



TUTORIAL KREO HMI

Driver di comunicazione per PLC Siemens S7 serie
1200 e 1500

Tutorial dedicato alla comunicazione Ethernet con
PLC Siemens S7 serie 1200 e 1500

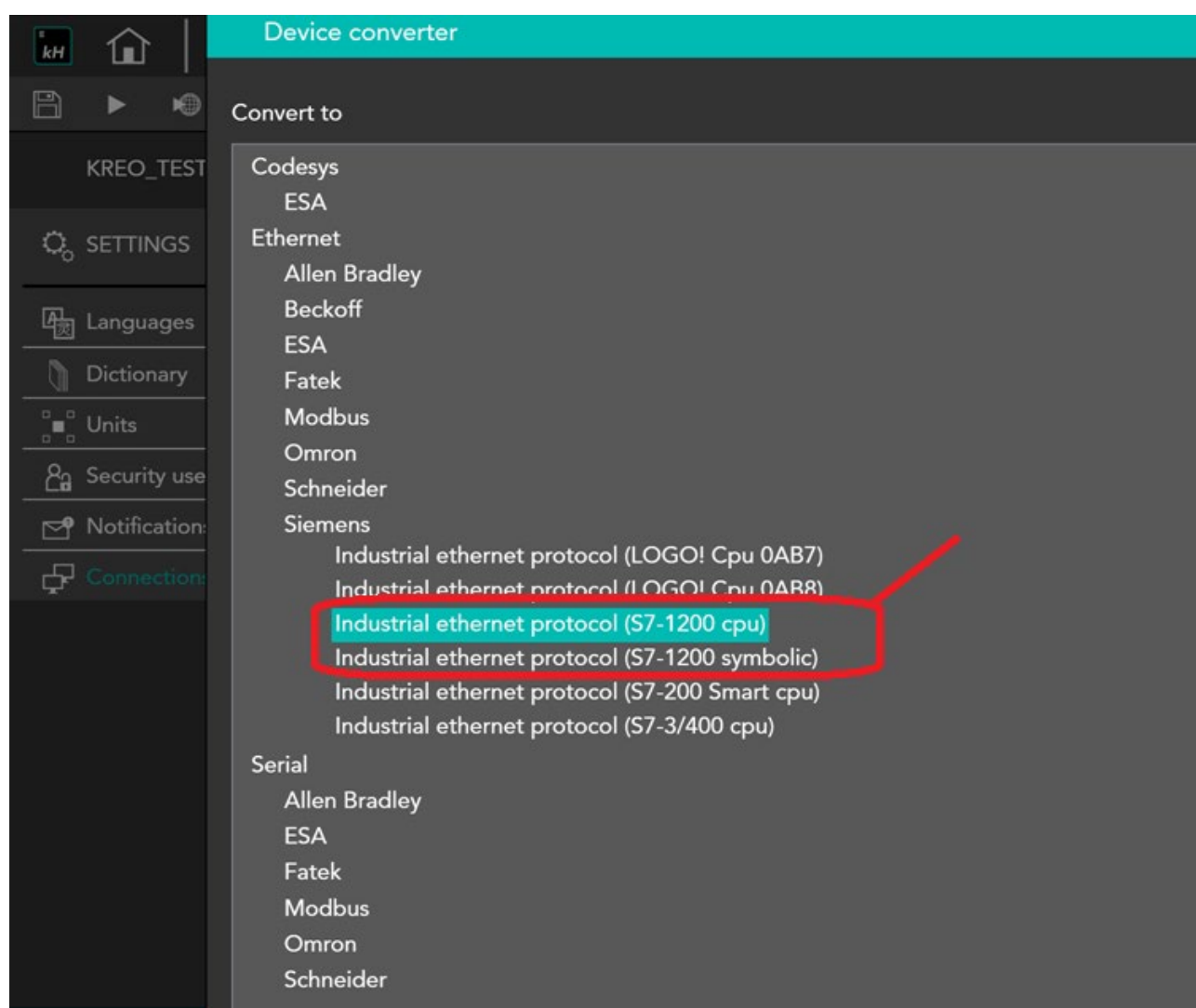
Connect
Ideas.
Shape
solutions.



Introduzione

I plc SIEMENS S7 permettono di configurare un progetto in modalità ottimizzata (a indirizzamento simbolico) oppure in modalità NON ottimizzata (indirizzamento fisico delle tags).

