

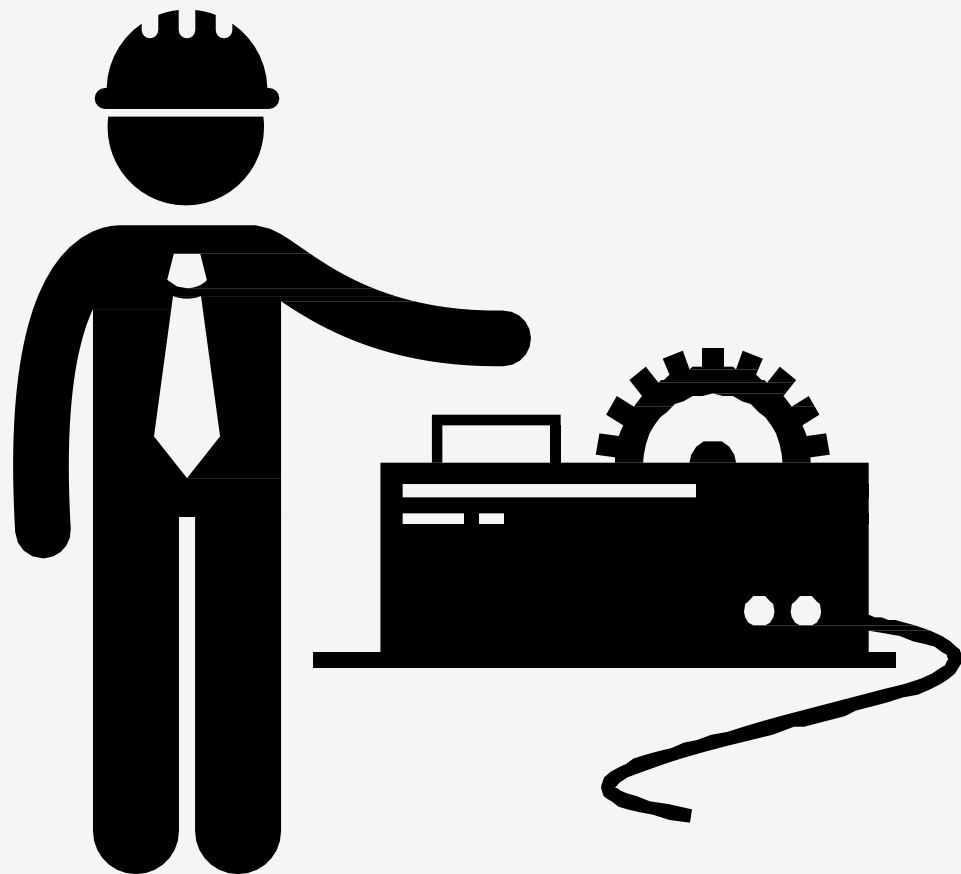


CASE

**PROGRAMMING OF
AUTOMATED MACHINE
FOR STEEL BLADE
CUTTING**

Machine Tool Sector

MAIN BENEFITS OBTAINED



**Automated process,
reducing operator **physical fatigue** ,
while respecting productivity, safety
and quality constraints.**

FLEXOGRAPHIC MARKET

Machine delivered to supplier of steel blades for the flexographic market.

WHEN

2020/2021

PROCESS

Raw material received as small and narrow steel coils inside boxes.

The operator pulls the coils, cuts at the desired length and stacks the steel blades for packaging.

CLIENT AND CONTEXT

NEEDS AND CHALLENGES

MANUAL PROCESS

Process entirely manual, resulting in operator physical fatigue, due to efforts for pulling the steel coils from the boxes and actuating the cutting tool.

PROJECT CHALLENGES

- Customized project, machine non-existent in the market
- High variability of products (lengths from 200 to 2000 mm)
- High productivity
- High accuracy (+/- 1 mm)
- Detection of metal splicing tape



SOLUTIONS DELIVERED

A CUSTOMIZED PROJECT

- Customized project of an automated machine with two partner companies, respecting safety standards
- Ledefi's scope: **PLC / HMI programming**, frequency inverters setup
- PLC programming of automatic sequences, sensor readings and actuator commands
- HMI development for machine operation, monitoring, diagnostics and maintenance
- Product length and quantity selection through the HMI
- Detection of metal splicing using contrast sensor

