



**smar**

*Technology Company*

# Ferramenta de configuração de sistemas O-PAS

**2022**

Libanio Carlos de Souza  
Diretor Presidente  
Nova Smar S/A



**Focado no desenvolvimento de uma arquitetura de controle de processo baseada em padrões, aberta, segura e interoperável**

*O Fórum é um grupo baseado em um consenso de usuários finais, fornecedores, integradores de sistemas, organizações de padrões e acadêmicos.*

*Ele aborda questões técnicas e comerciais para automação de processos.*

## Plataforma de Operações Data Center

(Executando IEC 62264, Funções Níveis 2 & 3)



DCN = DCP + DCFs

## LEGENDAS

- Plataforma em não conformidade com O-PAS
- Componentes O-PAS

- OCF - Connectivity Framework
- DCF - Distribuit Control Framework
- DCN - Distribuit Control Node
- DCP - Distribuit Control Plataforma

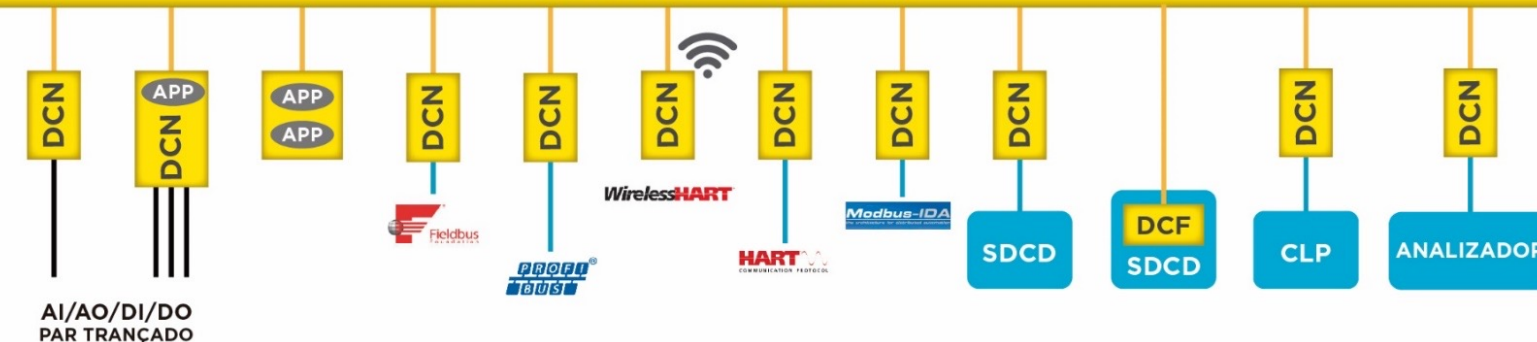
## Corporativo Data Center

(Executando IEC 62264, Funções Nível 4)



## Externos Data Center

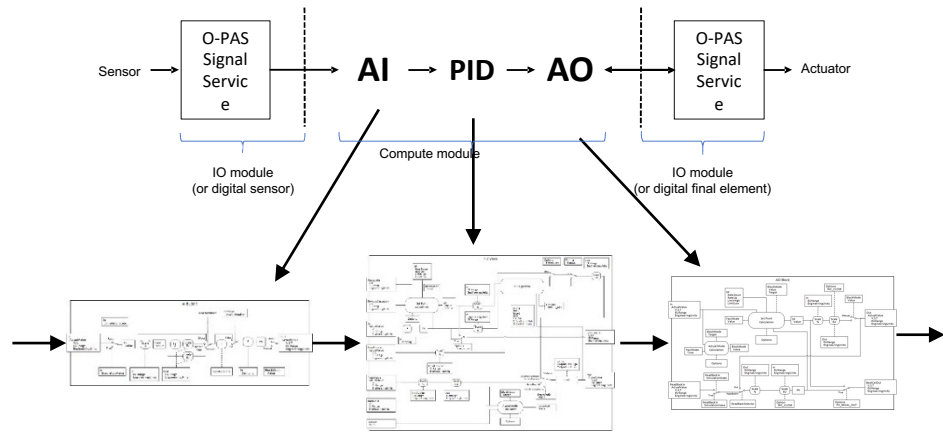
(Executando IEC 62264, Funções Níveis 2 & 3)



