Optris CT Profinet interface

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1 General

The Optris CT Profinet interface board can be easily installed inside the electronic box of any CT, CTlaser or CTratio. The Profinet interface connector is a 4-pin M12 connector, D-coded, installed on the left side of the CT electronic box. It is suited for industrial Ethernet with an IP67 protection rate and a screw retention feature. An extra implemented software stack guarantees the Profinet communication functionality.

The Profinet settings are stored on the board and the board communicates with the Optris CT via serial interface. The Profinet settings remain on the board in case of interchanging the Optris CT electronic box.

2 Description

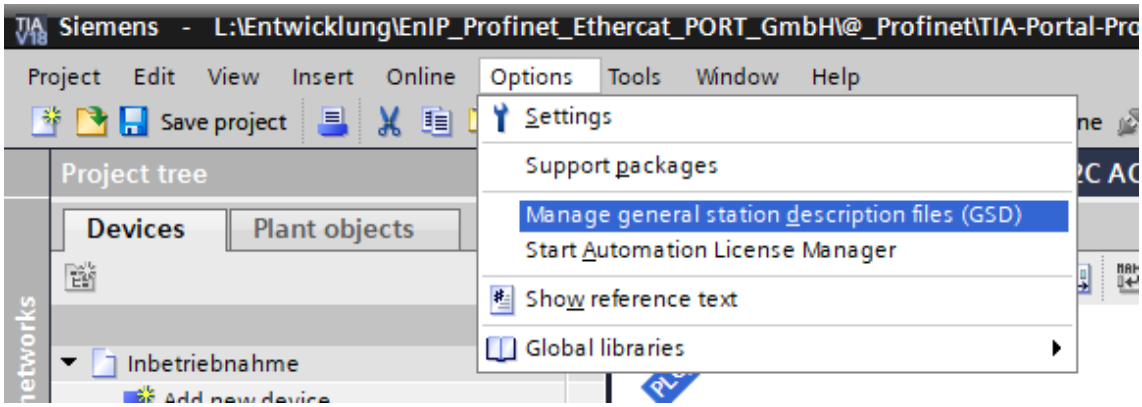
Optris CT Profinet interface board basic characteristics:
• Device class: adapter device
• Device type: 06h
• Connection: 1 x M12
• Transfer speed up to 100Mbit/s full-duplex, auto-negotiation capable
The CT Profinet module maps the object temperature, internal temperature, device status, and other Pyrometer data to its Input Assembly which is then sent onto the Profinet network using CIP. In the initialization phase, the CT Profinet interface board sends the device's configuration data which is accessible for setup via the PLC programming software Controller Tags. Furthermore, CT Profinet interface board allows you to change a subset of sensor parameters in data exchange mode using different classes.

3 Configuration

The easiest way to incorporate a CT Profinet device into a PLC programming software Project is by installing the GSD file.

3.1 Installing GSD file

Here you can see an example of installing the GSD file with ***SIEMENS TIA Portal V18.***
In the **project tree** go to **Options → Manage general station files (GSD)**. Choose your GSD file and click on **install**.



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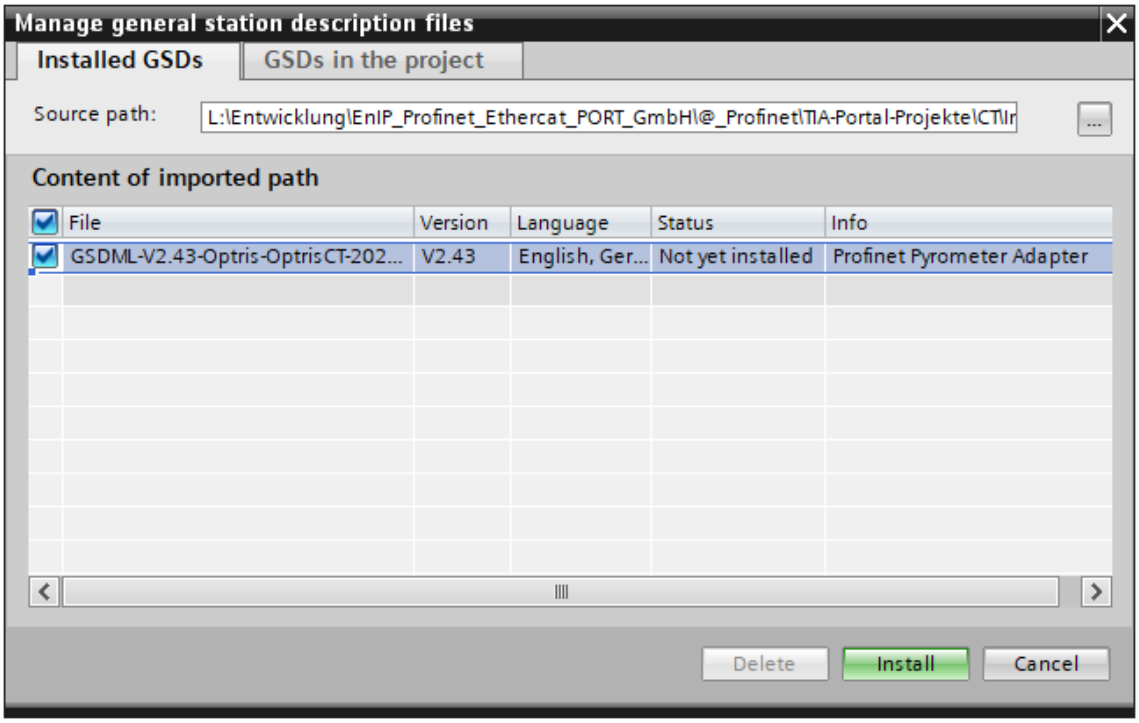
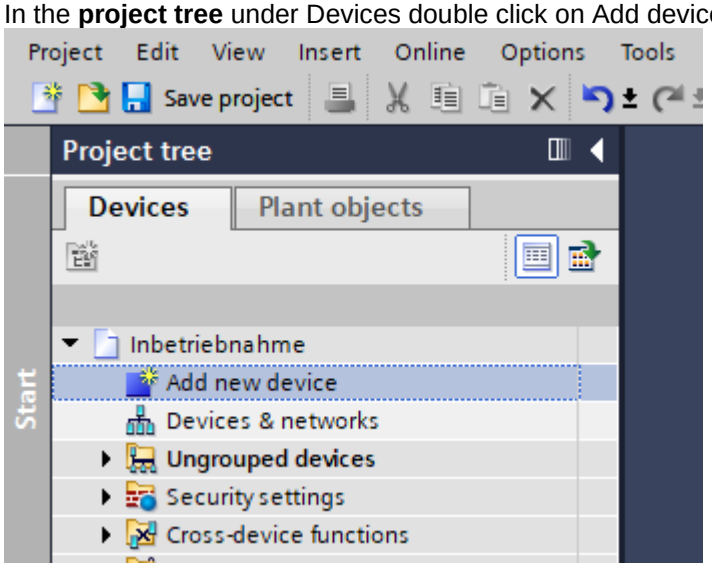


3.2 Installing PLC

In the **project tree** under Devices double click on Add device.



