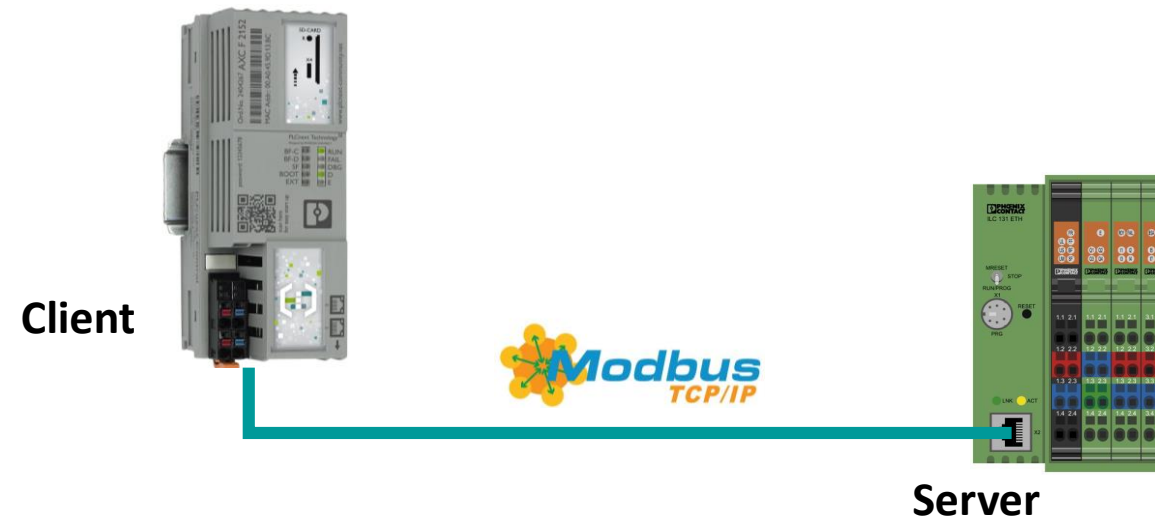


# Technical Guide

## Comunicação Modbus TCP entre controlador INLINE e PLCnext



PLCnext Technology   
Designed by PHOENIX CONTACT



PLCnext Control



PLCnext Engineer



PLCnext Store



PLCnext Community

# Comunicação MODBUS entre controlador INLINE e PLCnext

1. Fazer download das bibliotecas de comunicação MODBUS TCP
2. Configurando o controlador ILC como MODBUS Server
3. Vincular as variáveis do ILC a array de comunicação MODBUS
4. Criar um novo projeto no PLCnext Engineer configurando os parâmetros de rede
5. Criação da rotina com as funções de leitura e escrita MODBUS Client
6. Connect/Login, Download and Start, Debug e Watch Window.

# 1. Fazer download das bibliotecas de comunicação MODBUS TCP

Este tutorial utilizará bibliotecas para estabelecer a comunicação MODBUS TCP/IP entre os controladores.

As bibliotecas pode ser baixadas diretamente do site conforme a seguir:

## Controle - ILC 131 ETH - 2700973



O controlador Inline oferece a possibilidade de comunicar através de PROFINET e Modbus/TCP. A programação é feita com o PC Worx Express ou PC Worx (IEC 61131-3).

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Visão geral

Dados técnicos

Acessórios

Certificações

**Downloads**

### Módulo funcional

	Descrição	Idioma	Versão
<input type="checkbox"/>	[msi, 5 MB] <b>Módulo funcional</b> Módulos funcionais para a comunicação com o controlador através do protocolo Modbus TCP. PCW_6_Modbus_TCP_2_20200709.msi	Inglês	1

# 1. Fazer download das bibliotecas de comunicação MODBUS TCP

← → ↻ [plcnextstore.com/#/search?list-name=TopDownloads](https://plcnextstore.com/#/search?list-name=TopDownloads) 🔍 ☆

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 **AnalogTechnology** [Download](#)

Phoenix Contact GmbH & Co. KG

★★★★★ Downloads: 663 | Library

The AnalogTechnology library offers function blocks for acquisition and evaluation of analog signals.


Free

 **Modbus\_TCP** [Download](#)

Phoenix Contact GmbH & Co. KG

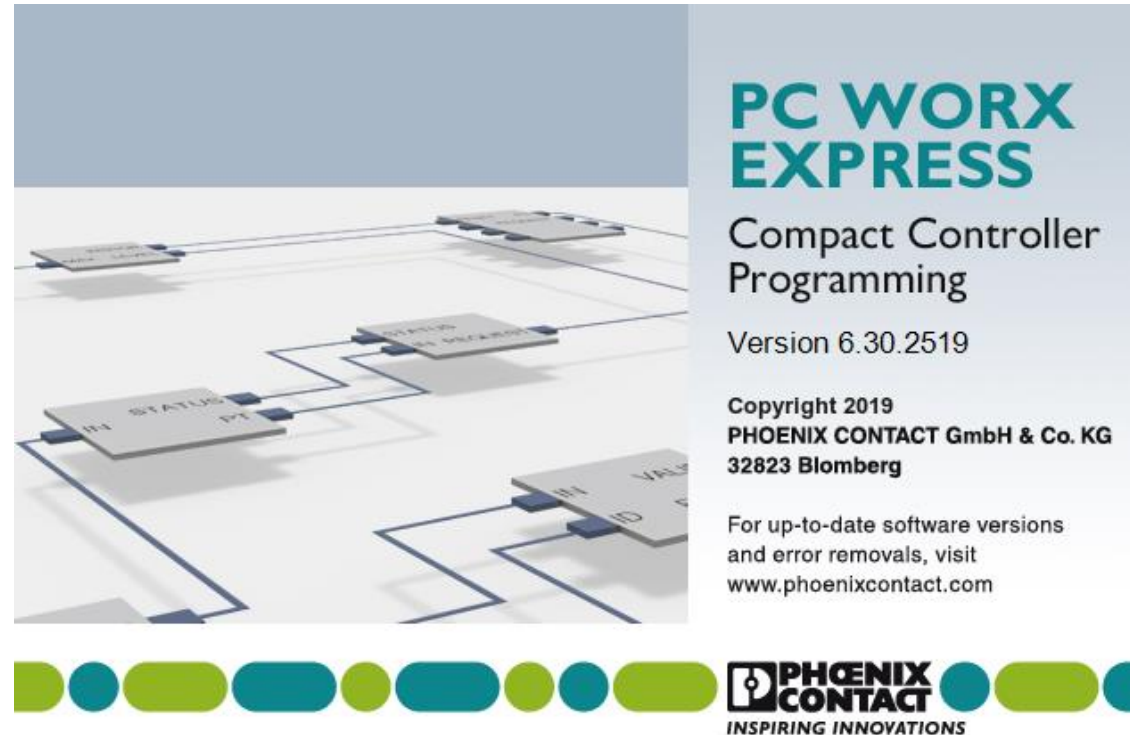
★★★★★ Downloads: 656 | Library

For the MB\_TCP\_Server function block, the registers used for Modbus correspond to the elements of the udtTCP\_ComData array. Each WORD array element is to be considered as a 16-bit Modbus register. The...

 **PHOENIX CONTACT**  
INSPIRING INNOVATIONS

## 2. Configurando o controlador ILC como MODBUS Server

Os controladores da família INLINE são configurados e programados no software PCWORX





## 2. Configurando o controlador ILC como MODBUS Server

### Configuração da faixa de IP do projeto

The screenshot shows the Phoenix Contact IEC Manager software interface. The 'Device Details' table is displayed, showing various project parameters. A red box highlights the IP configuration fields:

Project name	Value
Project name	EX_PND_DEVICE
Creator	7WRNZF
Computer name at project creation	PXCSW-N0082
MULTIPROG version at project creation	5.51.8.0
PC WORX version at project creation	PC WORX EXPRESS 6.30.1503
Creation date	2015-09-22T08:50:19+01:00
Last editor	Windows 7 x64
Computer name at last project backup	WIN-MFE067Q837J
MULTIPROG version at last project backup	5.51.593.0
PC WORX version at last project backup	PC WORX EXPRESS 6.30.2519
Date of last project backup	2021-01-12T16:39:11-03:00
Domain Postfix	
Template for DNS name creation	
First IP Address	192.168.15.2
Last IP-Address	192.168.15.254
Subnetmask	255.255.255.0
Default Gateway	
Use DHCP	No
Subnet Check for Multi MAC Devices	On
Certificate information	