KREO HMI permette di gestire entrambe le modalità di comunicazione. I DRIVER di comunicazione relativi sono quelli indicati in figura:





DRIVER OTTIMIZZATO (indirizzamento simbolico):

Come fare:

- 1) Supponiamo di configurare un progetto TIA PORTAL con diversi tipi di tag nel progetto configurate in 2 Program Blocks (di tipo DB):

DB10: Data Block di tag singole...

The screenshot displays the Siemens TIA Portal software interface. The Project tree on the left shows the project structure, including 'test16' and 'PLC_1 [CPU 1214C AC/DC/Rly]'. The main workspace shows the configuration for 'DataBlock10 [DB10]'. The configuration table lists various data types and their corresponding values, with columns for Name, Data type, Start value, Monitor value, Retain, Accessible f..., Writ..., Visible in ..., and Setpoint.

Name	Data type	Start value	Monitor value	Retain	Accessible f...	Writ...	Visible in ...	Setpoint
Static								
ByteArray	Array[0..255...]							
Bool	Bool	false	FALSE					
Word	Word	16#0025	16#0025					
Dword	DWord	16#FF8B_344F	16#FF8B_344F					
Real	Real	-0.1	-0.1					
LReal	LReal	-0.01	-0.01					
Byte	Byte	16#17	16#17					
String	String	'CIAOCIAO'	'CIAOCIAO'					
Char	Char	'Y'	'Y'					
SInt	SInt	-126	-126					
USInt	USInt	255	255					
Int	Int	-30000	-30000					
UInt	UInt	29990	29990					
DInt	DInt	-61378	-61378					
UDInt	UDInt	9876543	9876543					
Date	Date	D#2021-02-19	D#2021-02-19					
Time	Time	T#30000MS	T#30S					
TimeOfDay	TimeOfDay	TOD#11:12:13	TOD#11:12:13					
MyTimer1	TON_TIME							
MyTimer2	IEC_TIMER							
MyCount1	IEC_COUNTER							
MyCount2	CTUD_DINT							
IEC_TIMER	IEC_TIMER							



e DB26: Data Block di tag-array

Name	Data type	Start value	Retain	Accessible f...	Write...	Visible in ...	Setpoint	Comment
1	Static							
2	BoolArr	Array[0..100]						
3	WordArr	Array[0..100] of W...						
4	DWORDArr	Array[0..100] of D...						
5	RealArr	Array[0..100] of Real						
6	LRealArr	Array[0..100] of LR...						
7	ByteArr	Array[0..100] of Byte						
8	StringArr	Array[0..100] of Str...						
9	CharArr	Array[0..100] of Char						
10	SintArr	Array[0..100] of Sint						
11	UsintArr	Array[0..100] of US...						
12	IntArr	Array[0..100] of Int						
13	UIntArr	Array[0..100] of UInt						
14	DIntArr	Array[0..100] of DInt						
15	UDIntArr	Array[0..100] of UD...						
16	TimeArr	Array[0..100] of Ti...						

Automation License Management
STEP 7 Professional Edition
(00411000002021004008), validità: 1
giorni
Automation License Manager Service

2) Le DB in questo caso dovranno avere in TIA Portal la PROPRIETA' OTTIMIZZATA:

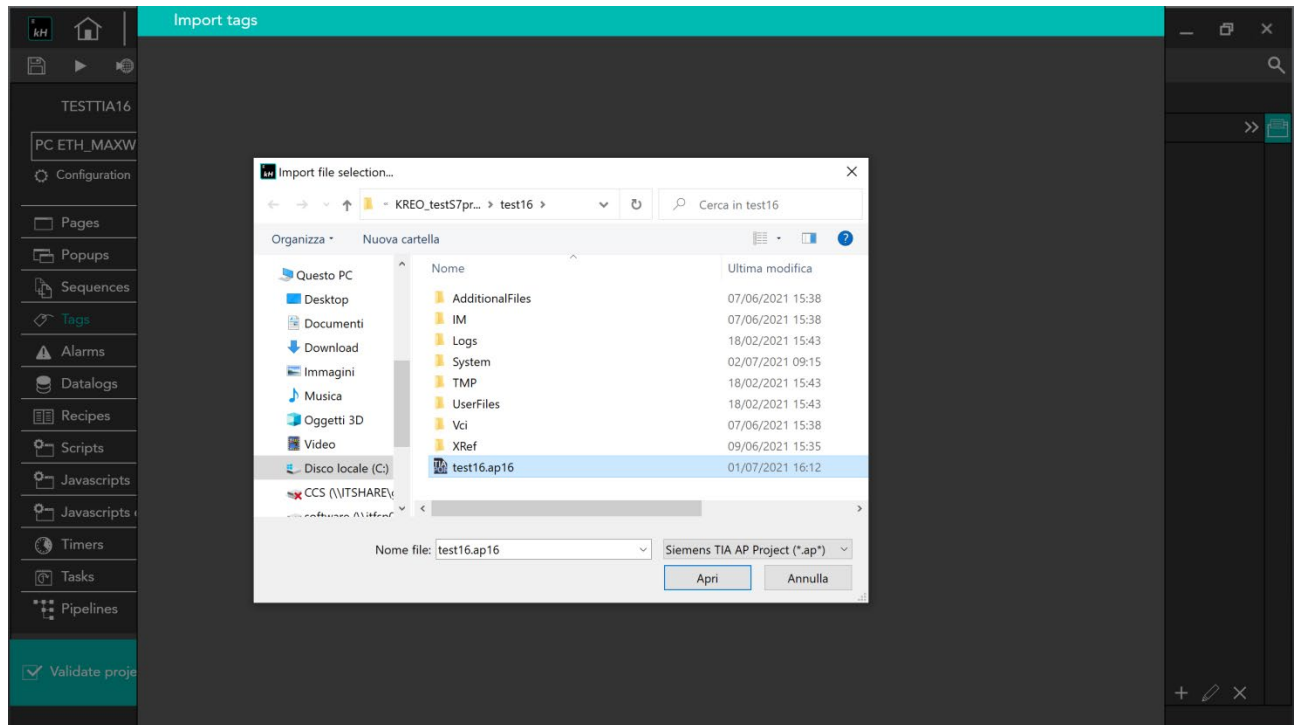
Attributes

- ☐ Only store in load memory
- ☐ Data block write-protected in the device
- ☒ Optimized block access
- ☒ Data block accessible from OPC UA
- ☒ Data block accessible via Web server

OK Cancel



- 3) KREO è in grado di elaborare il file .TIA16 creato dall'editor SIEMENS e importare il file simbolico delle tags-Siemens. Importare quindi le tag in modalità SIEMENS TIA AP Project (*.ap).





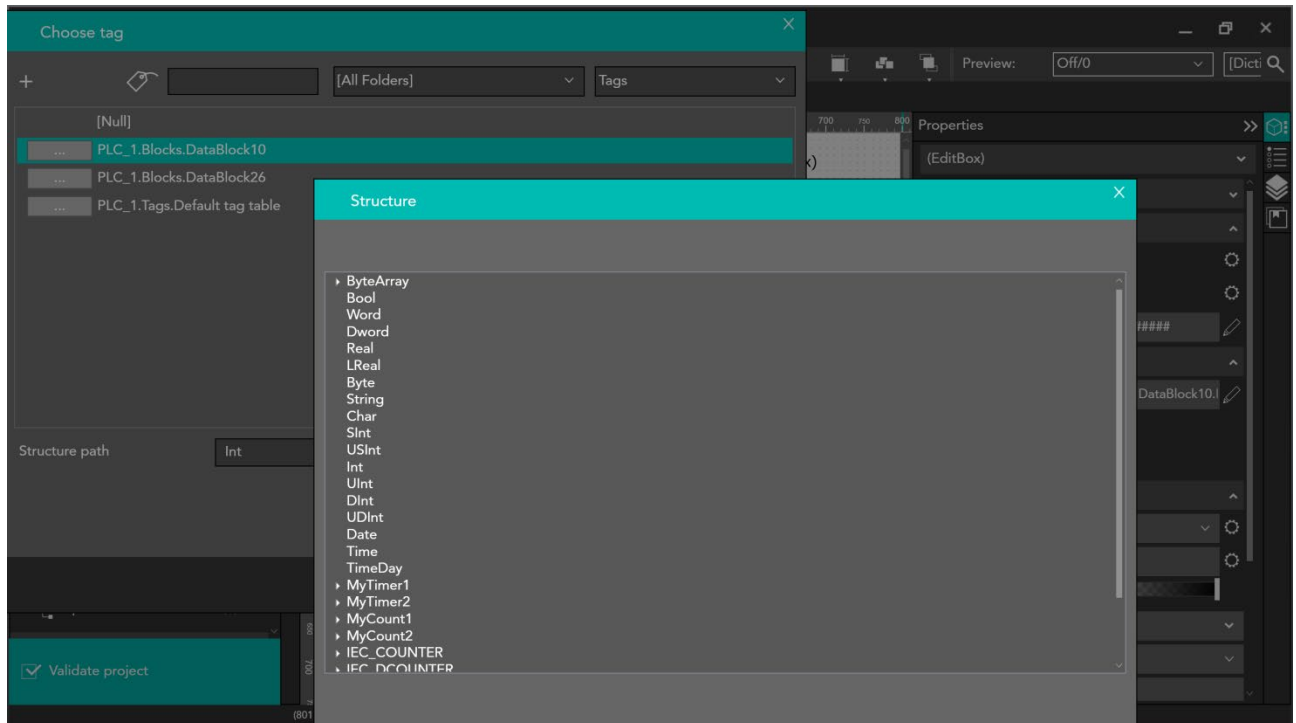
4) Le tags di TIA 16 sono ora disponibili in KREO sotto forma di tag-
struttura:

The screenshot shows the KREO software interface. On the left is a sidebar with a project tree for 'TESTTIA16'. The main area displays a table of tags. The table has columns for 'Folder', 'Name', 'Type', 'Address type', and 'Provider'. The first three rows are highlighted in teal. The first row is 'PLC_1.Blocks.DataBlock10', the second is 'PLC_1.Blocks.DataBlock26', and the third is 'PLC_1.Tags.Default tag table'. The remaining rows are greyed out.

	Folder ▾	Name ▾	Type ▾	Address type ▾	Provider ▾
1		PLC_1.Blocks.DataBlock10	Structure	Device	Industrial ethernet protoi
2		PLC_1.Blocks.DataBlock26	Structure	Device	Industrial ethernet protoi
3		PLC_1.Tags.Default tag table	Structure	Device	Industrial ethernet protoi
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					



5) Il puntamento sarà dunque del tipo: es.DataBlock10.NomeTag



6) Mettendo le varie tag sulla pagina e si ottiene a RUNTIME la comunicazione S71200/1500 ottimizzata dove il protocollo di comunicazione scambia i valori delle varie tags puntando ai nomi simbolici delle tags:



TEST S7 SIMBOLICO

25	word (hex)	0	Bool
FF8B344F	dword (hex)		
-0.1	real		
-0.01	lreal		
17	byte (hex)		string
0A0C0A0			
121	char		
-126	sint		
255	usint		
-30000	int		
29990	uint		
-61378	dint		
9876543	Udint		
11372	date (D#)		
30000	time (T#)		
08:36:40	time day (TOD#)		