Choose your connected PLC and click **OK.**

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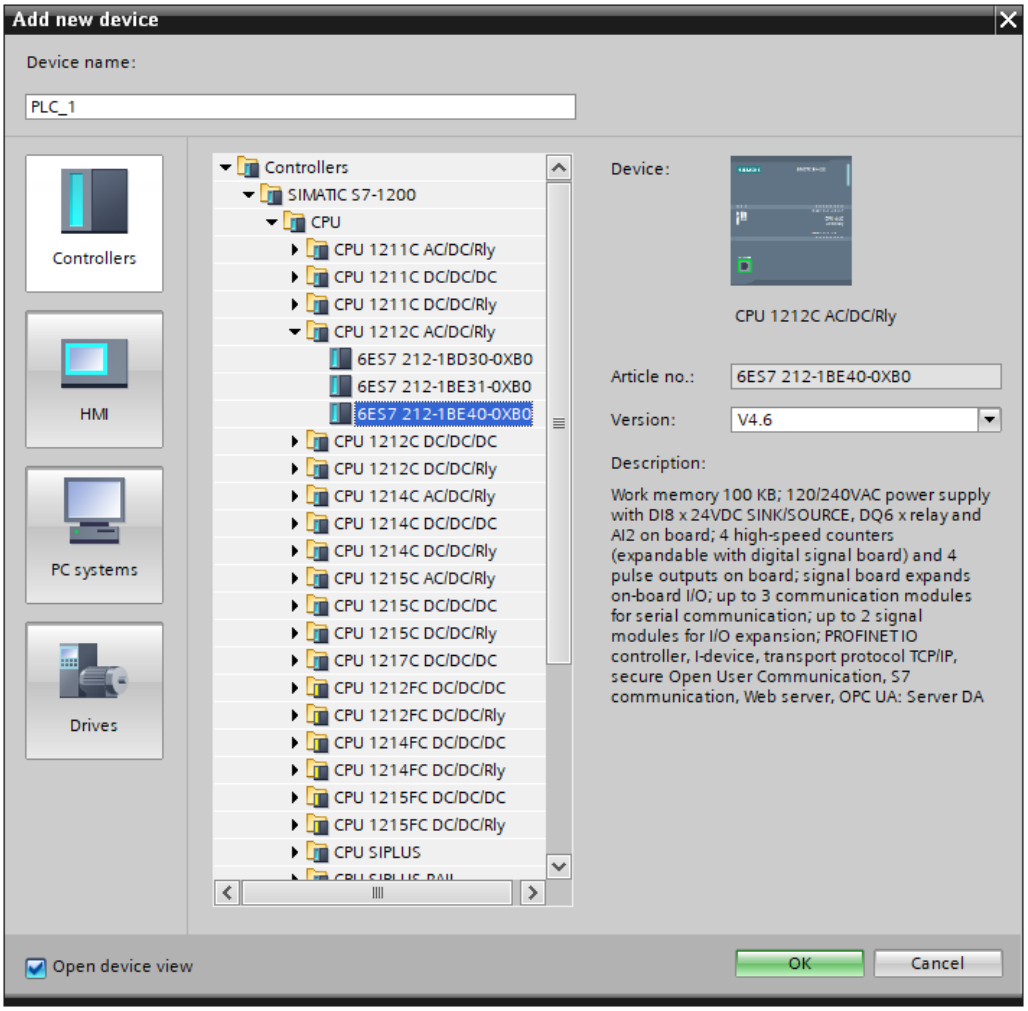

Go through the Settings dialog box of the PLC (depending on customer).

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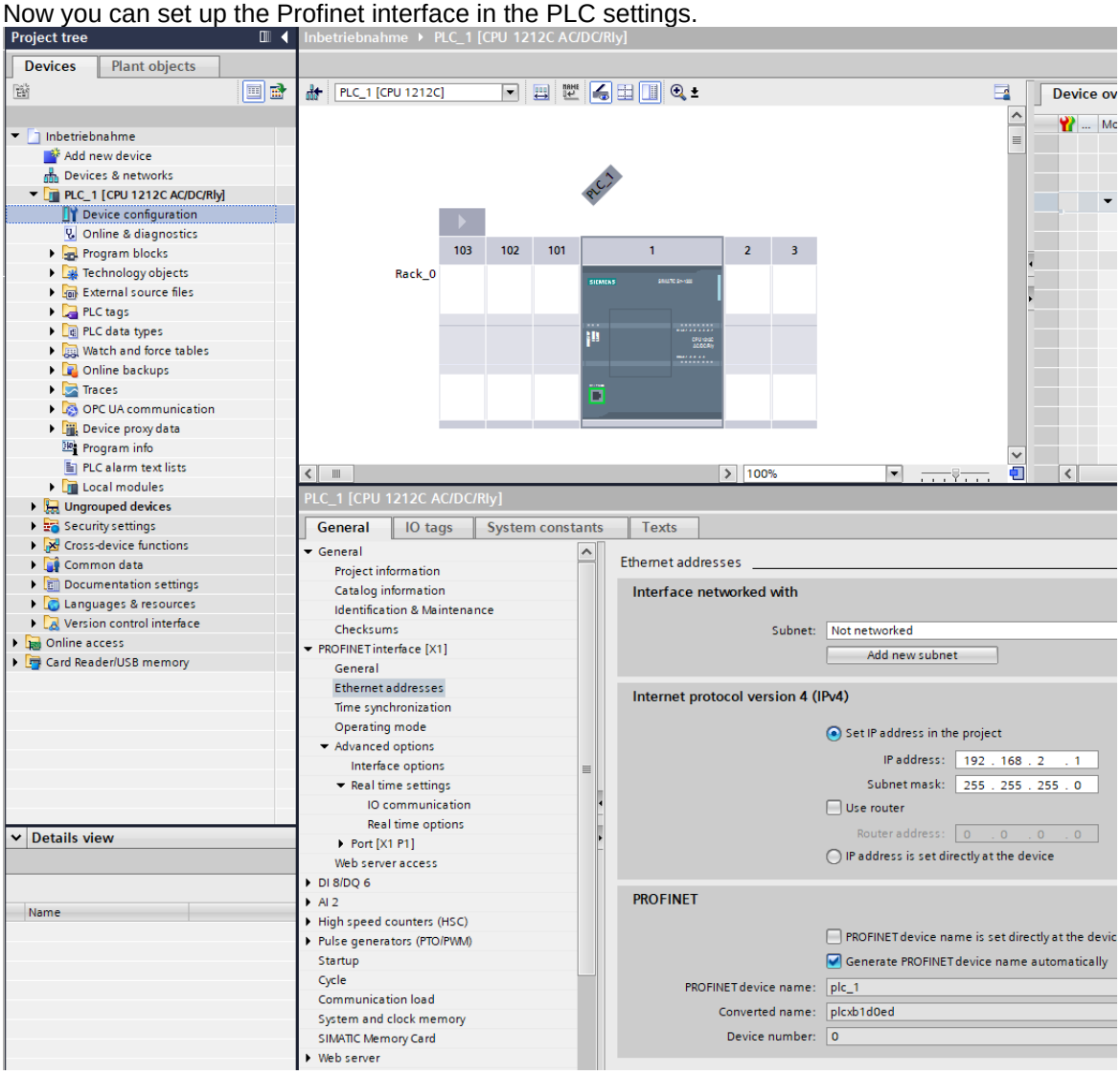
3.3 Configure the Profinet interface

