

# Technical Guide

## Comunicação OPC UA entre Node-RED e PLCnext



PLCnext Technology 

Designed by PHOENIX CONTACT



PLCnext Control



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PLCnext Store



PLCnext Community

# Configurações no PLCnext

O primeiro passo é realizar a instalação do Node-Red no PLCnext. Temos um guia dedicado que aborda esse assunto e mostra todas as etapas necessárias para esta instalação.



**Technical Guide**

Instalação do Node-Red no PLCnext



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# Configurações no PLCnext

As variáveis que serão usadas na comunicação, deverão ter seu check box OPC marcadas.

Variables												
Name	Type	Usage	Translate	Comment	Init	Retain	Constant	OPC	HMI	Proficloud	Search	
FB_Seno1	FB_Seno	Local	<input type="checkbox"/>									
SENO	REAL	Local	<input type="checkbox"/>		REAL#0.0	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Concat_Data_Hora1	Concat_Data_Hora	Local	<input type="checkbox"/>									
DATA_HORA	STRING	Local	<input type="checkbox"/>		"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
CTUD1	CTUD	Local	<input type="checkbox"/>									
RTC	RTC_TYPE	External	<input type="checkbox"/>									
RS1	RS	Local	<input type="checkbox"/>									
RS2	RS	Local	<input type="checkbox"/>									
SOBE	BOOL	Local	<input type="checkbox"/>		FALSE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
DESCE	BOOL	Local	<input type="checkbox"/>		FALSE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
SOBE_DESCE	INT	Local	<input type="checkbox"/>		INT#0	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
FB_CLK_60_Hz1	FB_CLK_60_Hz	Local	<input type="checkbox"/>									
Enter variable name here												

# Configurações no PLCnext

Configuração do OPC UA no PLCnext.

The screenshot displays the configuration interface for OPC UA in the PLCnext environment. The left sidebar shows a tree view with 'PLANT' at the top, followed by 'Project', 'axc-f-2152-1 : AXC F 2152', 'PLCnext (2)', 'PLC', 'HMI Webserver', and 'OPC UA' (highlighted in blue). Below 'OPC UA' are 'Profinet (0)' and 'AxioLine F (0)'. The main area shows the 'OPC UA / OPC UA Server' configuration page. A left-hand menu includes 'Basic settings' (highlighted in yellow), 'Security', 'Discovery server', and 'File system'. The 'Basic settings' section contains the following fields:

- Endpoint:** A text field containing 'opc-ua://axc-f-2152-1'.
- DNS name / IP address:** A text field containing 'axc-f-2152-1'.
- Information model:** A text field containing 'axc-f-2152-1'.
- Visibility of variables:** A dropdown menu with 'Marked' selected (highlighted in yellow).
- Subscription settings:** A section header.
- Subscription kind:** A dropdown menu with 'Direct Read' selected.

# Configurações no PLCnext

The screenshot displays the configuration interface for OPC UA. The left sidebar shows a tree view with 'Security' highlighted. The main content area is titled 'OPC UA' and contains several sections: 'Server certificate', 'Certificate', 'Subject 1', 'Subject 2', 'Subject 3', 'Subject 4', 'Type of subject', 'Security policies', and 'Application'. The 'Certificate' field is set to 'Self signed by controller'. The 'Security policies' section includes checkboxes for enabling various cryptographic algorithms, all of which are currently set to 'Yes'. The 'Application' section has two checkboxes, both of which are checked.

**PLANT**

Project

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

**OPC UA / OPC UA Server**

- OPC UA
- Basic settings
- Security**
- Discovery server
- File system

**OPC UA**

Server certificate

Certificate: Self signed by controller

**Subject 1**

Type of subject: Not set

**Subject 2**

Type of subject: Not set

**Subject 3**

Type of subject: Not set

**Subject 4**

Type of subject: Not set

**Security policies**

Enable basic 128 RSA15 algorithm:  No

Enable basic 256 algorithm:  No

Enable basic 256 SHA256 algorithm:  Yes

Enable AES 128 SHA256 RSA OAEP algorithm:  Yes

Enable AES 256 SHA256 RSA PSS algorithm:  Yes

**Application**

Use the truststore for client authentication:

Check application URI against client certificate:

# Configurações no Node-Red

A comunicação entre o Node-Red e o PLCnext será feita via OPCUA e por isso será necessário que o node *opcua* esteja instalado. A instalação deste node, também é abordada no mesmo guia de instalação do Node-Red.