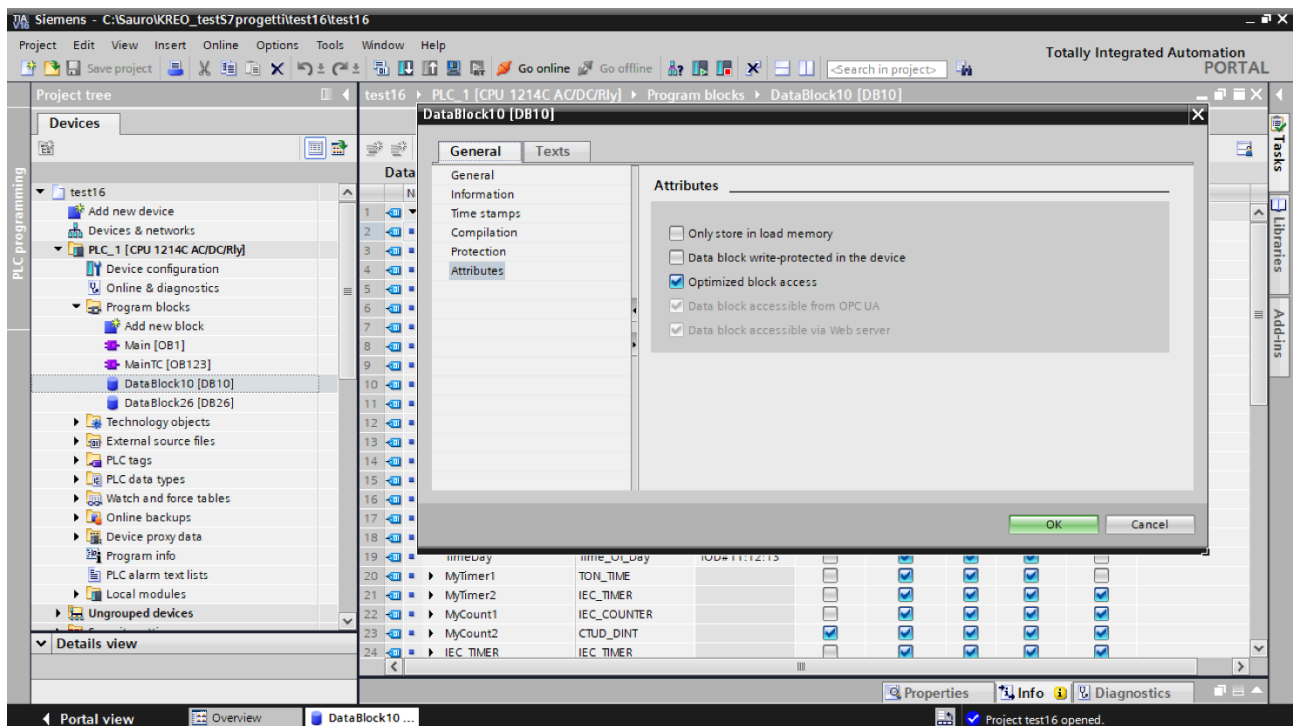




DRIVER NON OTTIMIZZATO (indirizzamento fisico):

Come fare:

- 1) Dallo stesso progetto TIA PORTAL deseleggiamo il check dell'ottimizzazione DB:



- 2) Ricompilando il progetto TIA P. genera gli indirizzi fisici delle tags nelle rispettive DB (vedi figura):



DB10 non ottimizzata:

Siemens - C:\Sauro\KREO_test\57progetti\TIAproject_NotOptim\TIAproject_NotOptim

Totally Integrated Automation PORTAL

Project tree: TIAproject_NotOptim > PLC_1 [CPU 1214C AC/DC/Rly] > Program blocks > DataBlock10 [DB10]

DataBlock10 (snapshot created: 6/7/2021 3:44:17 PM)

Name	Data type	Offset	Start value	Retain	Accessible f...	Writa...	Visible in ...	Setpoint	Comm...
Static									
Bool	Array[0..255...]	0.0			☒	☒	☒		
Word	Word	256.0	false		☒	☒	☒		
Dword	DWord	260.0	16#FF8B_344F		☒	☒	☒		
Real	Real	264.0	-0.1		☒	☒	☒		
LReal	LReal	268.0	-0.01		☒	☒	☒		
Byte	Byte	276.0	16#17		☒	☒	☒		
String	String	278.0	'CIAOCIAO'		☒	☒	☒		
Char	Char	534.0	'y'		☒	☒	☒		
Sint	Sint	535.0	-126		☒	☒	☒		
USint	USint	536.0	255		☒	☒	☒		
Int	Int	538.0	-30000		☒	☒	☒		
UInt	UInt	540.0	29990		☒	☒	☒		
Dint	Dint	542.0	-61378		☒	☒	☒		
UDint	UDint	546.0	9876543		☒	☒	☒		
Date	Date	550.0	D#2021-02-19		☒	☒	☒		
Time	Time	552.0	T#30000MS		☒	☒	☒		
TimeDay	Time_Of_Day	556.0	TOD#11:12:13		☒	☒	☒		
MyTimer1	TON_TIME	560.0			☒	☒	☒		
MyTimer2	IEC_TIMER	576.0			☒	☒	☒		
MyCount1	IEC_COUNTER	592.0			☒	☒	☒		
MyCount2	CTUD_DINT	598.0			☒	☒	☒		

Properties Info Diagnostics

Portal view Overview DataBlock10 ... Action canceled before download.

DB26 non ottimizzata:

Siemens - C:\Sauro\KREO_test\57progetti\TIAproject_NotOptim\TIAproject_NotOptim

Totally Integrated Automation PORTAL

Project tree: TIAproject_NotOptim > PLC_1 [CPU 1214C AC/DC/Rly] > Program blocks > DataBlock26 [DB26]

DataBlock26 (snapshot created: 6/7/2021 3:44:17 PM)