Now you can set up the Profinet interface in the PLC settings.



Set the IP address under Internet protocol version 4 (IPv4)

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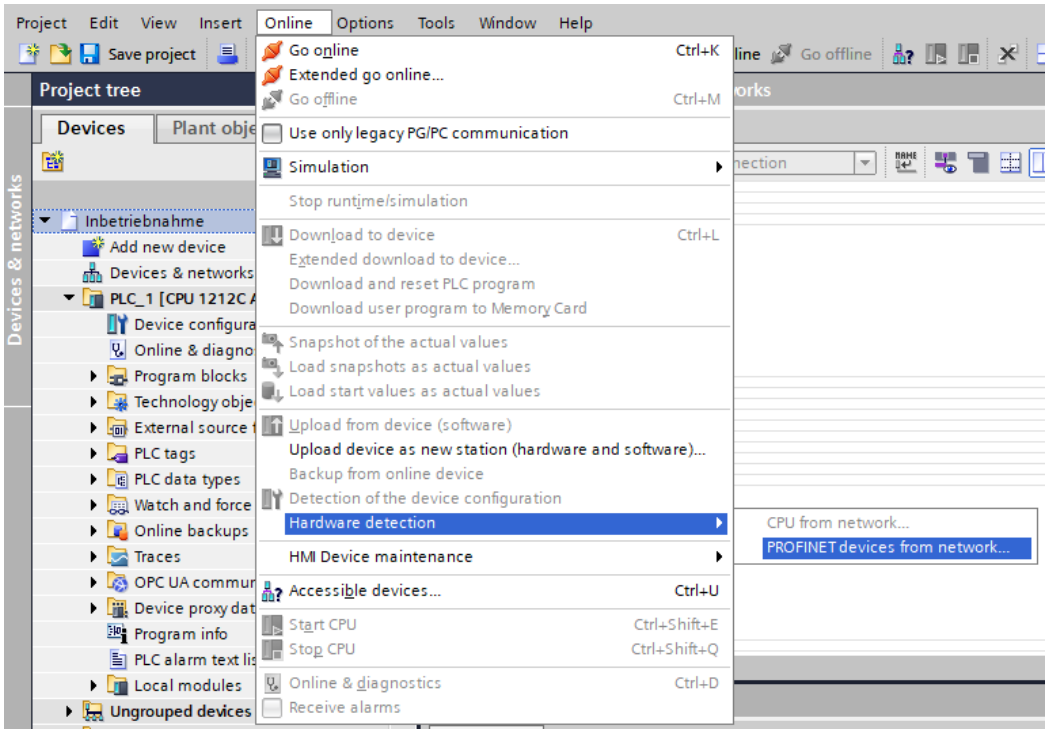
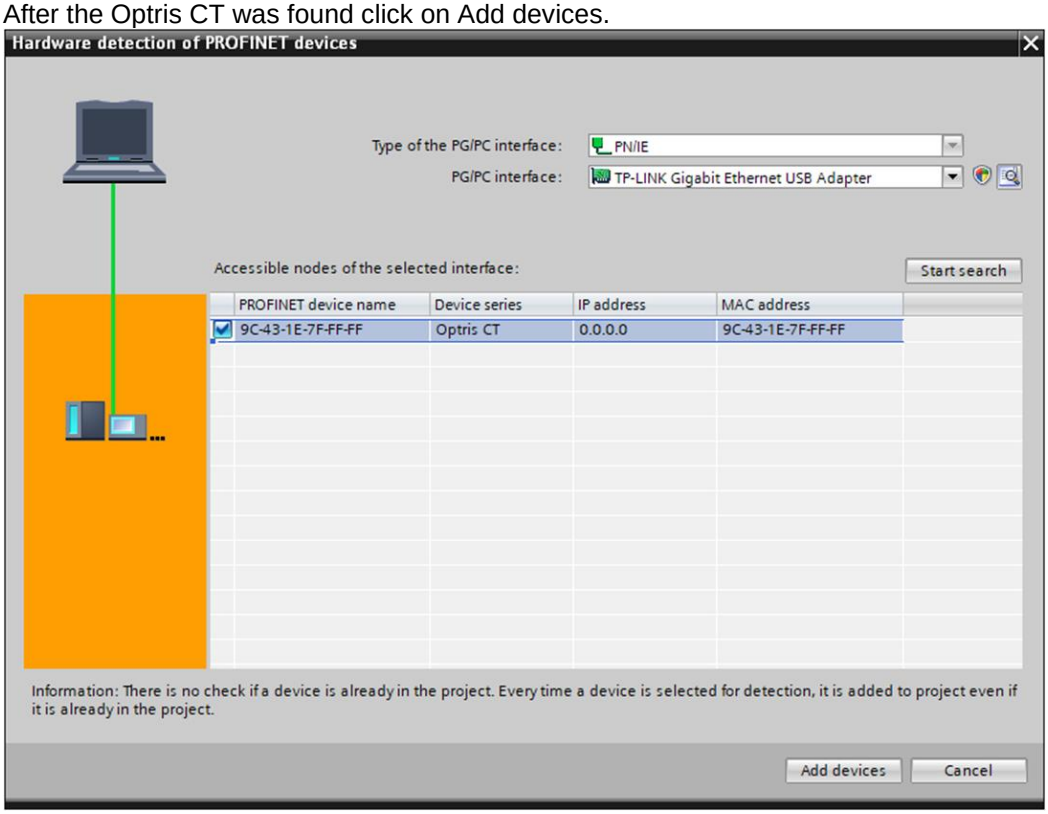
3.4 Add optris CT

