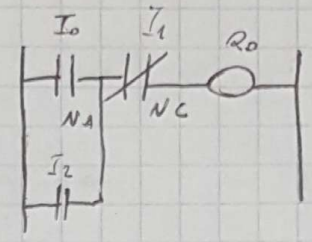
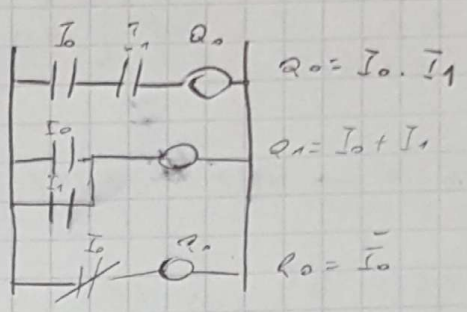
Practico

PLC

Ladder

Tciclo ~ 3ms





NC = si Yo lo activo se abre

I_L = ason

ST: ~ Pascal ~ C

LD: Circ. electrico

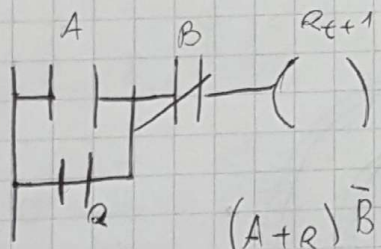
Grafcet: Maquinas de estado

Bloques: Comp. Norma Cur.

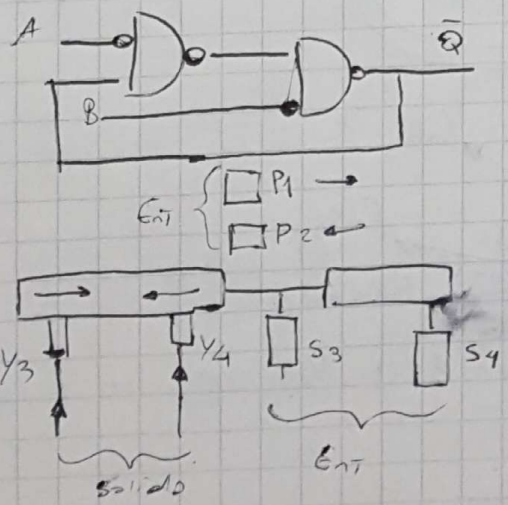
Load I0

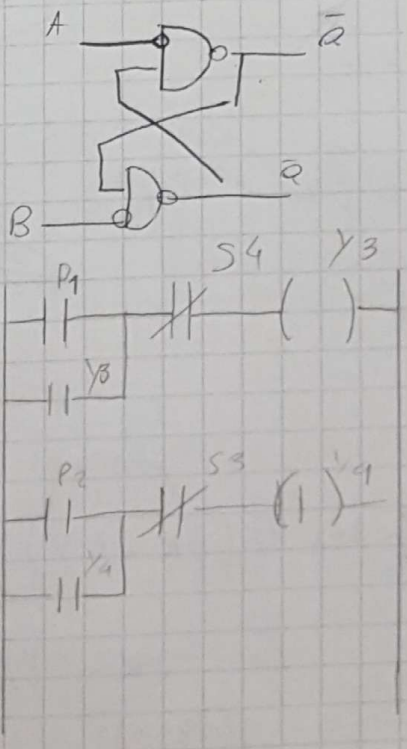
and I1

Out Q0



$(A+Q)\bar{B} = Q_{t+1}$





Implementacion PLC

~6 ent
≥4 sal

1) w³.OPENPLC.project.com

hard { .Rasp .Ard .Esp 8266 } soft { .Win .LINUX }

2) LD micro → http://ce.cx/ladder.pl → Entradas optoacopladas
sal Reles

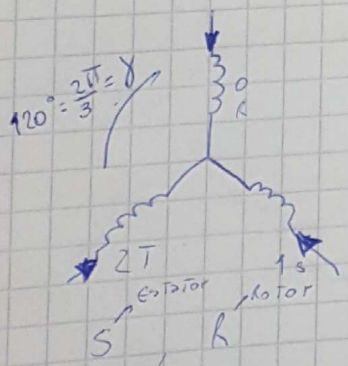
hard { .PIC 16F .AVR 18F } . Easy PLC { ldmicro.exe }

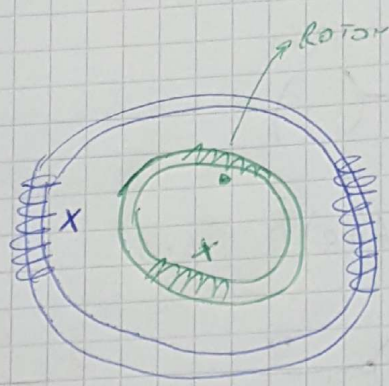
3) EDUCIAA IDE4 PLC

a) WinLDK

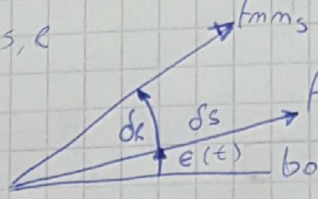
Configurar → Seleccion de PLC → open net