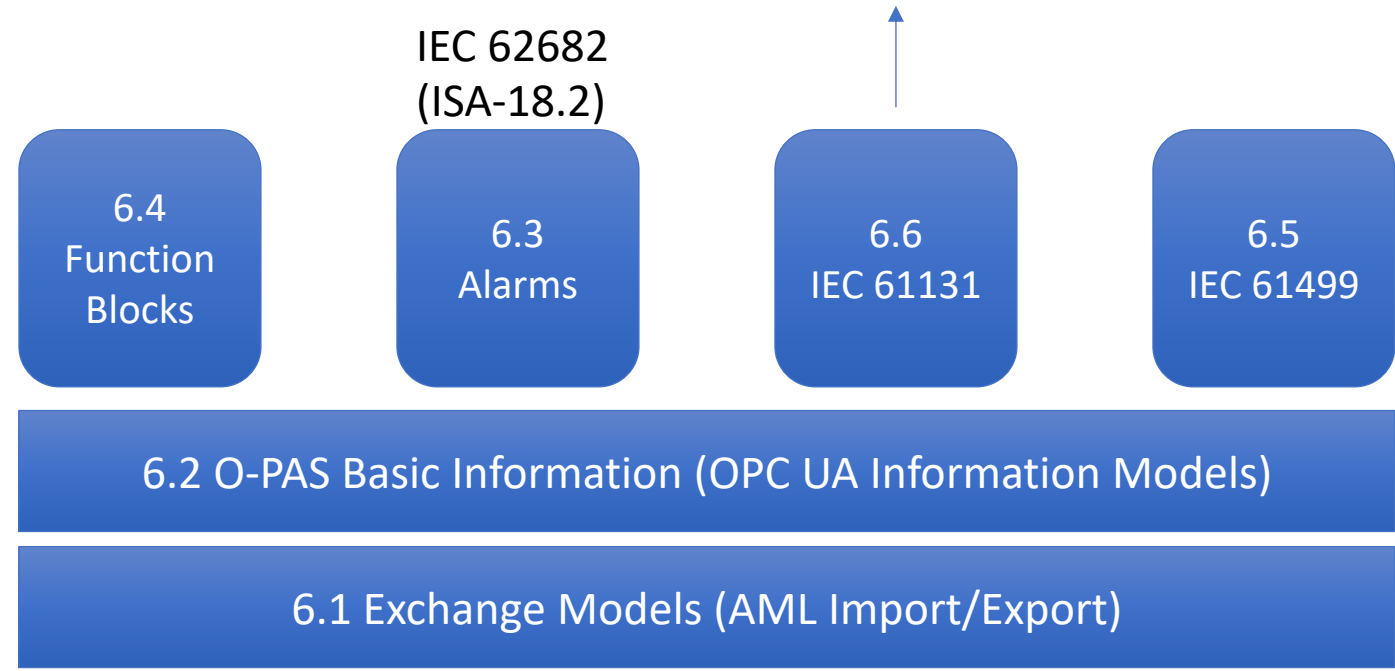
## Nó de Controle Distribuído

(Executando IEC 62264, Funções Níveis 1, 2 & 3)





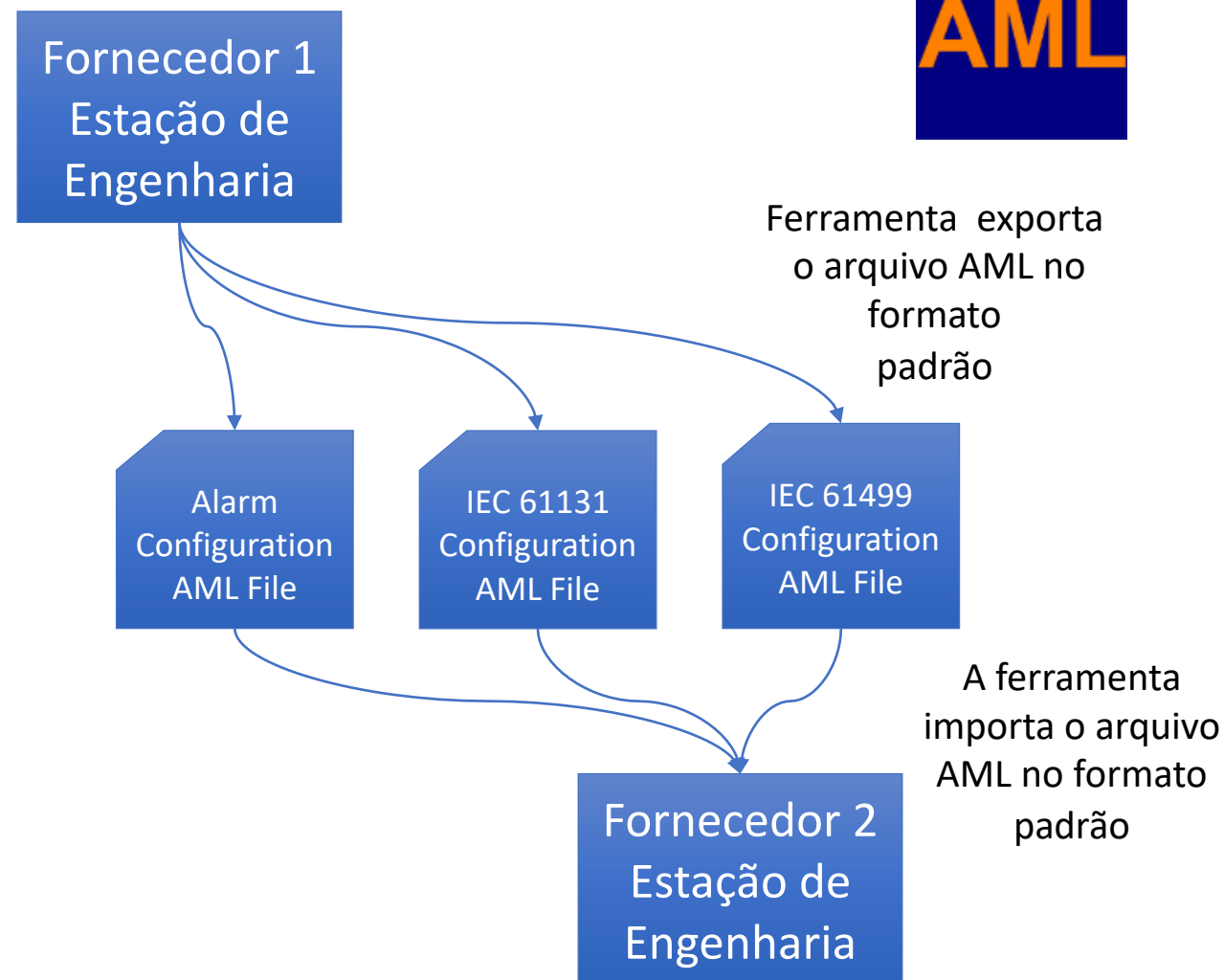
IEC 61131-3 – Programming Languages:

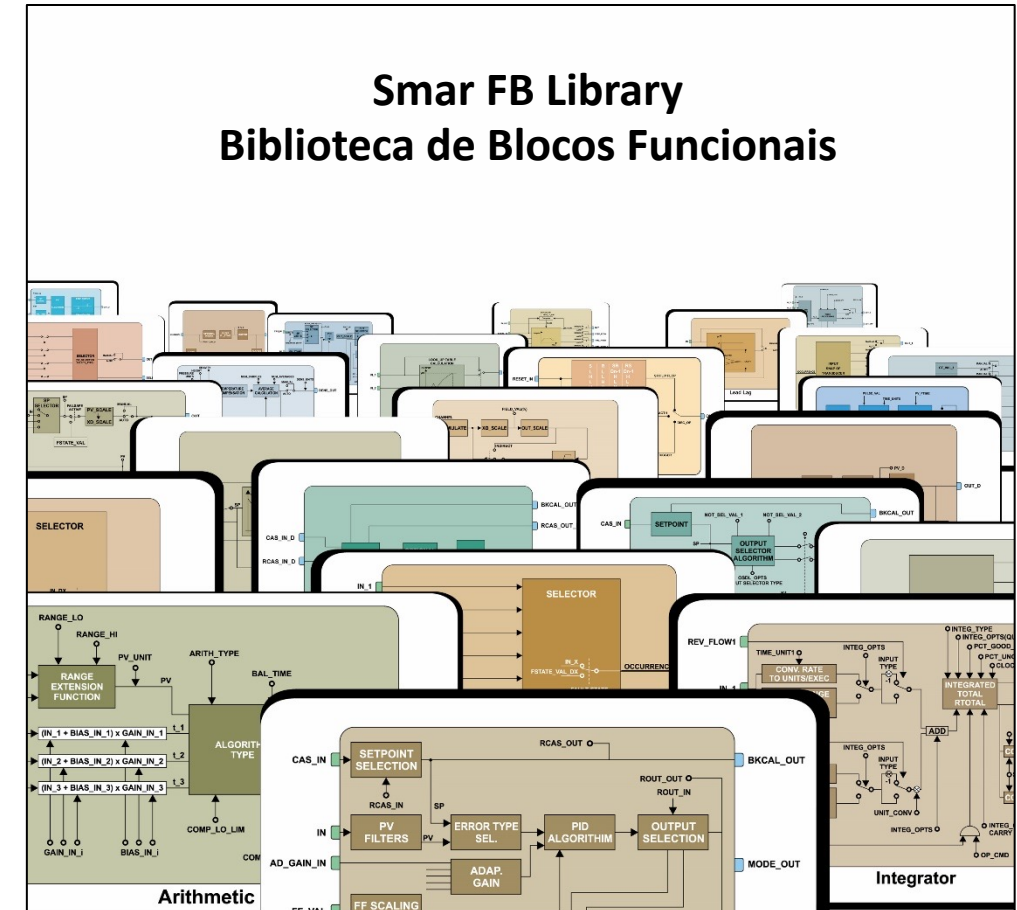
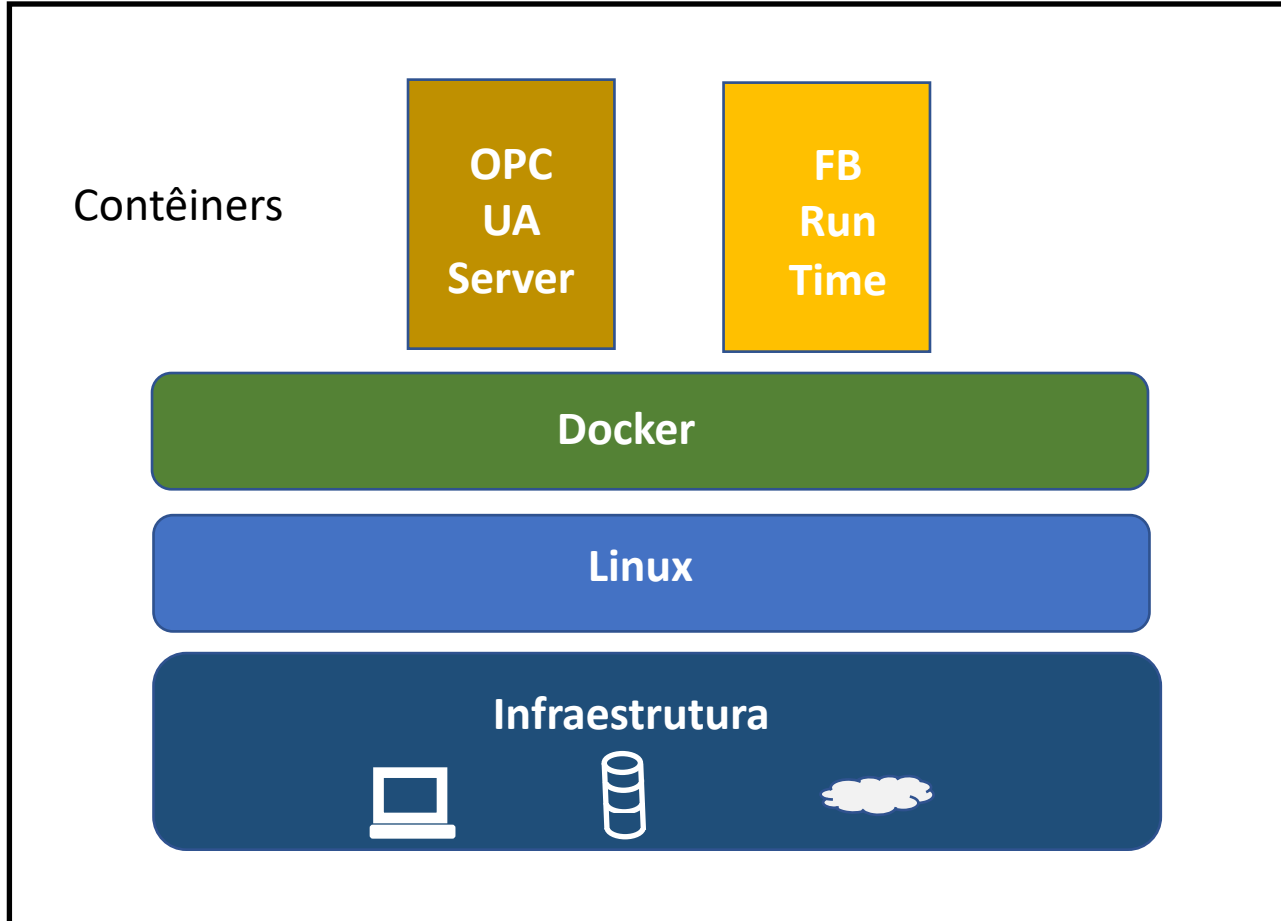


