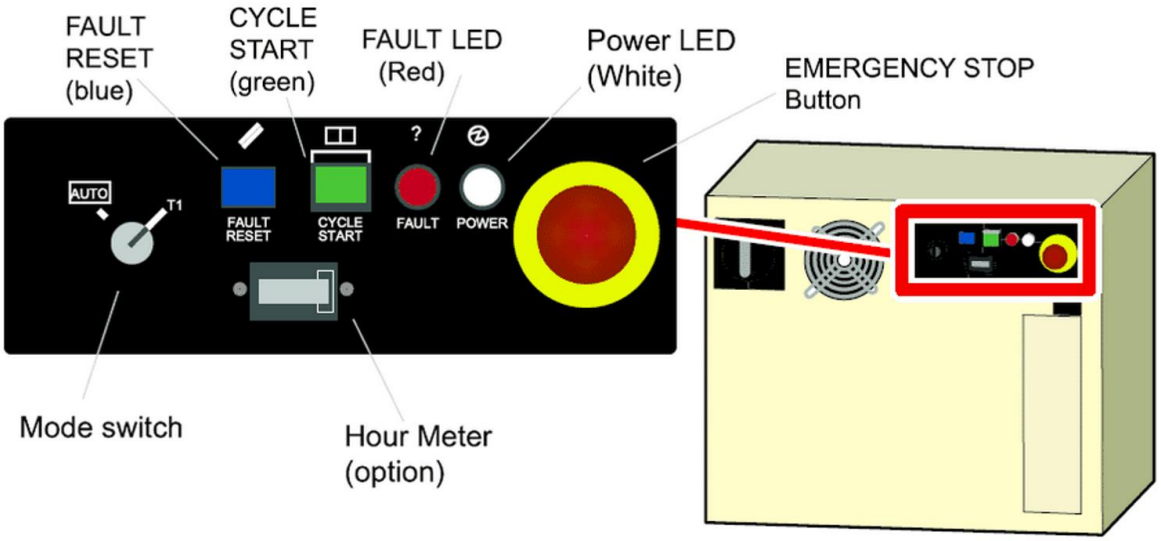
Major Axes:
J1 (Axis 1)
J2 (Axis 2)
J3 (Axis 3)

Minor Axes:
J4 (Axis 4)
J5 (Axis 5)
J6 (Axis 6)



- The first three axes (1, 2, and 3) make up the major axes.
- The next three axes (4, 5, and 6) are the minor axes.
- The movements are rotational twisting, up-and-down, and side-to-side motions.
- A robot is classified by the number of linear and rotational axes.

The operator panel on the unit is referred to as the Standard Operator Panel (SOP) and is pictured below:



The switches found on the SOP are given below with their function:

Item	Description
Emergency Stop	Applies robot brakes and removes power from motors.
Mode Switch	Selects between Auto, T1, or T2 mode.
Fault Reset	Clears a fault message from the iPendant Screen after fault has been corrected.
Cycle Start	Can start programs in Auto Mode. When lit, it indicates that a program is running.
Fault Indicator	When lit, indicates that a fault has occurred.
Power Indicator	When lit, indicates that the controller is on.
Hour Meter	Tracks Servo On time.

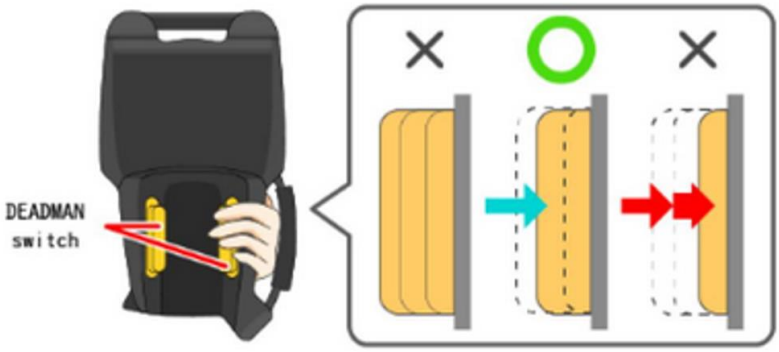
The mode switch found on the SOP can be set to either T1 or Auto. In larger units, the selector switch T2 is also provided. These switches allow reduced speed running to test the program prior to full Auto or production:

The Teach Pendant can also be used to cycle power. It can be used for configuring, programming and controlling the robot. Several of its functions are given in the following figures:

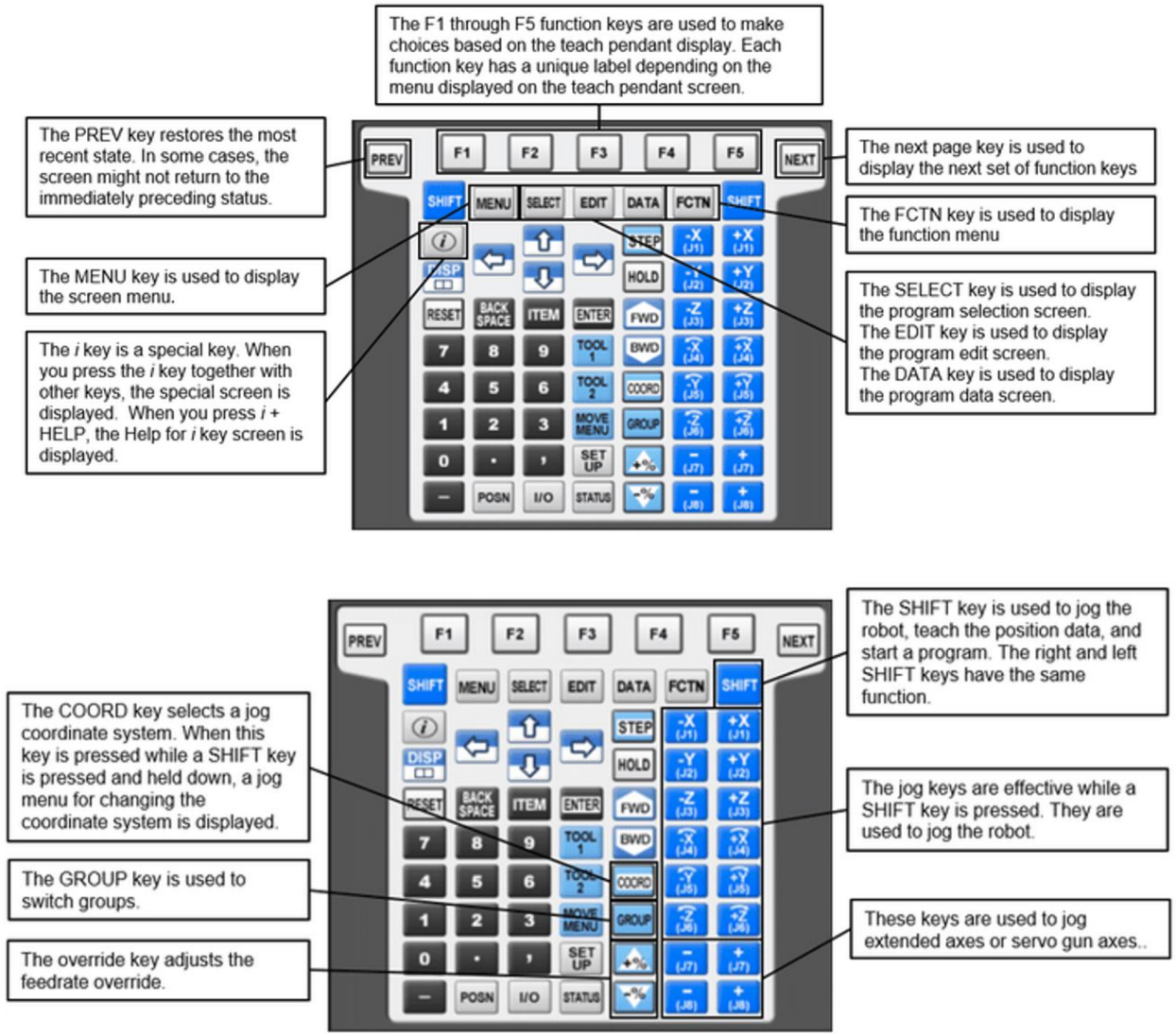
The teach pendant shown at right provides a number of functions for control of the robot including:

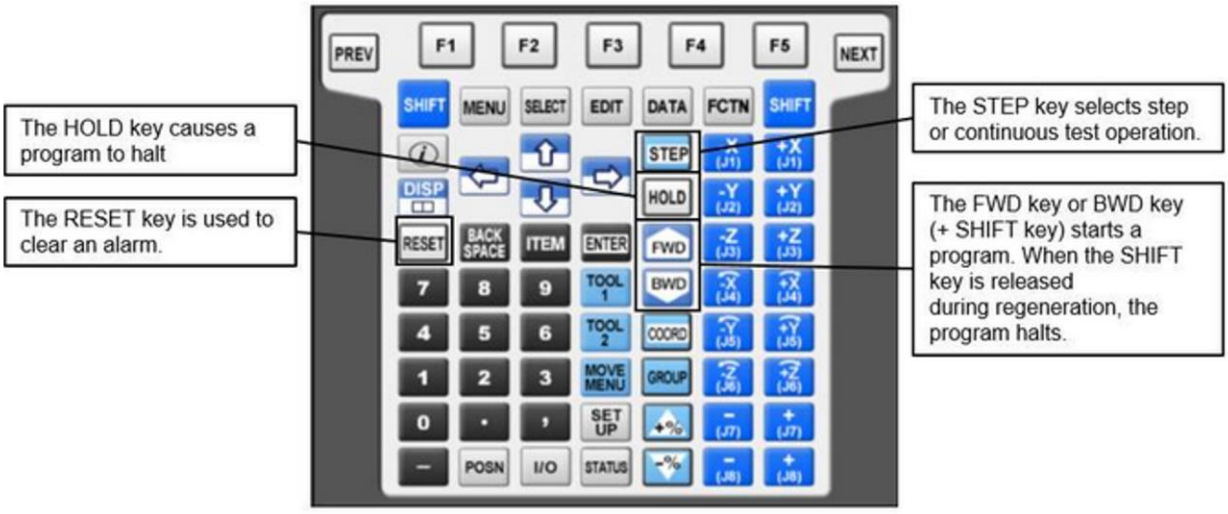
On/Off Switch
Many pop-up menues
USB Port
Displays
Helps screens

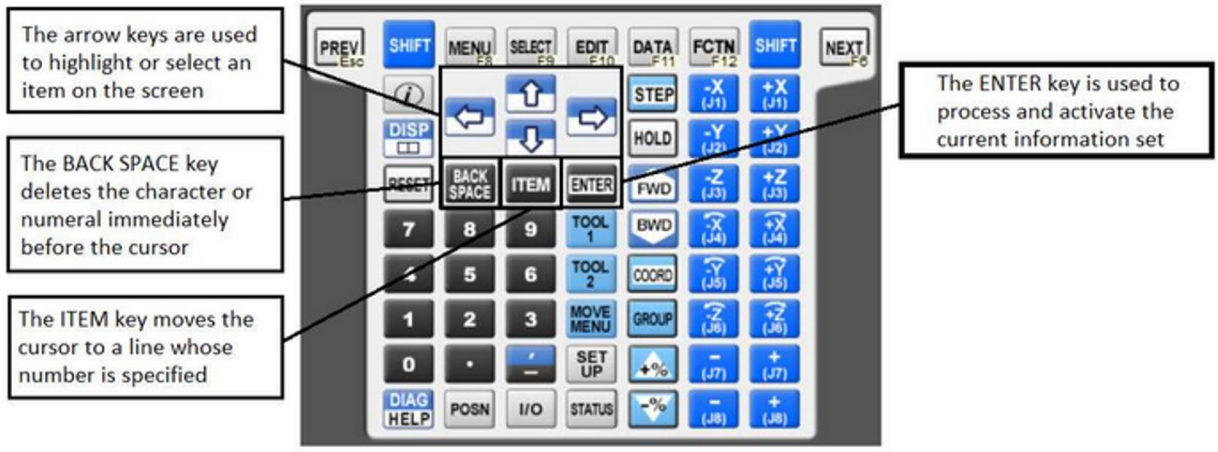
Shown next are the deadman switches and the position that must be maintained on the teach pendant to perform an operation:

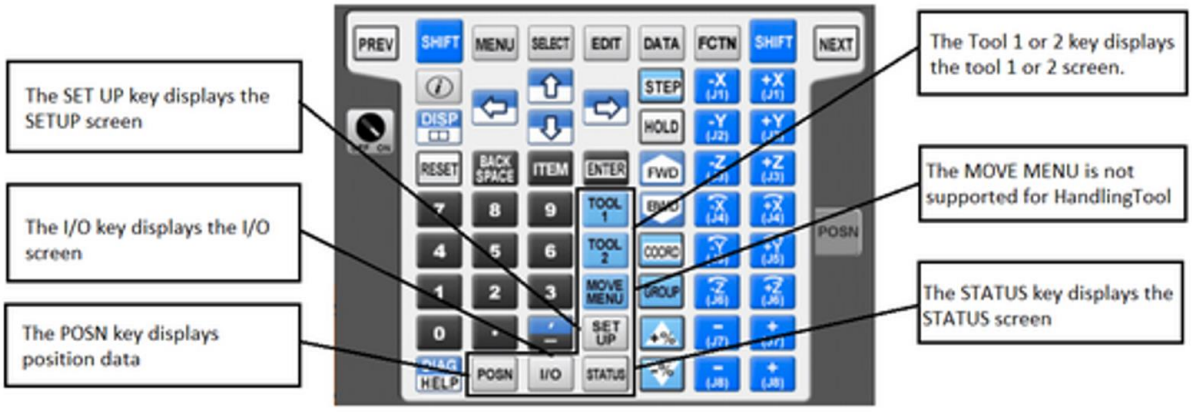


Pictured below are a number of figures showing the various keys and their function on the ipendant.




The HOLD key causes a program to halt
The RESET key is used to clear an alarm.
The STEP key selects step or continuous test operation.
The FWD key or BWD key (+ SHIFT key) starts a program. When the SHIFT key is released during regeneration, the program halts.


The arrow keys are used to highlight or select an item on the screen
The BACK SPACE key deletes the character or numeral immediately before the cursor
The ITEM key moves the cursor to a line whose number is specified
The ENTER key is used to process and activate the current information set


The SET UP key displays the SETUP screen
The I/O key displays the I/O screen
The POSN key displays position data
The Tool 1 or 2 key displays the tool 1 or 2 screen.
The MOVE MENU is not supported for HandlingTool
The STATUS key displays the STATUS screen

Here we stop the instruction in Fanuc and encourage you to find the robot, teach pendant and follow the youtube videos listed here:

Fanuc robot programming tutorial Part 1- Teach pendant

https://www.youtube.com/watch?v=UHSZeU5eyKY

FANUC Robot programming Tutorial part 2 - Pick and Place

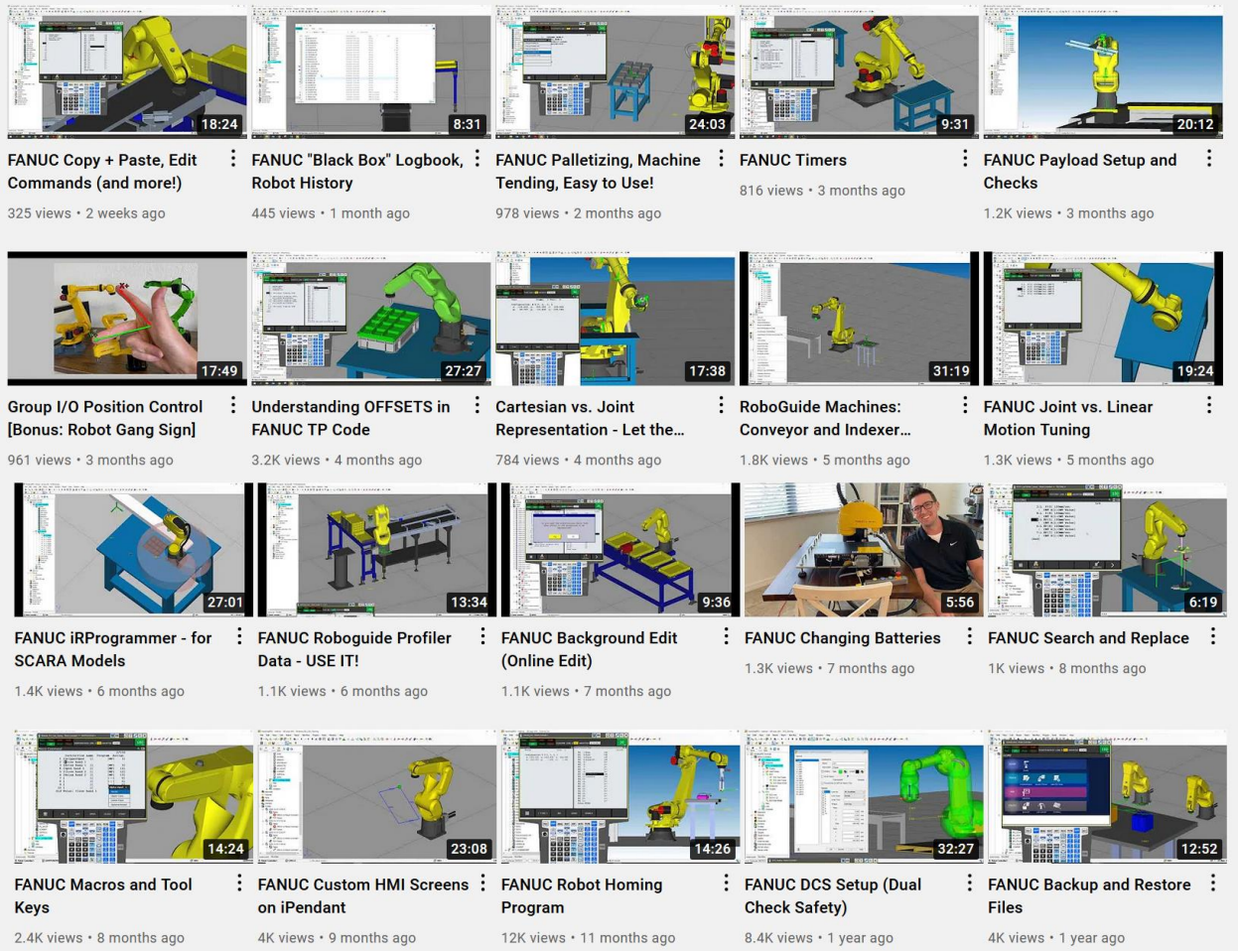
https://www.youtube.com/watch?v=Em11oXd3J5s