Click on your project in the **project tree** under Devices. In the menu go to **Online → Hardware detection → PROFINET devices from network**



Choose your Ethernet interface and click on Start search.
After the Optris CT was found click on Add devices.



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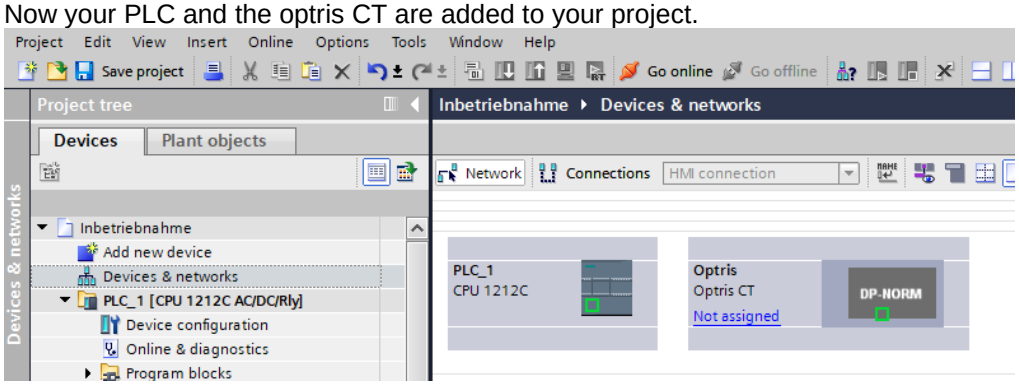
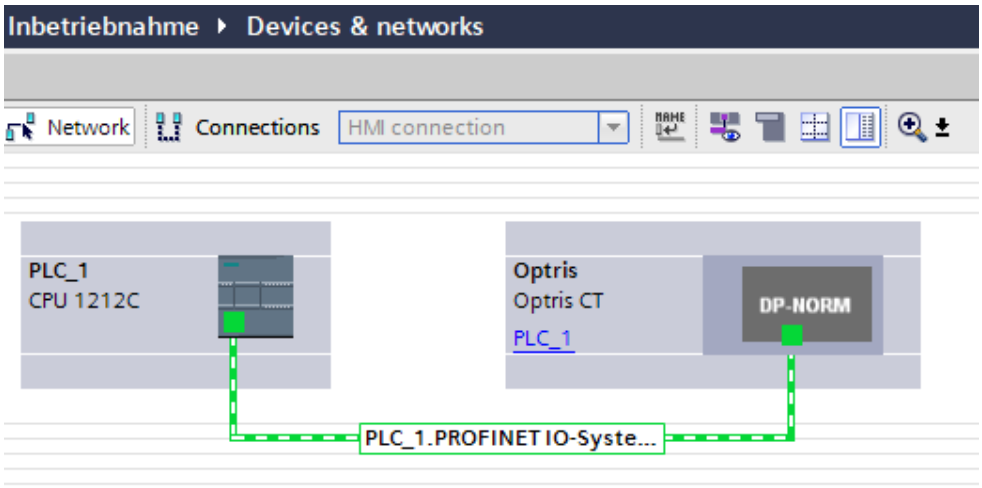
Now your PLC and the optris CT are added to your project.

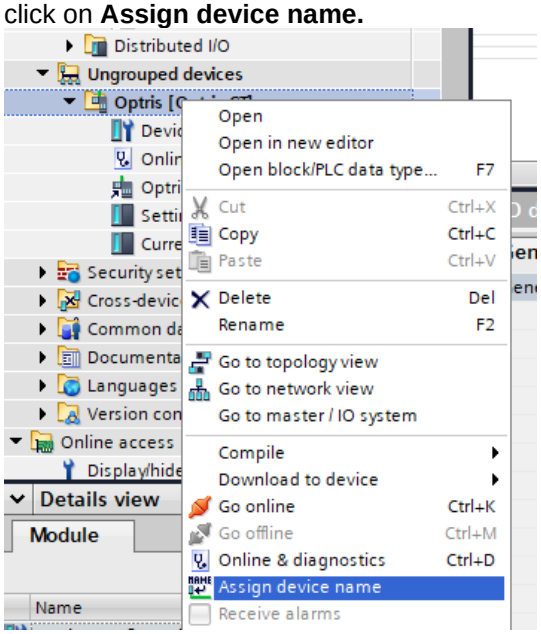


Draw a line with your mouse between the network keys (green boxes).



3.5 Rename Optris CT

Go to your project in the project tree under **Devices.** Click with the right mouse button on **Optris CT and** click on **Assign device name.**