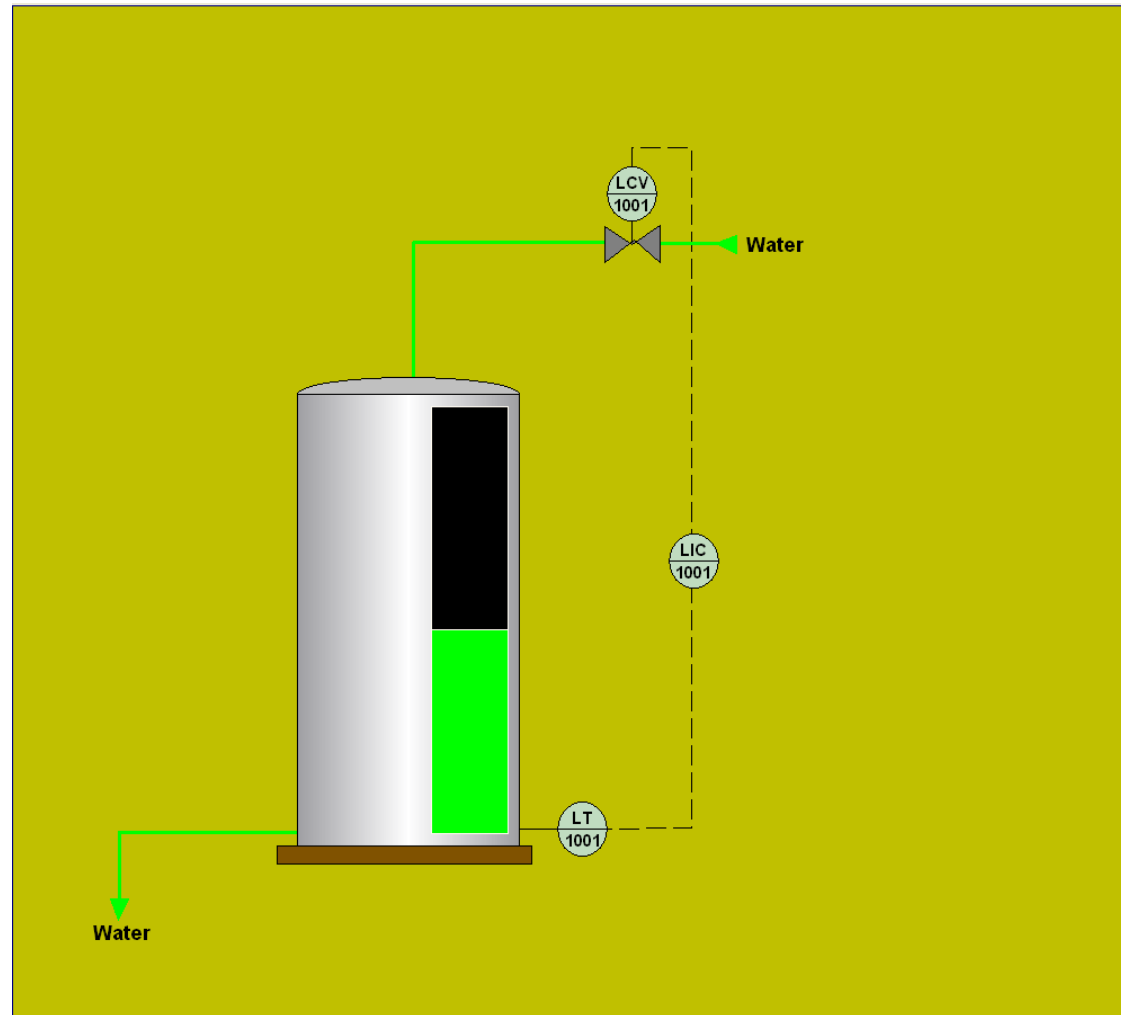


## Portabilidade de configuração do sistema de controle