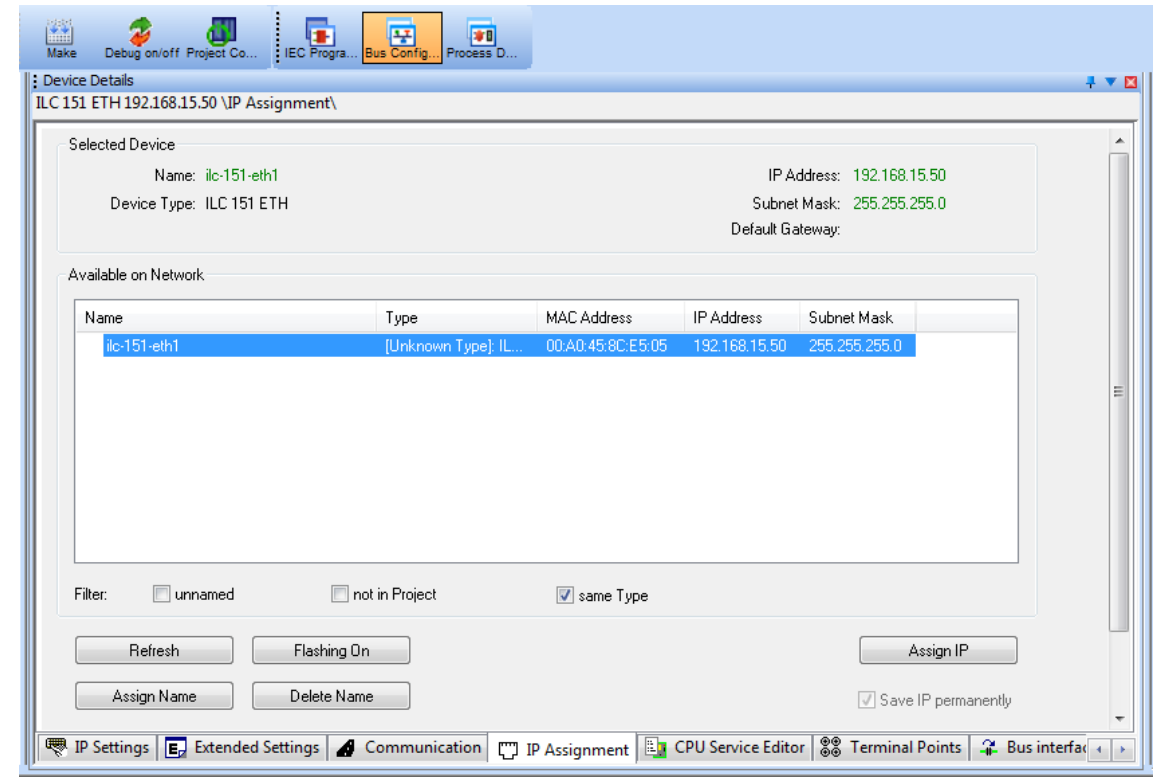
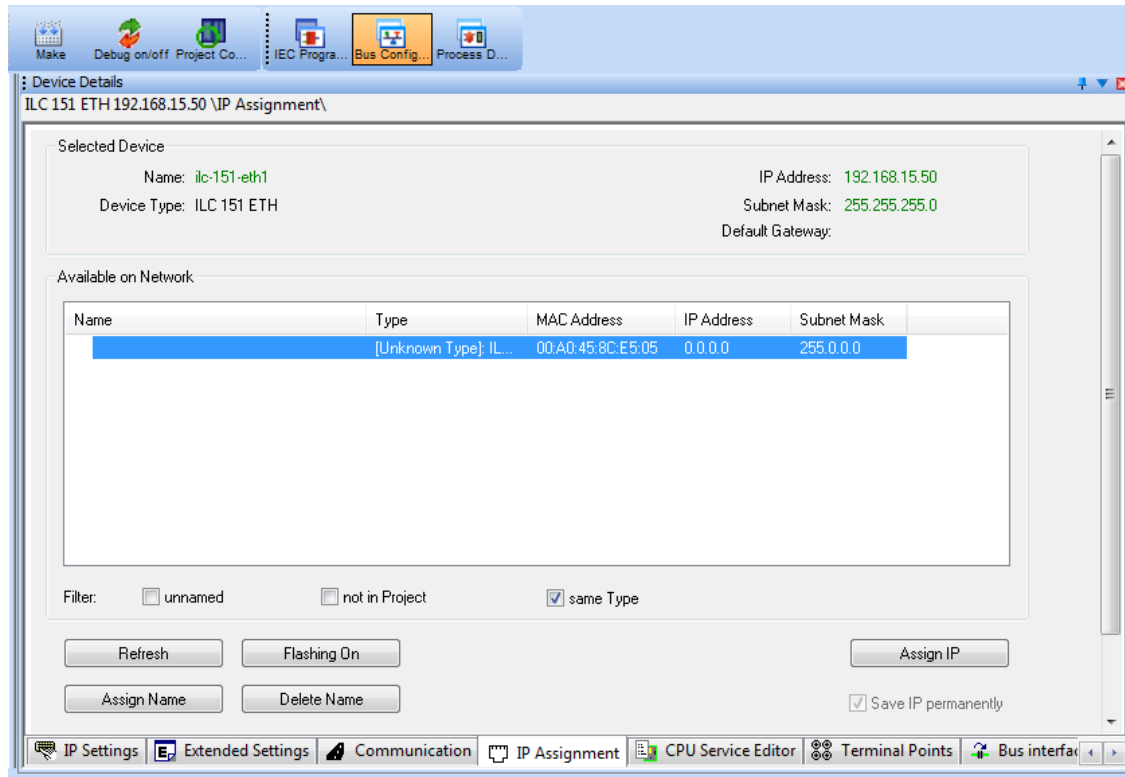
### Configuração do IP e DNS name do controlador

The screenshot shows the Phoenix Contact IEC Manager software interface. The 'Device Details' table is displayed, showing various project parameters. A red box highlights the IP and DNS configuration fields:

Name	Value
Vendor	Phoenix Contact
Designation	ILC 151 ETH
Functional description	Inline Controller for Ethernet Networks Wit...
Device type	PLC
Device family	ILC1xx
Order number	2700974
Revision	00/4.40
Station Name	
Device Name	
Module Equipment ID	
LAN1	
DNS Name	ilc-151-eth1
MAC Address	
IP Address	192.168.15.50
Subnetmask	255.255.255.0
Default Gateway	

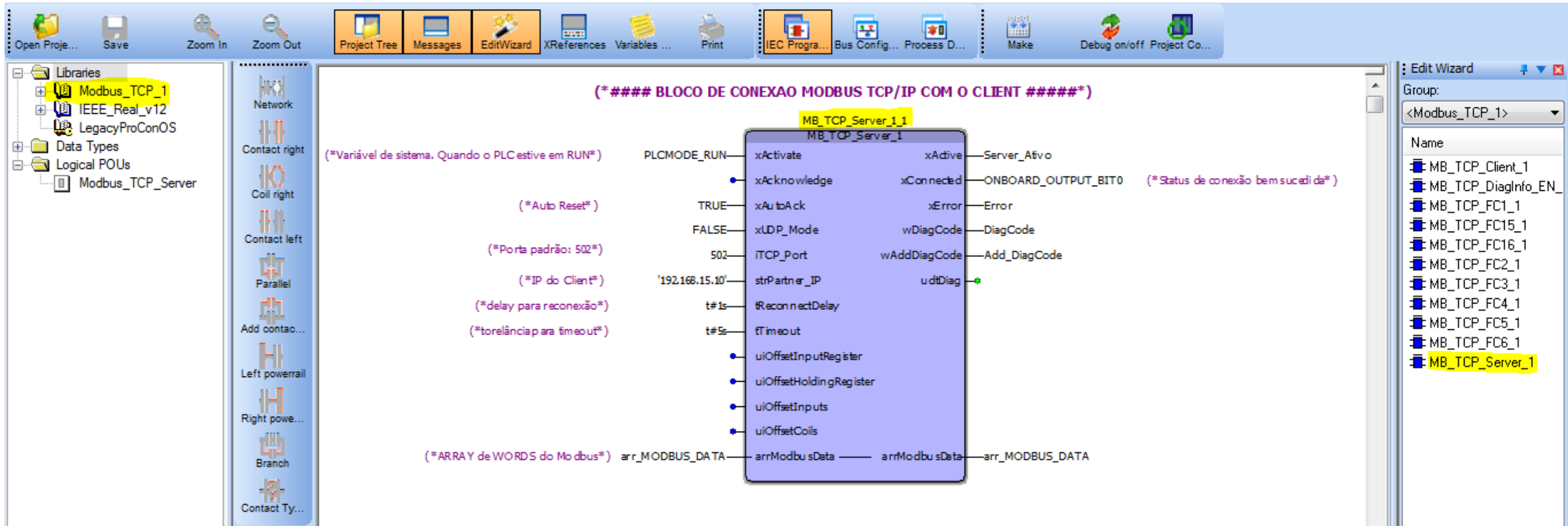
## 2. Configurando o controlador ILC como MODBUS Server

No PCWORX existe uma ferramenta a BootIP para atribuição de IP a assinatura do nome ao dispositivo



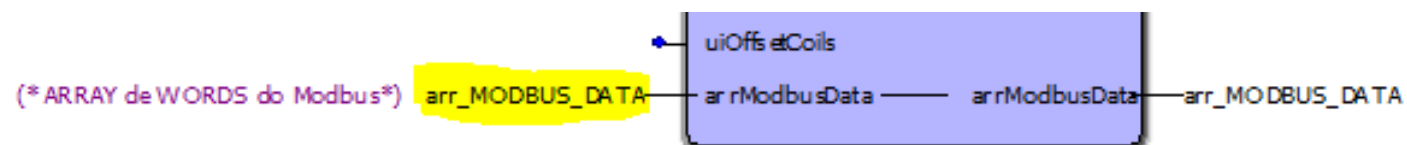
## 2. Configurando o controlador ILC como MODBUS Server

Incluir a biblioteca ao projeto e posteriormente instanciar o bloco MODBUS Server, conforme abaixo.

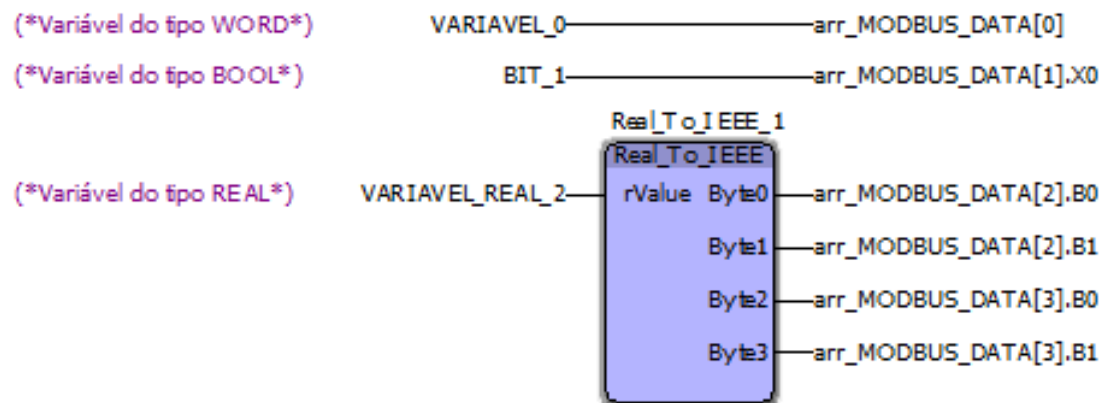




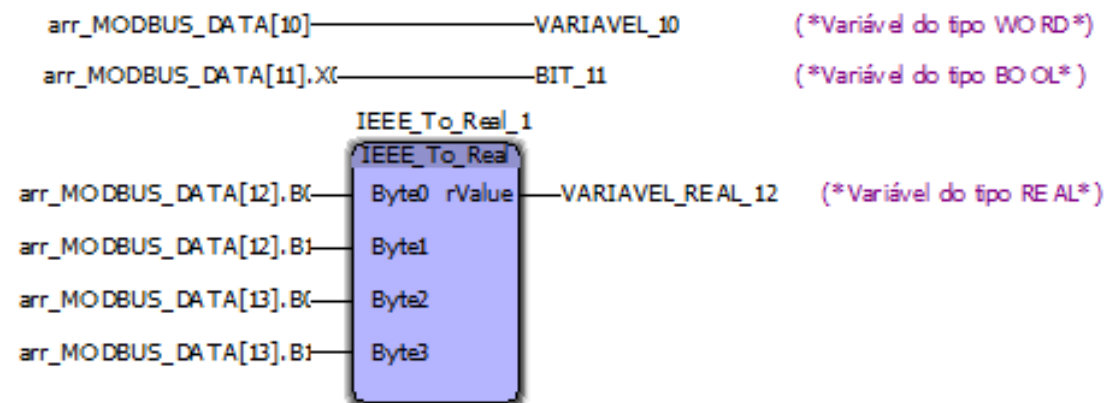
### 3. Vincular as variáveis do ILC a array de comunicação MODBUS