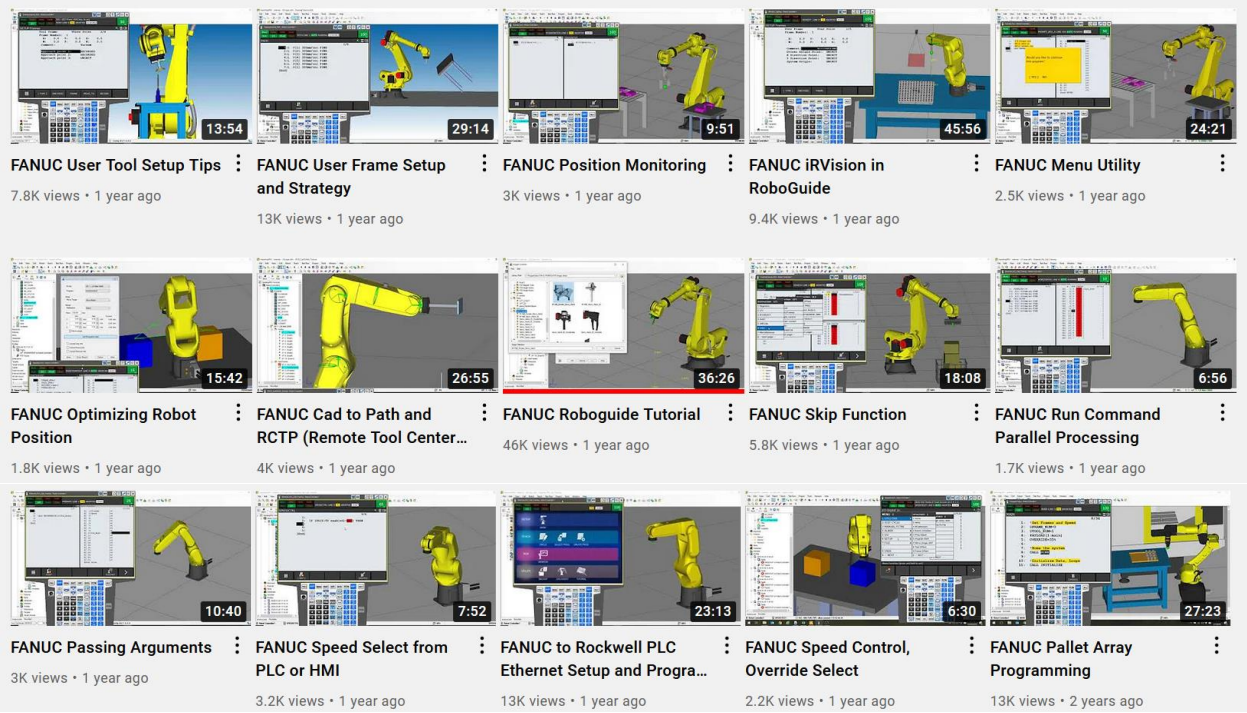
Fanuc robot programming tutorial Part 3- Back up and restore

https://www.youtube.com/watch?v=LJ6ueVoRgf0

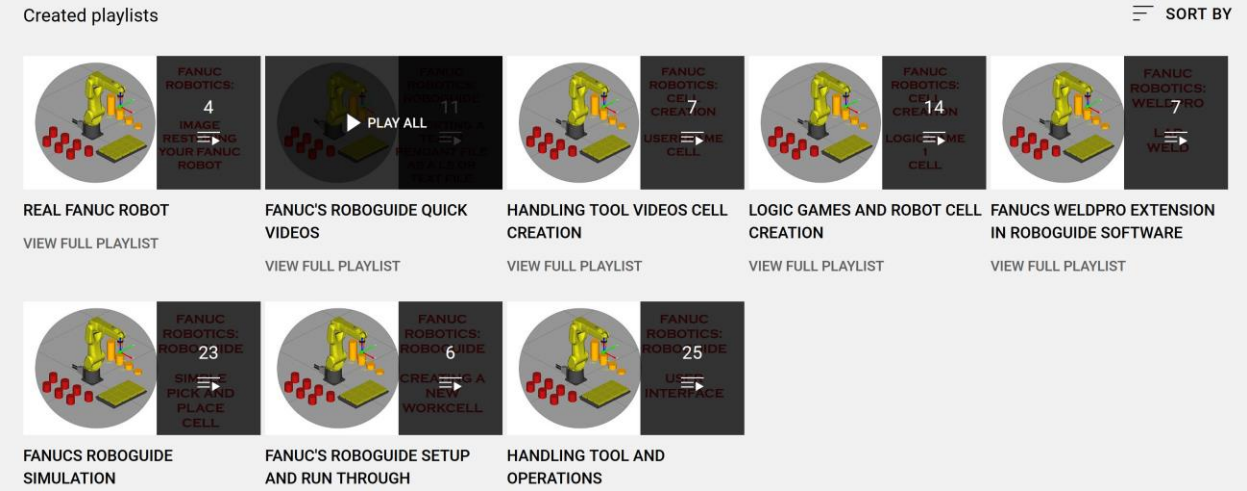
Fanuc Robot programming tutorial part 6 - How to create a program-Open and close Gripper

https://www.youtube.com/watch?v=hEPw5pfxtm4
Adam Willea:





Tim Mohring – Fanuc Instructor



A lab would consist of writing (in part at least) a program using the teach pendant to perform a function. You may use existing programs in the specific robot as a starter program.

Also, explore the various methods of communicating with the Fanuc using either Digital I/O or ethernet and write a program that communicates with the robot from a PLC and executes a program as the result.

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