HMI: monitoring, diagnostics, maintenance

Máquina de corte de lâminas em aço 01/09/2020
14:36:54

INICIO OPERAÇÃO MANUTENÇÃO ALARMES

Sinóticos

● Segurança OK
● Disjuntor Tracionador
● Disjuntor Esteira

VOLTAR MANUTENÇÃO SINÓTICOS DIAGNÓSTICOS

Máquina de corte de lâminas em aço 01/09/2020
14:35:25

INICIO OPERAÇÃO MANUTENÇÃO ALARMES

Manutenção

22CLP2	22MOD3	22MOD4
<input type="checkbox"/> X0 Encoder A	<input type="checkbox"/> X20 Manual/Auto	<input type="checkbox"/> X30 Sem Falha Irv. Tracion.
<input type="checkbox"/> X1 Encoder B	<input type="checkbox"/> X21 Presença Emenda	<input type="checkbox"/> X31 Sem Falha Irv. Esteira
<input type="checkbox"/> X2 Segurança OK	<input type="checkbox"/> X22 Ferramenta Corte Avançada	<input type="checkbox"/> X32 Limite Lâmina Esteira
<input type="checkbox"/> X3 Disjuntor motor Tracionador	<input type="checkbox"/> X23 Ferramenta Corte Recuada	<input type="checkbox"/> X33 Reserva
<input type="checkbox"/> X4 Disjuntor Motor Esteira	<input type="checkbox"/> X24 Cilindro 1 Avançado	<input type="checkbox"/> X34 Reserva
<input type="checkbox"/> X5 Sensor Esteira Máquina	<input type="checkbox"/> X25 Cilindro 1 Recuado	<input type="checkbox"/> X35 Reserva
<input type="checkbox"/> X6 Comando Liga Máquina	<input type="checkbox"/> X26 Cilindro 2 Avançado	<input type="checkbox"/> X36 Reserva
<input type="checkbox"/> X7 Comando Desliga Máquina	<input type="checkbox"/> X27 Cilindro 2 Recuado	<input type="checkbox"/> X37 Reserva
<input type="checkbox"/> Y0 Reserva	<input type="checkbox"/> Y20 Lamp. Verde Máq. Ligada	<input type="checkbox"/> Y30 Habilita Irv. Tracionador
<input type="checkbox"/> Y1 Reserva	<input type="checkbox"/> Y21 Lamp. Vermelha Máq. Desligada	<input type="checkbox"/> Y31 Habilita Irv. Esteira
<input type="checkbox"/> Y2 Reserva	<input type="checkbox"/> Y22 Lamp Amarela Falha/Pilha cheia	<input type="checkbox"/> Y32 Acion. Feram. Corte
<input type="checkbox"/> Y3 Reserva	<input type="checkbox"/> Y23 Reserva	<input type="checkbox"/> Y33 Acionamento Cilindro 1
<input type="checkbox"/> Y4 Reserva	<input type="checkbox"/> Y24 Reserva	<input type="checkbox"/> Y34 Acionamento Cilindro 2
<input type="checkbox"/> Y5 Reserva	<input type="checkbox"/> Y25 Reserva	<input type="checkbox"/> Y35 Aciona Freio Tracionador
	<input type="checkbox"/> Y26 Reserva	<input type="checkbox"/> Y36 Tracionador Lento
	<input type="checkbox"/> Y27 Reserva	<input type="checkbox"/> Y37 Reserva

VOLTAR MANUTENÇÃO SINÓTICOS DIAGNÓSTICOS

Máquina de corte de lâminas em aço 19/10/2020
10:35:53

INICIO OPERAÇÃO MANUTENÇÃO ALARMES

Diagnósticos

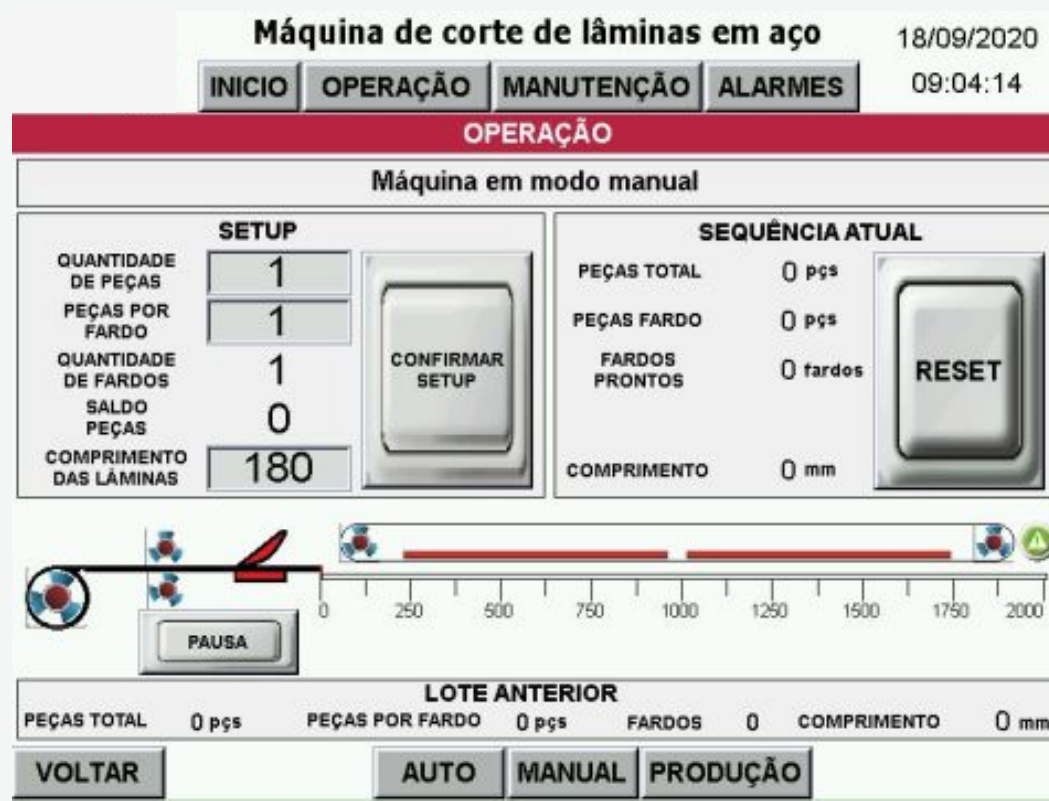
IOs	ALARMES	AJUSTES DE MÁQUINA
X0 X20 X30	0 D4872	40 mm Redução da velocidade do motor antes da parada
X1 X21 X31	0 D4873	1.3 mm Fator de inércia = 25 pulsos depois da parada
X2 X22 X32	0 D4874	0.051132 mm/p Coeficiente do encoder
X3 X23 X33	0 D4875	200.0 mm Comprimento de corte para caixas fechadas
X4 X24 X34	0 D4876	
X5 X25 X35	0 D4877	
X6 X26 X36	0 D4878	
X7 X27 X37		