(\*#### VARIÁVEIS QUE O CLIENT VAI LER ####\*)

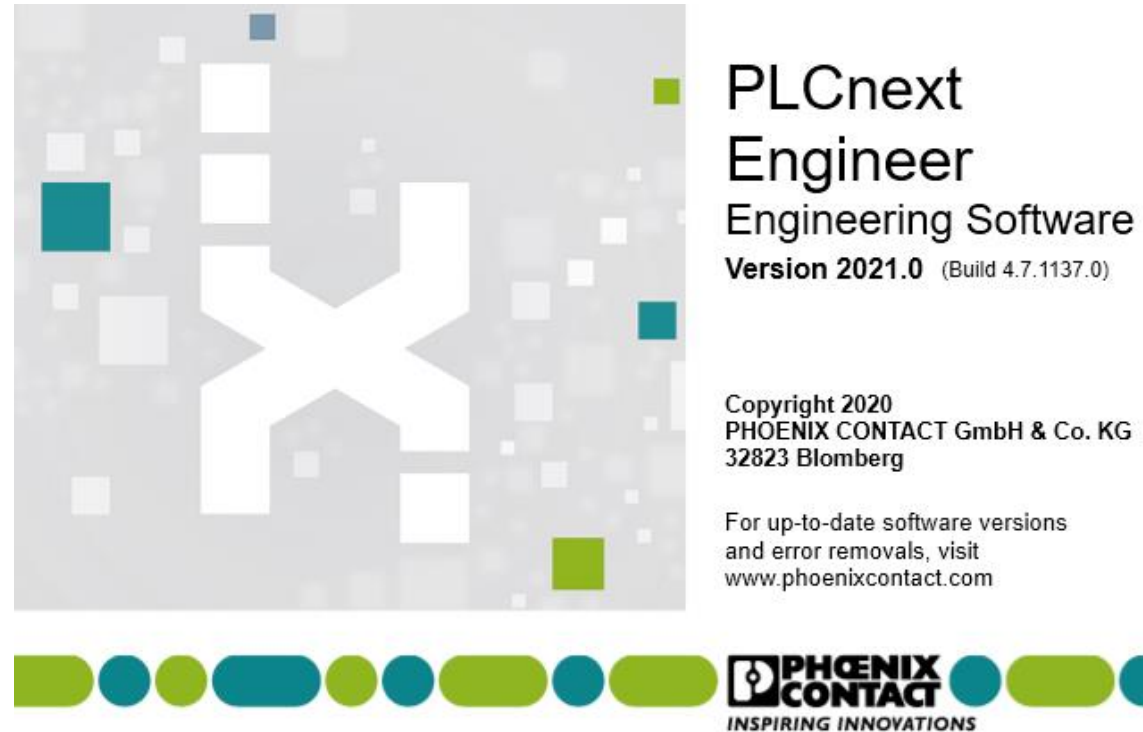


(\*#### VARIÁVEIS EM QUE O CLIENT VAI ESCREVER ####\*)



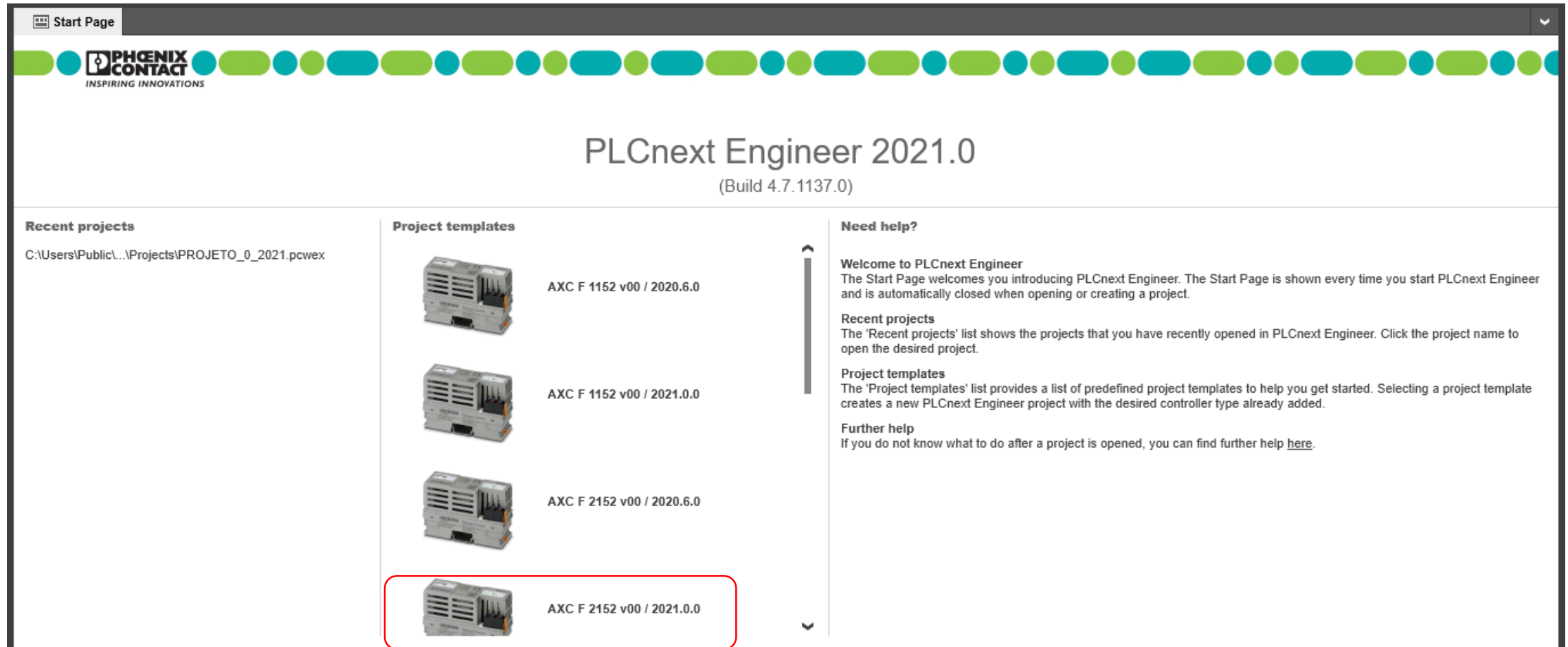
#### 4. Criar um novo projeto no PLCnext Engineer configurando os parâmetros de rede

Os controladores da família PLCnext são configurados e programados no software PLCnext Engineer



## 4. Criar um novo projeto no PLCnext Engineer configurando os parâmetros de rede

Selecione o modelo do controlador e sua versão de firmware.



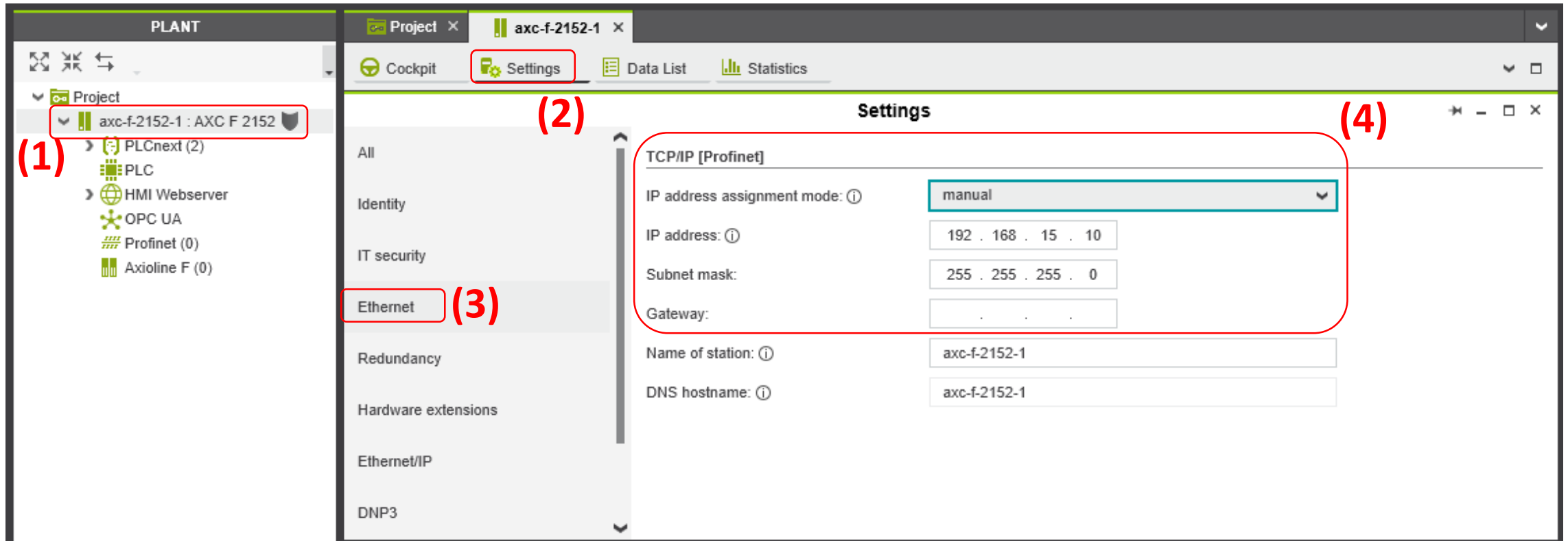
#### 4. Criar um novo projeto no PLCnext Engineer configurando os parâmetros de rede

Configuração da faixa de IP do projeto.