## node-red-contrib-opcua 0.2.256

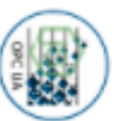
A Node-RED node to communicate via OPC UA based on node-opcua library.

```
npm install node-red-contrib-opcua
```

downloads **3.2k/month** npm package **0.2.256**

Node-RED OPC UA

## node-red-contrib-opcua



A Node-RED nodes to communicate or serve via OPC UA.  
based on node-opcua



### Node Info

Version: 0.2.256

Updated 22 hours ago

License: Apache-2.0

Rating: 4.3 ★ 4 🐙

[View on npm](#)

[View on GitHub](#)

### Actions

Rate: 🚫 ☆ ☆ ☆ ☆ ☆

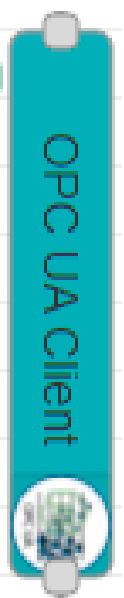
### Downloads

904 in the last week

### Nodes

- OpCua-Item
- OpCua-Client
- OpCua-Browser
- OpCua-Server
- OpCua-Endpoint


# Configurações do node *OPC UA Client*



**Edit OpCua-Client node**

Delete Cancel Done

**Properties**

Endpoint Add new OpCua-Endpoint... 

Action READ

Certificate None, use generated self-signed certificate

Local certificate file with absolute path selfSigned.pem

Local private key file with absolute path private\_key.pem

PKI certificate folder

Name

**Edit OpCua-Client node > Edit OpCua-Endpoint node**

Delete Cancel Update

**Properties**

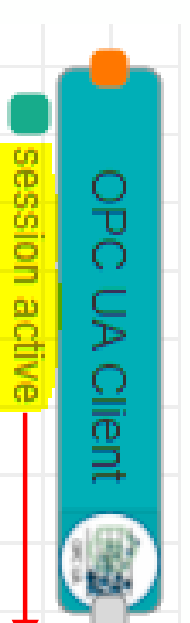
Endpoint opc.tcp://192.168.1.100:4840

SecurityPolicy Basic256Sha256

SecurityMode Sign  use credentials

User admin

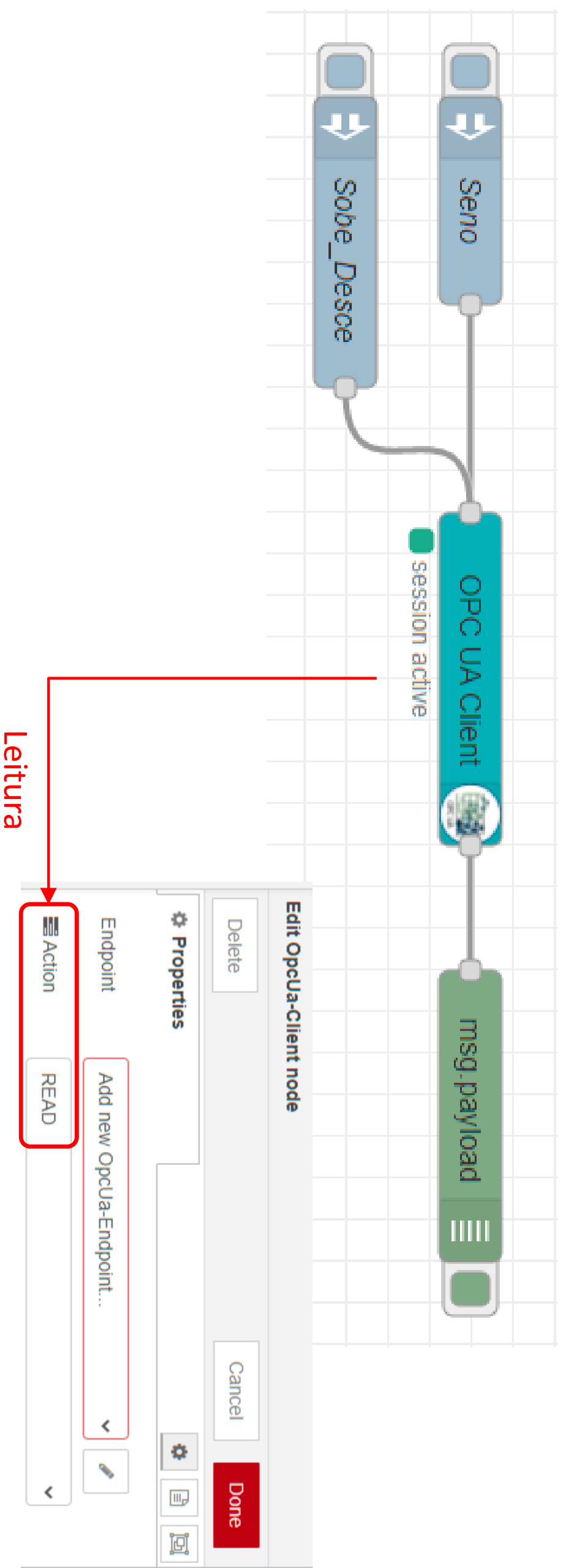
Password .....