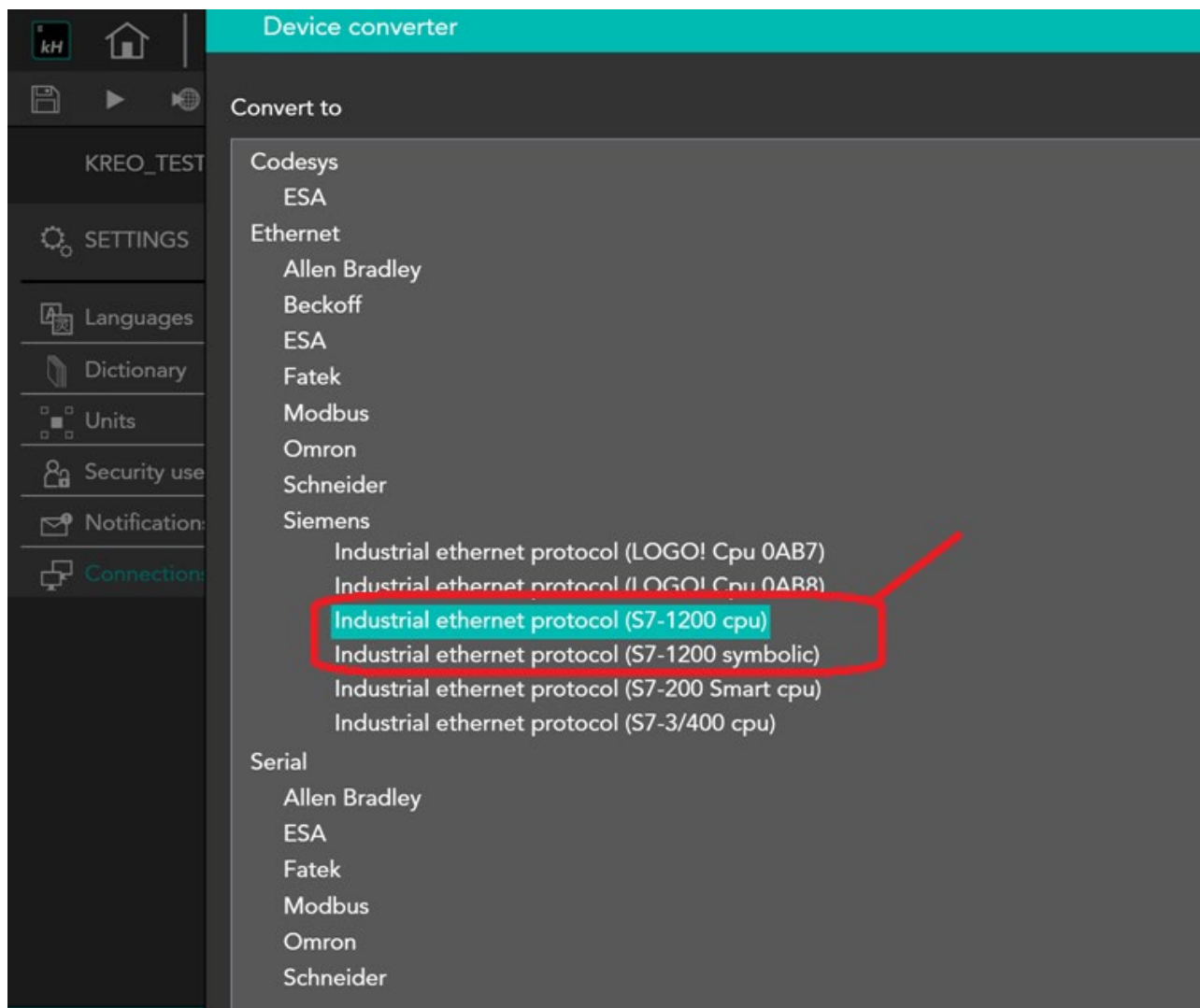
Name	Data type	Offset	Start value	Retain	Accessible f...	Writa...	Visible in ...	Setpoint	Comment
Static									
BoolArr	Array[0..100...]	0.0			☒	☒	☒		
WordArr	Array[0..100] of W...	14.0			☒	☒	☒		
DWORDArr	Array[0..100] of D...	216.0			☒	☒	☒		
RealArr	Array[0..100] of Real	620.0			☒	☒	☒		
LRealArr	Array[0..100] of LR...	1024.0			☒	☒	☒		
ByteArr	Array[0..100] of Byte	1832.0			☒	☒	☒		
StringArr	Array[0..100] of Str...	1934.0			☒	☒	☒		
CharArr	Array[0..100] of Char	27790.0			☒	☒	☒		
SintArr	Array[0..100] of Sint	27892.0			☒	☒	☒		
USintArr	Array[0..100] of US...	27994.0			☒	☒	☒		
IntArr	Array[0..100] of Int	28096.0			☒	☒	☒		
UIntArr	Array[0..100] of UInt	28298.0			☒	☒	☒		
DintArr	Array[0..100] of Dint	28500.0			☒	☒	☒		
UDintArr	Array[0..100] of UD...	28904.0			☒	☒	☒		
TimeArr	Array[0..100] of Ti...	29308.0			☒	☒	☒		