The screenshot displays the PLCnext Engineer software interface. On the left, the 'PLANT' sidebar shows a project tree with 'axc-f-2152-1 : AXC F 2152' expanded, revealing 'PLCnext (2)', 'PLC', 'HMI Webserver', 'OPC UA', 'Profinet (0)', and 'Axioline F (0)'. The 'Project' icon in the top toolbar is highlighted with a red box and labeled (1). The main window has a 'Project' tab selected, with the 'Settings' sub-tab highlighted by a red box and labeled (2). The 'Settings' panel shows various configuration options. The 'IP range' section is highlighted with a red box and labeled (3), containing the following fields:

IP range	
Start IP address: ⓘ	192 . 168 . 15 . 2
End IP address: ⓘ	192 . 168 . 15 . 254
Subnet mask: ⓘ	255 . 255 . 255 . 0
Default gateway: ⓘ	. . .

4. Criar um novo projeto no PLCnext Engineer configurando os parâmetros de rede
- Defina o IP do controlador do respectivo projeto.



## 4. Criar um novo projeto no PLCnext Engineer configurando os parâmetros de rede

Em modo automático o software sempre ira sugerir a faixa de IP configurada no projeto e IP com final 2.

TCP/IP [Profinet]

IP address assignment mode: ⓘ automatic ▼

IP address: ⓘ 192 . 168 . 15 . 2

Subnet mask: 255 . 255 . 255 . 0

Gateway: . . .

Em modo manual é possível configurar o IP conforme desejado.

TCP/IP [Profinet]

IP address assignment mode: ⓘ manual ▼

IP address: ⓘ 192 . 168 . 15 . 10

Subnet mask: 255 . 255 . 255 . 0

Gateway: . . .



#### 4. Criar um novo projeto no PLCnext Engineer configurando os parâmetros de rede

Realize o SCAN dos dispositivo online e atribua as configurações do projeto ao controlador.

(1) Project Tree

(2) Online Controllers Tab

(3) Ethernet Intel(R) Ethernet Connection I217-LM

(4) Online Controllers

Hardware e IP do projeto

Hardware e IP encontrado na rede

Name of station (Project)	IP address	Subnet mask	Default gateway	Type	Status	Name of stati...	IP address	Subnet mask	Default gateway	Type	MAC a
axc-f-2152-1	192.168.15.2	255.255.255.0		AXC F 2152	?	Select online devic...					
Select project device here					☀	axcf2152	192.168.1.10	255.255.255.0	192.168.1.1	AXC F 2152	00:AC

#### 4. Criar um novo projeto no PLCnext Engineer configurando os parâmetros de rede

Realize o SCAN dos dispositivo online e atribua as configurações do projeto ao controlador.

The screenshot shows the 'Online Controllers' window in the PLCnext Engineer software. The left sidebar displays a project tree with the following structure:

- Project
  - axc-f-2152-1 : AXC F 2152
    - PLCnext (2)
    - PLC
    - HMI Webserver
    - OPC UA
    - Profinet (0)
    - Axioline F (0)

The main window displays the 'Online Controllers' table. The table has the following columns: Name of station (Project), IP address, Subnet mask, Default gateway, Type, Status, Name of station (Device), IP address, Subnet mask, Default gateway, Type, and MAC address. The table shows two rows of data:

Name of station (Project)	IP address	Subnet mask	Default gateway	Type	Status	Name of station (Device)	IP address	Subnet mask	Default gateway	Type	MAC address
axc-f-2152-1	192.168.15.2	255.255.255.0		AXC F 2152	?						
Select project device here					⚙	axcf2152 : 00:A0:45:A0:AA:C7		255.255.255.0	192.168.1.1	AXC F 2152	00:A0:45:A0:AA:C7

A red callout box points to the 'Name of station (Device)' dropdown menu, which is currently empty. The text inside the callout box is: 'Atribua o hardware existente na rede ao seu projeto'.

#### 4. Criar um novo projeto no PLCnext Engineer configurando os parâmetros de rede

Realize o SCAN dos dispositivo online e atribua as configurações do projeto ao controlador.

The screenshot shows the 'Online Controllers' window in PLCnext Engineer. The left sidebar displays the project structure for 'axc-f-2152-1', including 'PLCnext (2)', 'PLC', 'HMI Webserver', 'OPC UA', 'Profinet (0)', and 'Axioline F (0)'. The main window shows a table of online controllers with the following columns: Name of station (Project), IP address, Subnet mask, Default gateway, Type, Status, Name of station (Online), IP address, Subnet mask, Default gateway, and Type. The table contains one entry for 'axc-f-2152-1' with IP address 192.168.15.10, Subnet mask 255.255.255.0, Default gateway 192.168.15.1, and Type AXC F 2152. The Status column shows a green checkmark, indicating that the configurations are correctly assigned. A red arrow points to the checkmark in the Status column.

Name of station (Project)	IP address	Subnet mask	Default gateway	Type	Status	Name of station (Online)	IP address	Subnet mask	Default gateway	Type
axc-f-2152-1	192.168.15.10	255.255.255.0	192.168.15.1	AXC F 2152	✓	axc-f-2152-1	192.168.15.10	255.255.255.0	192.168.15.1	AXC F 2152

Configurações atribuídas corretamente  
O IP do hardware está igual ao do projeto

#### 4. Criar um novo projeto no PLCnext Engineer configurando os parâmetros de rede

Realize o SCAN dos dispositivo online e atribua as configurações do projeto ao controlador.

The screenshot shows the PLCnext Engineer software interface. On the left, the 'PLANT' tree view shows a project named 'axc-f-2152-1 : AXC F 2152' with sub-items: PLCnext (2), PLC, HMI Webserver, OPC UA, Profinet (0), and Axioline F (0). The main window displays the 'Online Controllers' tab, which shows a table of online controllers. A context menu is open over the first row, with the option 'Apply Project Device Settings To Online Device' highlighted. A red callout box with the text 'Atribua as configurações do projeto ao hardware existente na rede' points to this option.

**Online Controllers**

Ethernet Intel(R) Ethernet Connection I217-LM

Last scan on 13/01/2021 09:34:48

Name of station (Project)	IP address	Subnet mask	Default gateway	Type	Status	Name of stati...	IP address	Subnet mask	Default gateway	Type	MAC a
axc-f-2152-1	192.168.15.2	255.255.255.0		AXC F 2152							

Atribua as configurações do projeto ao hardware existente na rede

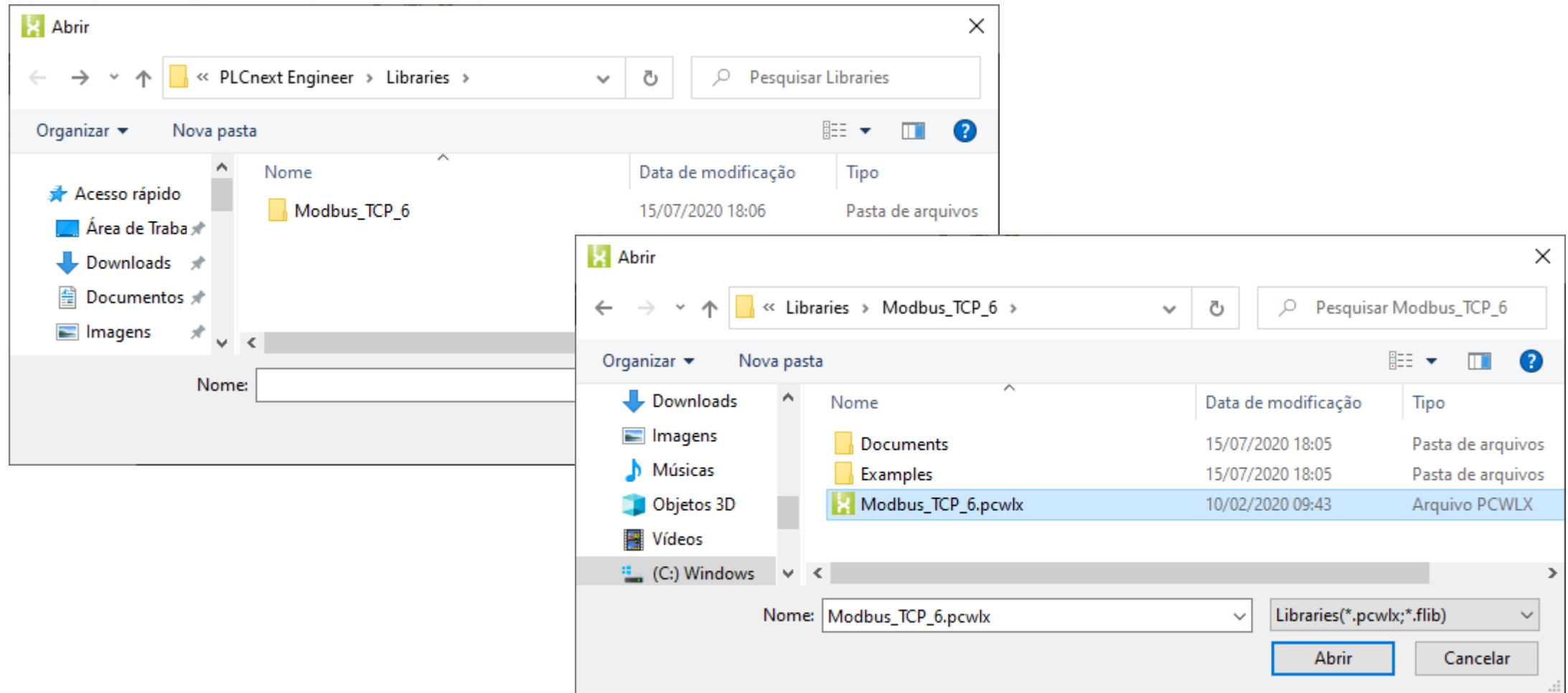
## 5. Criação da rotina com as funções de leitura e escrita MODBUS Client

Adicione a biblioteca Modbus TCP baixada do site.