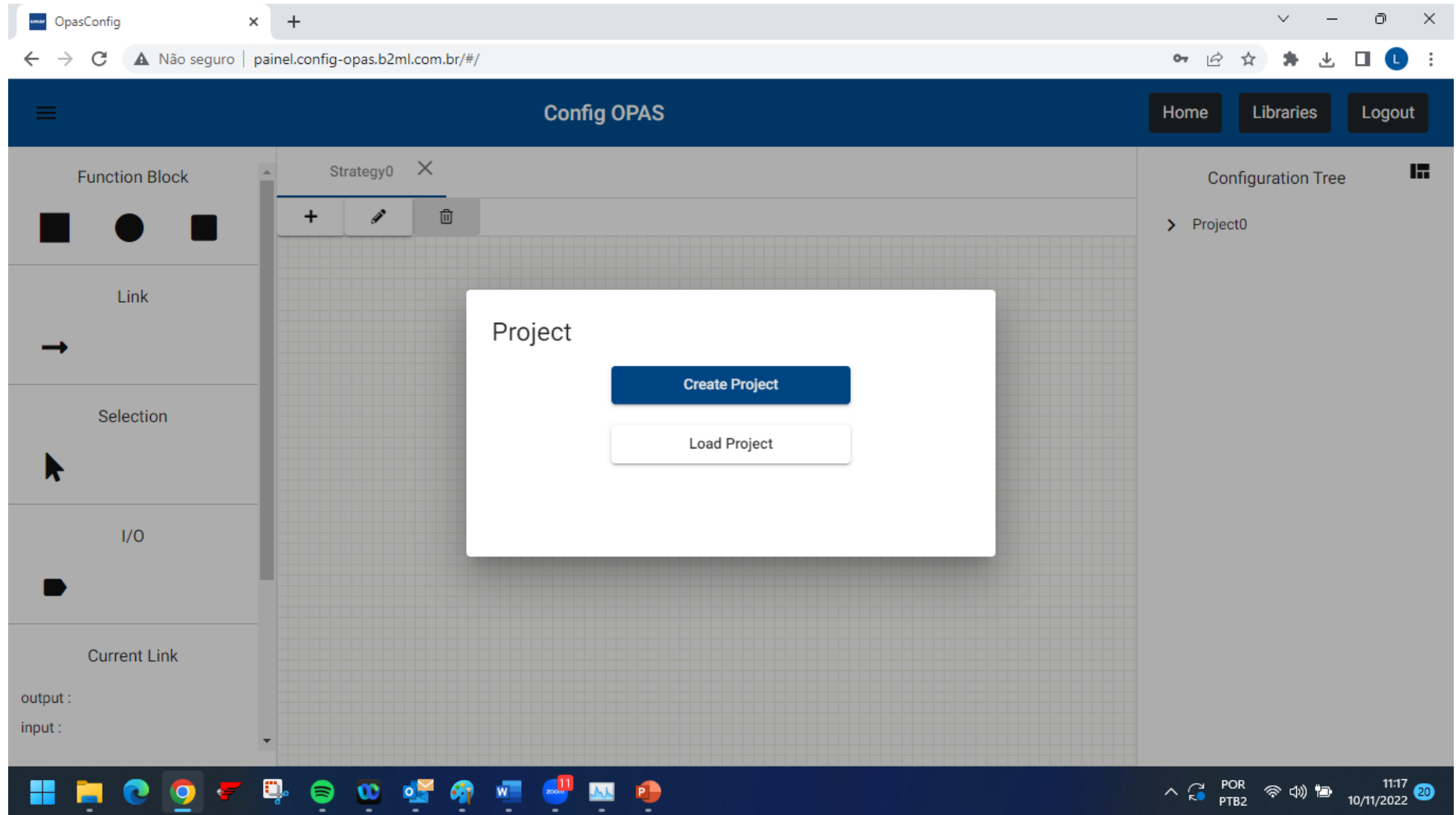
Troca de informação de configuração entre sistemas e ferramentas de fornecedores diferentes