Properties Info Diagnostics

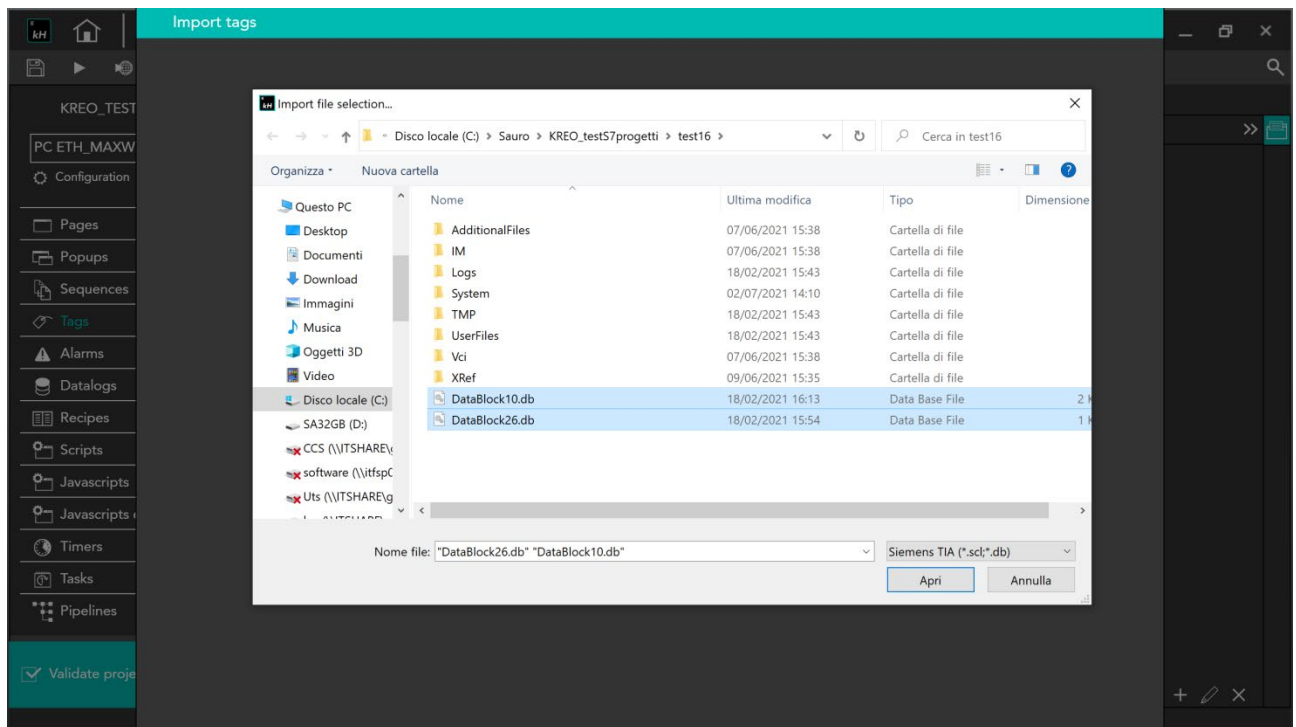
Portal view Overview DataBlock10 ... DataBlock26 ... Action canceled before download.