## 5. Criação da rotina com as funções de leitura e escrita MODBUS Client

Adicione a biblioteca Modbus TCP baixada do site.





## 5. Criação da rotina com as funções de leitura e escrita MODBUS Client

Adicionar e configurar os blocos de função da biblioteca no program “Main” .

The screenshot displays the Phoenix Contact software interface for creating a program. The main window is titled "Main" and contains a prompt: "Select the programming language of your first worksheet below".

Three programming language options are available:

- Add ST Code Worksheet:** Shows a code editor with the following text:

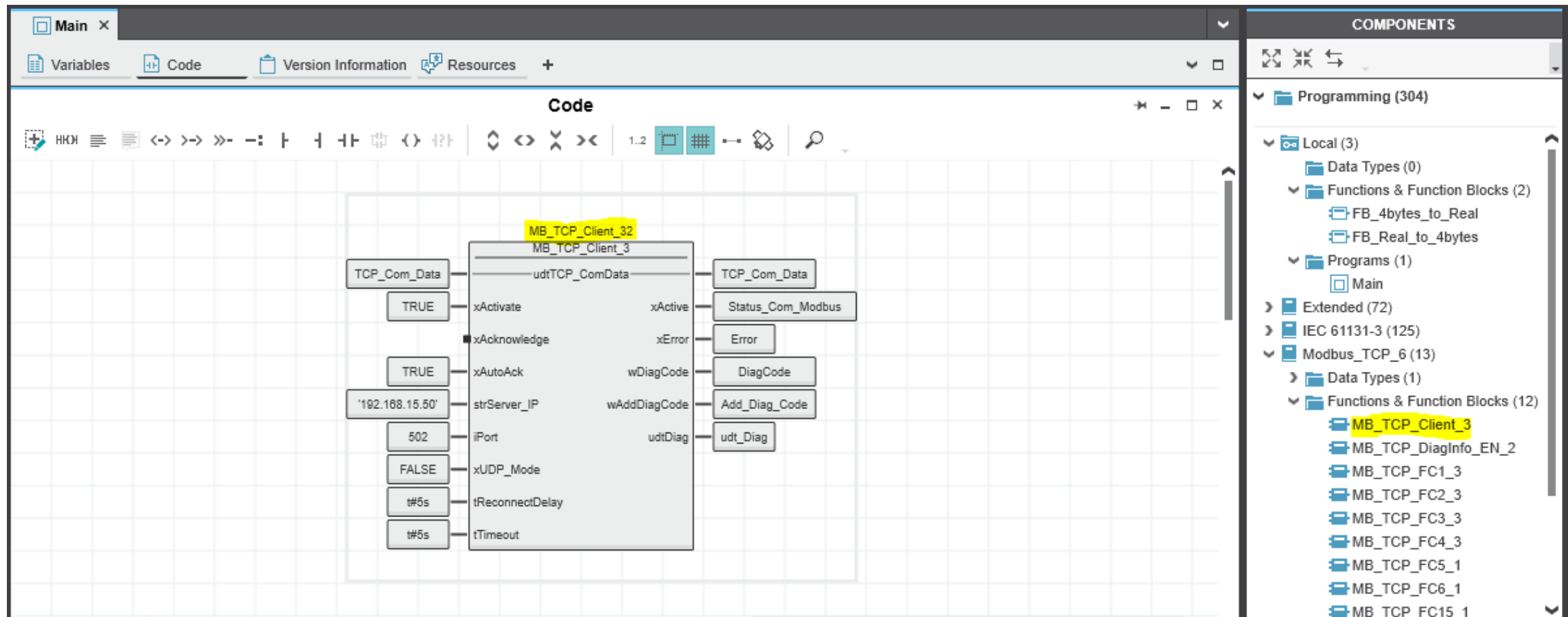
```
1 IF condition = TRUE THEN
2   opC := opA AND opC;
3 END_IF
```
- Add LD Code Worksheet:** (Highlighted with a red border) Shows a ladder logic diagram with two inputs, opA and opB, connected to an AND block, which is then connected to output opC.
- Add NOLD Code Worksheet:** Shows a network diagram labeled "Network (1) Network One" with two contacts, C001 and C002, connected in series.

The right sidebar, titled "COMPONENTS", lists various libraries and programs. The "Main" program is highlighted under the "Programs (1)" category. Other categories include "Programming (302)", "PLCnext Components & Programs (0)", "Network (457)", "HMI (34)", and "Libraries (2)".

A "Close" button is located at the bottom right of the main window.

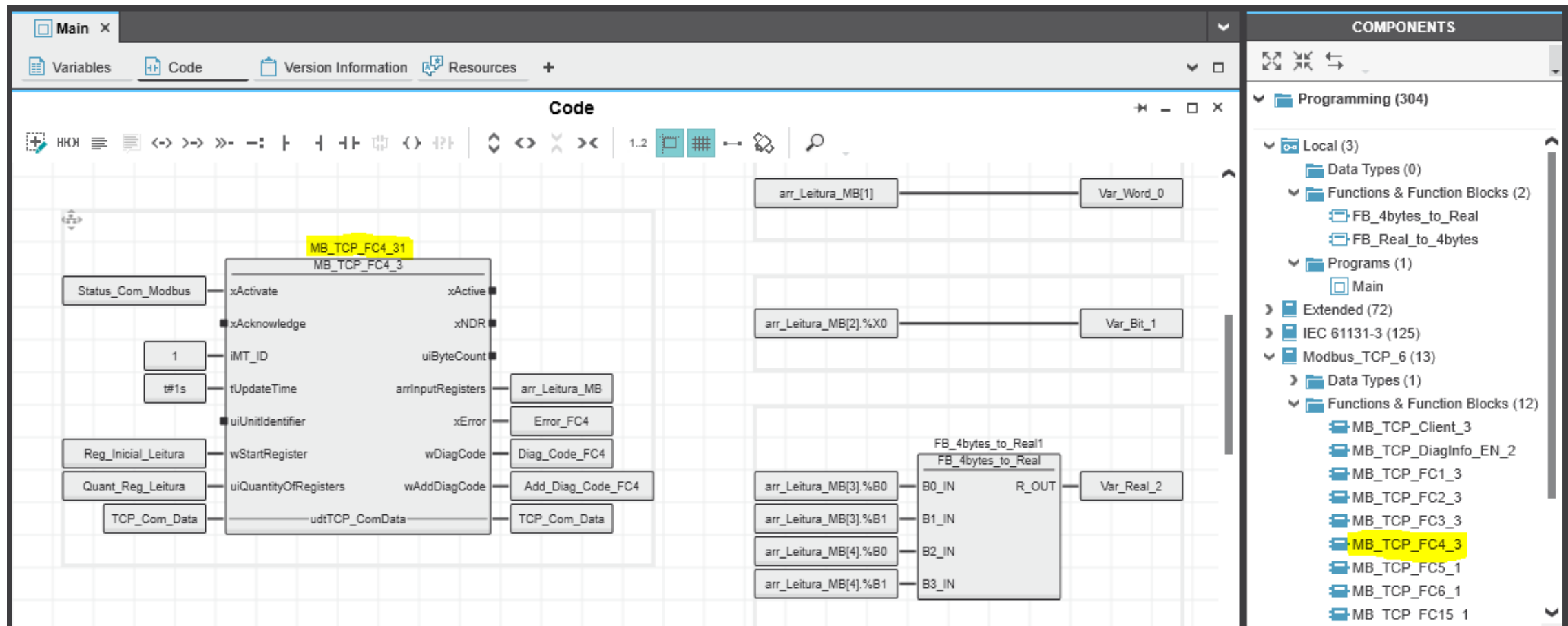
## 5. Criação da rotina com as funções de leitura e escrita MODBUS Client

Adicionar e configurar os blocos de função da biblioteca no program “Main” .



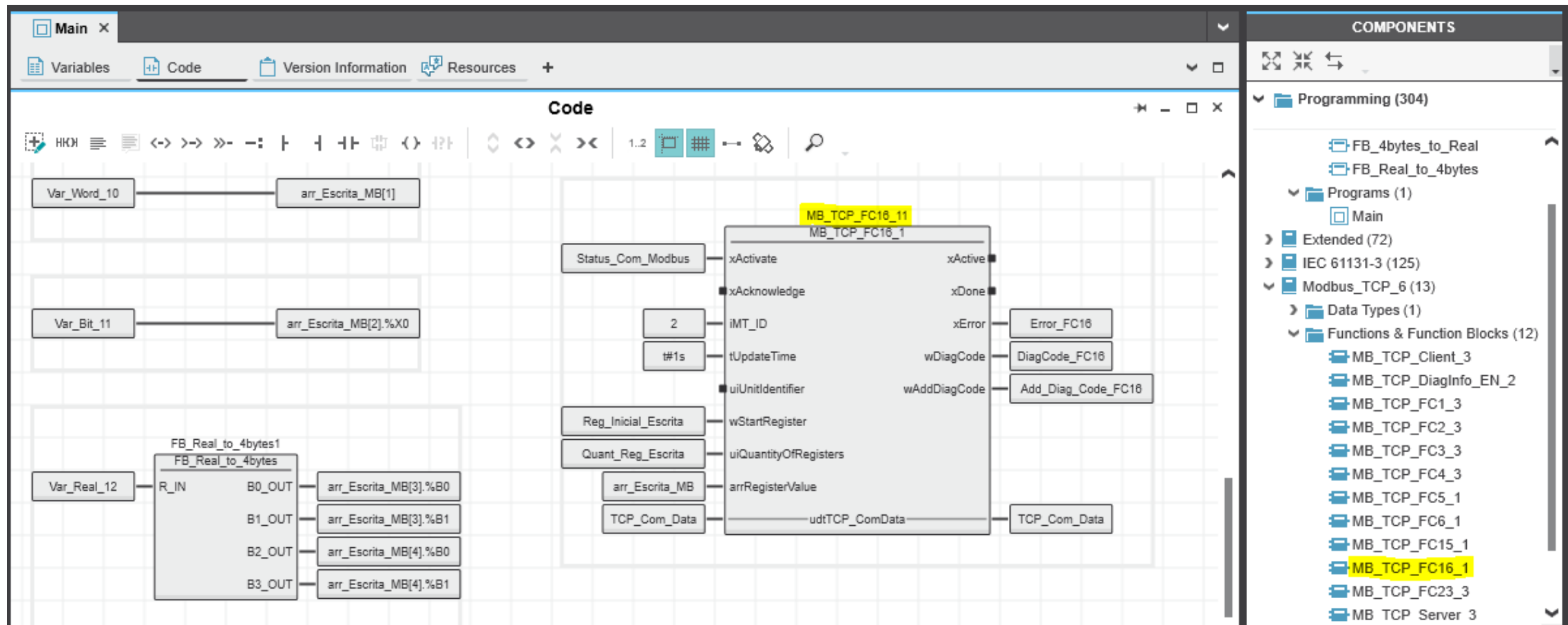
## 5. Criação da rotina com as funções de leitura e escrita MODBUS Client