## P&ID diagram Tank 1001 level control

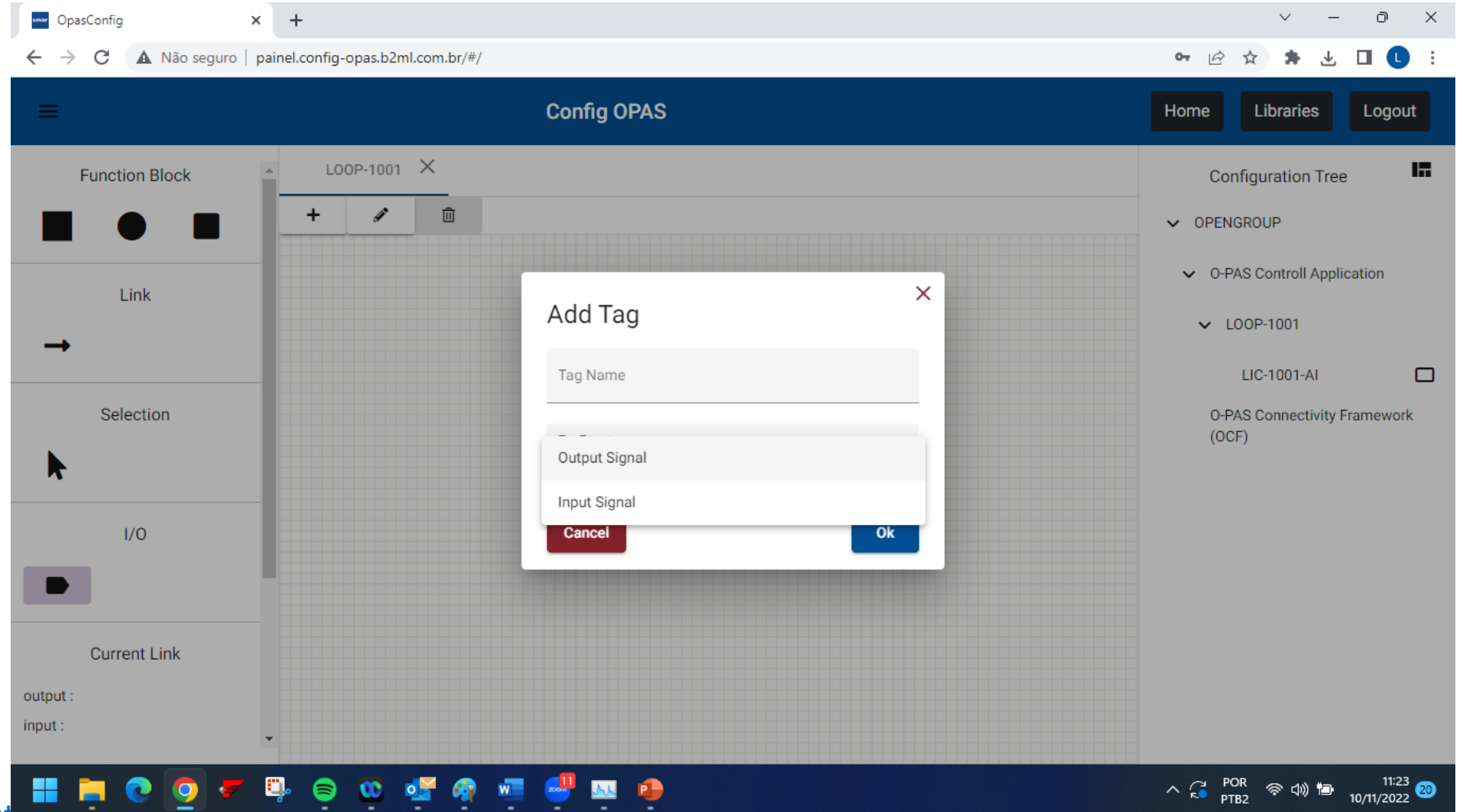


Output - AliasTag = LCV-1001



The screenshot displays the OpasConfig web application interface. At the top, there's a navigation bar with 'Home', 'Libraries', and 'Logout' buttons. The main workspace is titled 'Config OPAS' and shows a configuration tree on the right with 'LOOP-1001' selected. A central dialog box titled 'Add Function Block' is open, allowing the user to select a function block from a list. The list includes: AI - Analog Input, AO - Analog Output, CS - Control Selector, DI - Discrete Inout, DO - Discrete Output, and MDI - Multi State Discrete Input. The 'Libraris \*' dropdown is set to 'SMAR 1.0'. The background workspace shows a grid for placing function blocks, with a 'Function Block' palette on the left containing icons for 'Link', 'Selection', 'I/O', and 'Current Link'. The browser address bar shows 'painel.config-opas.b2ml.com.br/#/' and the system tray at the bottom indicates the time is 11:21 on 10/11/2022.

