

# TIA PORTAL & S7-1200

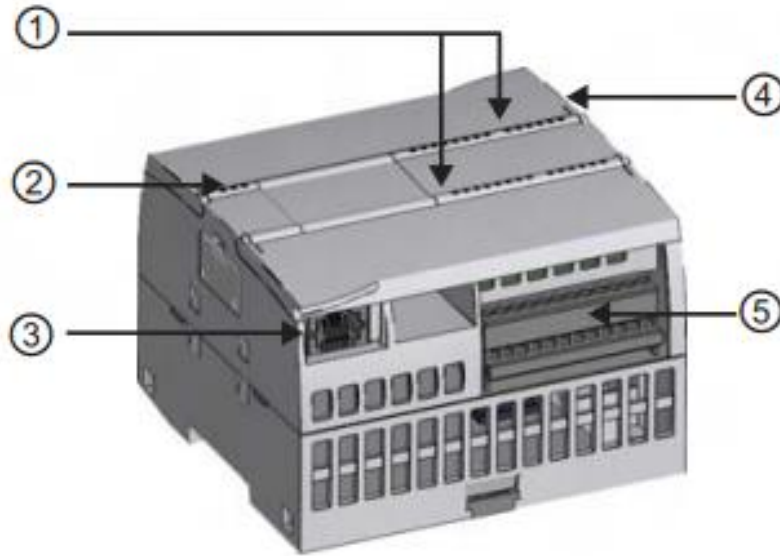


# S7 1200



- S7 200 AİLESİ YERİNE ÜRETİLEN YENİ NESİL GİRİŞ SEVİYESİ İŞLEMCİLERDİR
- KÜÇÜK VE ORTA ÖLÇEKLİ OTOMASYON İŞLERİNDE KULLANILIR
- SERİ PORT YERİNE İLETİŞİM ETHERNET (PROFINET) ÜZERİNDEN SAĞLANIR
- KOMPAKT BİR YAPIYA SAHİPTİR
- SIEMENS'İN EN UCUZ İŞLEMCİSİDİR

# S7 1200



- ① Status LEDs for the on-board I/O
- ② Status LEDs for the operational state of the CPU
- ③ PROFINET connector
- ④ Memory card slot (under door)
- ⑤ Removable user wiring connector

# S7 1200 DONANIMI

Feature	CPU 1211C	CPU 1212C	CPU 1214C
Physical size (mm)	90 x 100 x 75		110 x 100 x 75
User memory <ul style="list-style-type: none"><li>• Work memory</li><li>• Load memory</li><li>• Retentive memory</li></ul>	<ul style="list-style-type: none"><li>• 25 Kbytes</li><li>• 1 Mbyte</li><li>• 2 Kbytes</li></ul>		<ul style="list-style-type: none"><li>• 50 Kbytes</li><li>• 2 Mbytes</li><li>• 2 Kbytes</li></ul>
Local on-board I/O <ul style="list-style-type: none"><li>• Digital</li><li>• Analog</li></ul>	<ul style="list-style-type: none"><li>• 6 inputs/4 outputs</li><li>• 2 inputs</li></ul>	<ul style="list-style-type: none"><li>• 8 inputs/6 outputs</li><li>• 2 inputs</li></ul>	<ul style="list-style-type: none"><li>• 14 inputs/10 outputs</li><li>• 2 inputs</li></ul>
Process image size	1024 bytes (inputs) and 1024 bytes (outputs)		
Signal modules expansion	None	2	8
Signal board	1		
Communication modules	3 (left-side expansion)		
High-speed counters <ul style="list-style-type: none"><li>• Single phase</li><li>• Quadrature phase</li></ul>	3 <ul style="list-style-type: none"><li>• 3 at 100 kHz</li><li>• 3 at 80 kHz</li></ul>	4 <ul style="list-style-type: none"><li>• 3 at 100 kHz 1 at 30 kHz</li><li>• 3 at 80 kHz 1 at 20 kHz</li></ul>	6 <ul style="list-style-type: none"><li>• 3 at 100 kHz 3 at 30 kHz</li><li>• 3 at 80 kHz 3 at 20 kHz</li></ul>
Pulse outputs	2		
Memory card	SIMATIC Memory card (optional)		
Real time clock retention time	10 days, typical / 6 day minimum at 40 degrees		
PROFINET	1 Ethernet communications port		
Real math execution speed	18 $\mu$ s/instruction		
Boolean execution speed	0.1 $\mu$ s/instruction		

# BAZI EK MODÜLLER

Module		Input only	Output only	Combination in/out
Signal module (SM)	Digital	8 x DC In	8 x DC Out 8 x Relay Out	8 x DC In/8 x DC Out 8 x DC In/8 x Relay Out
		16 x DC In	16 x DC Out 16 x Relay Out	16 x DC In/16 x DC Out 16 x DC In/16 x Relay Out
	Analog	4 x Analog In	2 x Analog Out	4 x Analog In/2 x Analog Out
Signal board (SB)	Digital	-	-	2 x DC In/2 x DC Out
	Analog	-	1 x Analog Out	-
Communication module (CM)				
<ul style="list-style-type: none"><li>• RS485</li><li>• RS232</li></ul>				

# VERİTİPLERİ



Data type	Size (bits)	Range	Constant Entry Examples
Bool	1	0 to 1	TRUE, FALSE, 0, 1
Byte	8	16#00 to 16#FF	16#12, 16#AB
Word	16	16#0000 to 16#FFFF	16#ABCD, 16#0001
DWord	32	16#00000000 to 16#FFFFFFFF	16#02468ACE
Char	8	16#00 to 16#FF	'A', 't', '@'
Sint	8	-128 to 127	123, -123
Int	16	-32,768 to 32,767	123, -123
Dint	32	-2,147,483,648 to 2,147,483,647	123, -123
USInt	8	0 to 255	123
UInt	16	0 to 65,535	123
UDInt	32	0 to 4,294,967,295	123
Real	32	+/-1.18 x 10 <sup>-38</sup> to +/-3.40 x 10 <sup>38</sup>	123.456, -3.4, -1.2E+12, 3.4E-3
Time	32	T#-24d_20h_31m_23s_648ms to T#24d_20h_31m_23s_647ms stored as -2,147,483,648`ms to +2,147,483,647ms	T#5m_30s 5#-2d T#1d_2h_15m_30x_45ms
String	Variable	0 to 254 byte-size characters	'ABC'

# TIA PORTAL NEDİR?



- TOTALLY INTEGRATED AUTOMATION KELİMELERİNİN KISALTILMIŞIDIR
- SIMATIC MANAGER'IN YENİ VERSİYONUDUR
- SIEMENS'İN S7-1200, S7-300 VE S7-400 AİLESİ PLC'LERİ PROGRAMLAMAK VE YÖNETMEK İÇİN KULLANILAN YENİ NESİL EDİDÖRÜDÜR
- SADECE PROGRAM YAZMAKLA KALMAZ, AYNI ZAMANDA OPERATÖR PANEL PROGRAMLAMA VE SCADA OLUŞTURMADA DA KULLANILIR

# TIA PORTAL



- BASIC SÜRÜMLERİ SADECE S7-1200 AİLESİ İÇİN KULLANILABİLİR
- PROFESSIONAL VE DAHA ÜSTÜ SÜRÜMLER S7-1200 AİLESİ İLE BİRLİKTE S7-300 VE S7-400 AİLESİNİ DE PROGRAMLAYABİLİR

# TIA PORTAL



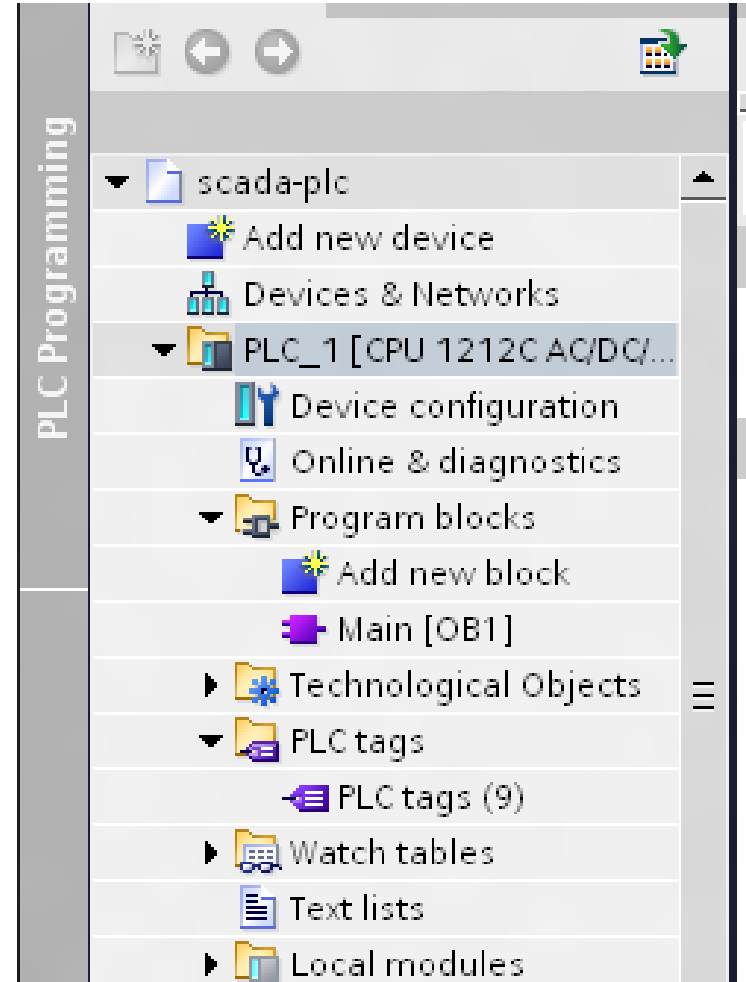
The screenshot displays the Siemens TIA Portal software interface. The top bar shows the Siemens logo and the text 'Totally Integrated Automation PORTAL'. The left sidebar contains navigation options: 'Start', 'Devices & networks', 'PLC programming', 'Visualization', and 'Online & Diagnostics'. The main area is titled 'Create new project' and contains the following fields:

- Project name:
- Path:
- Author:
- Comment:

A 'Create' button is located at the bottom right of the dialog box. The bottom left corner of the interface shows 'Project view'.

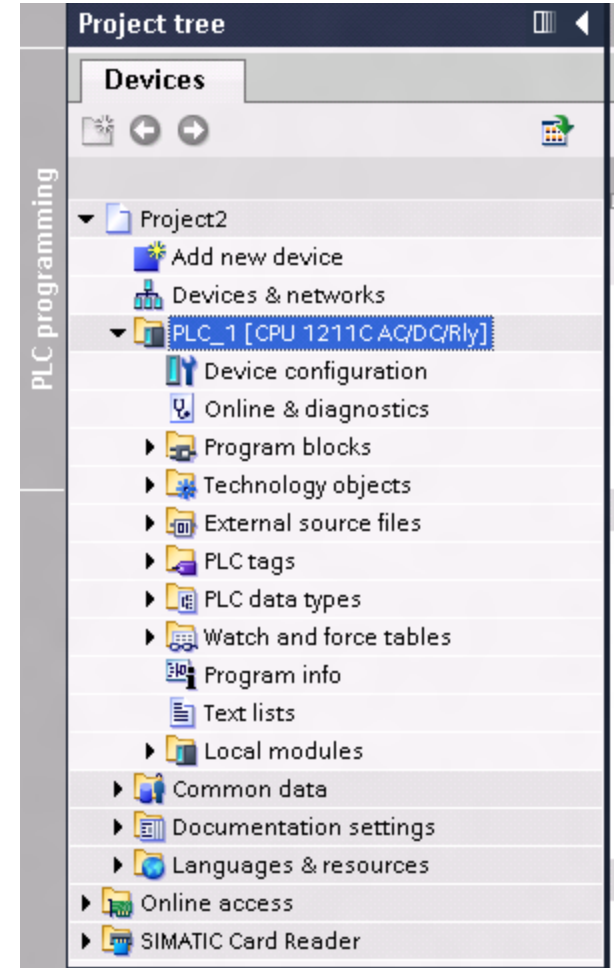
# TIA PORTAL

- PROJE OLUŐTURMA
- PLC ÖZELLİKLERİ
- UPLOAD & DOWNLOAD İŐLEMLERİ

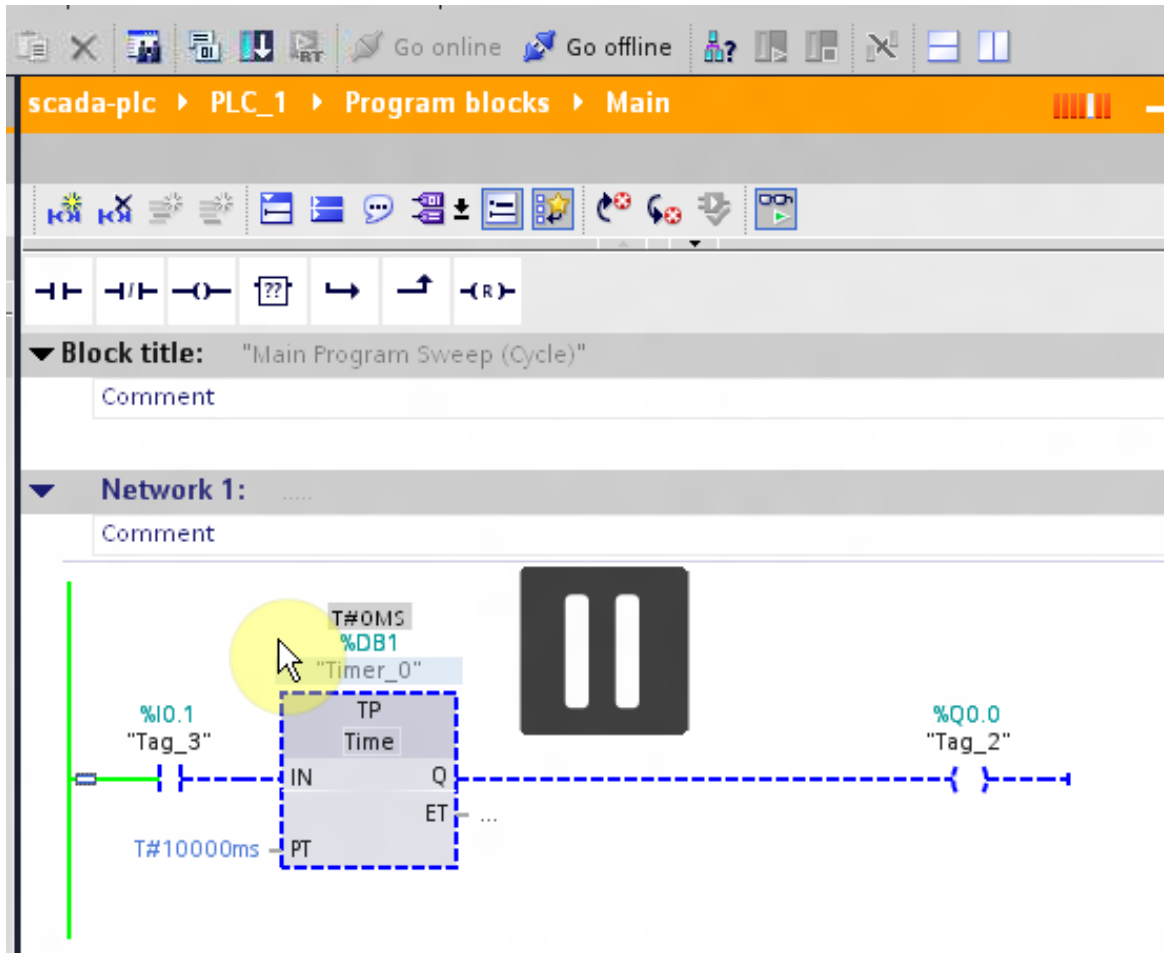


# PROJECT TREE

- PROJEMİZİN YAPISINI HİYERARŞİK OLARAK GÖSTEREN PANELDİR
- TÜM DONANIM VE YAZILIM VERİLERİNE BURADAN ULAŞILABİLİR

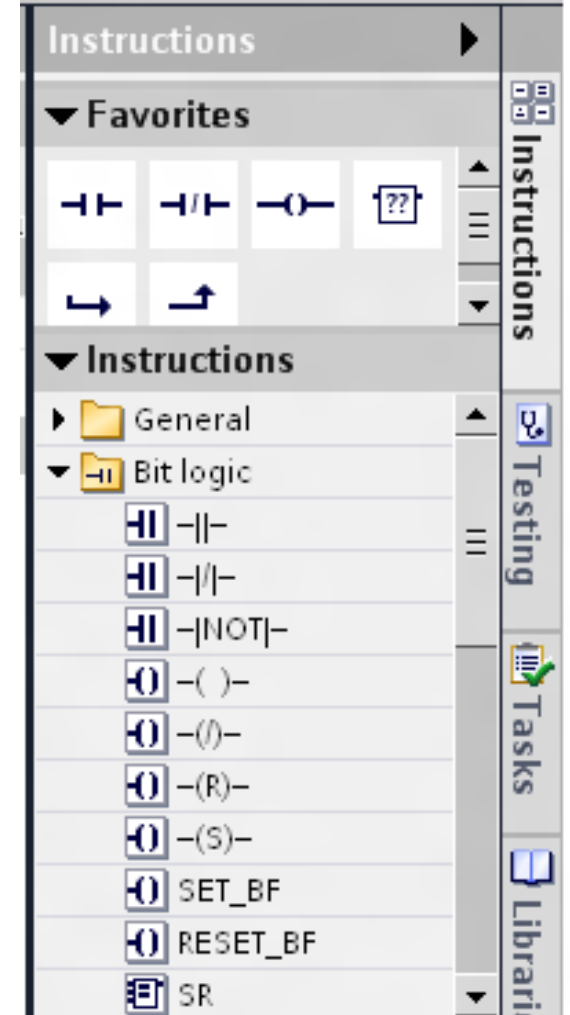


# EDİTÖR & PROGRAM YAZMA



# BIT LOGIC KOMUTLARI

- CONTAKLAR
- NOT KOMUTU
- BOBİNLER
- SET / RESET BOBİNLERİ
- RS/SR FLİP-FLOPLAR



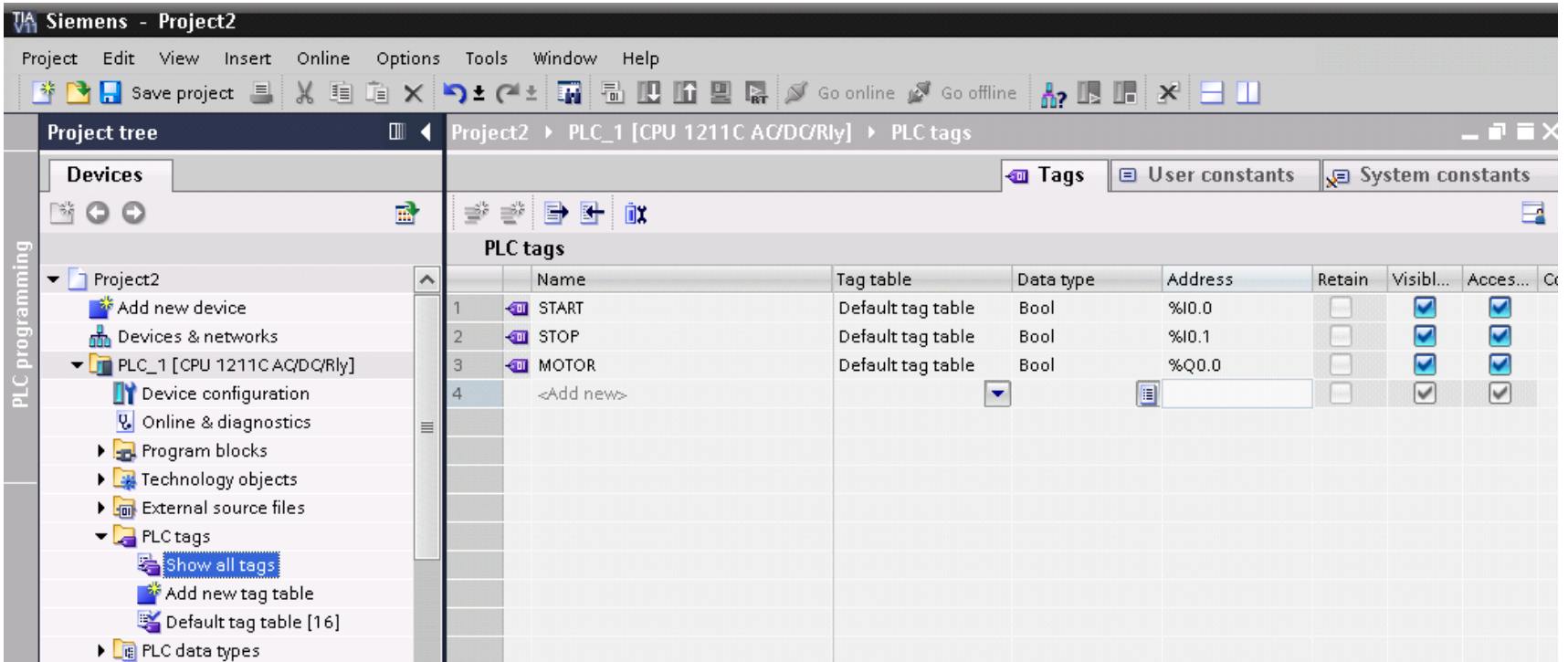
# PLC TAG



- HER ELEMANA BİR İSİM VERİP BU İSİMLERLE PROGRAM YAZMAYI SAĞLAR
- S7200'DEKİ SEMBOL TABLOSU GİBİ ÇALIŞIR
- PROJENİN YAZILMASINI VE TAKİBİNİ KOLAYLAŞTIRDIĞI İÇİN TAVSİYE EDİLİR