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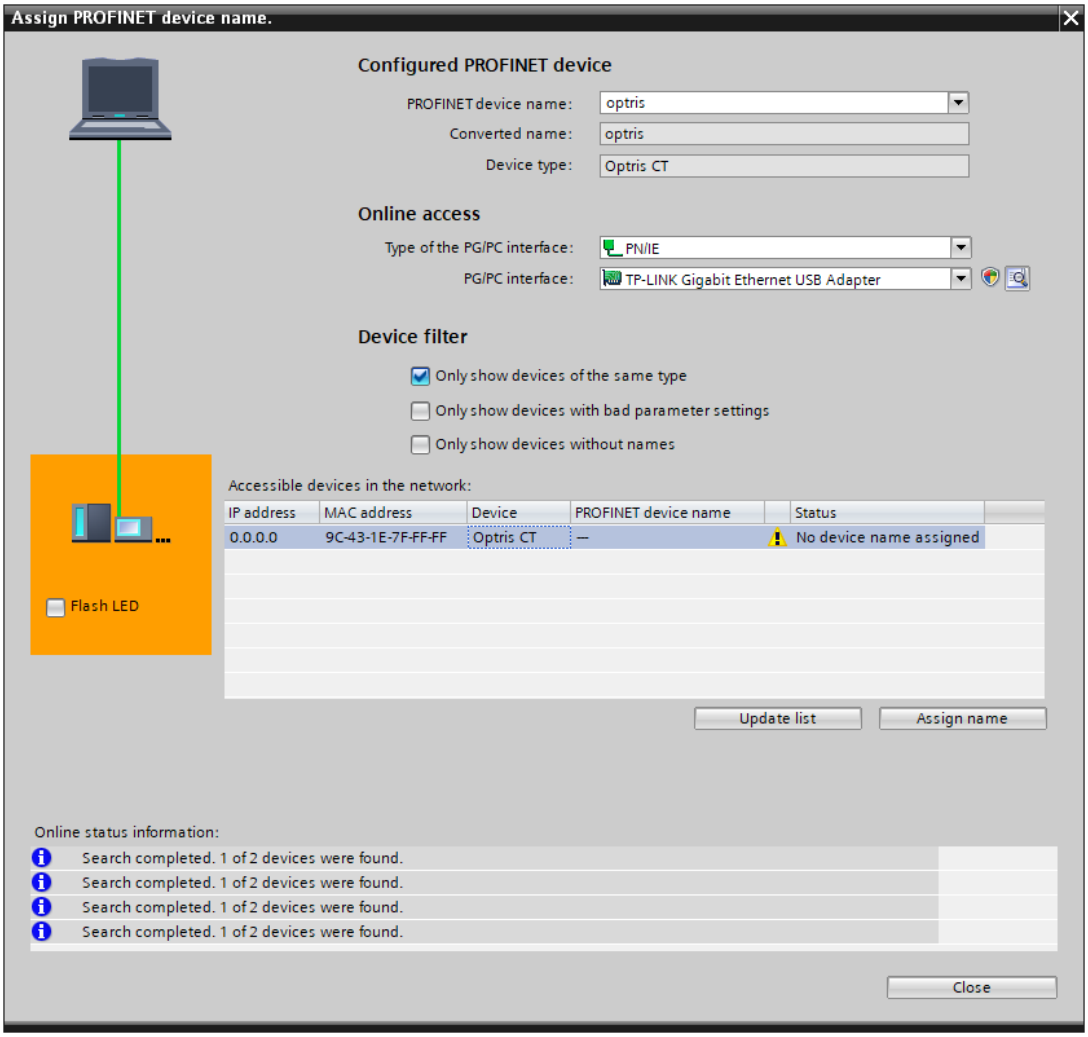
Type the new name of the device, click on **Update list choose the new founded device and click on Assign name** and **Close.**



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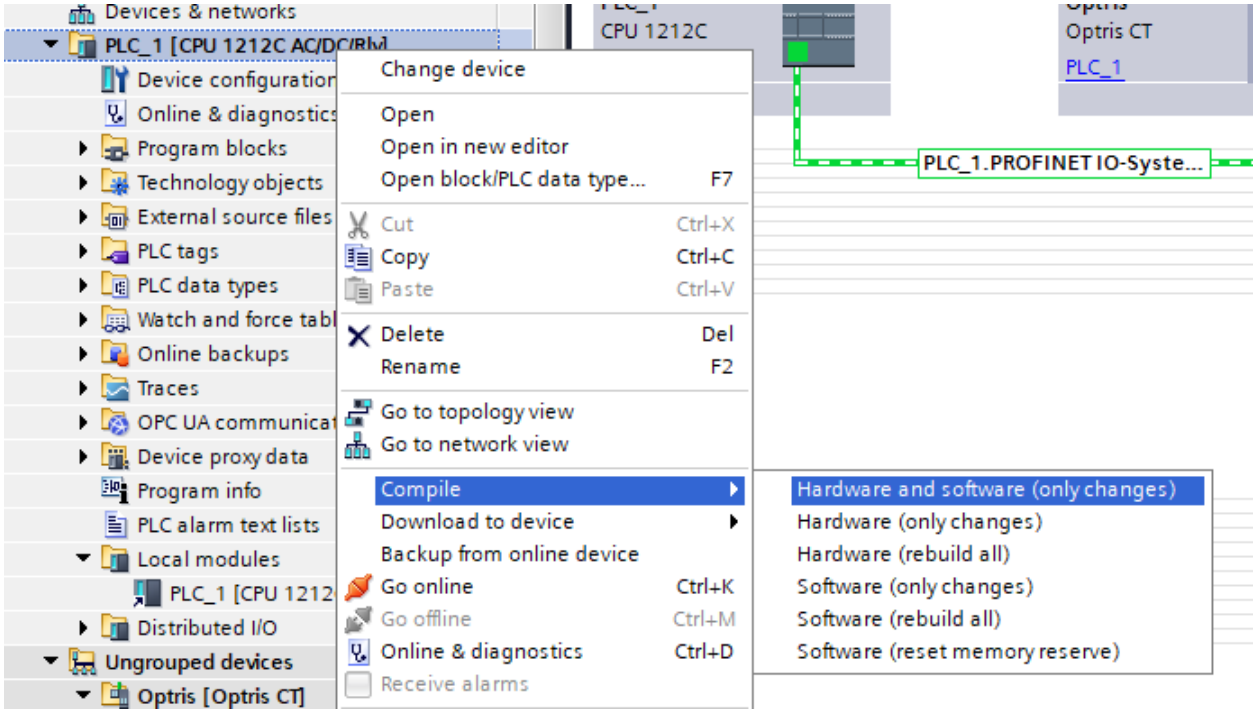
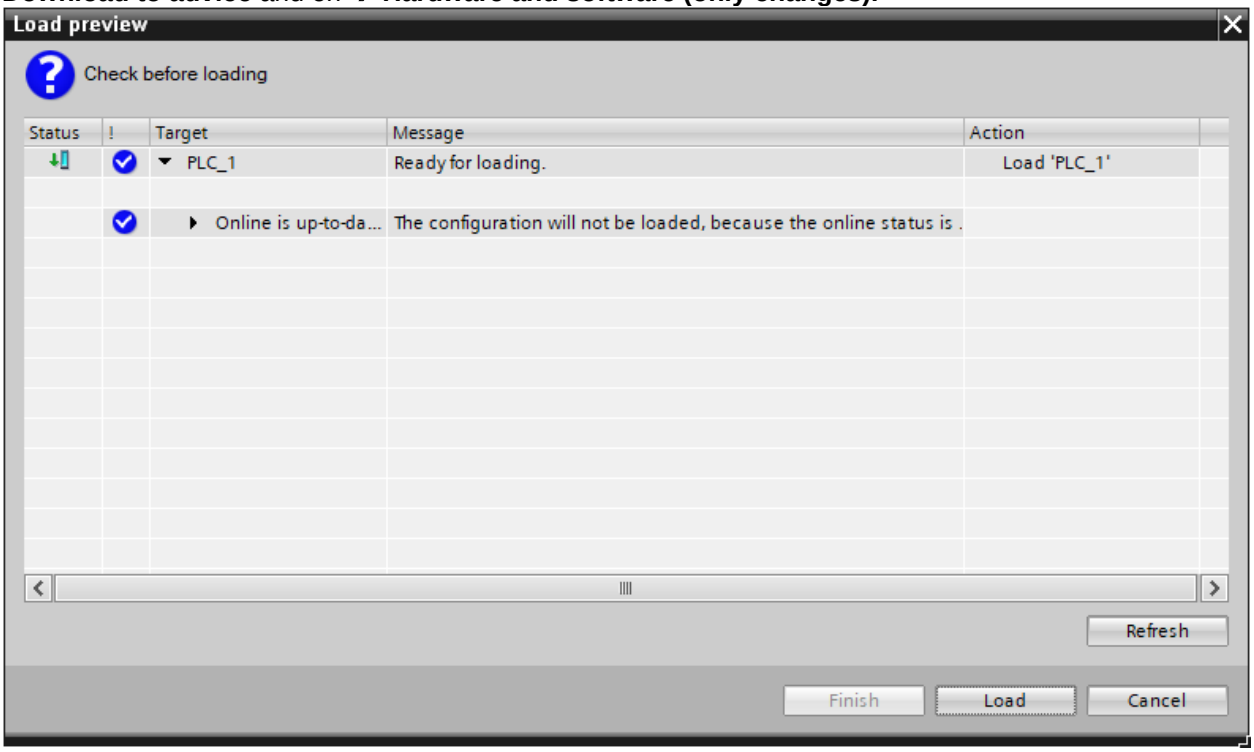
4 Compiling the project