Output - Alltag - LCV-1001

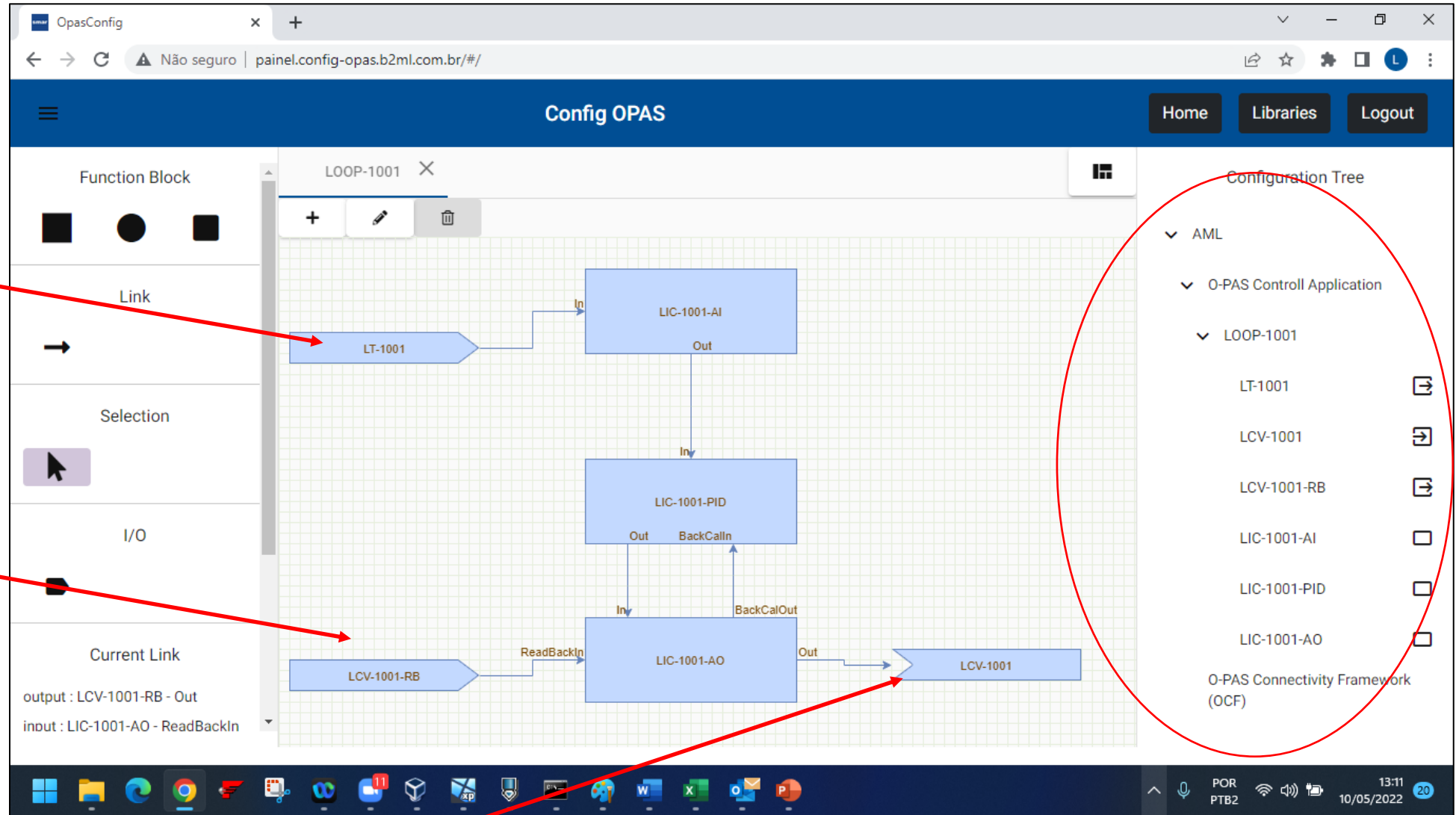


Output = Alias tag = LICV-1001

Input  
AliasTag = LT-1001

