

# Modicon M238

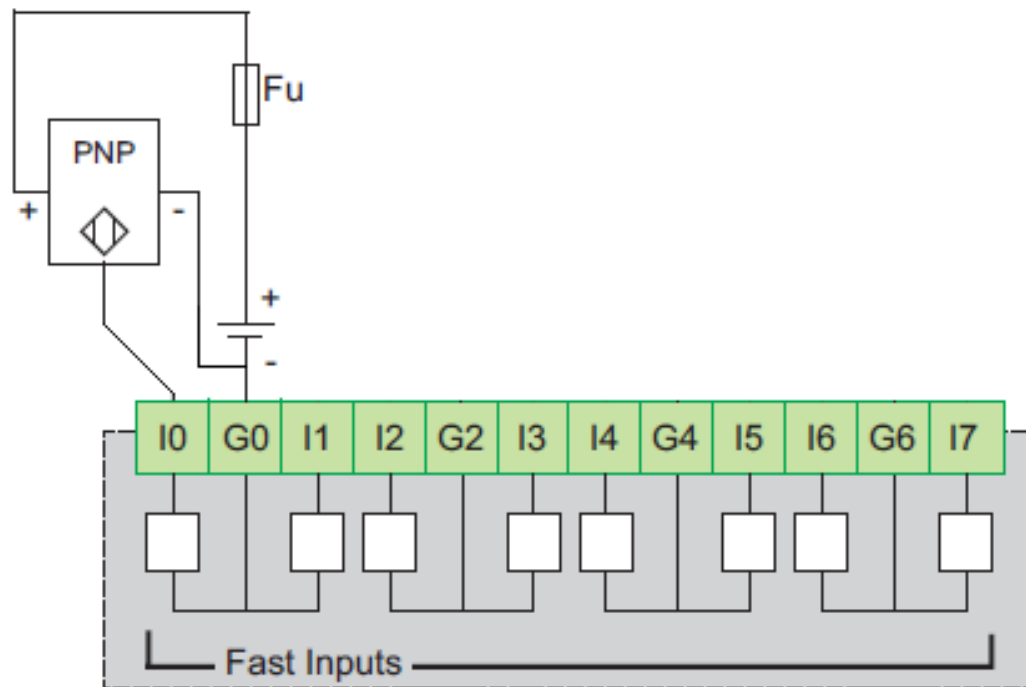
High Speed Counter on Fast Inputs

# Modicon M238

- Esquemas de Ligação – Fast Inputs: Sensor 3 fios.

TM238 LDD24DT/LFDC24DT, TM238 LDA24DR/LFAC24DR bases  
24 V  $\overline{\text{---}}$  inputs

**Fast sink inputs** (positive logic)  
Example of connection of 3-wire PNP



# Modicon M238

- Configuração:

Neste exemplo, temos a configuração do canal **HSC0** em One-Shot e colocamos o valor de preset de 5000.

The screenshot shows the configuration window for HSC0. The 'Variable' is set to HSC00. The parameters are as follows:

Parameter	Type	Value	Default Value	Unit	Description
HSC					
HSC00					
Type	Enumeration of BYTE	Main	Not used		Type of counter
Parameters					
Mode	Enumeration of BYTE	Modulo-loop	One-shot		Counting mode
Preset/Modulo	DINT (0...2147483647)	5000	2147483647		Preset or Modulo value according to the counting mode
Time	Enumeration of BYTE	1	1	s	Time base
Clock Inputs					
Input mode	Enumeration of BYTE	A=UP, B=DOWN	A Single Phase		Input mode
A Filter	Enumeration of BYTE	0.004	0.004	ms	Filtering value reduces the effect of bounce
B Filter	Enumeration of BYTE	0.004	0.004	ms	Filtering value reduces the effect of bounce
Auxiliary Inputs					
SYNC	Enumeration of BYTE	Disabled	Disabled		Enable SYNC input
SYNC Filter	Enumeration of BYTE	0.004	0.004	ms	Filtering value reduces the effect of bounce
SYNC Edge	Enumeration of BYTE	Rising edge	Rising edge		SYNC signal detection (if no SYNC input is connected)
EN	Enumeration of BYTE	Disabled	Disabled		Enable ENABLE input
EN Filter	Enumeration of BYTE	0.04	0.04	ms	Filtering value reduces the effect of bounce
CAP	Enumeration of BYTE	Disabled	Disabled		Enable Capture input
CAP Filter	Enumeration of BYTE	0.04	0.04	ms	Filtering value reduces the effect of bounce

Preset or Modulo value according to the counting mode

Modifiable by programming  = Yes  = No

IO Summarize...