COMPARAÇÃO PULSOS	SEQUENCIA
3520 pulsos solicitado	<input type="checkbox"/> Passo 0 - Inicio da sequencia
0 pulsos atual	<input type="checkbox"/> Passo 10 - Aguarda LIGA MÁQUINA
	<input type="checkbox"/> Comando Inicio Ciclo
	<input type="checkbox"/> Setup OK
	<input type="checkbox"/> Passo 20 - Avanço da Lâmina
	<input type="checkbox"/> Passo 30 - Corte da Lâmina
	<input type="checkbox"/> Corte
	<input type="checkbox"/> 0 / 1
	<input type="checkbox"/> Passo 40 - Empilhamento de Lâmina
	<input type="checkbox"/> Passo 50 - Detecção de Emenda
	<input type="checkbox"/> Passo 100 - Fim da Sequencia

MODO
 AUTO
 MANUAL

VOLTAR MANUTENÇÃO SINÓTICOS DIAGNÓSTICOS

HMI: operation



DELIVERABLES

- DELTA PLC AND HMI PROGRAMS, TESTED AND COMMISSIONED
- WEG INVERTERS CONFIGURED

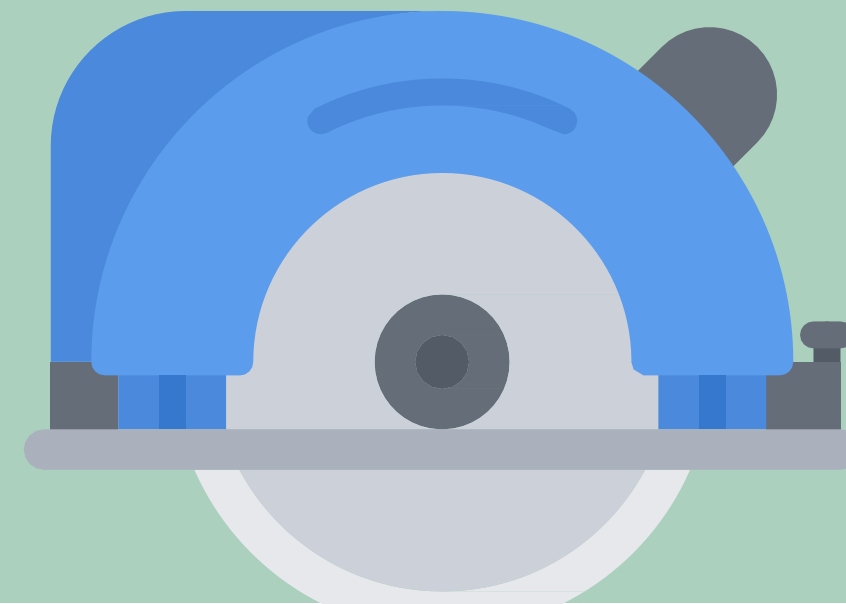
TECHNOLOGIES & BRANDS

- Delta DVP14 PLC, programmed on ISPSoft software.**
- Delta HMI, programmed on DOPSoft software.**
- WEG CFW300 frequency inverters.**
- RS-485 communication between PLC and HMI, configured on COMMGR software.**
- Balluff, Sick and Banner instrumentation.**
- Safety relays WEG CP-D for emergency buttons.**

WHERE ELSE CAN IT BE IMPLEMENTED?



All kinds of industries aiming to automate its processes, while reducing operator exposure to health and safety risks, and making production less susceptible to human errors.



WHY SHOULD I CHOOSE LEDEFI?

Besides our knowledge and experience on automation projects, we count more than 30 challenges delivered to the industries, all of them with customization and commitment.



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Please contact us to receive other cases that may be applied to your challenge.

WHAT IS YOUR CHALLENGE?