# PLC TAG

- RETAIN İLE VERİLER ALICI YAPILIR



Siemens - Project2

Project Edit View Insert Online Options Tools Window Help

Save project Go online Go offline

Project tree Project2 > PLC\_1 [CPU 1211C AC/DC/Rly] > PLC tags

Tags User constants System constants

PLC programming

Project2

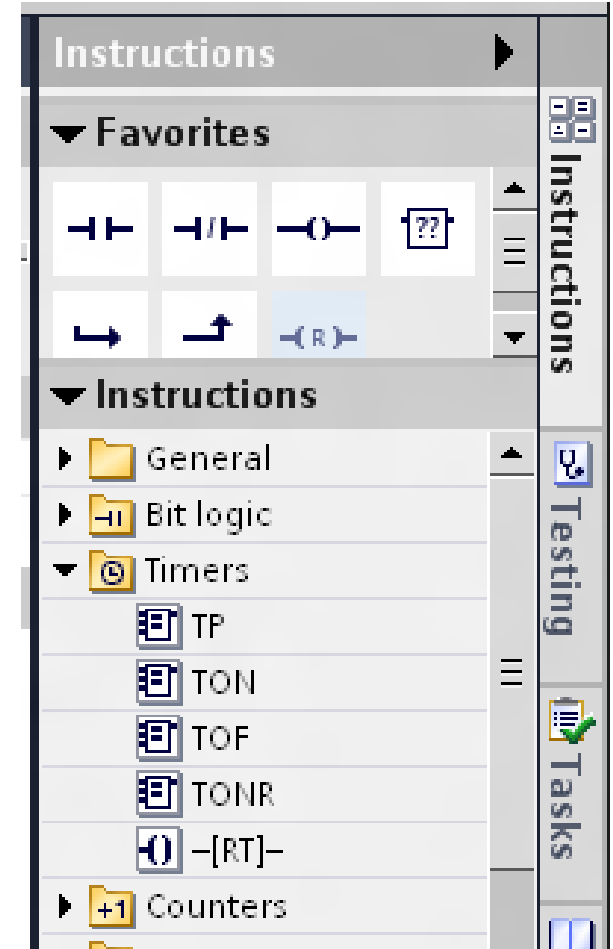
- Add new device
- Devices & networks
- PLC\_1 [CPU 1211C AC/DC/Rly]
  - Device configuration
  - Online & diagnostics
  - Program blocks
  - Technology objects
  - External source files
  - PLC tags
    - Show all tags
    - Add new tag table
    - Default tag table [16]
  - PLC data types

PLC tags

	Name	Tag table	Data type	Address	Retain	Visibl...	Acces...
1	START	Default tag table	Bool	%I0.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	STOP	Default tag table	Bool	%I0.1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3	MOTOR	Default tag table	Bool	%Q0.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4	<Add new>				<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

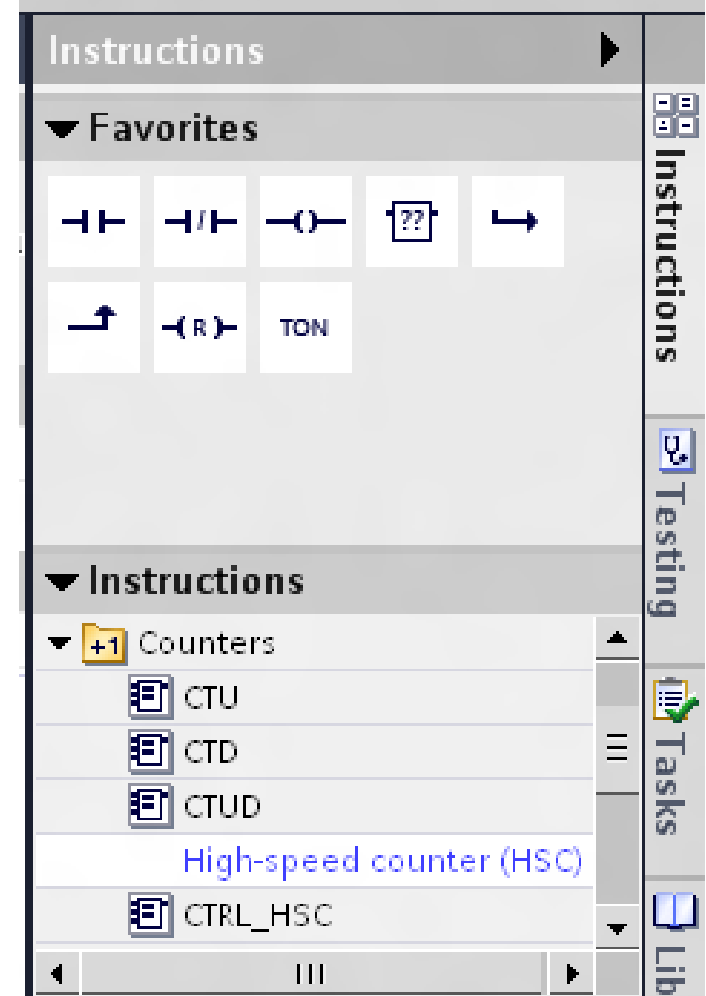
# ZAMANLAYICILAR

- TON
- TONR
- TOF
- TP
  - PT: PRESET TIME
  - ET: ELAPSED TIME
    - SÜRE BİÇİMİ
      - T#...MS
      - T#Xd\_yH\_zM\_tS\_wMS



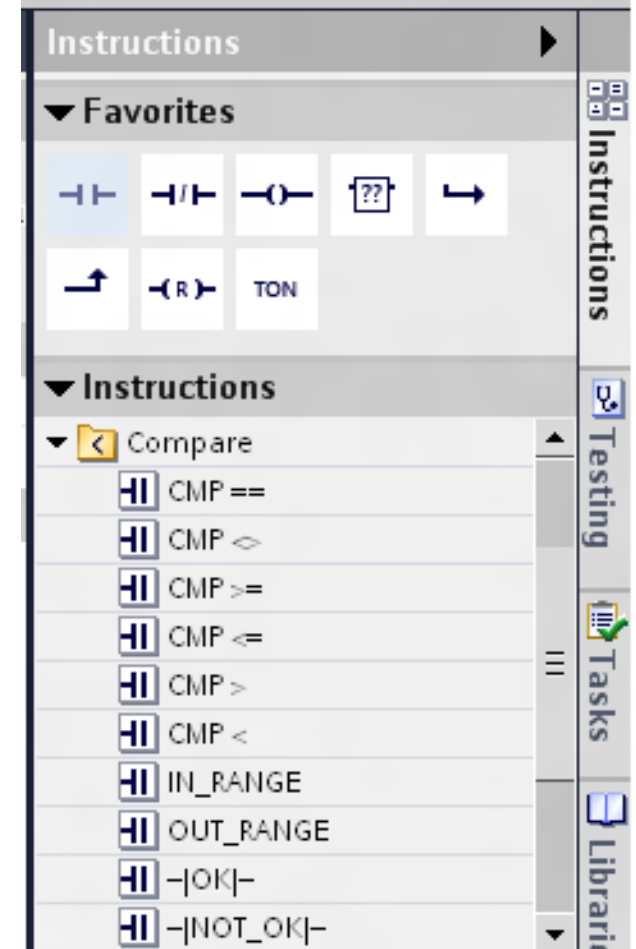
# SAYICILAR

- CTU
- CTD
- CTUD
  - SAYICI VERİTİPİ SAYICI ÜZERİNDEN AYARLANABİLİR
  - VERİTİPİNE BAĞLI OLARAK SAYMA LİMİTİ DEĞİŞİR

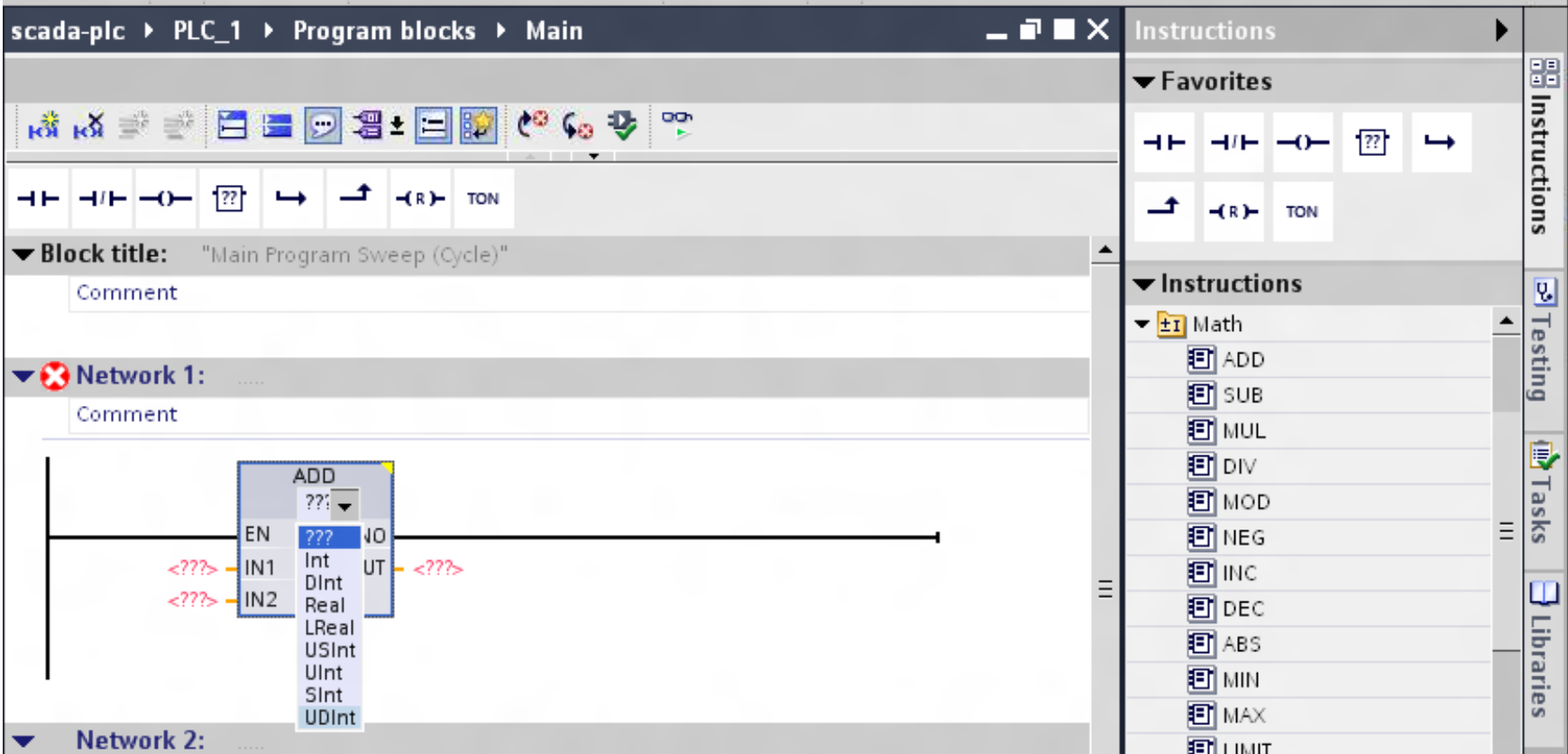


# KARŞILAŞTIRMA

- EŞİT / EŞİTDEĞİL
- KÜÇÜK / KÜÇÜKEŞİT
- BÜYÜK / BÜYÜKEŞİT
- ARALIK İÇİ / ARALIK DIŞI

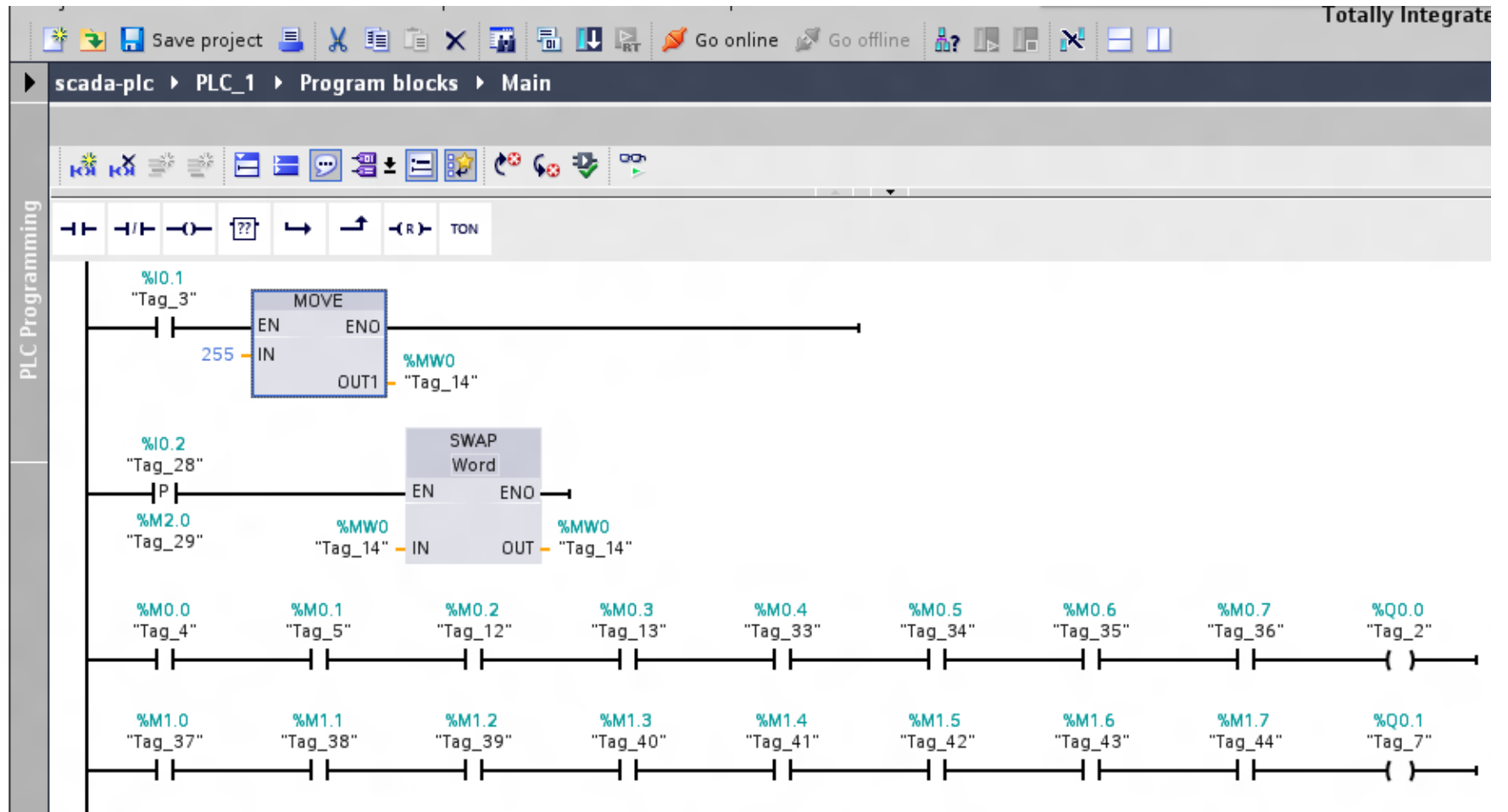


# MATEMATİK İŞLEMLERİ



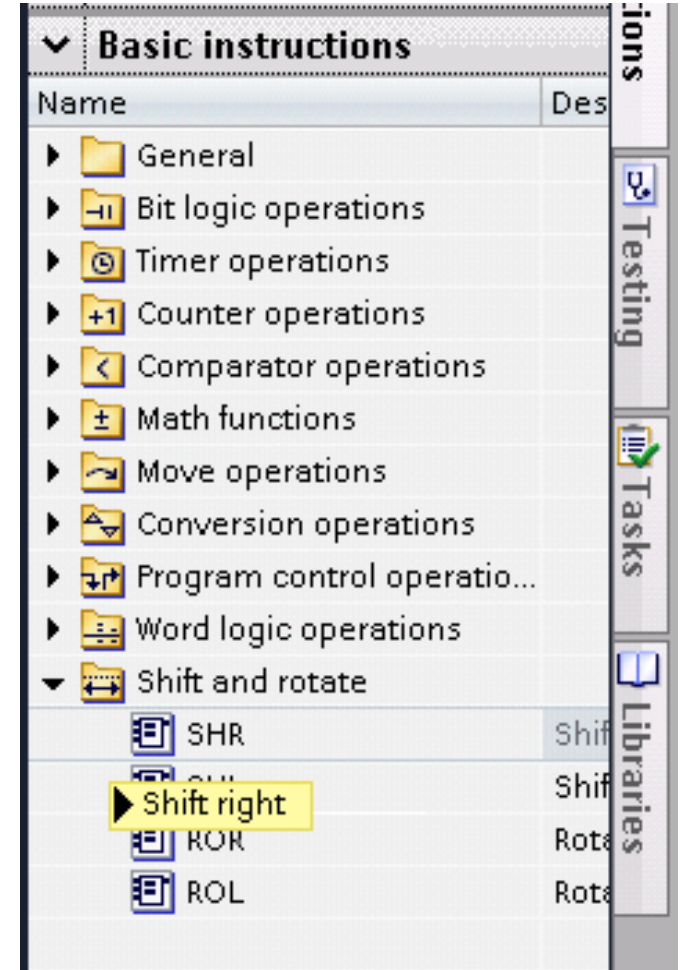
The screenshot displays a PLC programming environment. The main window shows a ladder logic network titled "Main Program Sweep (Cycle)". The network contains an "ADD" instruction block. The instruction block has an "EN" (Enable) input and an "NO" (Normally Open) output. The "NO" output is connected to a horizontal line representing the network output. The "ADD" instruction block has two input terminals, "IN1" and "IN2", both of which are currently empty. A dropdown menu is open over the "ADD" instruction, showing a list of data types: Int, Dint, Real, LReal, USint, Uint, Sint, and UDint. The "Int" data type is selected. The "ADD" instruction block is connected to a horizontal line representing the network output. The output line is currently empty. The software interface includes a toolbar with various icons, a "Block title" field, and a "Network 1" field. The right-hand side of the interface features a "Favorites" section and an "Instructions" section. The "Instructions" section is expanded to show a list of mathematical operations: ADD, SUB, MUL, DIV, MOD, NEG, INC, DEC, ABS, MIN, MAX, and LIMIT. The "ADD" instruction is highlighted in the list.