Seção ativa  
Comunicação OK

# Configurações no Node-Red

Configuração do node OPC UA Client para LEITURA.





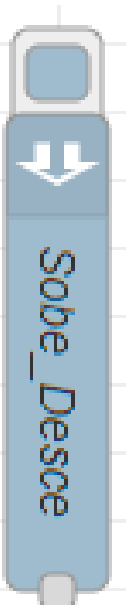
# Configurações no Node-Red

Na lógica foi adicionado dois *inject* referente as variáveis a serem lidas e um *debug* para visualizarmos os valores das variáveis lidas.



Name Senno

msg. payload	=	timestamp	x
msg. topic	=	<code>ns=5;s=Arp.Plc.Eclir/MainInstance.SENNO;datatype=Float</code>	x

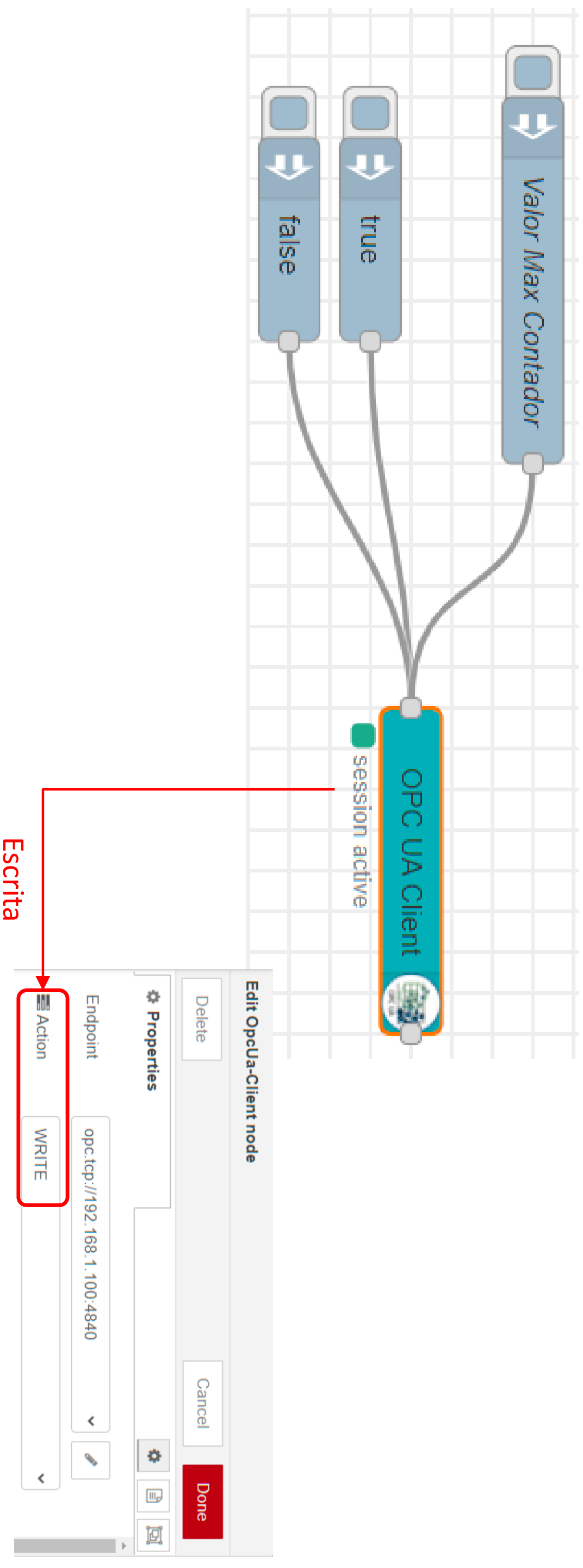


Name Sobe\_Desce

msg. payload	=	timestamp	x
msg. topic	=	<code>ns=5;s=Arp.Plc.Eclir/MainInstance.SOBE_DESCCE;datatype=Int16</code>	x