Go to your project in the project tree under **Devices.** Click with the right mouse button on **PLC → compile** and on → **Hardware and software (only changes).**



Go to your project in the project tree under **Devices.** Click with the right mouse button on **PLC → Download to advice** and on → **Hardware and software (only changes).**



Click on **Load** and after the project was loaded to the PLC click on **Finish.**

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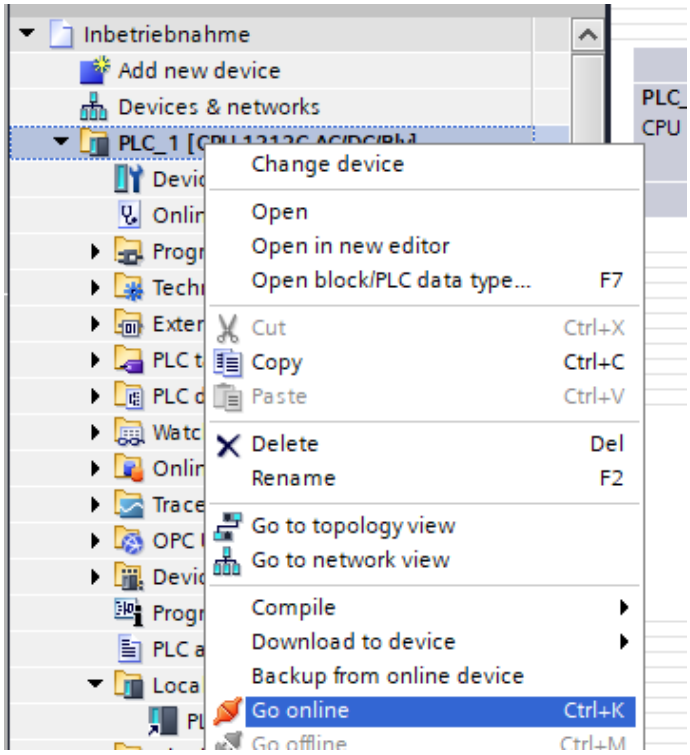
5 Strating the project

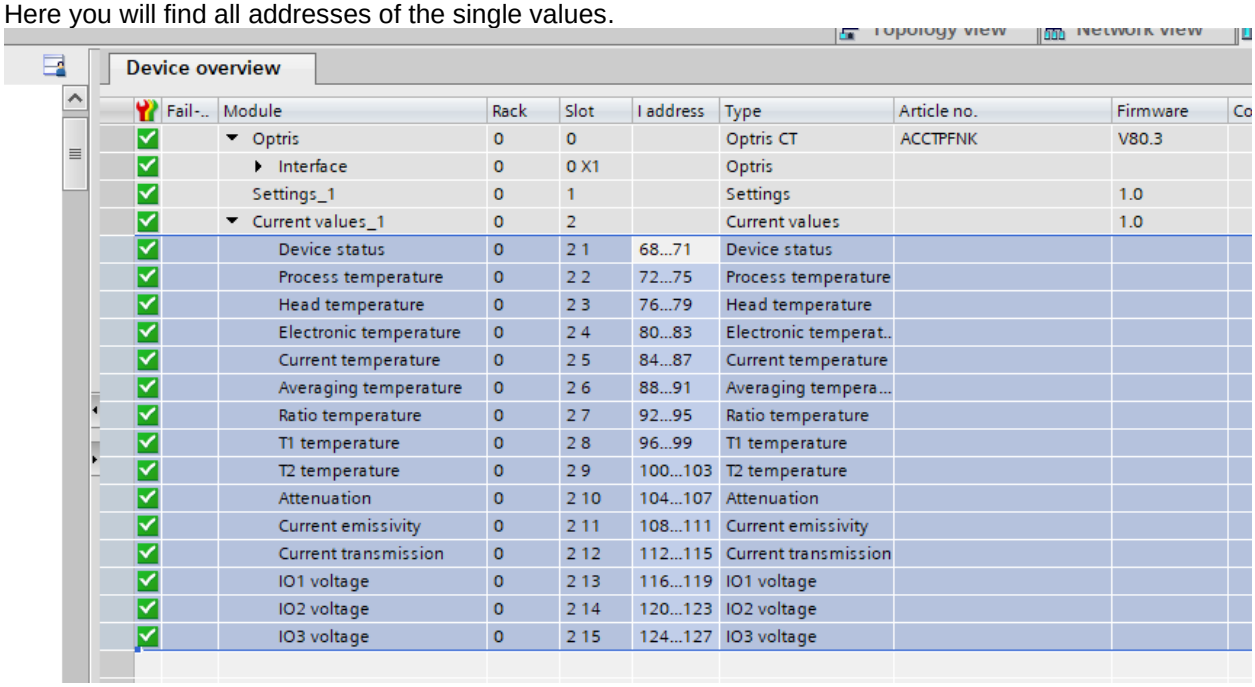
Go to your project in the project tree under **Devices.** Click with the right mouse button on **PLC** and click on **Go online.**