Werner Leonhard





Corrientes $i_{S0,1,2}$ $i_{R0,1,2}$ $\Big\}$ i_{Kn} K: 0, 1 ≥ S, R n: 0, 1, 2



$\omega = \varepsilon(t)$: Vel angular R respecto S

$$\sum_n i_{Kn} = 0$$

Angulo que se movio el campo

$$F_K = N_K \cdot \sum_n i_{Kn}\, \theta(\delta_K - n\gamma)$$

$$\downarrow$$

$$\cos(\delta_K - n\gamma)$$

$$\frac{e^{j(\delta_K - n\gamma)} + e^{-j(\delta_K - n\gamma)}}{2}$$

NOTA

Los Q no dependen de n las saco mas de la sumatoria

$$F_k = \frac{N_k}{2} \sum_n i_{kn} \left(e^{j\delta_k} \cdot e^{-jn\gamma} + e^{j\delta_k} e^{jn\gamma} \right)$$

Angulo de separación del motor

$$e^{j\delta_k} \underbrace{\sum_n i_{kn} e^{-jn\gamma}}_{\bar{i}_k^*} + e^{-j\delta_k} \underbrace{\sum_n i_{kn} e^{jn\gamma}}_{\bar{i}_k = \sum_n i_{kn} e^{jn\gamma}}$$

$$A B^* + A^* B = 2 \bar{A} \bar{B}$$

$$F_k = N_k \, \bar{i}_k \cdot e^{j\delta_k}$$

factor de forma

$$B_s = \frac{1}{2h} \mu_0 \left[(1 + \sigma_s) F_s(\delta_s, t) + F_k(\delta_k, t) \right]$$

entrehierro

$0 \ldots 1$

$\frac{d}{dt}$

$$V_{kn} = R_k \cdot i_{kn} + \dot{\lambda}_{kn}$$

$$\bar{V}_k = R_k \bar{i}_k + \dot{\bar{\lambda}}_k$$

Modelo del motor

$$J \dot{\omega}_n = T_{motor} - T_{L\ carga}$$

Torque

$$T_m = \frac{2}{3} M \left(\bar{i}_k \cdot e^{j\varepsilon} \times \bar{i}_s \right)$$

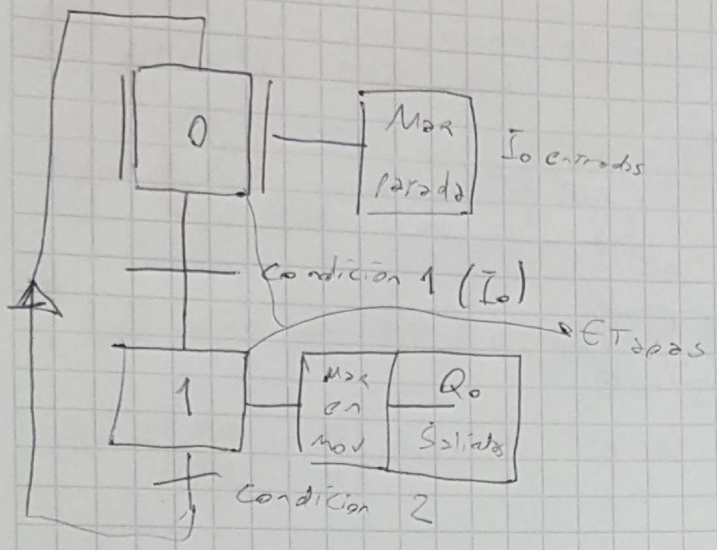
$$\lambda_{kn} = \frac{2}{3} \left[L_k \bar{i}_k \cdot e^{jn\gamma} + M \overline{i_{k+1}} \cdot e^{j(n\gamma - \varepsilon)} \right]$$

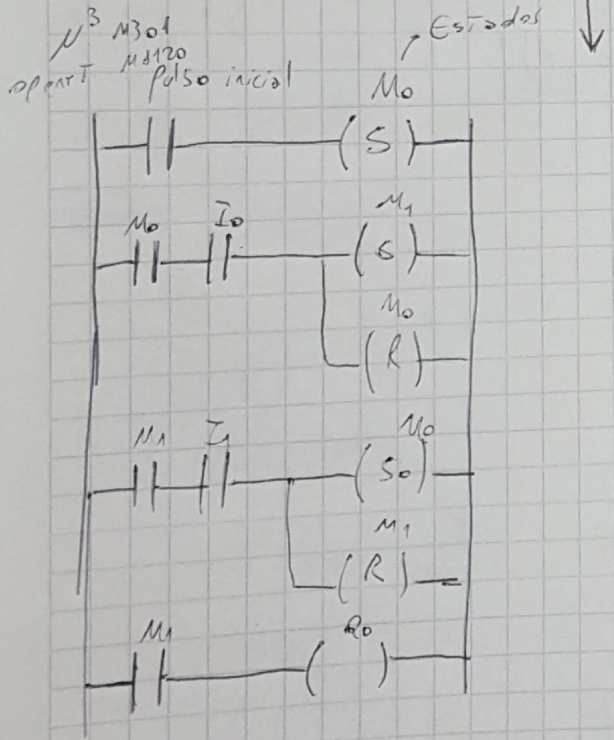
inducc propias

inducc mutuas

PLC Open editor

• Arduino





otro ejercicio en las hojas anterior