# MOVE



# SHIFT & ROTATE

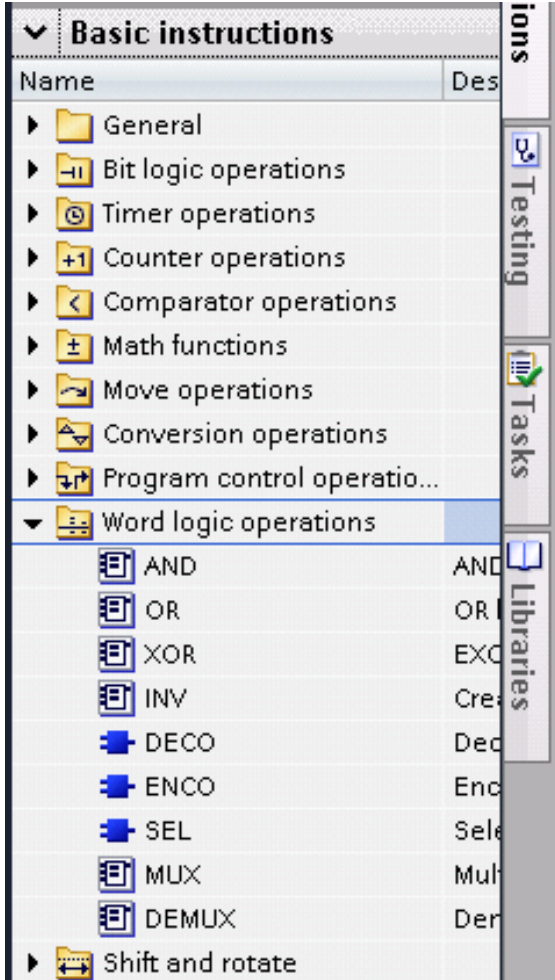
- VERİLERİ KAYDIRMAK VE DÖNDÜRMEK İÇİN KULLANILAN KOMUTLARDIR



Name	Description
General	
Bit logic operations	
Timer operations	
Counter operations	
Comparator operations	
Math functions	
Move operations	
Conversion operations	
Program control operations	
Word logic operations	
Shift and rotate	
SHR	Shift right
SHL	Shift left
ROR	Rotate right
ROL	Rotate left

# WORD LOGIC

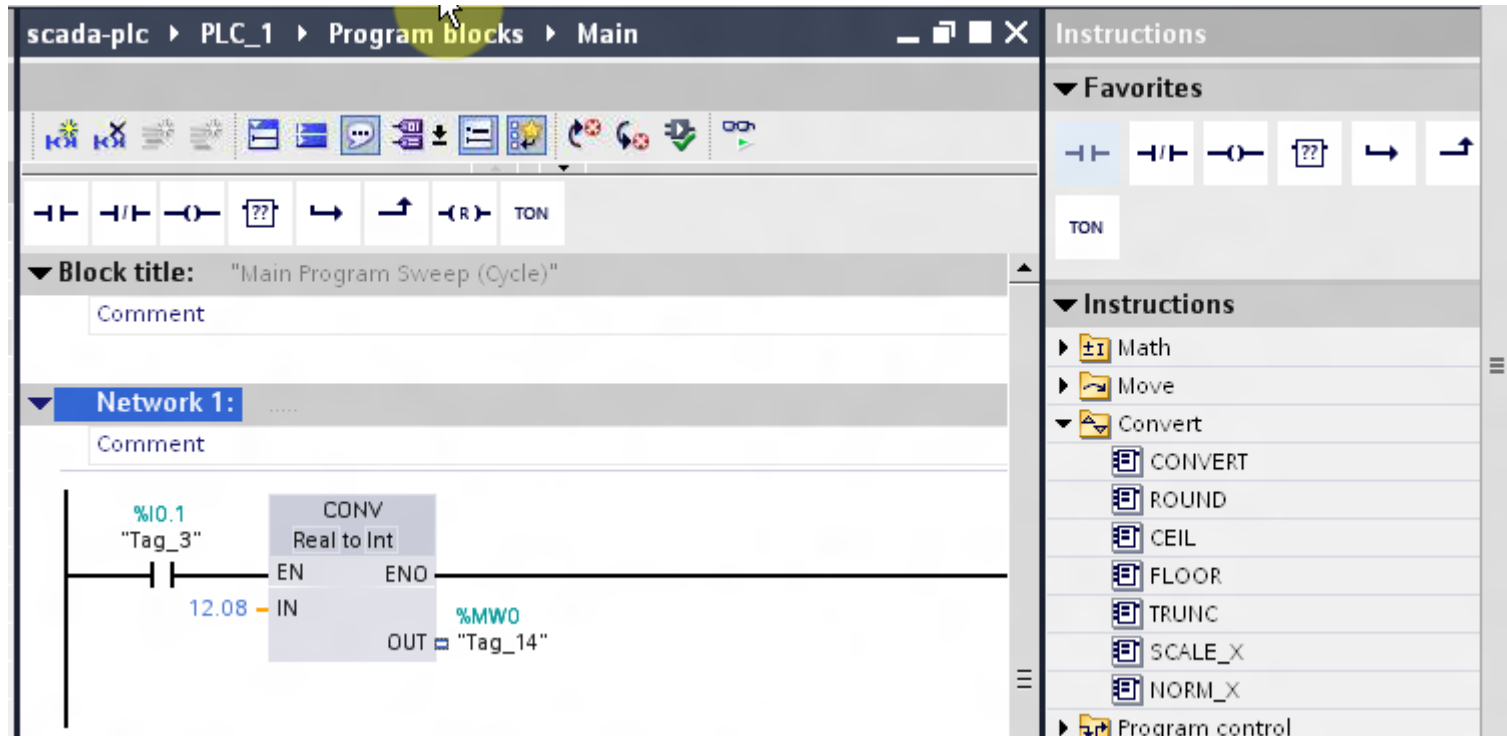
- BYTE, WORD, DWORD TİPİNDEKİ VERİLERE MANTIKSAL İŞLEM KOMUTLARI UYGULANIR



Basic instructions	
Name	Description
▶ General	
▶ Bit logic operations	
▶ Timer operations	
▶ Counter operations	
▶ Comparator operations	
▶ Math functions	
▶ Move operations	
▶ Conversion operations	
▶ Program control operations	
▼ Word logic operations	
AND	AND
OR	OR
XOR	EXC
INV	Cre
DECO	Dec
ENCO	Enc
SEL	Sele
MUX	Mult
DEMUX	Der
▶ Shift and rotate	

# CONVERT

- VERİTİPLERİ ARASINDA DÖNÜŞÜM YAPILMASINI SAĞLAR



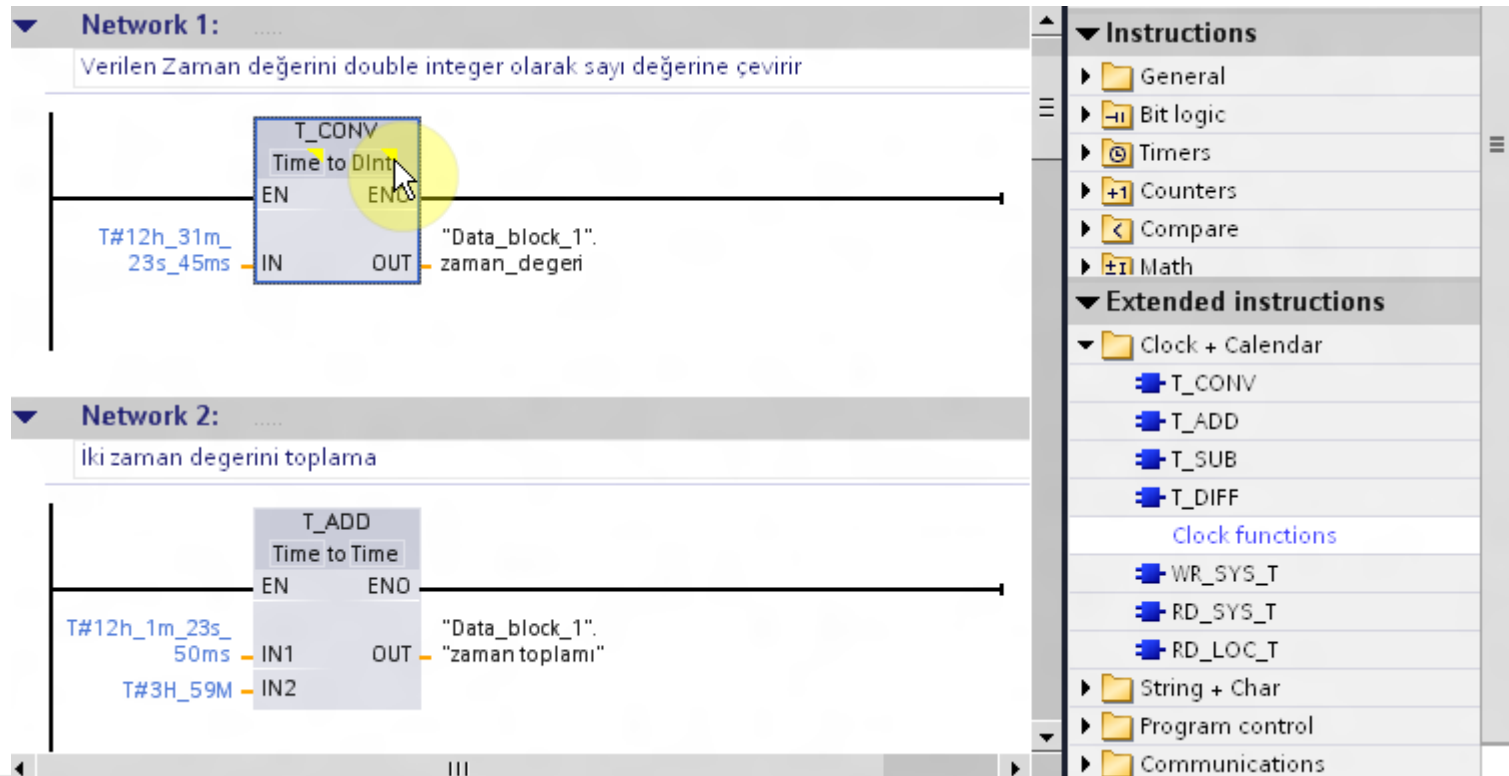
The screenshot displays a PLC programming environment. The main window shows a ladder logic network titled "Main Program Sweep (Cycle)". The network contains a "CONV" instruction (Real to Int) with the following connections:

- EN (Enable) is connected to a normally open contact labeled "%I0.1 'Tag\_3'".
- IN (Input) is connected to a constant value "12.08".
- OUT (Output) is connected to a coil labeled "%MWO 'Tag\_14'".

The right-hand side of the interface shows the "Instructions" panel, which includes a "Favorites" section with navigation icons and a "Convert" section with a list of instructions: CONVERT, ROUND, CEIL, FLOOR, TRUNC, SCALE\_X, and NORM\_X. The "Program control" section is also visible at the bottom of the panel.

# CLOCK & CALENDAR

- T\_CONVERT
- WR\_SYS\_T & RD\_SYS\_T



**Network 1:** Verilen Zaman değerini double integer olarak sayı değerine çevirir

T\_CONV  
Time to DInt  
EN ENO  
IN OUT  
T#12h\_31m\_23s\_45ms "Data\_block\_1": zaman\_degeri

**Network 2:** İki zaman degerini toplama

T\_ADD  
Time to Time  
EN ENO  
IN1 IN2 OUT  
T#12h\_1m\_23s\_50ms "Data\_block\_1": zaman\_toplami  
T#3H\_59M

**Instructions**

- General
- Bit logic
- Timers
- Counters
- Compare
- Math
- Extended instructions**
- Clock + Calendar
  - T\_CONV
  - T\_ADD
  - T\_SUB
  - T\_DIFF
- Clock functions
  - WR\_SYS\_T
  - RD\_SYS\_T
  - RD\_LOC\_T
- String + Char
- Program control
- Communications

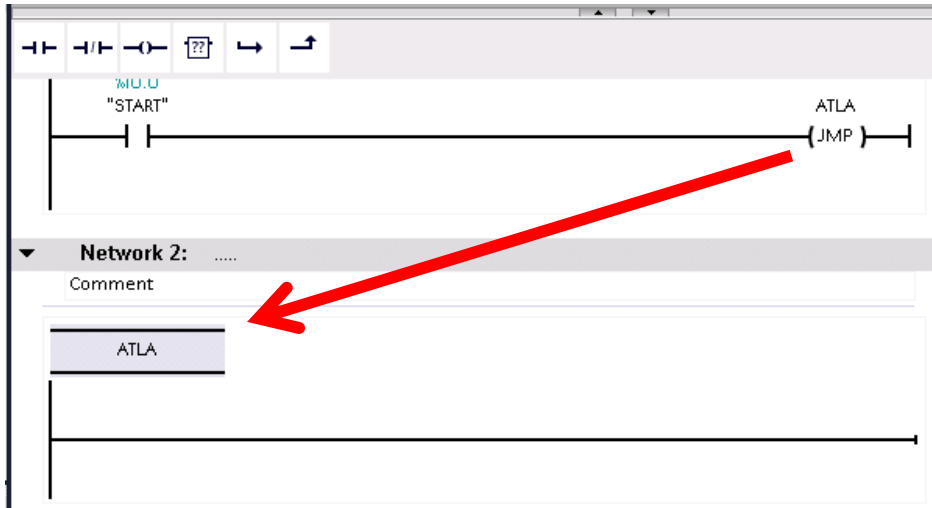
# SYSTEM & CLOCK MEMORY BIT



- S7-200'DEKİ GİBİ SM ADRESLERİ GİBİ BAZI ADRESLER TANIMLANIR
- AYRICA BELİRLİ FREKANSTA KARE DALGA ÜRETEBİR BİR BELLEK BELİRLENEBİLİR
- CPU\ SAĞ TIKLA\ PROPERTIES

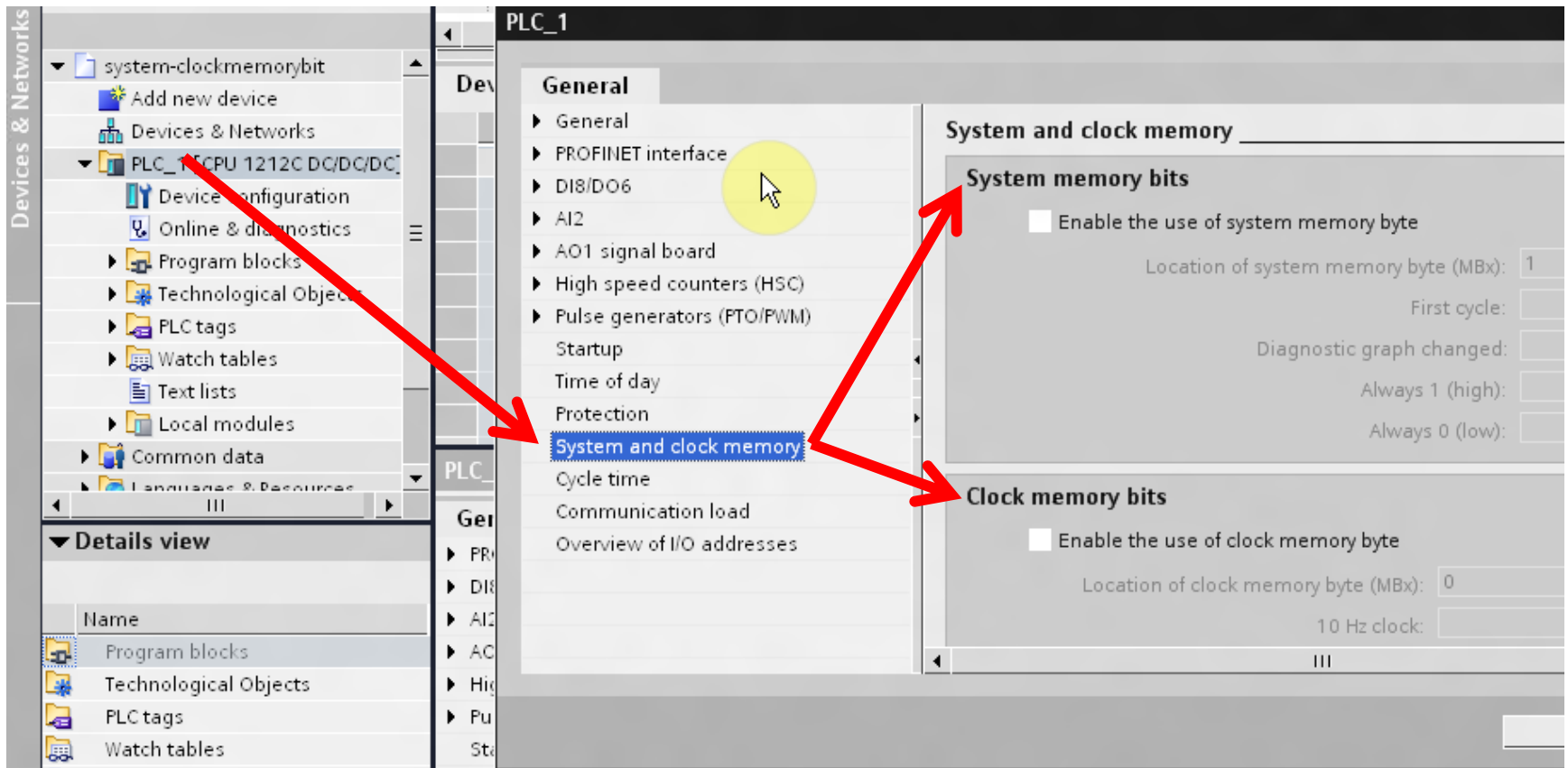
# PROGRAM CONTROL

- ATLAMA, GERİ DÖNME, ETİKET V.B. İŞLEMLERİN YAPILMASINI SAĞLAR



Name	Description	Ver
Basic instructions		
General		
Bit logic operations		
Timer operations		
Counter operations		
Comparator operations		
Math functions		
Move operations		
Conversion operations		
Program control operations		
-(JMP)	Jump if RLO = 1	
-(JMPN)	Jump if RLO = 0	
LABEL	Jump label	
JMP_LIST	Define jump list	
SWITCH	Jump distributor	
-(RET)	Return	
Runtime control		
RE_TRIGR	Restart cycle time mon...	
STP	Exit program	
GetError	Get error locally	
GetErrorID	Get error ID locally	
Word logic operations		
Shift and rotate		

# SYSTEM & CLOCK MEMORY BIT



The screenshot displays the SIMATIC Manager interface for configuring a PLC. The left sidebar shows the 'Devices & Networks' tree with 'PLC\_1' selected. The main window shows the 'System and clock memory' configuration page for 'PLC\_1'. The 'System memory bits' section includes a checkbox for 'Enable the use of system memory byte' (unchecked), a 'Location of system memory byte (MBx)' field set to '1', and fields for 'First cycle', 'Diagnostic graph changed', 'Always 1 (high)', and 'Always 0 (low)'. The 'Clock memory bits' section includes a checkbox for 'Enable the use of clock memory byte' (unchecked), a 'Location of clock memory byte (MBx)' field set to '0', and a '10 Hz clock' field. Red arrows point from the 'System and clock memory' menu item in the left sidebar to the corresponding configuration page, and from the 'System memory bits' and 'Clock memory bits' sections to their respective configuration fields.