5.1 Show the device data

Go to your project in the project tree under **Optris.** Click with the right mouse button on **Current values_1** and click on **Open.**

Here you will find all addresses of the single values.



Fail-..	Module	Rack	Slot	I address	Type	Article no.	Firmware	Co
	Optris	0	0		Optris CT	ACCTPFNK	V80.3	
	Interface	0	0 X1		Optris			
	Settings_1	0	1		Settings		1.0	
	Current values_1	0	2		Current values		1.0	
	Device status	0	2 1	68...71	Device status			
	Process temperature	0	2 2	72...75	Process temperature			
	Head temperature	0	2 3	76...79	Head temperature			
	Electronic temperature	0	2 4	80...83	Electronic temperat..			
	Current temperature	0	2 5	84...87	Current temperature			
	Averaging temperature	0	2 6	88...91	Averaging tempera...			
	Ratio temperature	0	2 7	92...95	Ratio temperature			
	T1 temperature	0	2 8	96...99	T1 temperature			
	T2 temperature	0	2 9	100...103	T2 temperature			
	Attenuation	0	2 10	104...107	Attenuation			
	Current emissivity	0	2 11	108...111	Current emissivity			
	Current transmission	0	2 12	112...115	Current transmission			
	IO1 voltage	0	2 13	116...119	IO1 voltage			
	IO2 voltage	0	2 14	120...123	IO2 voltage			
	IO3 voltage	0	2 15	124...127	IO3 voltage			

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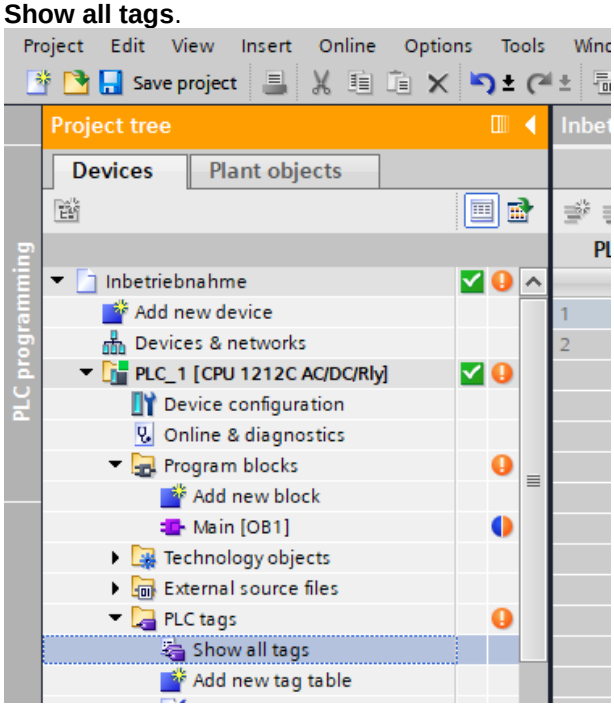
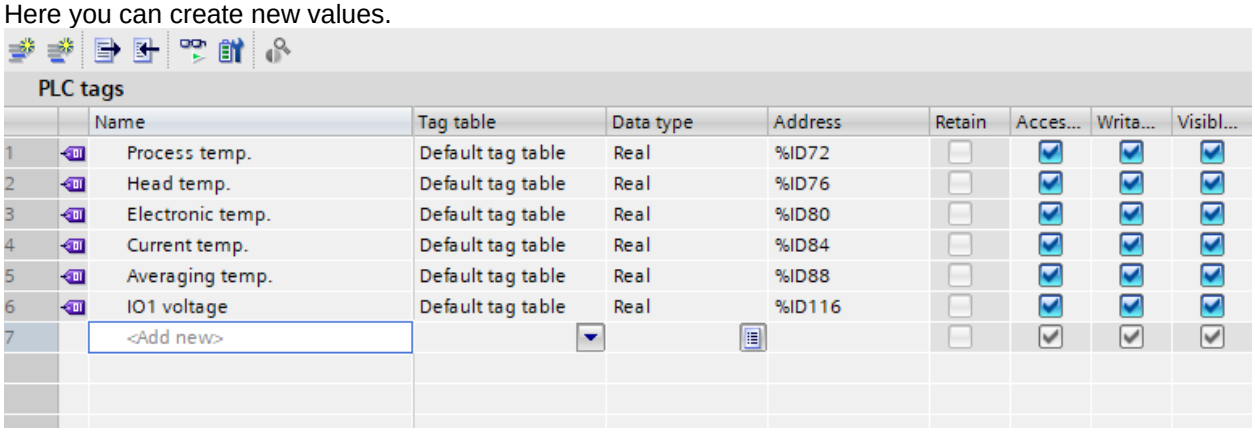
The addresses will be needed for creating new variables in the project: Double click on PLC and click on **Show all tags**.