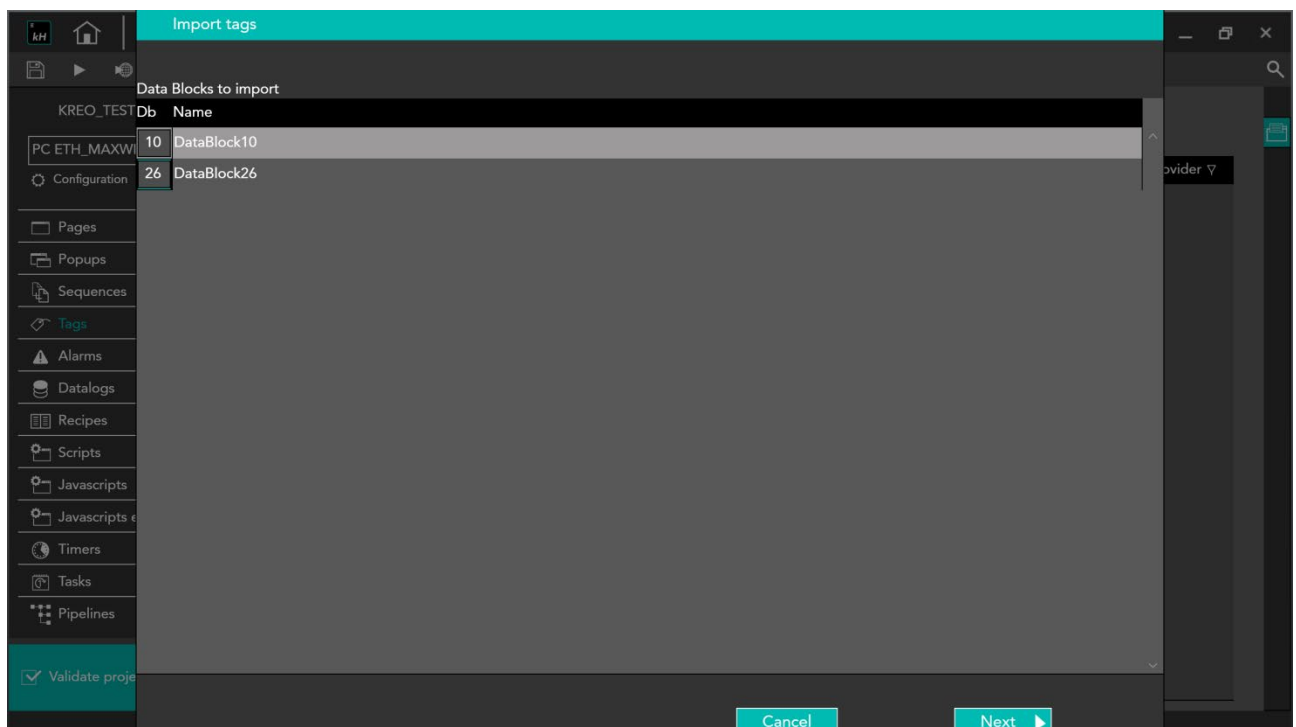
- 3) Il progetto KREO in questo caso è configurato con il driver SIEMENS S71200 (NON simbolico)



- 4) In questo caso cambia anche la modalità di importazione KREO. Le tags si importano in modalità SIEMENS TIA (*.scl,*db)



5) Le tags in KREO saranno ora viste non più come strutturate ma come singole tags, ciascuna con proprio indirizzo fisico



Da notare in figura che l'import richiede, in questo caso, di riconfigurare nella colonna Db il nr del DataBlock da importare.



6) Il risultato in KREO sarà il seguente:

The screenshot shows the KREO software interface. On the left is a sidebar with a project tree. The main area displays a table of data blocks. The table has columns for Folder, Name, Type, Provider, and Description. The first row is highlighted in teal.

	Folder ▾	Name ▾	Type ▾	Provider ▾	Descript
1		DataBlock10.ByteArray	Byte(256)	Industrial ethernet protocol (S7-1200 cpu)	
2		DataBlock10.Word	UInt16	Industrial ethernet protocol (S7-1200 cpu)	
3		DataBlock10.Dword	UInt32	Industrial ethernet protocol (S7-1200 cpu)	
4		DataBlock10.Real	Real	Industrial ethernet protocol (S7-1200 cpu)	
5		DataBlock10.LReal	Double	Industrial ethernet protocol (S7-1200 cpu)	
6		DataBlock10.Byte	Byte	Industrial ethernet protocol (S7-1200 cpu)	
7		DataBlock10.String	String	Industrial ethernet protocol (S7-1200 cpu)	
8		DataBlock10.Char	Char	Industrial ethernet protocol (S7-1200 cpu)	
9		DataBlock10.SInt	Char	Industrial ethernet protocol (S7-1200 cpu)	
10		DataBlock10.USInt	Byte	Industrial ethernet protocol (S7-1200 cpu)	
11		DataBlock10.Int	Int16	Industrial ethernet protocol (S7-1200 cpu)	
12		DataBlock10.UInt	UInt16	Industrial ethernet protocol (S7-1200 cpu)	
13		DataBlock10.DInt	Int32	Industrial ethernet protocol (S7-1200 cpu)	
14		DataBlock10.UDInt	UInt32	Industrial ethernet protocol (S7-1200 cpu)	
15		DataBlock10.Date	UInt32	Industrial ethernet protocol (S7-1200 cpu)	
16		DataBlock10.Time	UInt32	Industrial ethernet protocol (S7-1200 cpu)	
17		DataBlock10.Time	UInt32	Industrial ethernet protocol (S7-1200 cpu)	



Connect
ideas.
shape
solutions.

[ESA S.p.A. | www.esa-automation.com](http://www.esa-automation.com) |