# KALICI (RETENTIVE) HAFIZA

Project tree: kalicihafiza-watchtable-assignment > PLC\_1 > PLC tags

Devices: PLC\_1 [CPU 1212C DC/DC/DC]

- Device configuration
- Online & diagnostics
- Program blocks
  - Add new block
  - Main [OB1]
- Technological Objects
- PLC tags
  - PLC tags (5)
- Watch tables
  - Add new Watch
  - Watch table\_1
- Text lists
- Local modules
- Common data
  - Text lists
- Languages & Resources

PLC tags table:

	Name	Data type	Address	Retain	Co
1	Tag_1	Bool	%I0.0	<input type="checkbox"/>	
2	Tag_2	Bool	%M0.0	<input checked="" type="checkbox"/>	
3	Tag_3	Bool	%Q0.1	<input type="checkbox"/>	
4	Tag_4	Bool	%Q0.0	<input type="checkbox"/>	
5	Tag_5	Bool	%M0.1	<input checked="" type="checkbox"/>	
6				<input type="checkbox"/>	

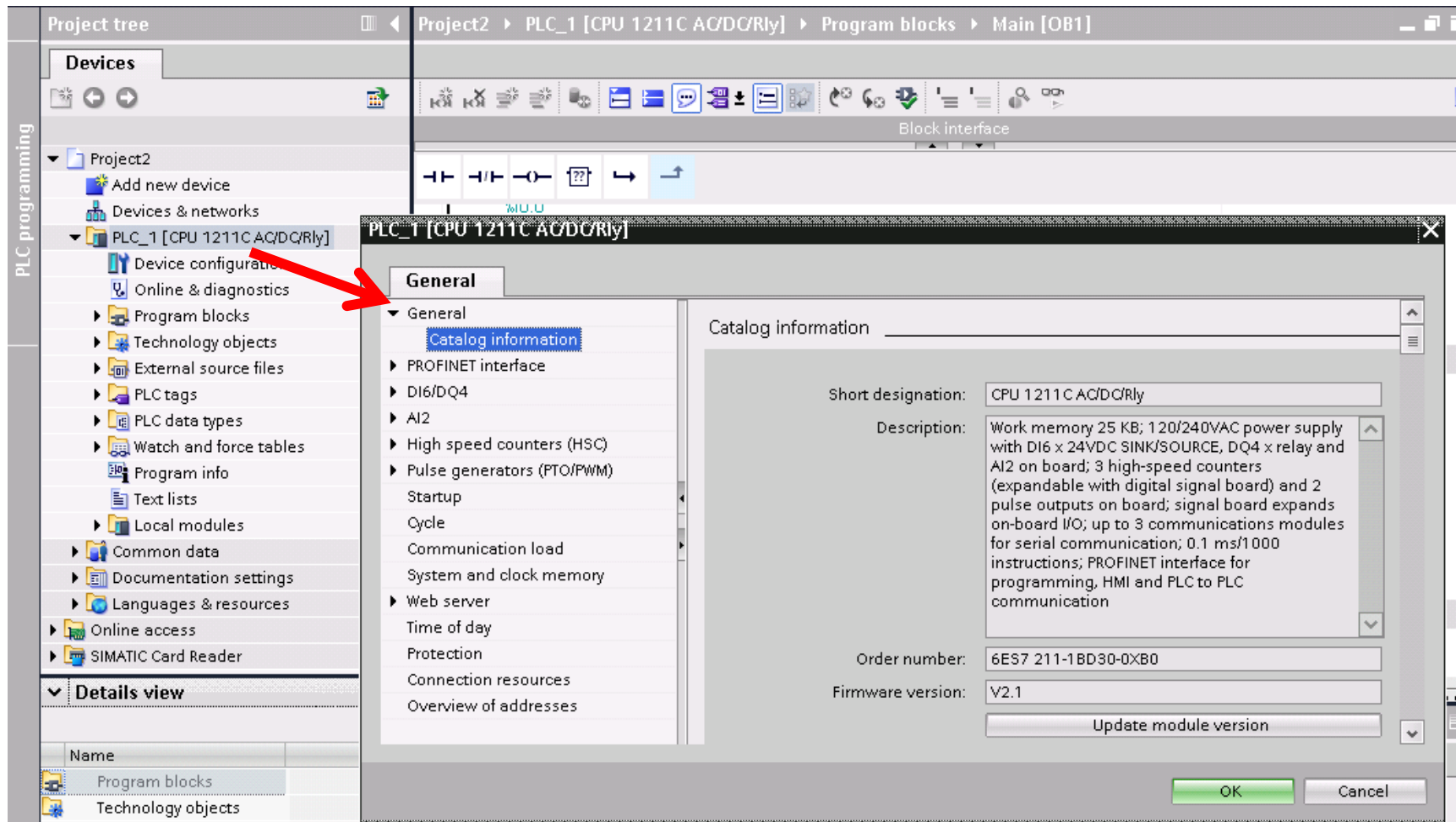
Retain memory dialog box:

Number of memory bytes starting at MB0: 10

Available retentive memory (Bytes): 2046

Buttons: OK, Cancel

# CPU PROPERTIES



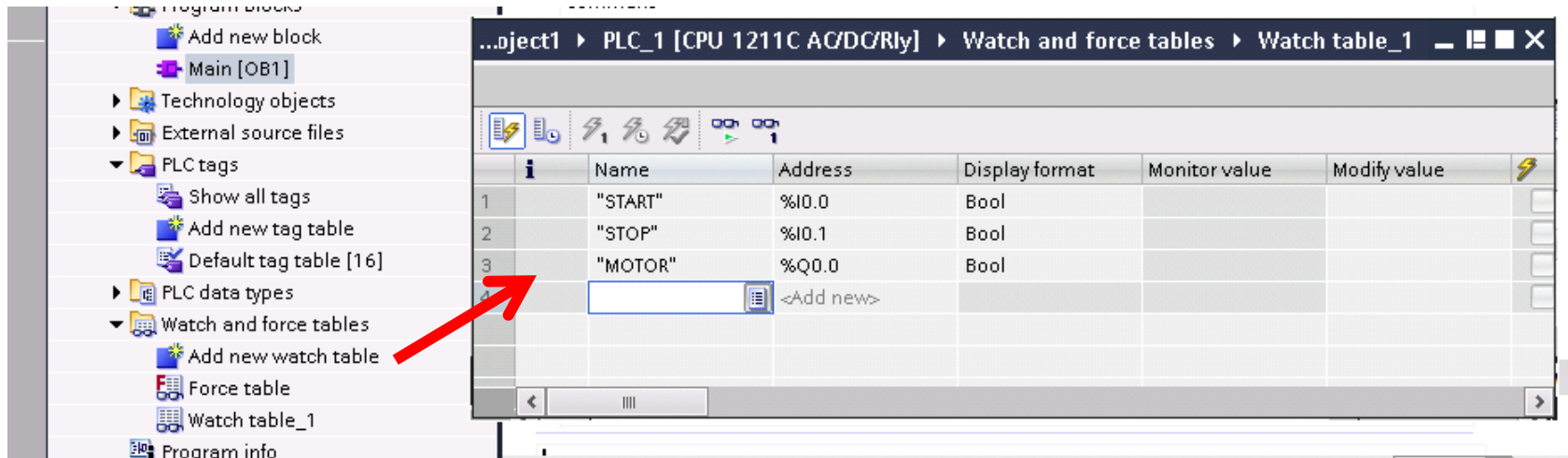
The screenshot displays the SIMATIC Manager interface. On the left, the 'Project tree' shows the hierarchy: Project2 > PLC\_1 [CPU 1211C AC/DC/Rly] > Program blocks > Main [OB1]. A red arrow points from the 'PLC\_1 [CPU 1211C AC/DC/Rly]' folder to the 'General' tab of the 'PLC\_1 [CPU 1211C AC/DC/Rly]' dialog box. The 'General' tab is active, showing a list of categories on the left and 'Catalog information' selected. The 'Catalog information' section on the right provides the following details:

- Short designation: CPU 1211C AC/DC/Rly
- Description: Work memory 25 KB; 120/240VAC power supply with DI6 x 24VDC SINK/SOURCE, DQ4 x relay and AI2 on board; 3 high-speed counters (expandable with digital signal board) and 2 pulse outputs on board; signal board expands on-board I/O; up to 3 communications modules for serial communication; 0.1 ms/1000 instructions; PROFINET interface for programming, HMI and PLC to PLC communication
- Order number: 6ES7 211-1BD30-0XB0
- Firmware version: V2.1

Buttons for 'Update module version', 'OK', and 'Cancel' are visible at the bottom of the dialog box.

# WATCH & FORCE TABLE

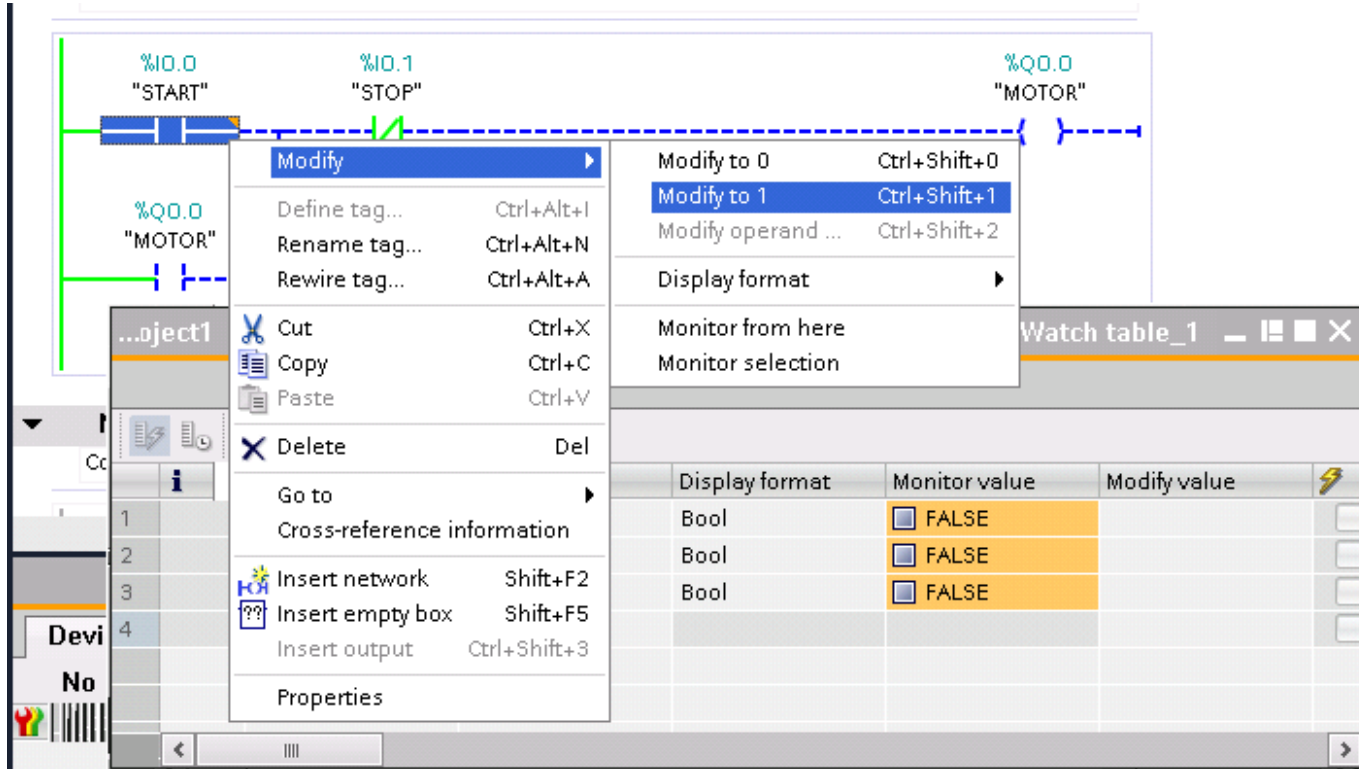
- PROGRAMDAKİ BELİRLİ VERİLERİ İZLEMeye VE DEĞİŞTİRMEYE YARAYAN PENCEREDİR; BELİRLİ ADRESLERİ VEYA DATA BLOCK'LARDAN GETİRİLEN ADRESLER İZLENEBİLİR



	Name	Address	Display format	Monitor value	Modify value
1	"START"	%I0.0	Bool		
2	"STOP"	%I0.1	Bool		
3	"MOTOR"	%Q0.0	Bool		
4		<Add new>			

# MODIFY

- DEVRE ÜZERİNDEKİ KONTAKLARIN KONUMUNUN DEĞİŞTİRİLMESİNİ SAĞLAR



The screenshot shows a PLC ladder logic diagram with three contacts: %I0.0 "START", %I0.1 "STOP", and %Q0.0 "MOTOR". A context menu is open over the %I0.1 contact, showing the 'Modify' option selected. The 'Modify' submenu is also open, showing the following options:

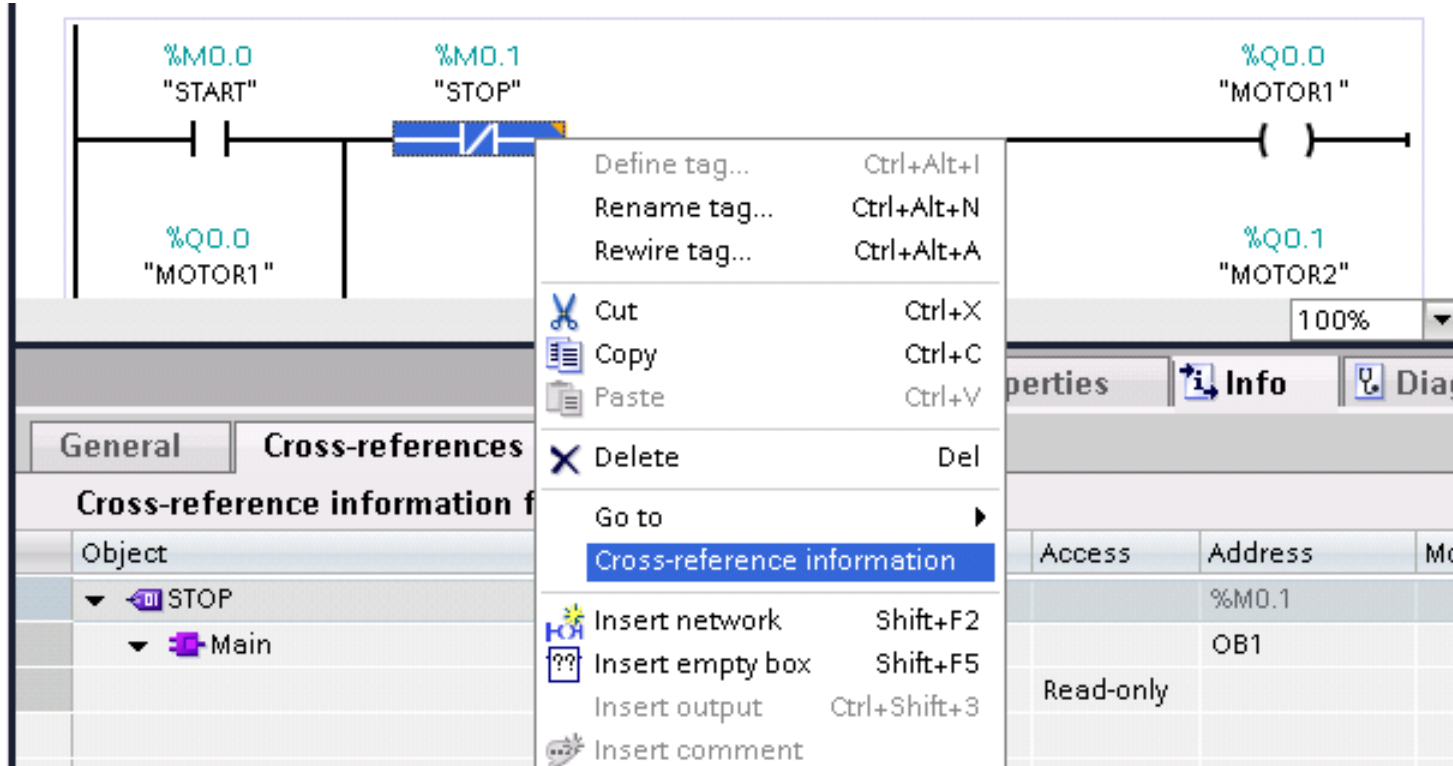
- Modify to 0 (Ctrl+Shift+0)
- Modify to 1 (Ctrl+Shift+1)
- Modify operand ... (Ctrl+Shift+2)
- Display format
- Monitor from here
- Monitor selection

The 'Watch table\_1' window is visible in the foreground, showing a table with the following columns: Display format, Monitor value, and Modify value.

Display format	Monitor value	Modify value
Bool	<input type="checkbox"/> FALSE	
Bool	<input type="checkbox"/> FALSE	
Bool	<input type="checkbox"/> FALSE	

# CROSS REFERENCE

- BİR PARAMETRENİN NERELERDE VE KAÇ DEFA KULLANILDIĞINI GÖSTERİR



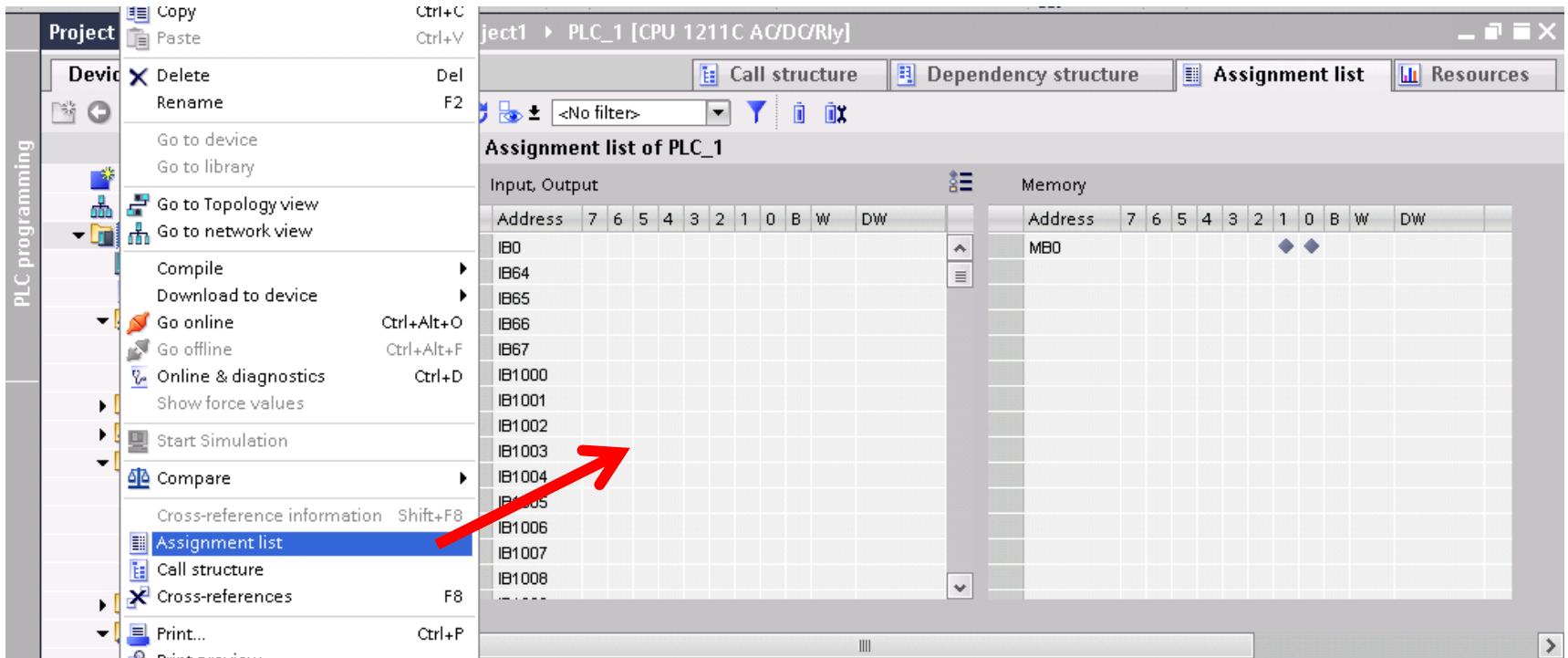
The screenshot illustrates the cross-reference functionality in a PLC software. The main window shows a ladder logic diagram with a coil for %Q0.1 "MOTOR2" and two normally open contacts for %M0.0 "START" and %M0.1 "STOP". A context menu is open over the %M0.1 contact, with "Cross-reference information" selected. The "Cross-reference information" table shows the object "STOP" under "Main" with an address of "%M0.1". The "Properties" window on the right shows the coil's address as "%Q0.1" and "MOTOR2".