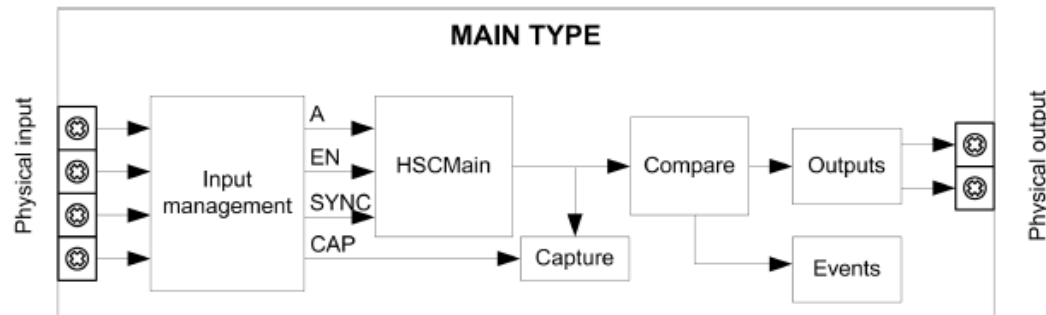
# Modicon M238

- Descrição do modo de configuração:

## Synopsis Diagram

### Synopsis Diagram

The following diagram provides an overview of the **Main** type in **One-shot** mode:



A is the counting input of the counter.  
 EN is the enable input of the counter.  
 CAP is the capture input of the counter.  
 SYNC is the synchronization input of the counter.

## Programmable Filter

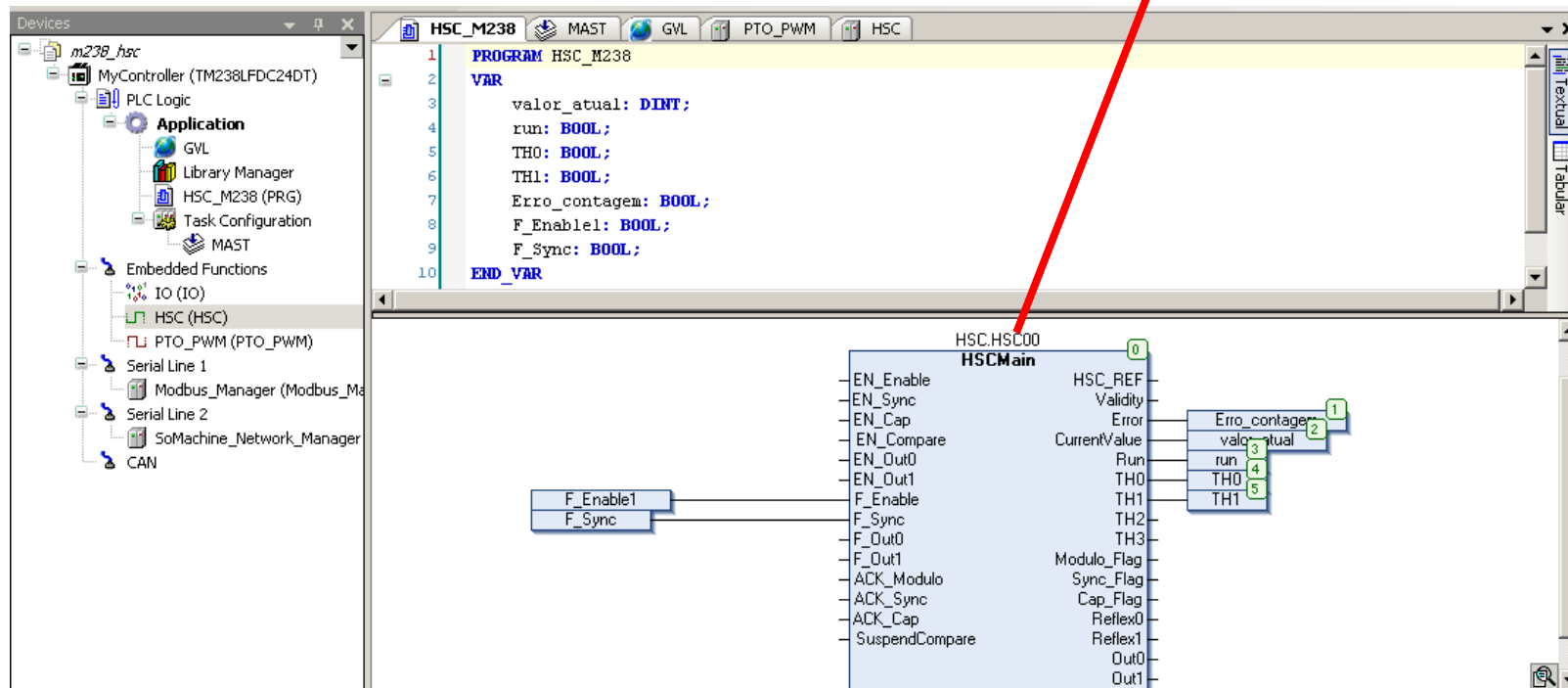
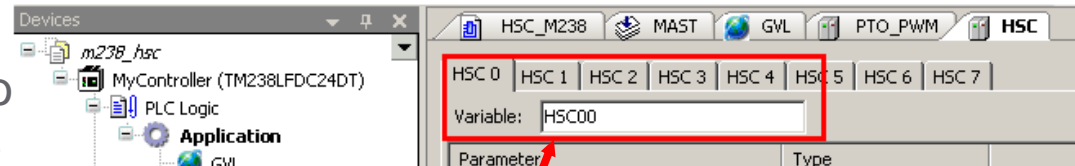
The filtering value on the **Main** type input determines the counter maximum frequency as shown in the table below:

Input	Filter value	Maximum counter frequency
A	0.004 ms	100 kHz
	0.4 ms	1 kHz
	1.2 ms	400 Hz
	4 ms	100 Hz

# Modicon M238

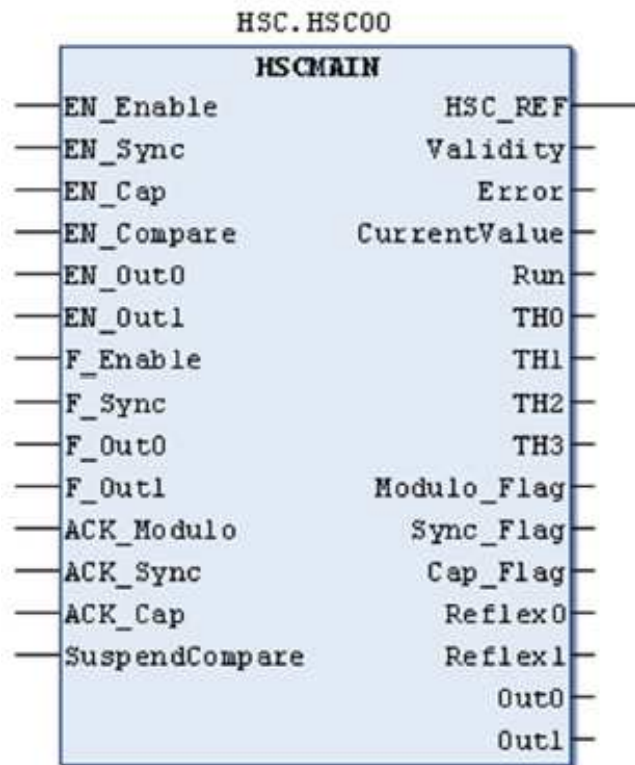
- Configuração:

Nesta configuração utiliza-se o bloco **HSC\_Main** e vincula-se à variável configurada anteriormente no canal.



# Modicon M238

- HSC\_Main:



## I/O Variables Usage

The tables below describe how the different pins of the function block are used in **One-shot** mode.

The following table describes the input variables:

Input	Type	Description
EN_Enable	BOOL	When <b>EN</b> input is configured: if TRUE, authorizes the counter enable via the Enable input ( <i>see page 218</i> ).
EN_Sync	BOOL	When <b>SYNC</b> input is configured: if TRUE, authorizes the counter synchronization and start via the Sync input ( <i>see page 214</i> ).
EN_Cap	BOOL	When <b>CAP</b> input is configured: if TRUE, enables the Capture input ( <i>see page 206</i> ).
EN_Compare	BOOL	TRUE = enables the comparator operation ( <i>see page 193</i> ) (using Thresholds 0, 1, 2, 3): <ul style="list-style-type: none"> <li>• basic comparison (TH0, TH1, TH2, TH3 output bits)</li> <li>• reflex (Reflex0, Reflex1 output bits)</li> <li>• events (to trigger external tasks on threshold crossing)</li> </ul>
EN_Out0	BOOL	TRUE = enables physical output Output0 to echo the Reflex0 value (if configured).
EN_Out1	BOOL	TRUE = enables physical output Output1 to echo the Reflex1 value (if configured).
F_Enable	BOOL	Forces the Enable condition ( <i>see page 218</i> ).
F_Sync	BOOL	Forces the Sync condition ( <i>see page 214</i> ).
F_Out0	BOOL	TRUE = forces Output0 to 1 (if Reflex0 is configured).
F_Out1	BOOL	TRUE = forces Output1 to 1 (if Reflex1 is configured).
ACK_Modulo	BOOL	Not used
ACK_Sync	BOOL	On rising edge, resets Sync_Flag.
ACK_Cap	BOOL	On rising edge, resets Cap_Flag.
SuspendCompare	BOOL	TRUE = compare results are suspended: <ul style="list-style-type: none"> <li>• TH0, TH1, TH2, TH3, Reflex0, Reflex1, Out0, Out1 output bits of the block maintain their last value.</li> <li>• Physical Outputs Output0 and Output1 maintain their last value.</li> <li>• Events are masked.</li> </ul> <p><b>NOTE:</b> EN_Compare, EN_Out0, EN_Out1, F_Out0, F_Out1 remain operational while SuspendCompare is set.</p>

