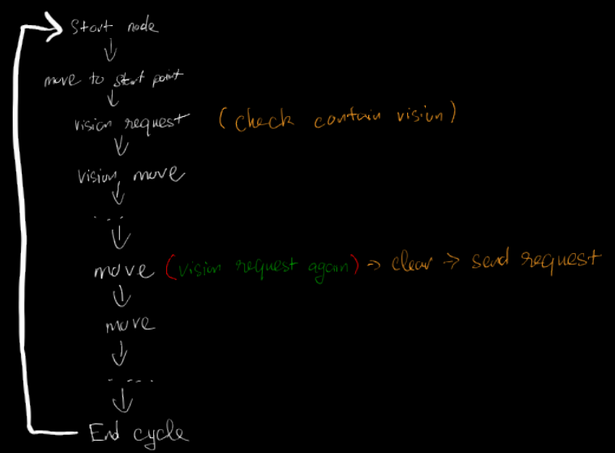
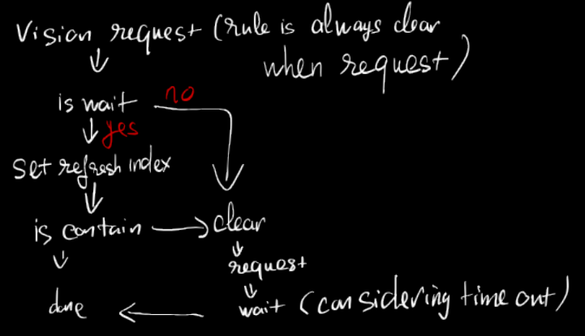
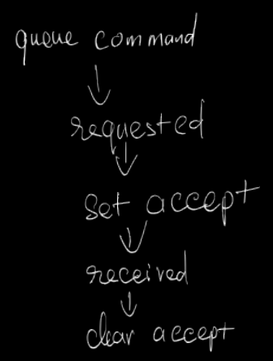






Soft → PLC

+ Communicating flag (set interval 500 ms)

+ Process in operate

+ New cycle started

+ Finished one cycle

+ Cycle stop

+ Cycle force stop

(when force stop, robot error stop)

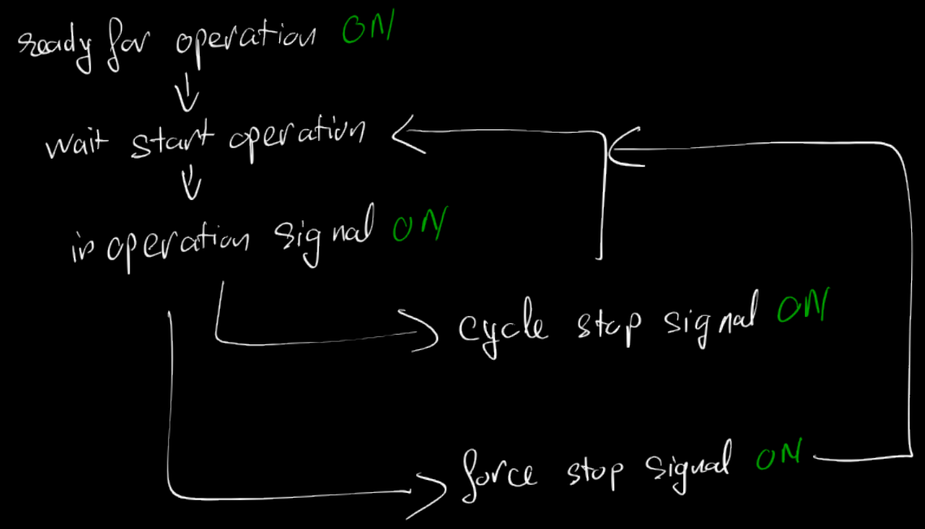
+ Robot in Error

Soft → PLC

+ Communicating flag (set interval 500 ms)
+ Ready operate signal
+ Process in operate
+ New cycle started
+ Finished one cycle
+ Cycle stop
+ Cycle force stop
(when force stop, robot error stop)
+ Robot in Error
+ Matched pattern index
+ Homing finish

PLC → Soft

+ Start operate
+ Stop operate
+ Patter index number (D)
+ Camera index number (D)
+ Direct home signal
+ matching signal (on and rising edge when matching failed and waiting)


ready for operation ON
wait start operation
in operation signal ON
cycle stop signal ON
force stop signal ON

Start

↓

if gripper close → open

↓

request vision → checking for certain

↓

move to picking position

↓

close gripper

↓

move out of vision workspace

↓

checking workspace handled → request and wait → end cycle

↓

move to place position

↓

place

↓

move out of placing zone

↓

end cycle

Robot ready → - Motor ON
- Cycle ON
- Repeat ON
- Robot at home
- No Error

Vision ready – Camera connected – Camera index valid
– Pattern configured – Patter index valid

Robot ready
Vision ready
} Software ready

Cycle wait
↓
Software ready ⇒ Cycle ready
↓
PLC set start cycle ⇒ Cycle operation
↓
PLC set cycle stop ⇒ End cycle
↓
Back to wait

PLC set force stop ⇒ Stop robot immediately (set state)
↓
Back to wait

Robot err
Robot Estop
→ (Robot already stop) → Back to wait (set error state)

Cmd handle
⇓
Flag handle
⇓
Vision request handle

⇓
Wait for coordinate
⇓
...
⇓
Request coordinate
⇓

{ not contains ⇒ Set to request state
Waiting ⇒ wait until contains
Contains ⇒ next

⇒ Set state to not contains
⇓
Save request index

} Cmd request handle

Vision request state

- Not contains
- Request
- Waiting
- contains

When finished cmd = request index
=> If state is not contains
=> Set state to request

} Vision request handle

Under coordinate state control

- Not contains : pass
- Request : trigger request ⇒ Set to Waiting
  (Set receive flag to off)
- Waiting : if receive flag ON ⇒ Backup coordinate
  ⇓
  Set to contains
- Contains : pass

} Vision request handle