Object	Address	Memory
STOP	%M0.1	

Access	Address	Memory
	%Q0.1	
	MOTOR2	
Read-only		

# ASSIGNMENT LIST

- HANGİ BELLEKLERİN KULLANILDIĞINI GÖSTEREN BİR HARİTA PENCERESİDİR



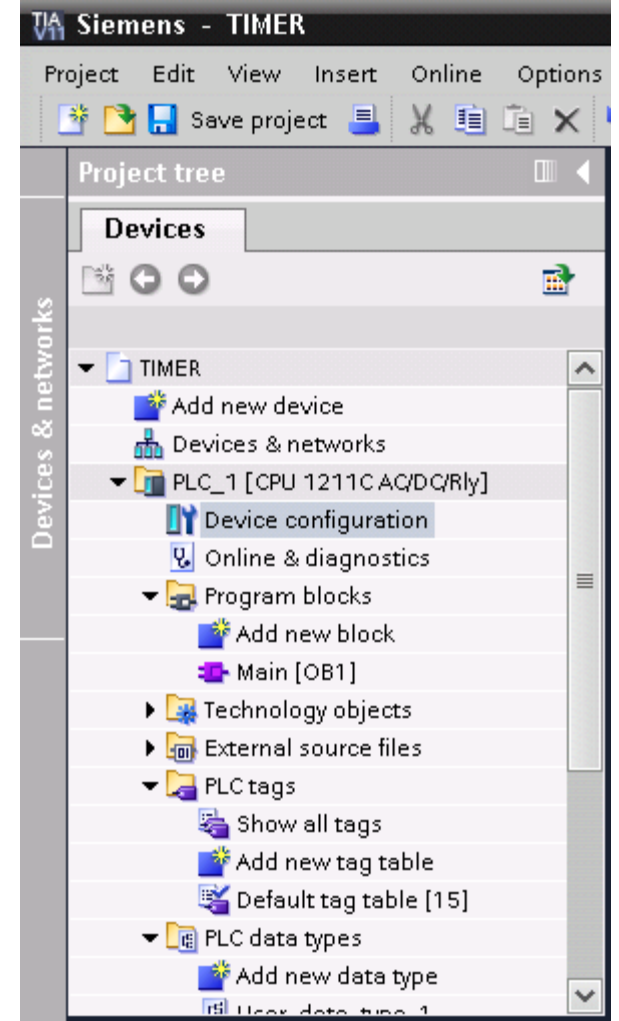
The screenshot shows the 'Assignment list' window for a PLC\_1 project. The window is divided into two main sections: 'Input, Output' and 'Memory'. The 'Input, Output' section has a table with columns for Address, bits 7-0, B, W, and DW. The 'Memory' section has a table with columns for Address, bits 7-0, B, W, and DW. A red arrow points to the 'Assignment list' menu item in the Project window.

Address	7	6	5	4	3	2	1	0	B	W	DW
IB0											
IB64											
IB65											
IB66											
IB67											
IB1000											
IB1001											
IB1002											
IB1003											
IB1004											
IB1005											
IB1006											
IB1007											
IB1008											
-----											

Address	7	6	5	4	3	2	1	0	B	W	DW
M00											

# ANALOG GİRİŞ

- ANALOG GİRİŞLER «PROJECT TREE\ DEVICE CONFIGURATION» BÖLÜMÜNDEN AYARLANABİLİR

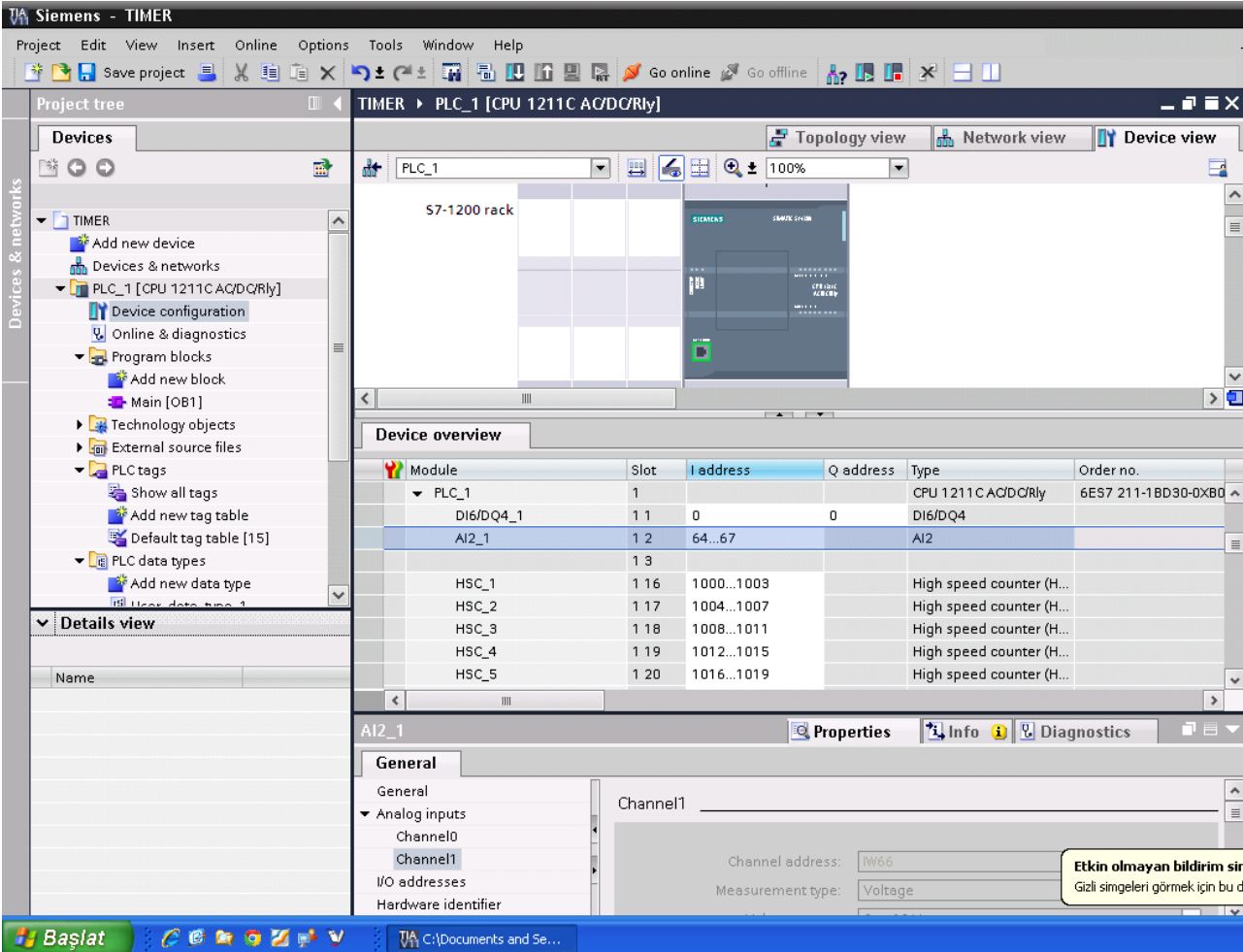


# ANALOG GİRİŞ



- S7-1200 AİLESİNDE HER CPU'DA 2 ADET ANALOG GİRİŞ BULUNMAKTADIR
- ANALOG GİRİŞLER 0-10 VOLT GERİLİMLE ÇALIŞMAKTADIR
- VARSAYILAN OLARAK ANALOG GİRİŞLERİN ADRESLERİ IW64 VE IW66'DIR

# ANALOG GİRİŞ



The screenshot shows the Siemens SIMATIC Manager interface for configuring a PLC rack. The main window displays the rack configuration for a SIMATIC 1200 rack. The rack is populated with a CPU 1211C AC/DC/Rly module in slot 1, and several I/O modules in slots 2 through 5. The AI2\_1 module is selected, and its properties are shown in the lower right pane.

**Device overview**

Module	Slot	I address	Q address	Type	Order no.
PLC_1	1			CPU 1211 C AC/DC/Rly	6ES7 211-1BD30-0XB0
DI6/DQ4_1	1 1	0	0	DI6/DQ4	
AI2_1	1 2	64...67		AI2	
	1 3				
HSC_1	1 16	1000...1003		High speed counter (H...	
HSC_2	1 17	1004...1007		High speed counter (H...	
HSC_3	1 18	1008...1011		High speed counter (H...	
HSC_4	1 19	1012...1015		High speed counter (H...	
HSC_5	1 20	1016...1019		High speed counter (H...	

**AI2\_1 Properties**

Channel1

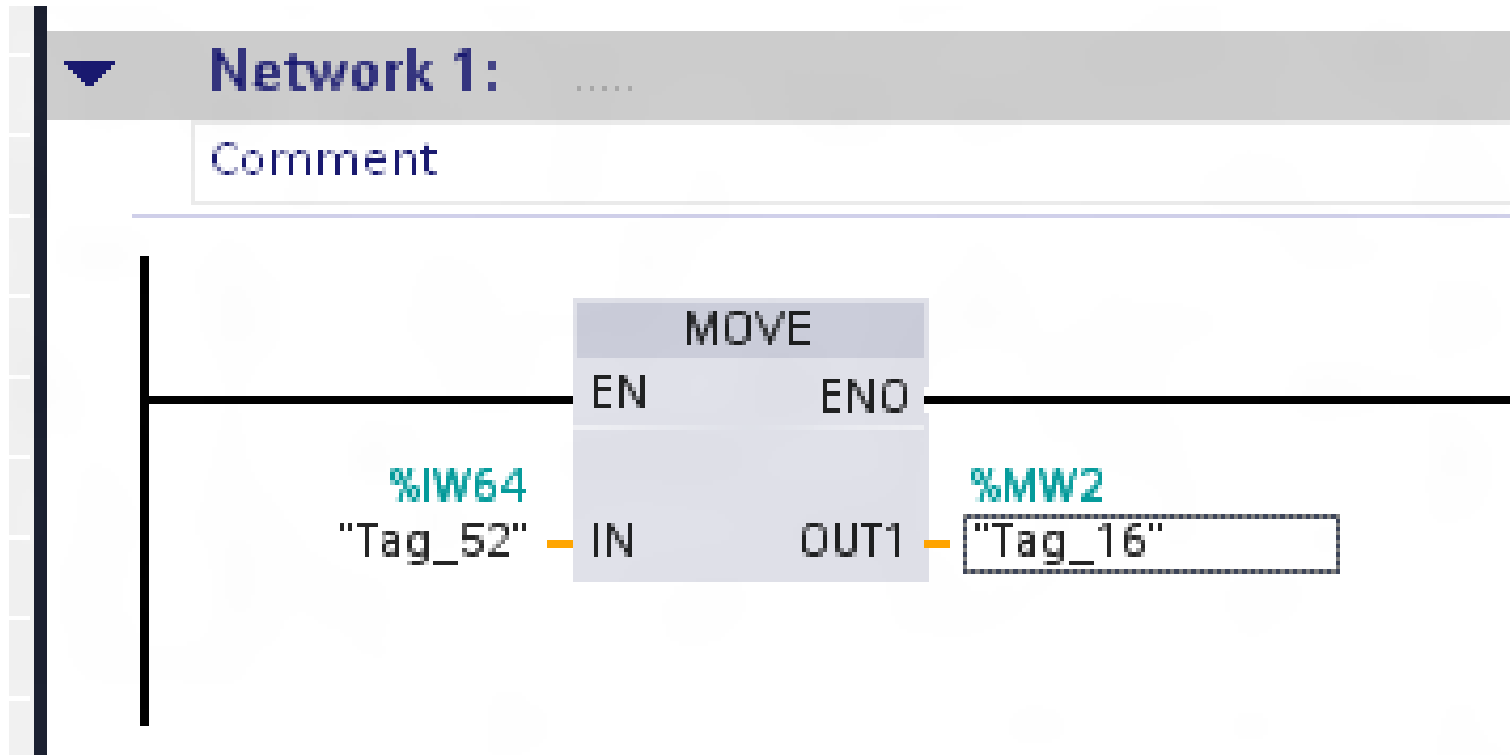
Channel address: IW66

Measurement type: Voltage

Etkin olmayan bildirim sim  
Gizli simgeleri görmek için bu dü

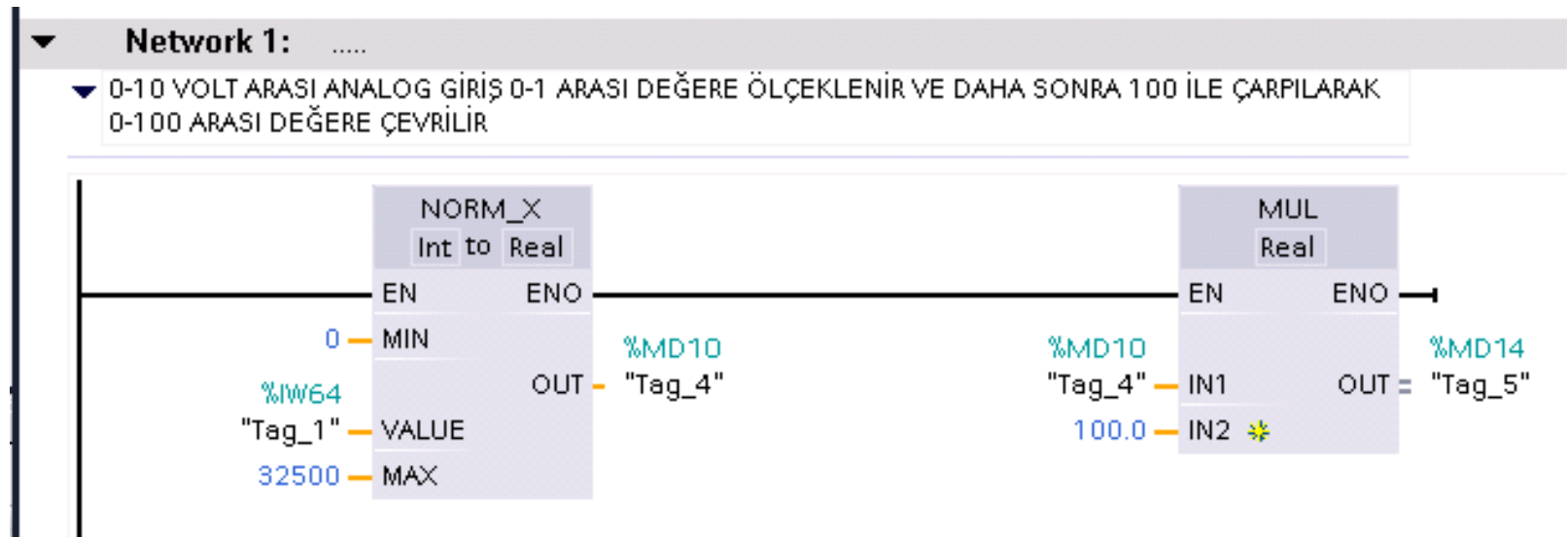
# ANALOG GİRİŞ

- MOVE KOMUTU İLE ANALOG GİRİŞLER HER HANGİ BİR ADRESE TAŞINABİLİR



# ANALOG GİRİŞ ÖLÇEKLEME

- 0-100 DERECE ARASI SICAKLIK İÇİN 0-10 VOLT ARASI GERİLİM VEREN PT 100 İÇİN AŞAĞIDAKİ İŞLEMLER YAPILABİLİR



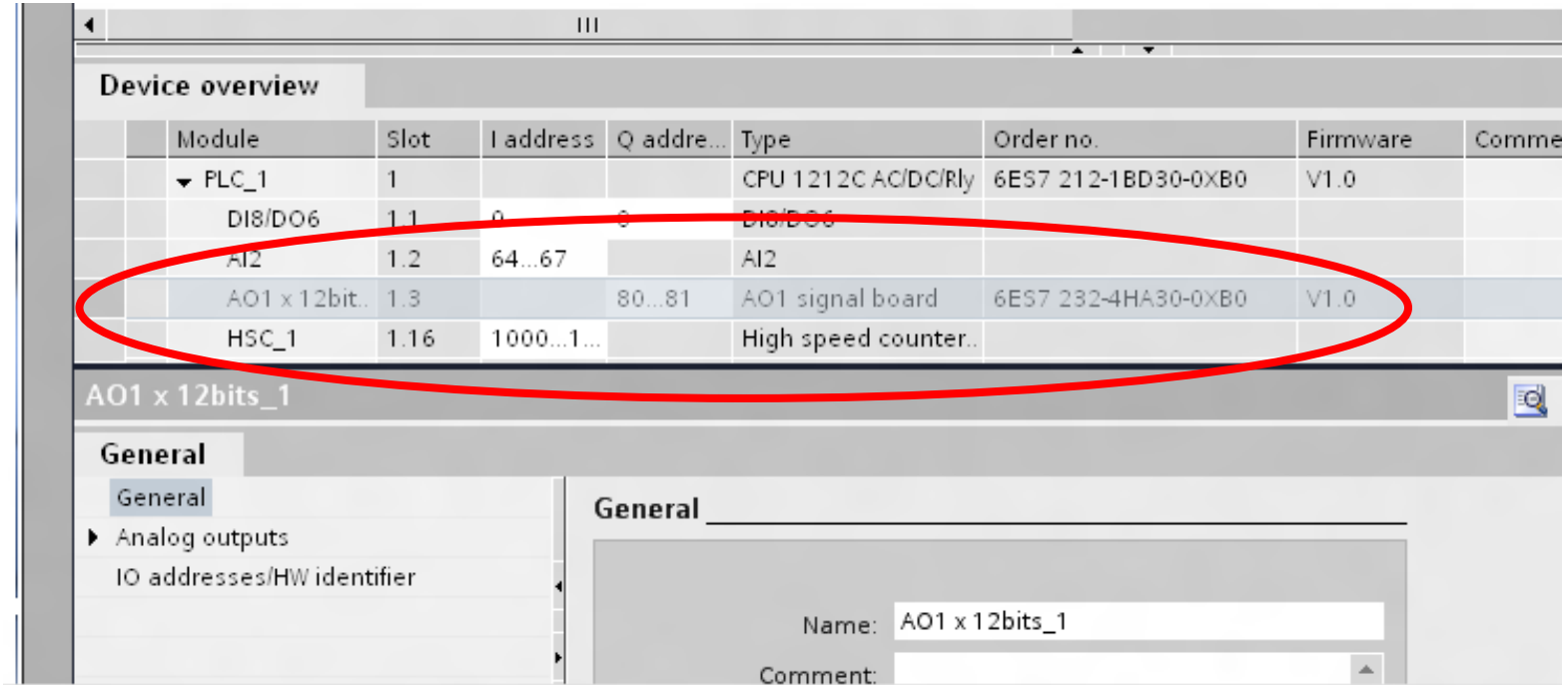
# ANALOG ÇIKIŞ



- ANALOG ÇIKIŞLAR SÜRÜCÜ HIZLARINI AYARLAMA VB AMAÇLARLA KULLANILABİLİR
- S7-1200 CPU'LARDA ANALOG ÇIKIŞ YOKTUR
- SATIN ALINABİLECEK MODÜLLERLE BİR VEYA DAHA FAZLA ANALOG ÇIKIŞ EKLENEBİLİR
- ANALOG ÇIKIŞLAR 0-10V VEYA 0-20mA OLABİLİR

# ANALOG ÇIKIŞ

- ANALOG ÇIKIŞLAR «DEVICE CONFIGURATION» BÖLÜMÜNDEN AYARLANABİLİR



Module	Slot	I address	Q address	Type	Order no.	Firmware	Comments
PLC_1	1			CPU 1212C AC/DC/Rly	6ES7 212-1BD30-0XB0	V1.0	
DI8/DO6	1.1	0...	0...	DI8/DO6			
AI2	1.2	64...67		AI2			
AO1 x 12bit	1.3		80...81	AO1 signal board	6ES7 232-4HA30-0XB0	V1.0	
HSC_1	1.16	1000...1...		High speed counter..			