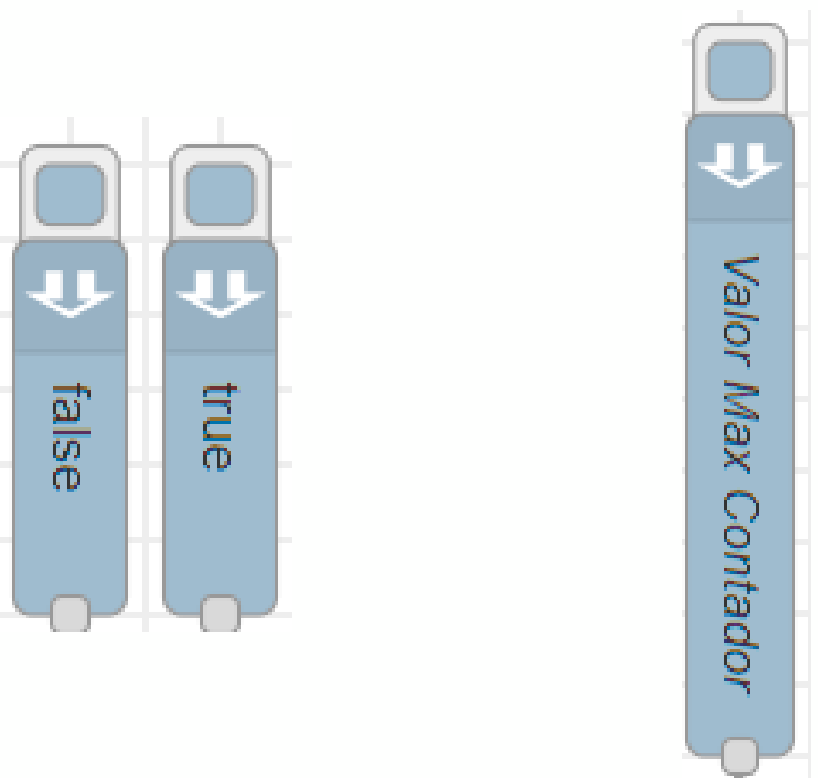
# Configurações no Node-Red

Configuração do node OPC UA Client para ESCRITA.



# Configurações no Node-Red

Nos node *inject* são configurados para a escrita na variáveis via OPC UA.



Name

msg. payload	=	0	g	123
msg. topic	=	a	z	ns=5;s=Arp.Plc.Eclr/MainInstance.VRL_MAX_SOBRE;datatype=Int16

msg. payload	=	⊙	true	
msg. topic	=	a	z	ns=5;s=Arp.Plc.Eclr/MainInstance.ACT_SOBRE_DESCE;datatype=Boolean

msg. payload	=	⊙	false	
msg. topic	=	a	z	ns=5;s=Arp.Plc.Eclr/MainInstance.ACT_SOBRE_DESCE;datatype=Boolean

# Configurações do node *Inject*

Para facilitar o preenchimento do **Topic** no node **Inject**, utilizamos o software UA Expert que estabelece uma comunicação OPC UA com o CLP e lista todas as variáveis suas respectivas informações.