Adicionar e configurar os blocos de função da biblioteca no program “Main” .

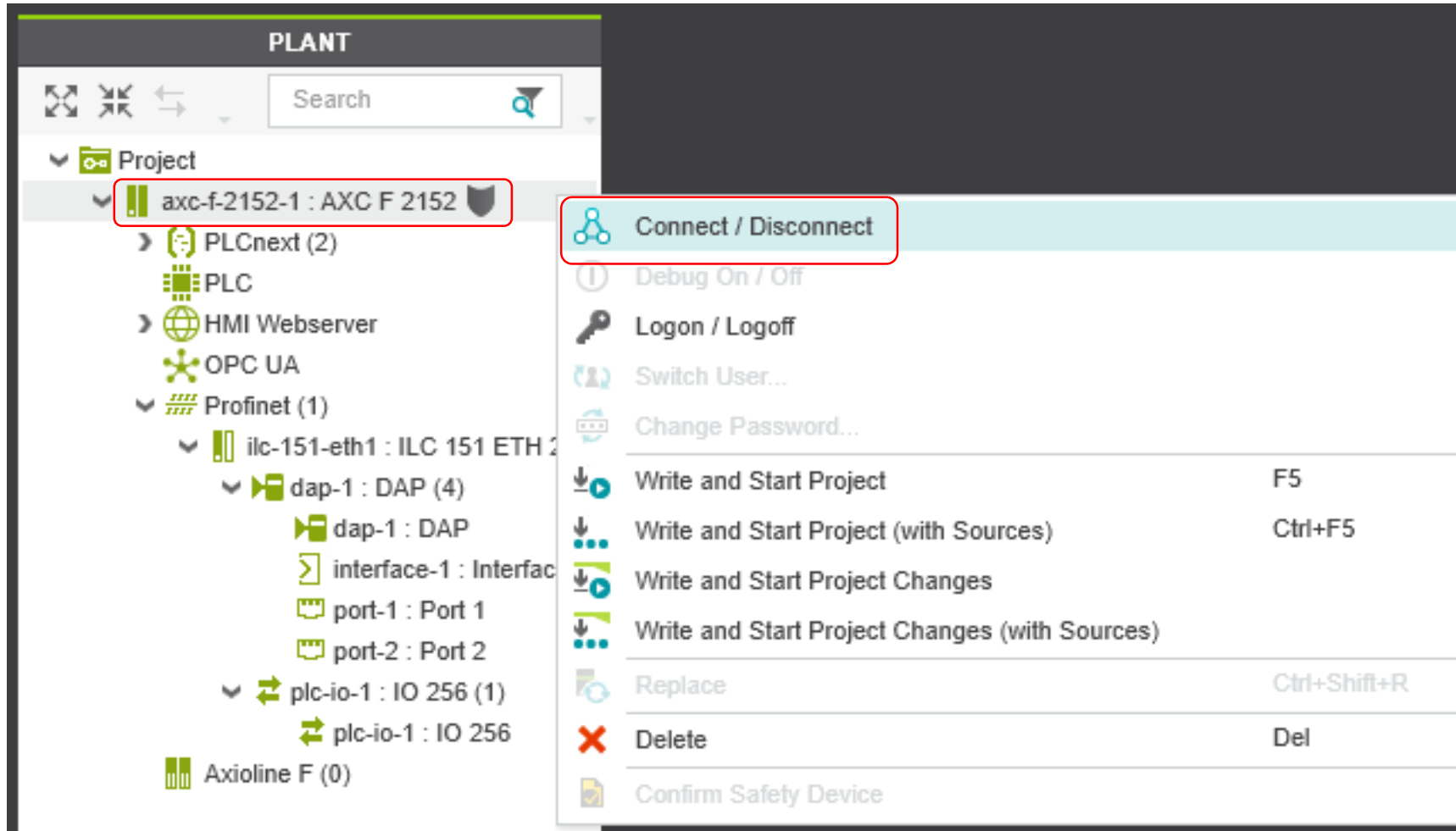


## 5. Criação da rotina com as funções de leitura e escrita MODBUS Client

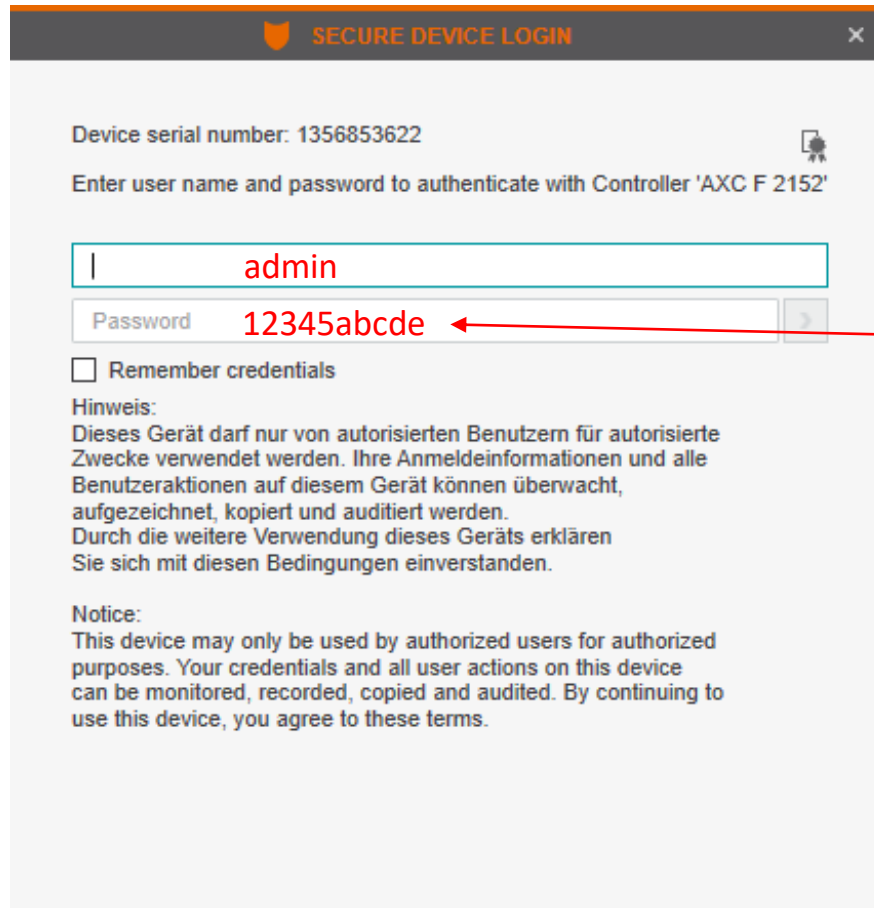
Adicionar e configurar os blocos de função da biblioteca no program “Main” .



## 6. Connect/Login, Download and Start, Debug e Watch Window.



## 6. Connect/Login, Download and Start, Debug e Watch Window.



**SECURE DEVICE LOGIN**

Device serial number: 1356853622

Enter user name and password to authenticate with Controller 'AXC F 2152'

Username:

Password:

☐ Remember credentials

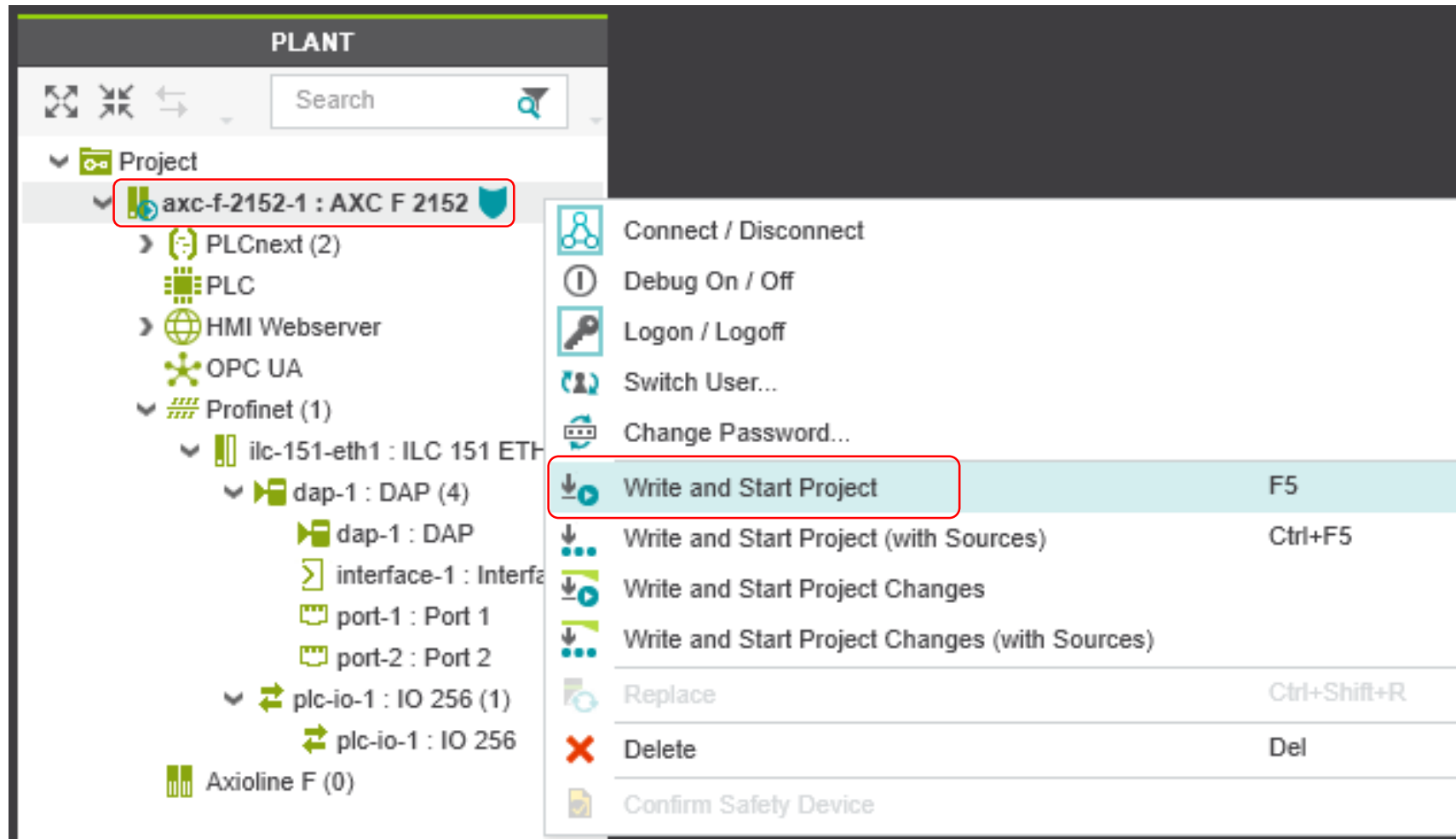
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Dieses Gerät darf nur von autorisierten Benutzern für autorisierte Zwecke verwendet werden. Ihre Anmeldeinformationen und alle Benutzeraktionen auf diesem Gerät können überwacht, aufgezeichnet, kopiert und auditiert werden.  
Durch die weitere Verwendung dieses Geräts erklären Sie sich mit diesen Bedingungen einverstanden.

**Notice:**  
This device may only be used by authorized users for authorized purposes. Your credentials and all user actions on this device can be monitored, recorded, copied and audited. By continuing to use this device, you agree to these terms.

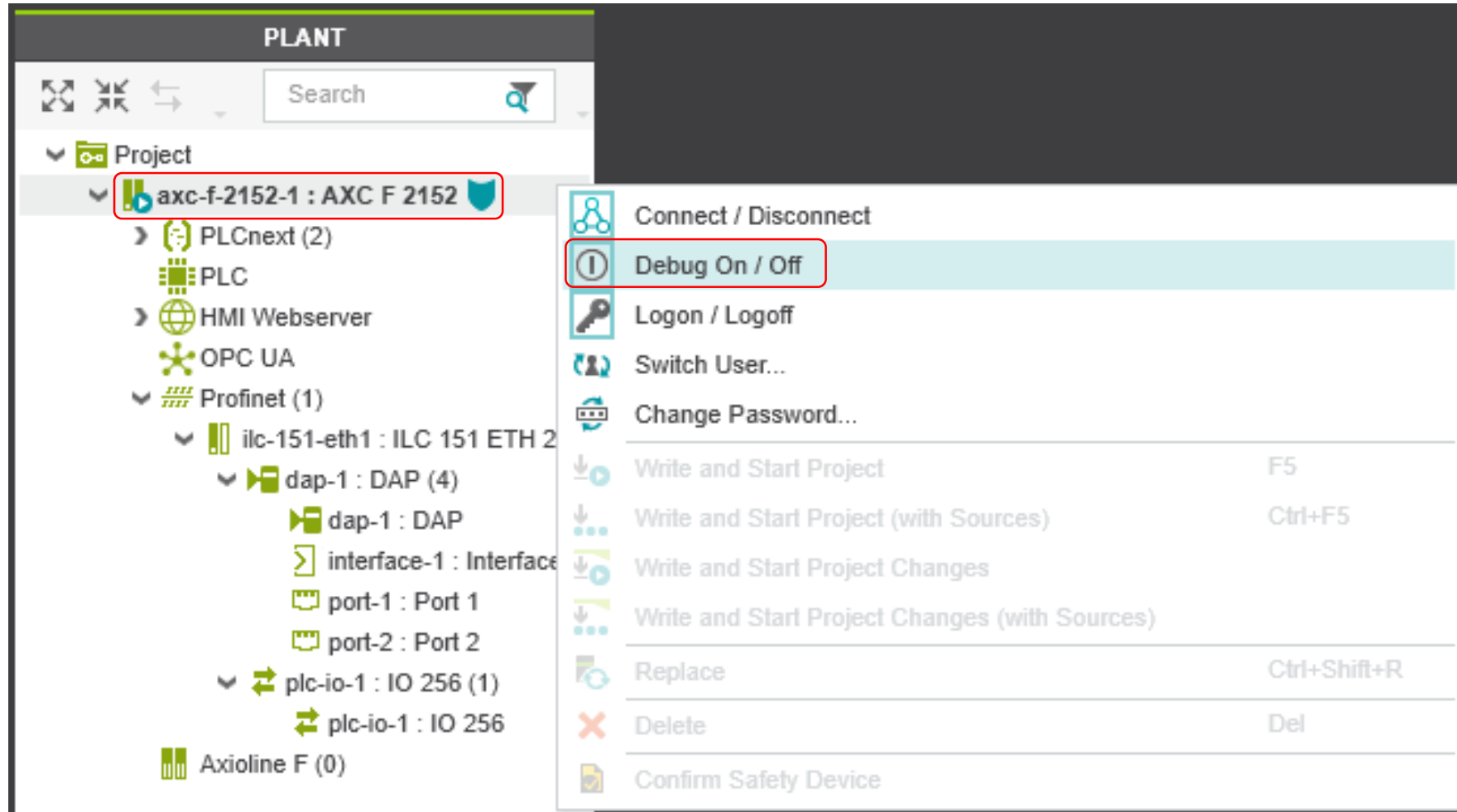




## 6. Connect/Login, Download and Start, Debug e Watch Window.



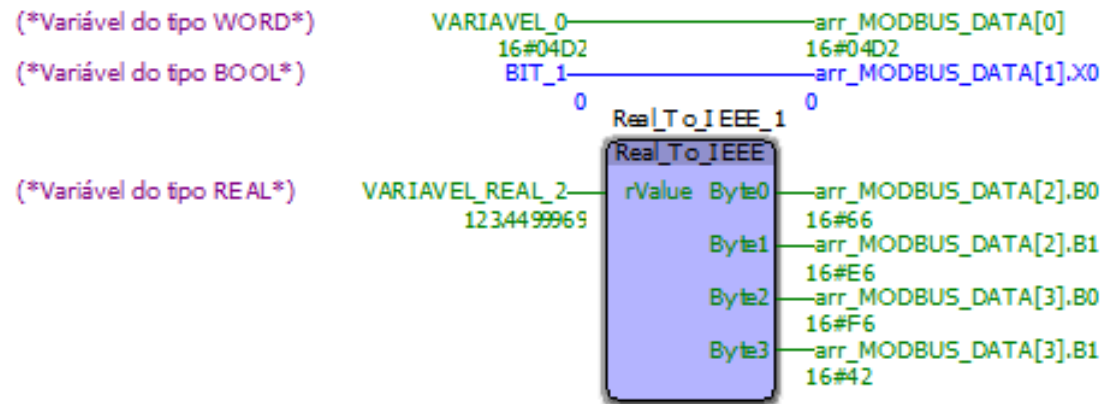
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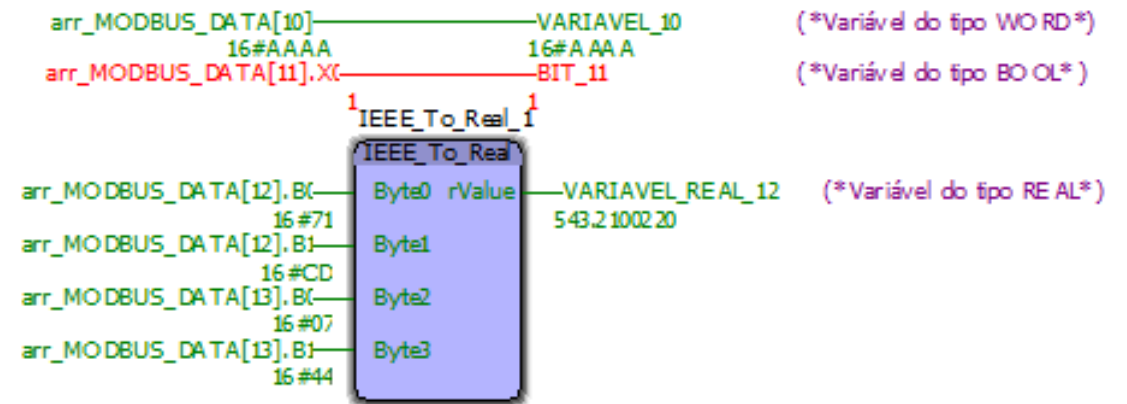
## 6. Connect/Login, Download and Start, Debug e Watch Window.