AO1 x 12bits\_1

**General**

General

► Analog outputs

IO addresses/HW identifier

Name: AO1 x 12bits\_1

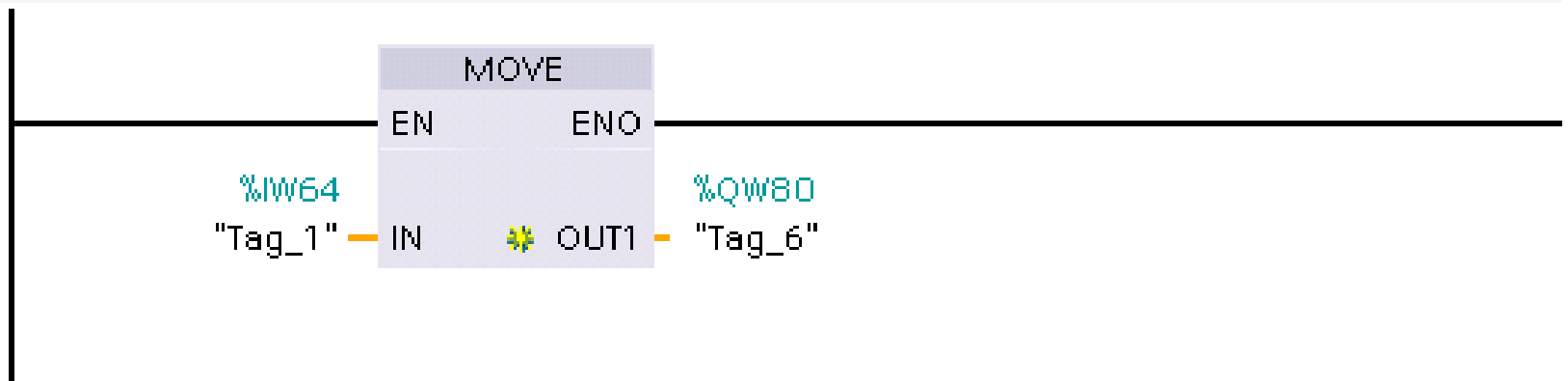
Comment:

# ANALOG ÇIKIŞ

- DEĞİŞTİRİLEBİLMEKLE BERABER VARSAYILAN OLARAK ANALOG ÇIKIŞ ADRESLERİ QW80, QW82, ... ŞEKLİNDE OLUR

Network 1: .....

ANALOG GİRİŞİN AYNEN ANALOG ÇIKIŞA GÖNDERİLMESİ İÇİN AŞAĞIDAKİ DEVRE YAPILABİLİR



# BAZI ANALOG MODÜLLER



- S7-1200 AİLESİNDE ENTEGRE ANALOG ÇIKIŞ PORTU BULUNMAZ
- EĞER ANALOG ÇIKIŞA İHTİYACINIZ VARSA CPU ÜZERİNE TAKILACAK «SIGNAL BOARD» VEYA CPU YANINA TAKILACAK «SIGNAL MODULE» İLE BU İHTİYACINIZI GİDEREBİLİRSİNİZ

# SM 1234 ANALOG A/I

- 4 ADET 0-10 VOLT VEYA 0-20mA ÇALIŞAN 12 BIT ANALOG GİRİŞ SAĞLAR
- 2 ADET DE 0-10 VOLT VEYA 0-20mA ÇALIŞAN 13 BIT ANALOG ÇIKIŞ SAĞLAR





# SB 1231 RTD

- 1 ADET 16 BIT RTD SAĞLAYAN VE CPU ÜZERİNE TAKILAN BİR İŞARET KARTIDIR
- RTD (RESISTANCE TEMPERATURE DEVICE), SICAKLIĞA BAĞLI OLARAK DİRENÇ DEĞERİ DEĞİŞEN ELEMANDIR
- PİYASADA EN ÇOK PT 100 KULLANILIR



# SİNYAL ÇEVİRİCİ/ TRANSMITTER

- SENSÖRLERDEN (PT100 V.B.) GELEN SİNYALLERİ UYGUN AKIM VE GERİLİME ÇEVİREN VE PLC'YE GÖNDEREN CİHAZLARDIR
- T/C (J, K, S, R TİP), NTC VE PT-100 GİRİŞLİ, 0-20, 4-20MA VEYA 0-10/1-5V DC ÇIKIŞLI CİHAZLAR BULUNABİLİR



# DİKKAT!



- SENSÖR ALIRKEN ENTEGRE TRANSMİTTER'LI VEYA TRANSMİTTER'SIZ ALABİLİRSİNİZ
- EĞER SADECE SENSÖR ALDIYSANIZ YANINA TRANSMİTTER DA ALMALI VE TRANSMİTTER AYARLARINI YAPMALISINIZ
- SENSÖR SİPARİŞİ VERİRKEN YAPACAĞI İŞİ, ÇALIŞACAĞI DEĞERLERİ, TRANSMİTTERLI OLUP OLMAYACAĞINI, ÇIKIŞININ GERİLİM VEYA AKIM OLACAĞINI BELİRTMELİSİNİZ

# AC MOTOR SÜRÜCÜLERİ

- GİRİŞLERİNE GELEN 50HZ ŞEBEKE FREKANSINI ANALOG GİRİŞLERİNE GELEN 0-10V İLE DEĞİŞTİREREK AC MOTORA İLETEN VE MOTORUN HIZINI KONTROL EDEN CİHAZLARDIR
- ÜZERİNDEKİ BAĞLANTI VEYA YAZILIMLARLA MOTORUN DÖNÜŞ YÖNÜNÜ DE DEĞİŞTİREBİLİRLER



# AC MOTOR SÜRÜCÜLERİ



- MOTOR SÜRÜCÜ TEKNOLOJİSİ, SÜRÜŞ İŞLEMİNİN ÜRETKENLİĞİNİ VE VERİMLİLİĞİNİ ARTTIRIRKEN TAM BİR MOTOR HIZI KONTROLÜ SUNMAKTADIR.
- DÜŞÜK KAPASİTEYE İHTİYAÇ DUYULDUĞUNDA, SÜRÜCÜ MAKİNEİNİN HIZINI AZALTARAK ENERJİ TASARRUFU SAĞLAR.

# SÜRÜCÜLER NASIL ÇALIŞIR



- **1- DOĞRULTUCU:** 1/3 FAZLI 50HZ'LİK ŞEBEKE DOĞRULTUCUDA DC AKIMA DÖNÜŞTÜRÜLÜR.
- **2- ARA DEVRE (DC BARA):** OLUŞTURULAN BU DC GERİLİM KAPASİTE VE BOBİNLERDEN MEYDANA GELEN ARA DEVRE (DC BARA) TARAFINDAN DARBELERİ FİLTRE EDİLİR.
- **3- EVİRİCİ (INVERTER):** MOTOR FAZLARINI, POZİTİF YA DA NEGATİF DC BARAYA BELİRLİ BİR SIRALAMA İLE BAĞLAR.

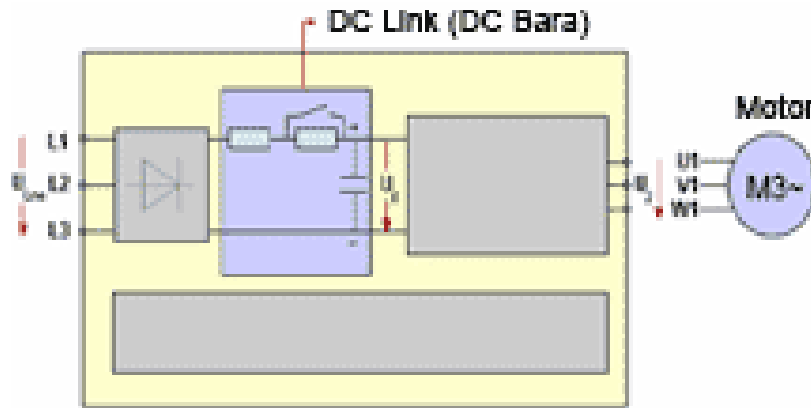
# SÜRÜCÜ & DOĞRULTUCU

- AC GERİLİM DC GERİLİME DÖNÜŞTÜRÜLÜR



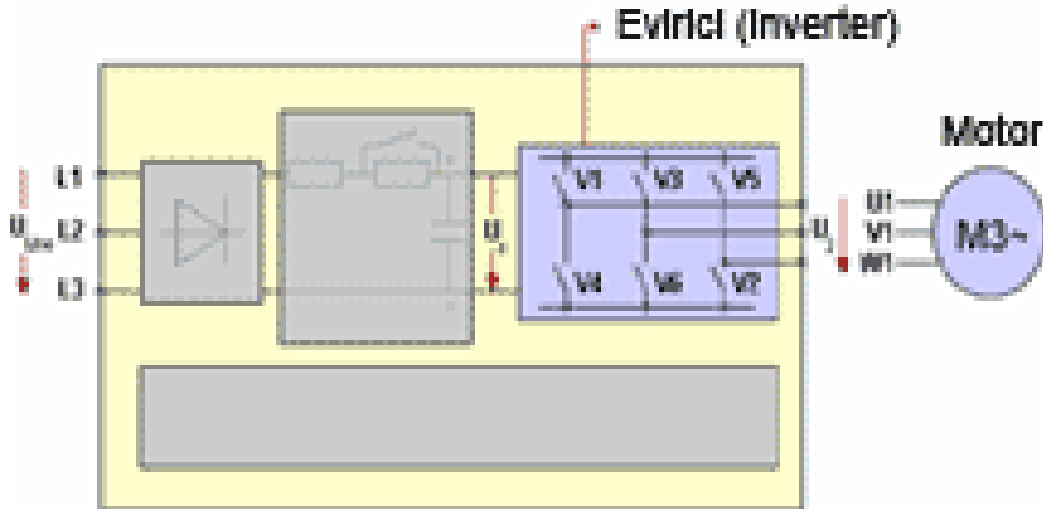
# SÜRÜCÜ & ARA DEVRE

- DC BARA EVİRİCİYİ BESLER. TİPİK OLARAK KAPASİTELER HAT ÇEVİRİCİDEN (DOĞRULTUCU) GELEN TEPELERİ FİLTRE EDER VE YUMUŞATIR



# SÜRÜCÜ & INVERTER

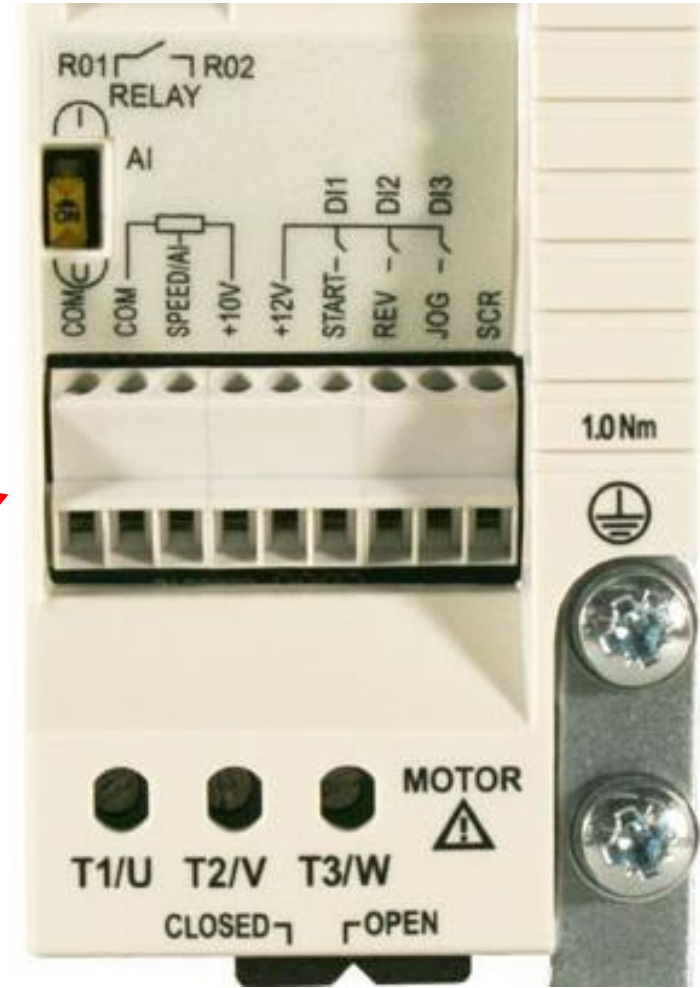
- DC GERİLİMİ TEKRAR AC'YE ÇEVİRİR



# AC MOTOR SÜRÜCÜLERİ

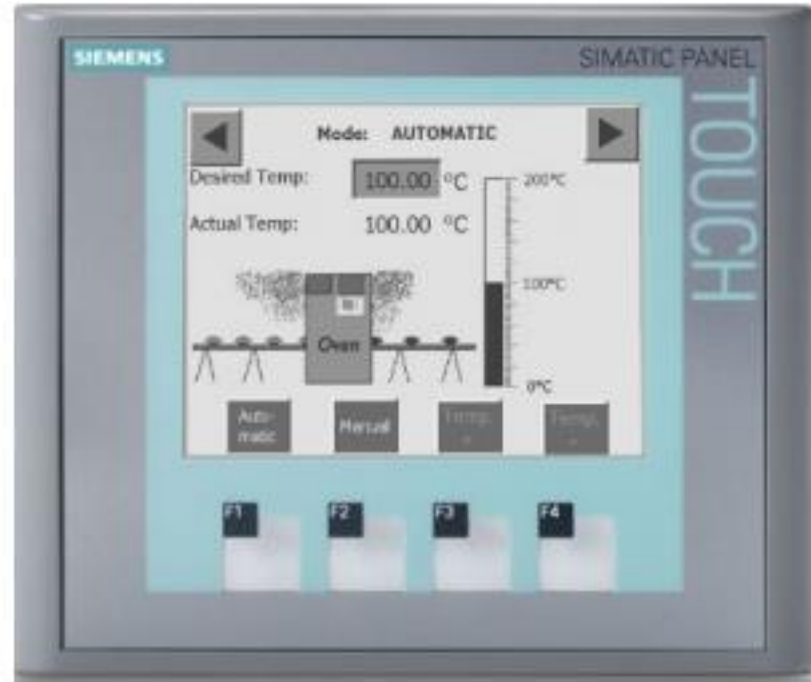


# AC MOTOR SÜRÜCÜLERİ



# SIMATIC BASIC PANELLER

- PROGRAMDAKİ PARAMETRELERİ İZLEMeye VEYA DEĞİŞTİRMeye YARAYAN GİRİŞ SEVİYESİ PANELLERDİR



# SIMATIC BASIC PANELLER

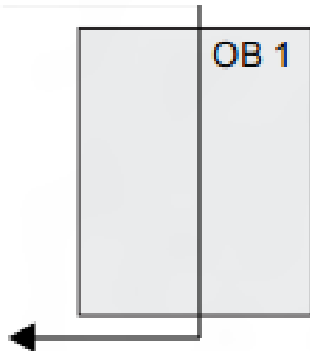


- BAŞKA HERHANGİ BİR YAZILIMA İHTİYAÇ DUYMADAN BASIC PANELLER TIA PORTAL İLE TASARLANIR VE KULLANILIR
- DAHA GELİŞMİŞ VE GÖRSEL OLAN SCADA (Supervisory Control And Data Acquisition) UYGULAMALARI İÇİN «WINCC» YAZILIMININ KURULMASI GEREKMEKTEDİR

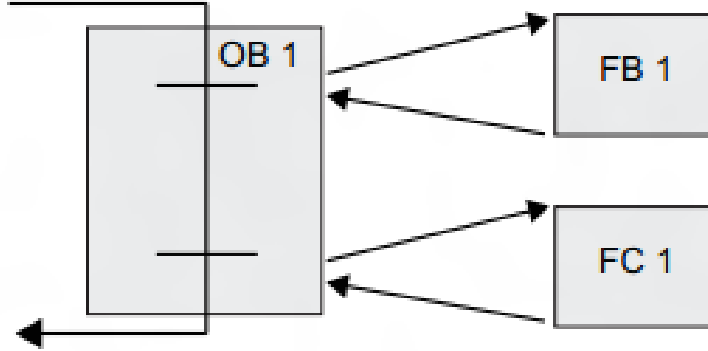
# YAPISAL PROGRAMLAMA

- ALT ALTA ÇALIŞAN KOMUTLAR YERİNE, FARKLI İŞLER YAPAN VE GEREKTİĞİNDE ÇAĞIRILAN PROGRAM BLOKLARI (TOPLULUKLARI) TERCİH EDİLMELİDİR

Linear structure:



Modular structure:



# ORGANIZATION BLOCK NEDİR?



- FARKLI İŞLEMLERİ FARKLI KOMUT GRUPLARI YAZIP ÇALIŞTIRARAK YAPMAYA YARAYAN KOD TOPLULUĞUDUR
- BAZI BLOKLAR ÇEVİRİM İÇİNDE SIRAYLA, BAZI BLOKLAR SADECE İLK ÇEVİRİMDE, BAZI BLOKLAR KESİNTİ İLE, BAZI BLOKLAR İSE ÇAĞRILDIĞINDA ÇALIŞIR

# ORGANIZATION BLOCK



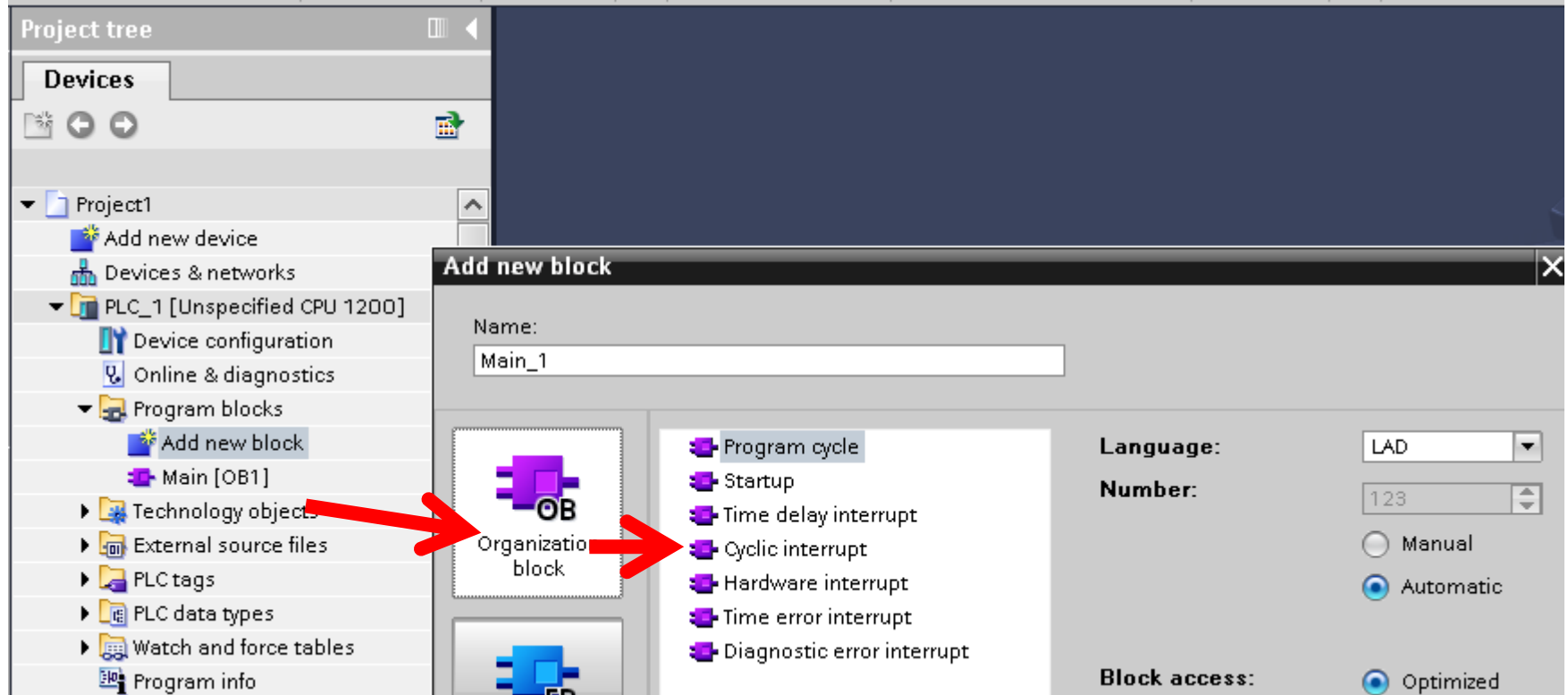
- OB'LAR BÜYÜK BİR PROGRAMI KÜÇÜK PARÇALARA BÖLEREK BASİTLEŞTMEYİ SAĞLAR
- BELLİ BİR ADLA KAYDEDİLEN KOMUTLAR TOPLULUĞU (FUNCTION) İSE AYNI KODLARI DEFALARCA KULLANMAYI SAĞLAR; GEREKSİZ KOD TEKRARLARI ENGELLENMİŞ OLUR