# Configurações do node *Inject*

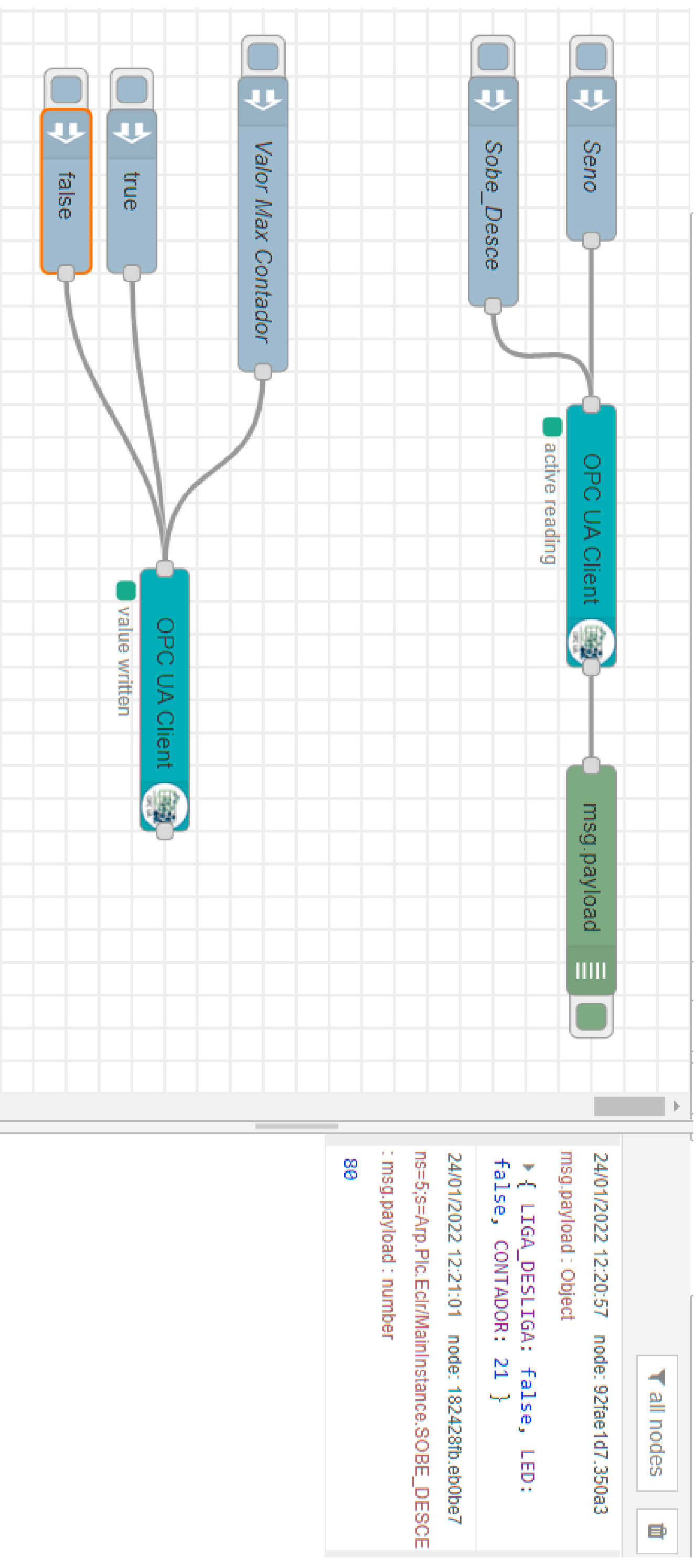
The screenshot displays the InjeX software interface. On the left, a tree view shows the project structure: Project > Servers > eUAServer@axc-f-2152-1 > Documents > Data Access View. The main area is divided into two panes. The top pane, titled 'Data Access View', contains a table with the following data:

#	Server	Node Id	Display Name	Value
1	eUAServer@axc-f-21...	NS5[String]Arp.Plc.Eclr/MainInstance.SENO	SENO	0.0198586
2	eUAServer@axc-f-21...	NS5[String]Arp.Plc.Eclr/MainInstance.SOBESDESCE	SOBE_DESCE	3

The bottom pane, titled 'Attributes', shows a list of attributes for the selected node. The 'Nodeid' attribute is highlighted with a yellow box, showing its value as 'ns=5;s=Arp.Plc.Eclr/MainInstance.SENO'. Below this, a list of other attributes is visible, including 'SourceTimestamp', 'ServerTimestamp', 'ServerPicoseconds', and 'StatusCode'. The 'Data Type' is listed as 'Float'.

The 'Name' configuration dialog box is shown, with the 'Name' field set to 'Seno'. The 'msg. payload' field is empty, and the 'msg. topic' field is also empty. The 'Data Type' dropdown is set to 'Float', and the 'Data Type' field is highlighted with a red box. The 'Data Type' field contains the text 'ns=5;s=Arp.Plc.Eclr/MainInstance.SENO;datatype=Float'.

# Leitura das variáveis do PLC via OPC UA



*Obriigada...*



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