### Modo Debug(Online) no PCWORX

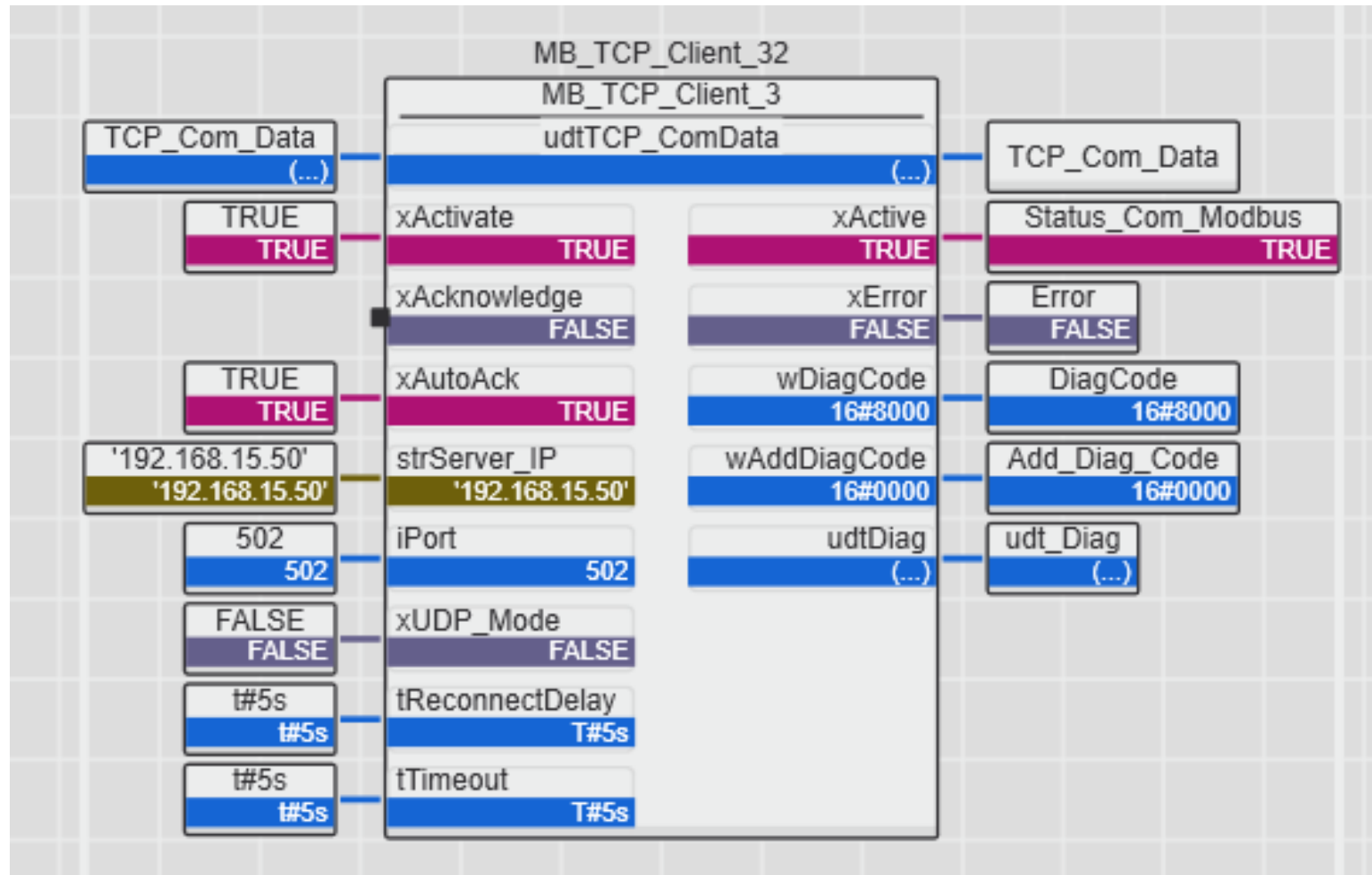
(\*#### VARIÁVEIS QUE O CLIENT VAI LER ####\*)



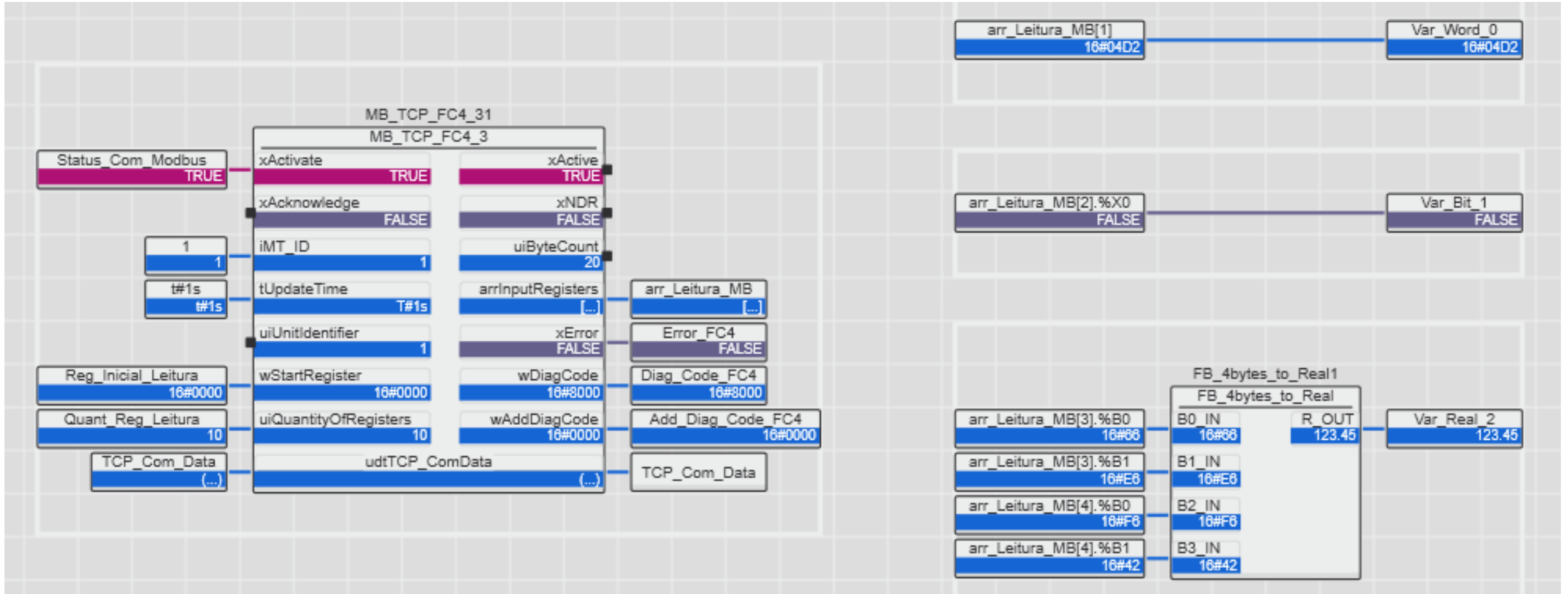
(\*#### VARIÁVEIS EM QUE O CLIENT VAI ESCREVER ####\*)



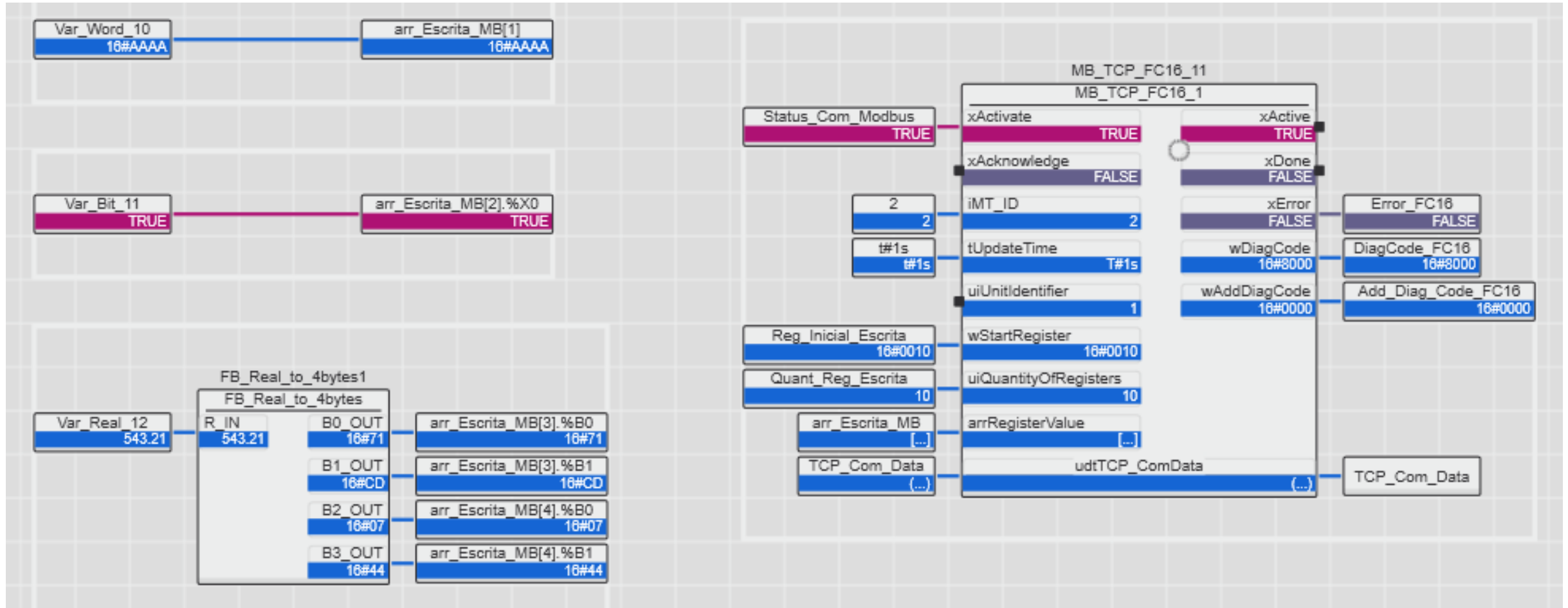
## 6. Connect/Login, Download and Start, Debug e Watch Window.



## 6. Connect/Login, Download and Start, Debug e Watch Window.



## 6. Connect/Login, Download and Start, Debug e Watch Window.





# Apresentação



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*Obrigado...*



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