# MAIN (OB1)



- NORMALDE, PROGRAM SADECE OB1 İSİMLİ BLOKTAN OLUŞUR
- OB1, TÜM PROGRAM İÇİN TEMEL YAPIYI SAĞLAR; YANI BİR NEVİ ANA PROGRAMDIR
- FARKLI BLOKLAR OLUŞTURULARAK SIRAYLA VEYA GEREKTİĞİNDE ÇALIŞTIRILABİLİR

# OB OLUŐTURMA



Project tree

Devices

Project1

- Add new device
- Devices & networks
- PLC\_1 [Unspecified CPU 1200]
  - Device configuration
  - Online & diagnostics
  - Program blocks
    - Add new block
    - Main [OB1]
  - Technology objects
  - External source files
  - PLC tags
  - PLC data types
  - Watch and force tables
  - Program info

Add new block

Name: Main\_1

- Program cycle
- Startup
- Time delay interrupt
- Cyclic interrupt
- Hardware interrupt
- Time error interrupt
- Diagnostic error interrupt

Language: LAD

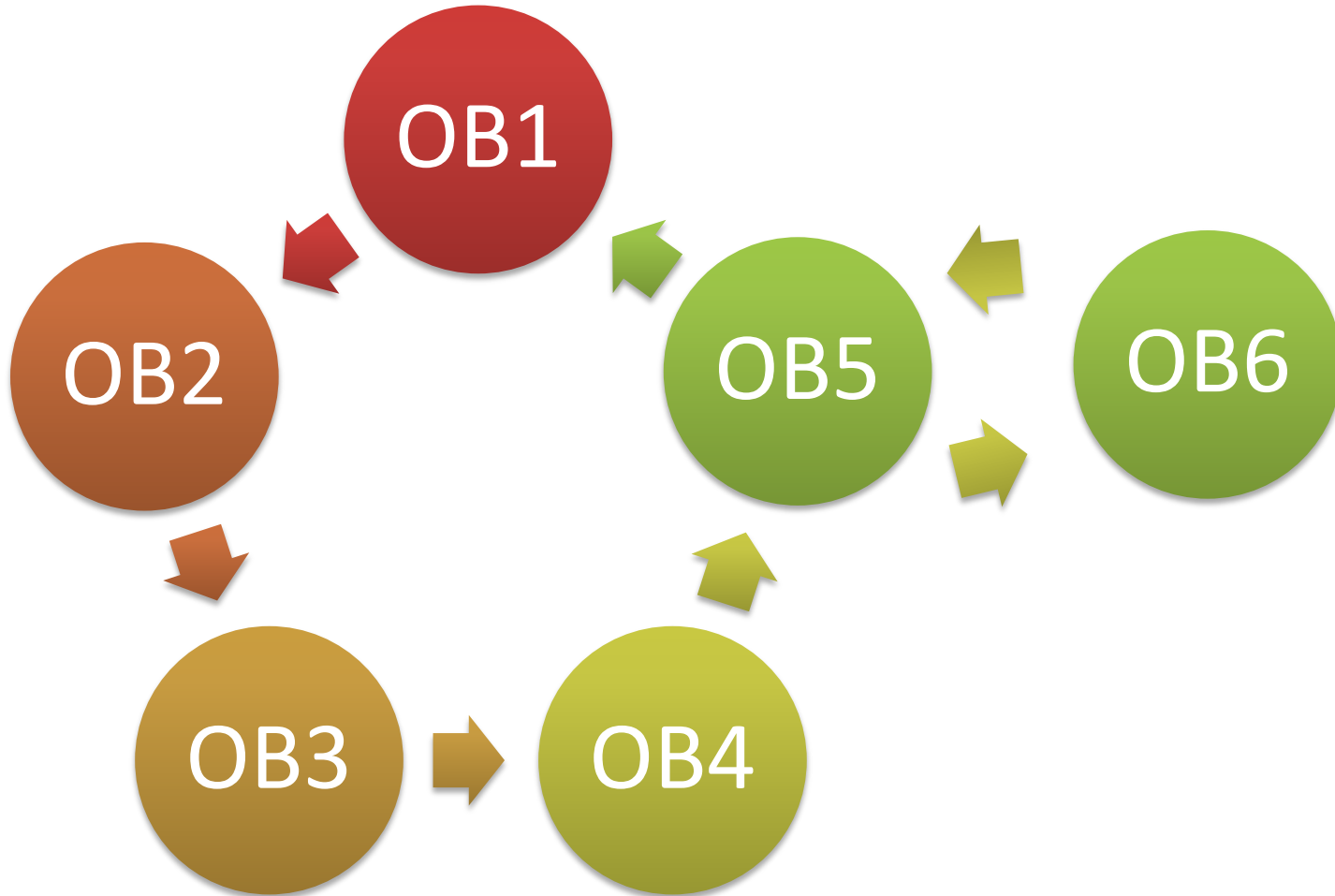
Number: 123

Manual

Automatic

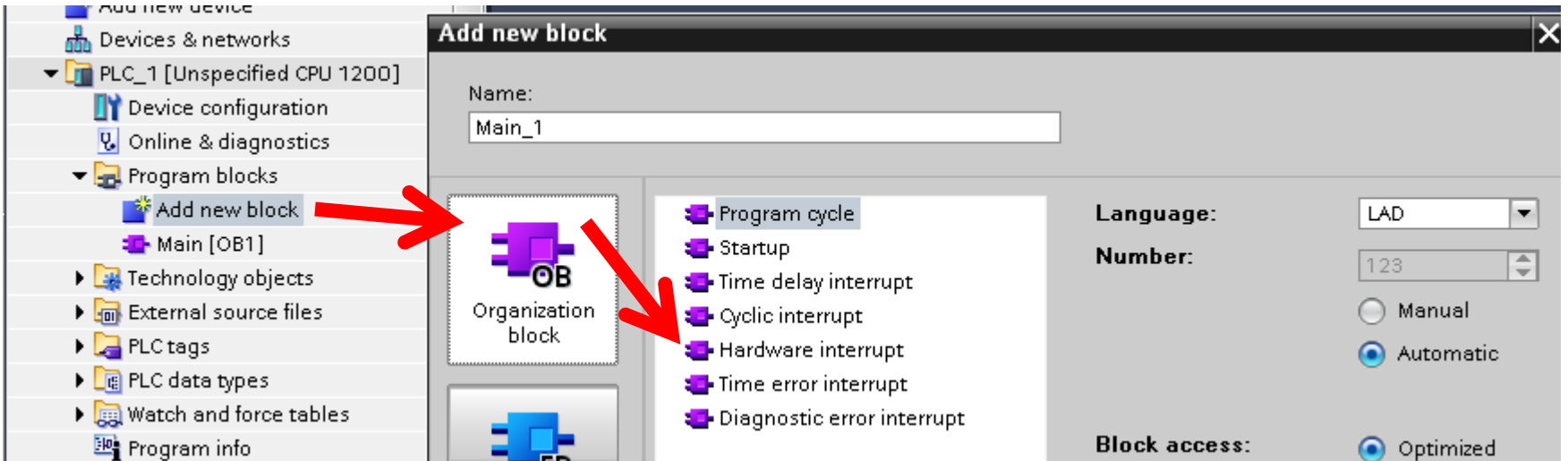
Block access: Optimized

# OB ALIŐMA MANTIĐI



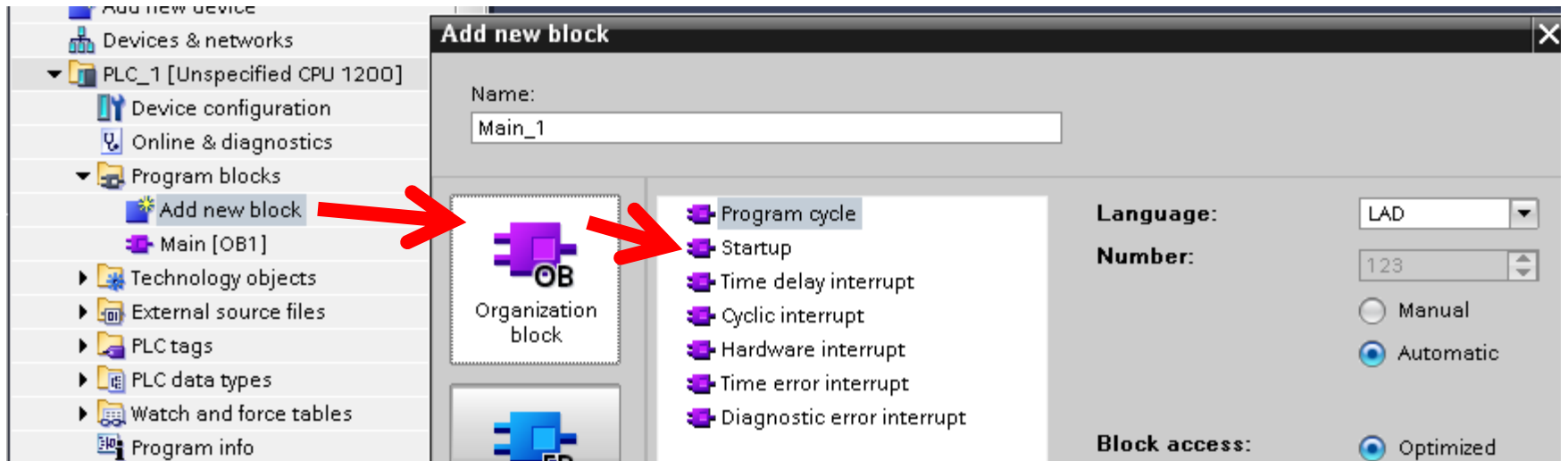
# HARDWARE INTERRUPT

- AYARLANAN DİJİTAL GİRİŞLERE GELEN POZİTİF VEYA NEGATİF KENAR TETİKLEME İLE ÇALIŞAN OB'LERDİR



# STARTUP OB

- SADECE İLK ÇEVİRİMDE ÇALIŞAN KOD BLOKLARIDIR



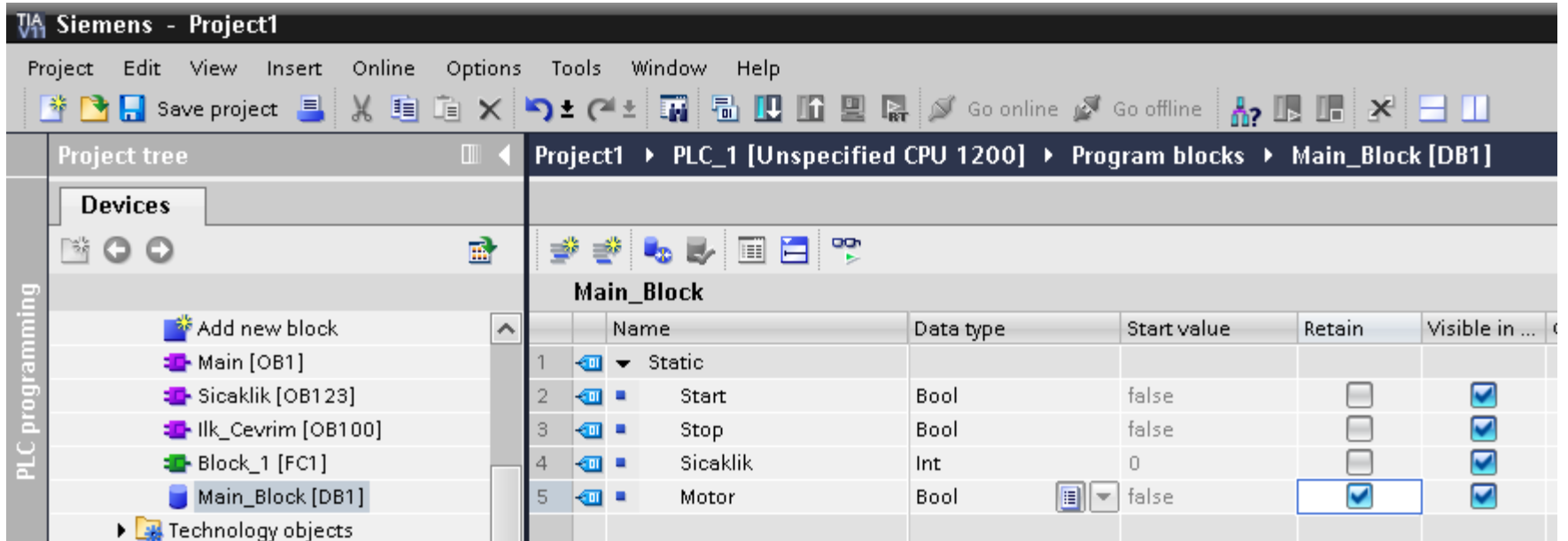
# DATA BLOCK



- PROGRAM İÇİNDEKİ BAZI VERİLERİ KAYDETMEK İÇİN KULLANILAN BELLEKLERDİR
- VERİLERİ BİZİM BELİRTTİĞİMİZ BİR ADRESE KOYMAK YERİNE, AYNI PROGRAMLAMA DİLLERİNDE OLDUĞU GİBİ, VERİNİN NEREYE KAYDEDİLECEĞİ EDITÖR TARAFINDAN BELİRLENİR
- BİZ SADECE ADRESLERE İSİM VERİRİZ VE GEREKTİĞİNDE KULLANIRIZ

# DATA BLOCK

- BLOCK İÇİNDE TANIMLANAN DEĞİŞKENLERİN PLC STOP KONUMUNA GEÇTİĞİNDE SİLİNMEMESİ İÇİN «RETAIN» İŞARETLERİNİZ



The screenshot shows the Siemens TIA Portal interface. The main window displays the configuration for the Main\_Block [DB1]. The table below is a representation of the data shown in the software.

Name	Data type	Start value	Retain	Visible in ...
Static				
Start	Bool	false	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Stop	Bool	false	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Sicaklik	Int	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Motor	Bool	false	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

# FUNCTION (FC)



- BELİRLİ KODLARI BELLİ BİR İSİMLE SAKLAYIP TEKRAR TEKRAR KULLANMAYA YARAR
- BELLİ BİR İSİMLE KAYDEDİLEN BİR FONKSİYON (ALT PROGRAM) PROGRAMIN HER HANGİ BİR YERİNDE ÇAĞIRILABİLİR
- FUNCTION VERİLERİ BİR YERE (DATA BLOCK) KAYDEDİLMEZ. BU NEDENLE EĞER GEREKLİYSE VERİLER M HAFIZASINA KAYDEDİLMELİDİR

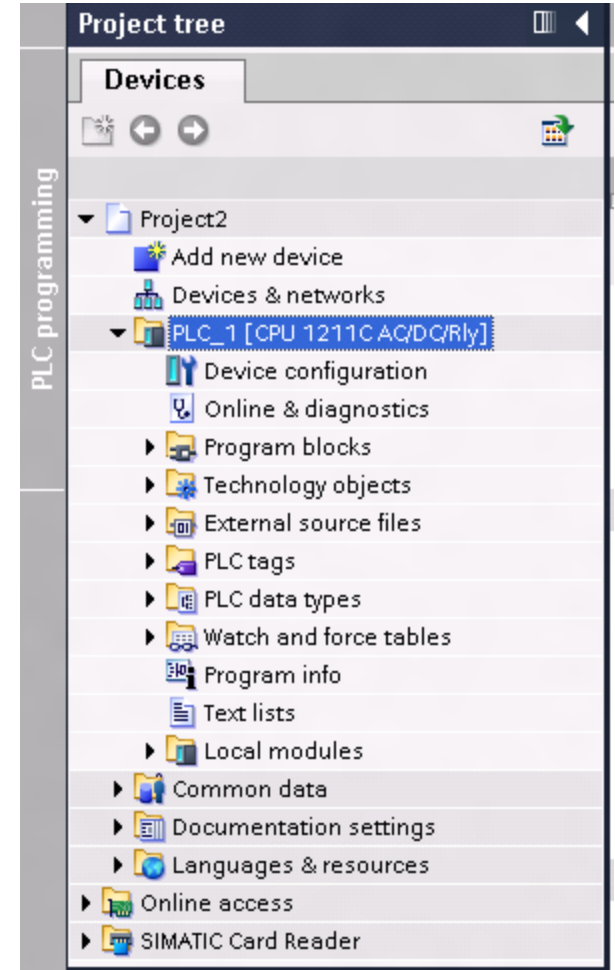
# FUNCTION BLOCK (FB)



- BELİRLİ KODLARI BELLİ BİR İSİMLE SAKLAYIP TEKRAR TEKRAR KULLANMAYA YARAR
- FB İÇİNDEKİ VERİLER KENDİNE AİT BİR VERİTABANINDA (DATA BLOCK) SAKLANIR; BÖYLECE BU VERİLER GEREKTİĞİNDE SONRA DA KULLANILABİLİR
- FB, HER KULLANIMDAN DİĞERLERİNDEN BAĞIMSIZ BİR DATA BLOCK OLUŞTURUR

# PROJECT TREE

- PROJEMİZİN YAPISINI HİYERARŞİK OLARAK GÖSTEREN PANELDİR
- TÜM DONANIM VE YAZILIM VERİLERİNE BURADAN ULAŞILABİLİR
- CPU\ SAĞ TUŞ\ PROPERTIES İLE CPU ÖZELLİKLERİNE ERİŞİLİR



# ÇİHAZ KONTROL TEKNİKLERİ



- ÇIKIŞA BAĞLI BİR ÇİHAZ 3 FARKLI TEKNİKLE KONTROL EDİLEBİLİR:
  - ON / OFF
  - ORANSAL
  - PID
    - PID KOMUTU «TECHNOLOGICAL OBJECT» ALTINDA «ADD NEW OBJECT» KOMUTU İLE BAŞLATILIR