# Modicon M238

- Descrição do modo de configuração:

The following table describes the output variables:

Output	Type	Comment
HSC_REF	HSC_REF (see page 228)	Reference to the HSC. To be used with the HSC_REF_IN input pin of the <b>Administrative</b> function blocks.
Validity	BOOL	TRUE = indicates that output values on the function block are valid.
Error	BOOL	TRUE = indicates that an error was detected. Use the HSCGetDiag (see page 234) function block to get more information about this detected error.
CurrentValue	DINT	Current count value of the counter.
Run	BOOL	TRUE = counter is running. Switches to 0 when CurrentValue reaches 0. A rising edge on Sync is needed to restart the counter.
TH0	BOOL	Set to 1 when CurrentValue > Threshold 0 (see page 193).
TH1	BOOL	Set to 1 when CurrentValue > Threshold 1 (see page 193).
TH2	BOOL	Set to 1 when CurrentValue > Threshold 2 (see page 193).
TH3	BOOL	Set to 1 when CurrentValue > Threshold 3 (see page 193).
Modulo_Flag	BOOL	Not relevant
Sync_Flag	BOOL	Set to 1 by the synchronization of the counter (see page 214).
Cap_Flag	BOOL	Set to 1 when a new capture value is stored in the Capture register (see page 206). This flag must be reset before a new capture can occur.
Reflex0	BOOL	State of Reflex0. (see page 194)
Reflex1	BOOL	State of Reflex1. (see page 194)
Out0	BOOL	State of physical output Output0 (if Reflex0 configured).
Out1	BOOL	State of physical output Output1 (if Reflex1 configured).

# Modicon M238

- Em operação:

Ao habilitar no bloco **HSC\_Main** as variáveis **F\_Enable** e **F\_Sync**, a contagem está habilitada e a cada sinal enviado, ocorre o incremento do valor de contagem e o resultado pode ser visualizado em **CurrentValue**.

The screenshot displays the Schneider Electric software interface for the Modicon M238. The left sidebar shows the project tree with 'Application [run]' selected. The main window shows the 'HSC\_Main' block configuration. The 'F\_Enable1' and 'F\_Sync' inputs are set to 'TRUE'. The 'CurrentValue' output is set to 140. The 'run' input is set to 'TRUE'. The 'TH0', 'TH1', and 'TH2' inputs are set to 'FALSE'. The 'Erro\_contagem' output is set to 'FALSE'. The 'Modulo\_Flag' and 'Sync\_Flag' outputs are set to 'FALSE'. The 'Cap\_Flag', 'Reflex0', 'Reflex1', 'Out0', and 'Out1' outputs are also set to 'FALSE'. The 'HSC\_REF' and 'Validity' outputs are set to 'FALSE'. The 'Error' output is set to 'FALSE'. The 'Modulo\_Flag' output is set to 'FALSE'. The 'Sync\_Flag' output is set to 'FALSE'. The 'Cap\_Flag' output is set to 'FALSE'. The 'Reflex0' output is set to 'FALSE'. The 'Reflex1' output is set to 'FALSE'. The 'Out0' output is set to 'FALSE'. The 'Out1' output is set to 'FALSE'. The 'HSC\_Main' block is connected to the 'F\_Enable1' and 'F\_Sync' inputs. The 'CurrentValue' output is connected to the 'Erro\_contagem' output. The 'run' input is connected to the 'run' input. The 'TH0', 'TH1', and 'TH2' inputs are connected to the 'TH0', 'TH1', and 'TH2' inputs. The 'Modulo\_Flag' output is connected to the 'Modulo\_Flag' output. The 'Sync\_Flag' output is connected to the 'Sync\_Flag' output. The 'Cap\_Flag' output is connected to the 'Cap\_Flag' output. The 'Reflex0' output is connected to the 'Reflex0' output. The 'Reflex1' output is connected to the 'Reflex1' output. The 'Out0' output is connected to the 'Out0' output. The 'Out1' output is connected to the 'Out1' output.

Expression	Type	Value	Prepared value	Comment
valor_atual	DINT	140		
run	BOOL	TRUE		
TH0	BOOL	FALSE		
TH1	BOOL	FALSE		
Erro_contagem	BOOL	FALSE		
F_Enable1	BOOL	TRUE		
F_Sync	BOOL	TRUE		