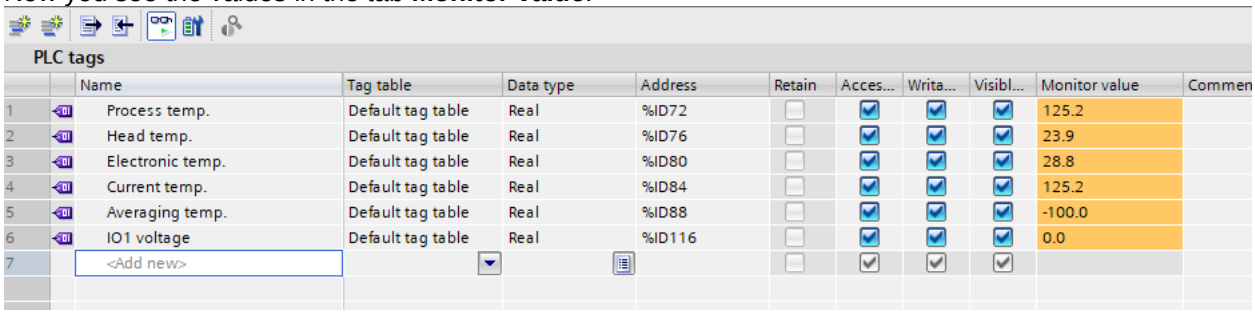
Here you can create new values.



	Name	Tag table	Data type	Address	Retain	Acces...	Writa...	Visibl...
1	Process temp.	Default tag table	Real	%ID72		☑	☑	☑
2	Head temp.	Default tag table	Real	%ID76		☑	☑	☑
3	Electronic temp.	Default tag table	Real	%ID80		☑	☑	☑
4	Current temp.	Default tag table	Real	%ID84		☑	☑	☑
5	Averaging temp.	Default tag table	Real	%ID88		☑	☑	☑
6	IO1 voltage	Default tag table	Real	%ID116		☑	☑	☑
7	<Add new>					☑	☑	☑

Click on the symbol “glasses with the green arrow” 

Now you see the values in the tab **Monitor value**.



	Name	Tag table	Data type	Address	Retain	Acces...	Writa...	Visibl...	Monitor value	Commen
1	Process temp.	Default tag table	Real	%ID72		☑	☑	☑	125.2	
2	Head temp.	Default tag table	Real	%ID76		☑	☑	☑	23.9	
3	Electronic temp.	Default tag table	Real	%ID80		☑	☑	☑	28.8	
4	Current temp.	Default tag table	Real	%ID84		☑	☑	☑	125.2	
5	Averaging temp.	Default tag table	Real	%ID88		☑	☑	☑	-100.0	
6	IO1 voltage	Default tag table	Real	%ID116		☑	☑	☑	0.0	
7	<Add new>					☑	☑	☑		

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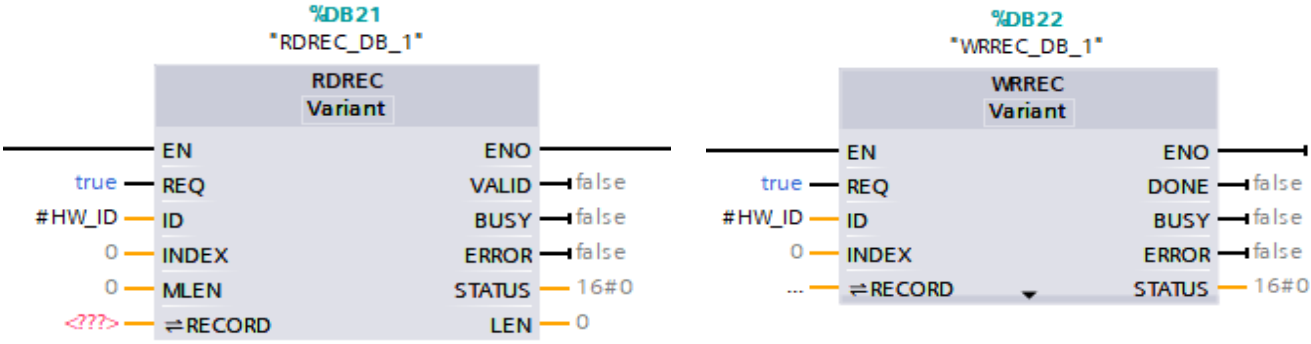
6 Read and write CT Information

Read and write of CT Information via "RDREC" und "WRREC":



Parameter :

HW_ID Optris~Current_values_1~Device_status

INDEX	MLEN	RECORD (Typ)	Value	Notice
16#03e9	4	DWORD	Serial number	
16#03ea	2	WORD	FW Revision	
16#03eb	1	BOOL	Temp. unit	false - °F | true - °C
16#03ec	4	REAL	Measuring range 1 min	
16#03ed	4	REAL	Measuring range 1 max	
16#03ee	4	REAL	Measuring range 2 min	
16#03ef	4	REAL	Measuring range 3 min	
16#03f0	4	BYTE	Device Temp. Range min	
16#03f1	4	REAL	Device Temp. Range max	
16#03f2	24	ARRAY[0..23] OF CHAR	Device description	
16#03f3	8	ARRAY[0..4] OF BYTE	Device Flags	

7 Read and write CT Settings

Parameter :

HW_ID Optris~Settings_1

INDEX	MLEN	RECORD (Typ)	Value	Notice
16#0001	1	BOOL	Temp. unit	false - °F | true - °C
16#0002	1	BOOL	Panel Lock	false | true
16#0003	1	BOOL	Laser on	false | true
16#0005	4	REAL	Emissivity	
16#0006	4	REAL	Transmission	
16#0007	4	REAL	Slope	
16#0008	4	REAL	Emissivity T1	
16#0009	1	BYTE	Average Mode	0 - normal | 1 - Smart

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16#000b	4	REAL	Average time	
16#000c	4	REAL	Threshold for Smart Mode	
16#000d	4	REAL	max. Attenuation	
16#000e	1	BYTE	max. Attenuation Mode	
16#0010	4	REAL	max. Attenuation Fix Value	

8 Tunnel commands – direct CT communication

This feature allows you via tunnel to have access to all CT settings.

Parameter :

HW_ID Optris~Current_values_1~Device_status
INDEX 10001
RECORD Variable vom Typ "Array [0..x] of Byte"

Example : Read Firmware Revision	
Record = Array[0..4] of Byte	
Record[0] := 16#00	
Record[1] := 16#02	← CT command answer number of bytes
Record[2] := 16#00	
Record[3] := 16#14	← CT command Timeout in ms
Record[4] := 16#0f	CT command 0x0f read FW Revision
WRREC execute	
RDREC execute	
Record[0] := 16#00	
Record[1] := 16#02	← answer number of bytes
Record[2] := 16#xx	
Record[3] := 16#yy	<-- xx*256 + yy = FW Revision

Note: If the command requires a checksum, the checksum must be in the command!

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