# ENCODER



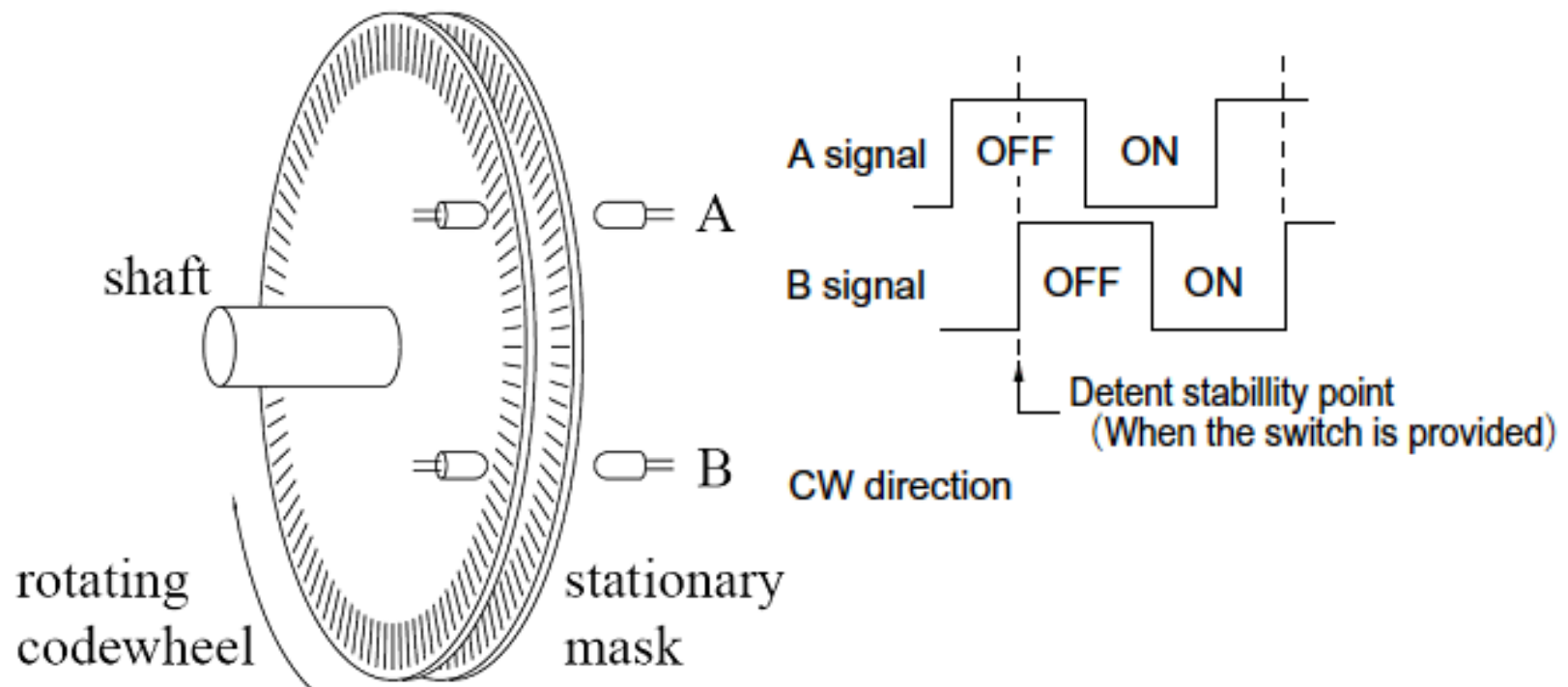
- BİR MİLİN DÖNÜŞÜ İLE BELLİ BİR MİKTARDA KARE DALGA ÜRETEN VEYA MİLİN DÖNÜŞ FREKANSINI ÖLÇEN CİHAZLARDIR
- ÖRNEĞİN MİLİN/MOTORUN BİR TURUNDA 8,16, ..., 100, 200 VEYA 360 KARE DALGA ÜRETEBİLİRLER; BÖYLECE KARE DALGA SAYISINA BAKARAK MOTORUN DÖNÜŞÜ VE YÖNÜ KONTROL EDİLİR

# ENCODER

- ÇOK DEĞİŞİK BOY VE ÖZELLİKLERDE ENCODER BULUNMAKTADIR
- TEK FAZLI, ÇİFT FAZLI, ARTIMLI VE MUTLAK ENCODERLAR BULUNMAKTADIR

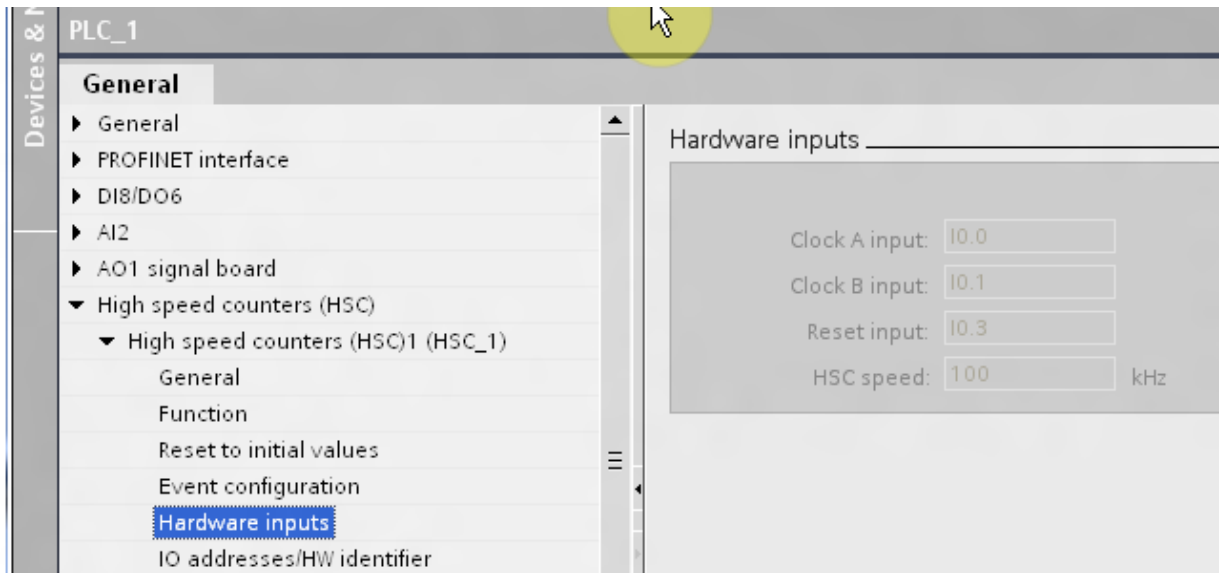


# ENCODER



# ENCODER

- ENCODER'LARDAN GELEN YÜKSEK FREKANSLI KARE DALGAYI SAYMAK İÇİN PLC'LERİN NORMAL SAYICILARI DEĞİL DE İLGİLİ GİRİŞLERE BAĞLANAN «HIZLI SAYICILAR» KULLANILIR

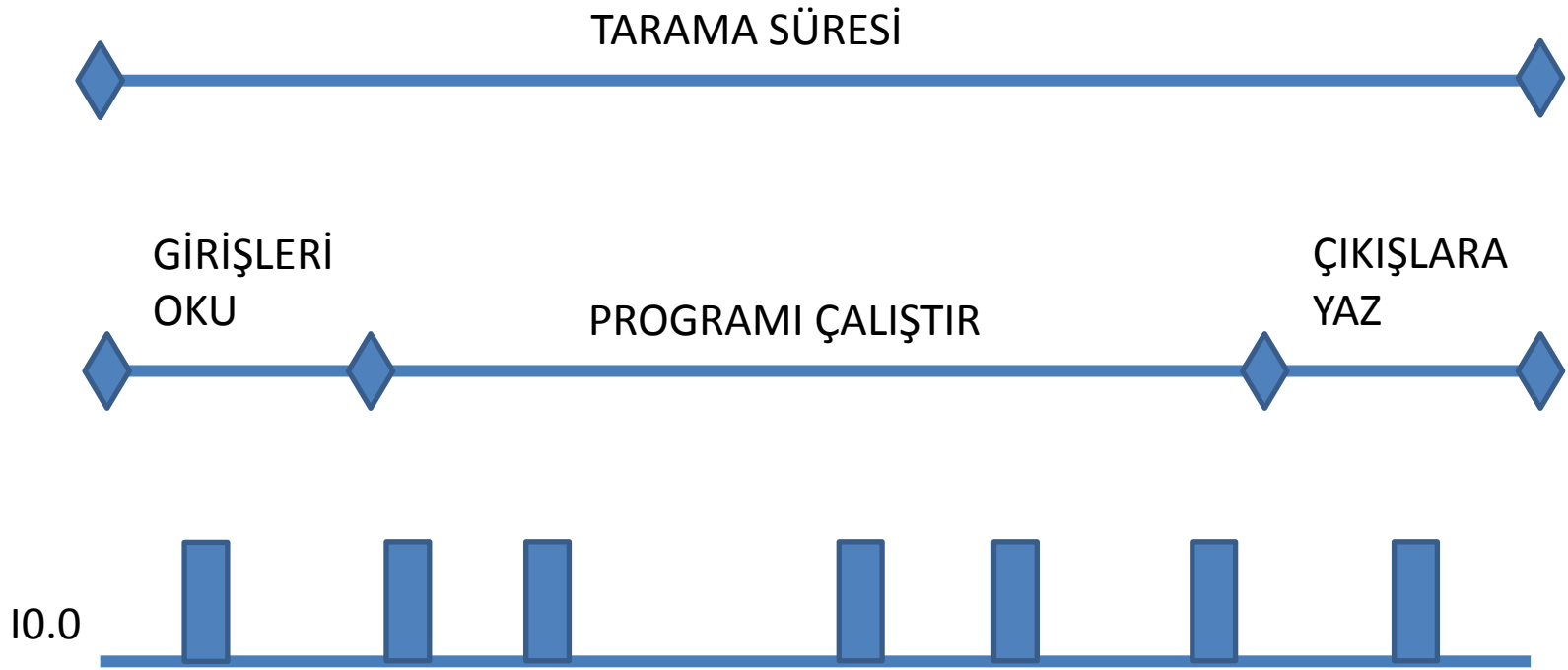


# HIZLI SAYICILAR



- NORMAL ÇEVİRİM HIZIYLA YAKALANAMAYAN YÜKSEK HIZLI GİRİŞLERİ SAYMAK AMACIYLA KULLANILAN SAYICILARDIR
- HIZLI SAYICILARDA MAKSİMUM OKUMA FREKANSI 20KHZ İLE 200KHZ ARASI DEĞİŞEBİLİR; FREKANSA GÖRE PLC TERCİH EDİLMELİDİR

# HIZLI SAYICILAR



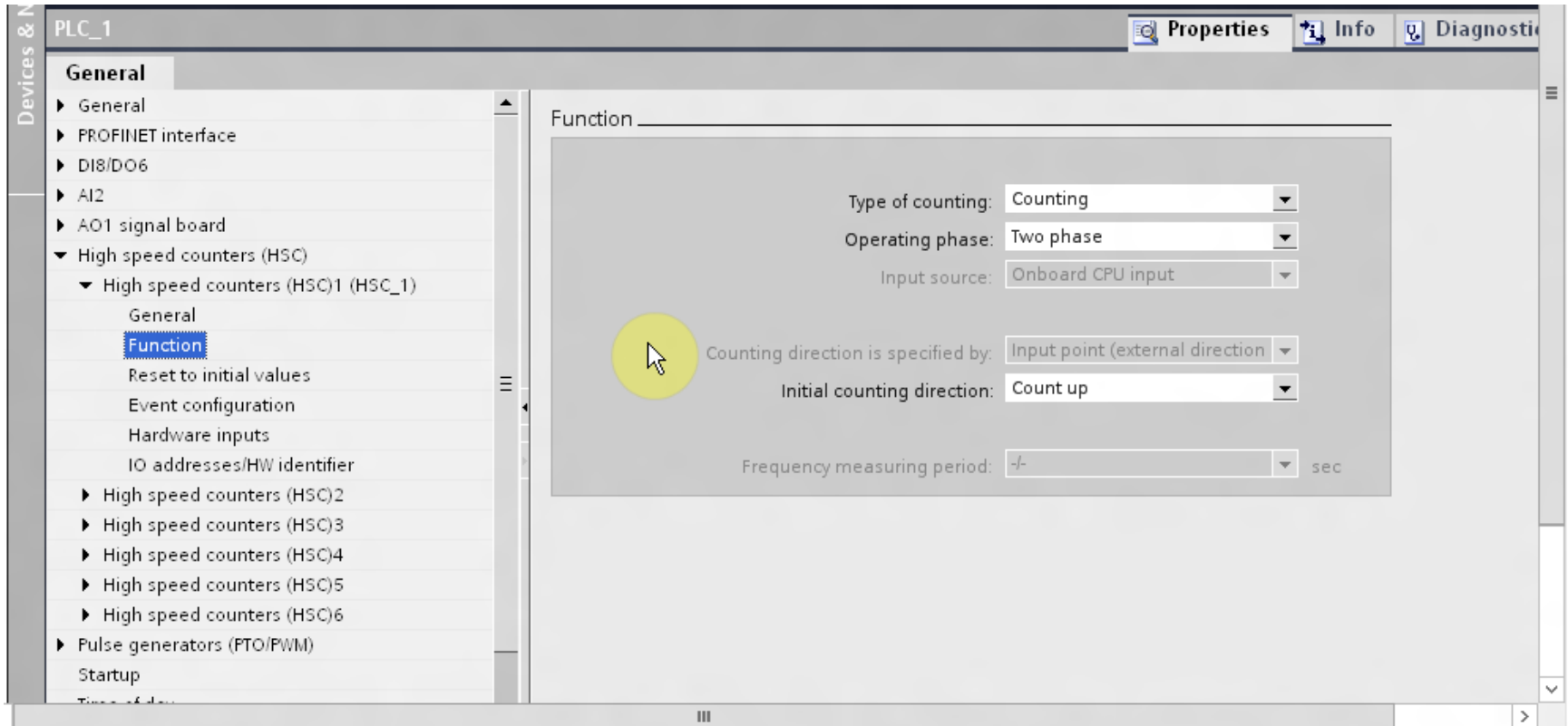
# HIZLI SAYICILAR



- KLASİK SAYICILARDA OLDUĞU GİBİ, YUKARI, AŞAĞI VE YUKARI-AŞAĞI SAYABİLİRLER
- HIZLI SAYICILARIN GİRİŞ SİNYALİ TEK SİNYAL OLABİLDİĞİ GİBİ ÇİFT SİNYAL DE OLABİLİR
- HIZLI SAYICILARA GENELDE GİRİŞ SİNYALİ OLARAK ENCODER ÇIKIŞI VERİLİR

# HIZLI SAYICI AYARLARI

- PLC\ SAĞ TUŞ\ PROPERTIES\ HSC

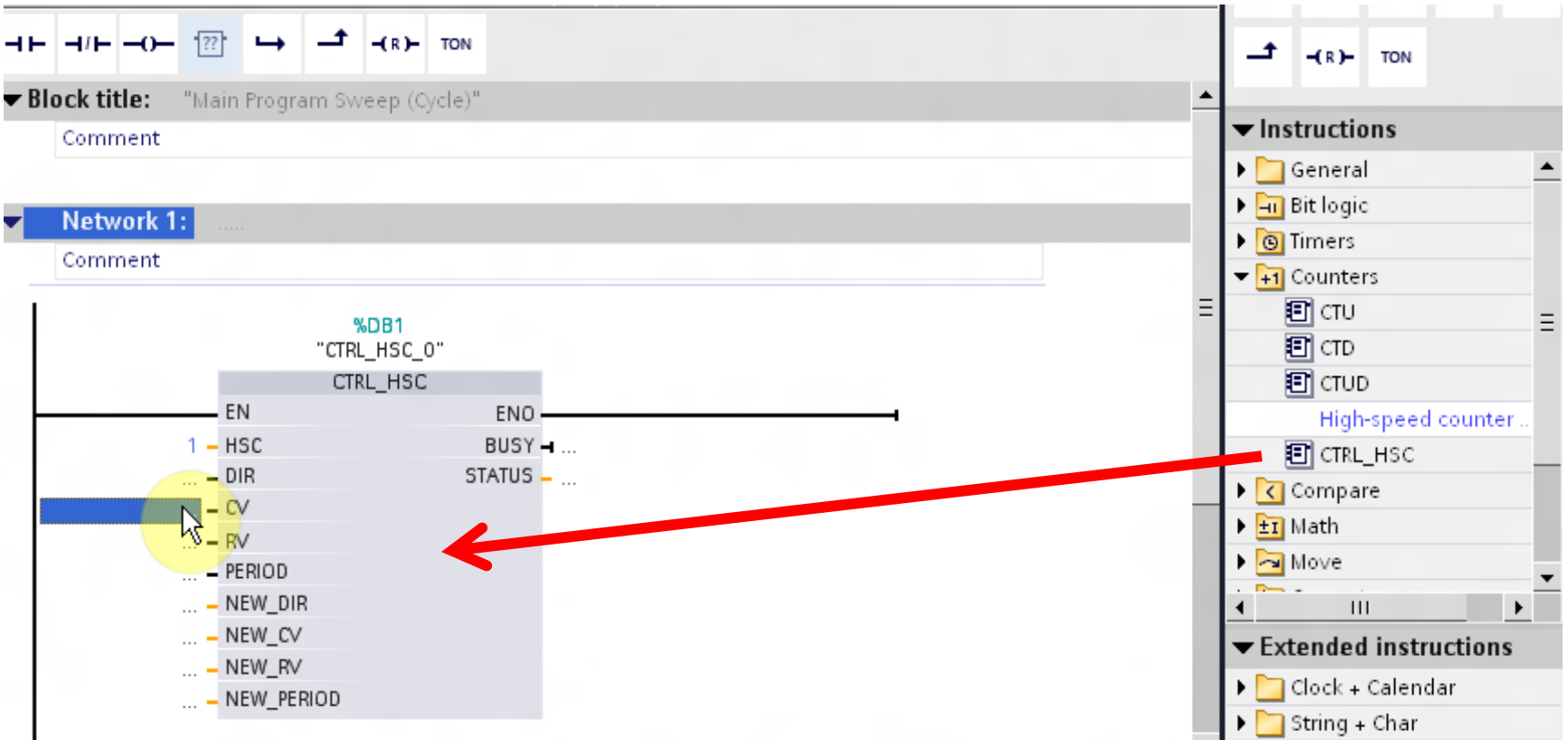


The screenshot displays the 'Properties' window for a High Speed Counter (HSC) device in the SIMATIC Manager. The left sidebar shows the device tree with 'High speed counters (HSC)1 (HSC\_1)' selected, and the 'Function' tab is active. The main area shows the following settings:

- Type of counting: Counting
- Operating phase: Two phase
- Input source: Onboard CPU input
- Counting direction is specified by: Input point (external direction)
- Initial counting direction: Count up
- Frequency measuring period: +/- sec

# HIZLI SAYICI & CTRL\_HSC

- HIZLI SAYICI KONTROL İŞLEMLERİ YAPILIR



The screenshot displays a PLC programming environment. The main window shows a ladder logic network titled "Network 1:". The network contains a high-speed counter (HSC) instruction, specifically the "CTRL\_HSC" instruction. The instruction is configured with the following parameters:

- EN: Enabled
- END: End of network
- HSC: High-speed counter
- DIR: Direction
- CV: Current value
- RV: Reset value
- PERIOD: Period
- NEW\_DIR: New direction
- NEW\_CV: New current value
- NEW\_RV: New reset value
- NEW\_PERIOD: New period
- BUSY: Busy status
- STATUS: Status

The "CTRL\_HSC" instruction is highlighted in blue. A red arrow points from the "CTRL\_HSC" instruction in the "Instructions" list on the right side of the interface to the "CTRL\_HSC" instruction in the ladder logic network. The "Instructions" list on the right includes:

- General
- Bit logic
- Timers
- Counters
  - CTU
  - CTD
  - CTUD
  - High-speed counter ..
  - CTRL\_HSC
- Compare
- Math
- Move
- Extended instructions
  - Clock + Calendar
  - String + Char

# YÜKSEK HIZLI ÇIKIŞLAR



- PLC'LERDE NORMAL TARAMA DÖNGÜSÜ DIŞINDA ÇALIŞAN HIZLI PALS (PTO) VE GENİŞLİK MODÜLASYONU (PWM) ÇIKIŞLARI VARDIR
- S7-200 AİLESİNDE Q0.1 VE Q0.2 ADRESLERİ HIZLI ÇIKIŞ OLARAK KULLANILABİLİR