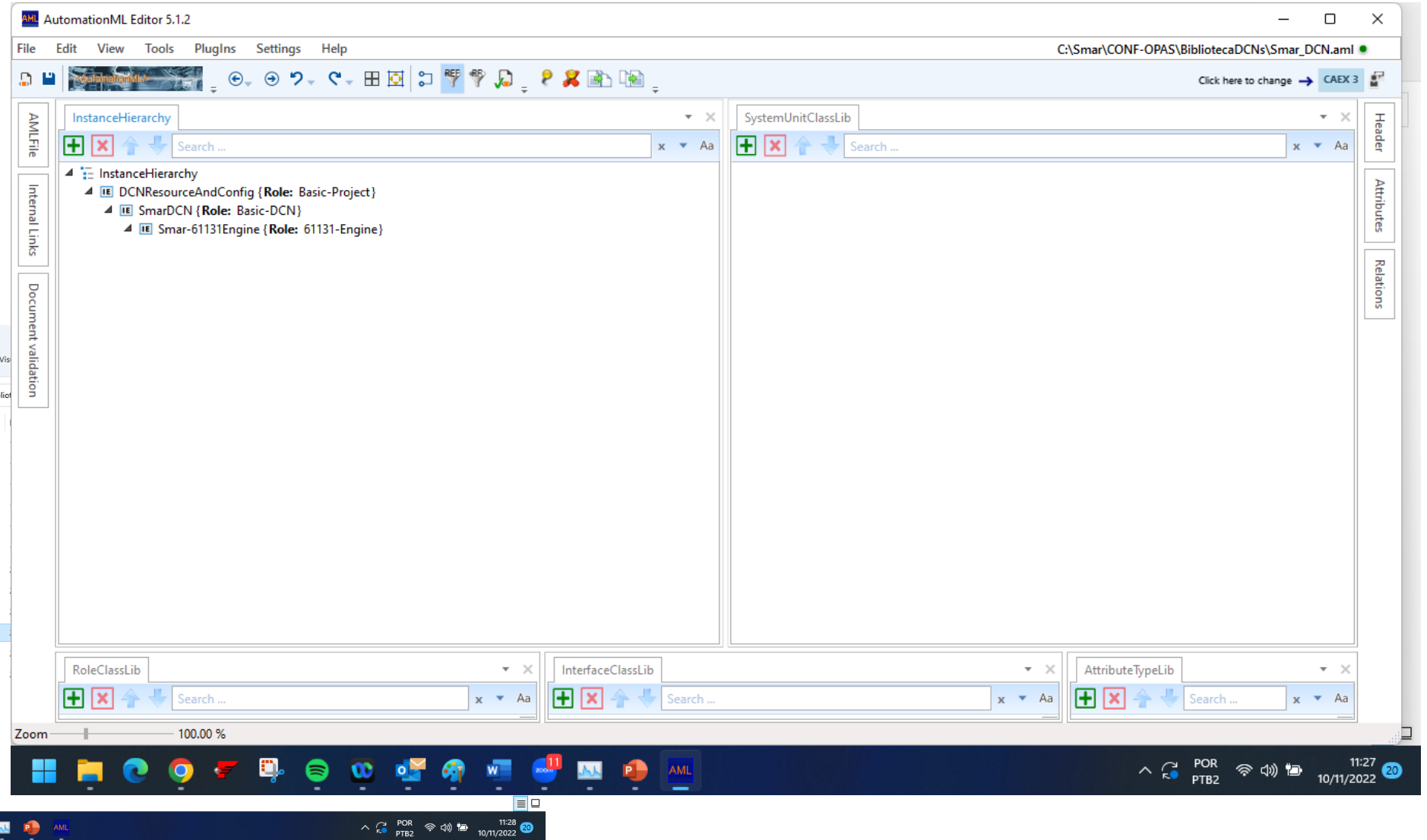
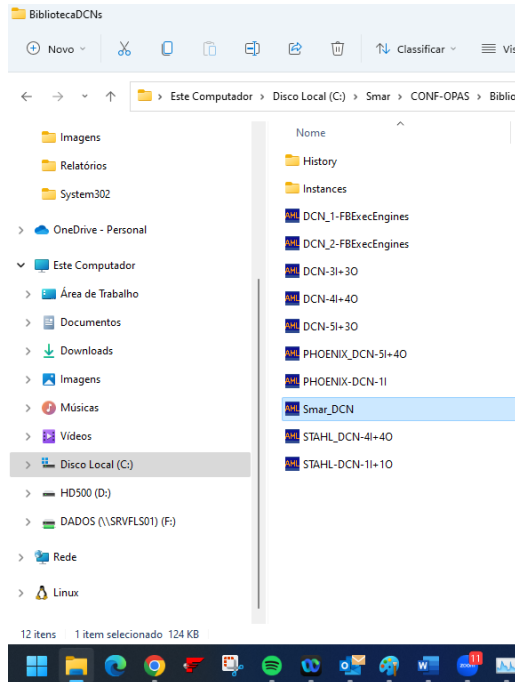
Input  
AliasTag LCV-1001-RB

Output - AliasTag = LCV-1001

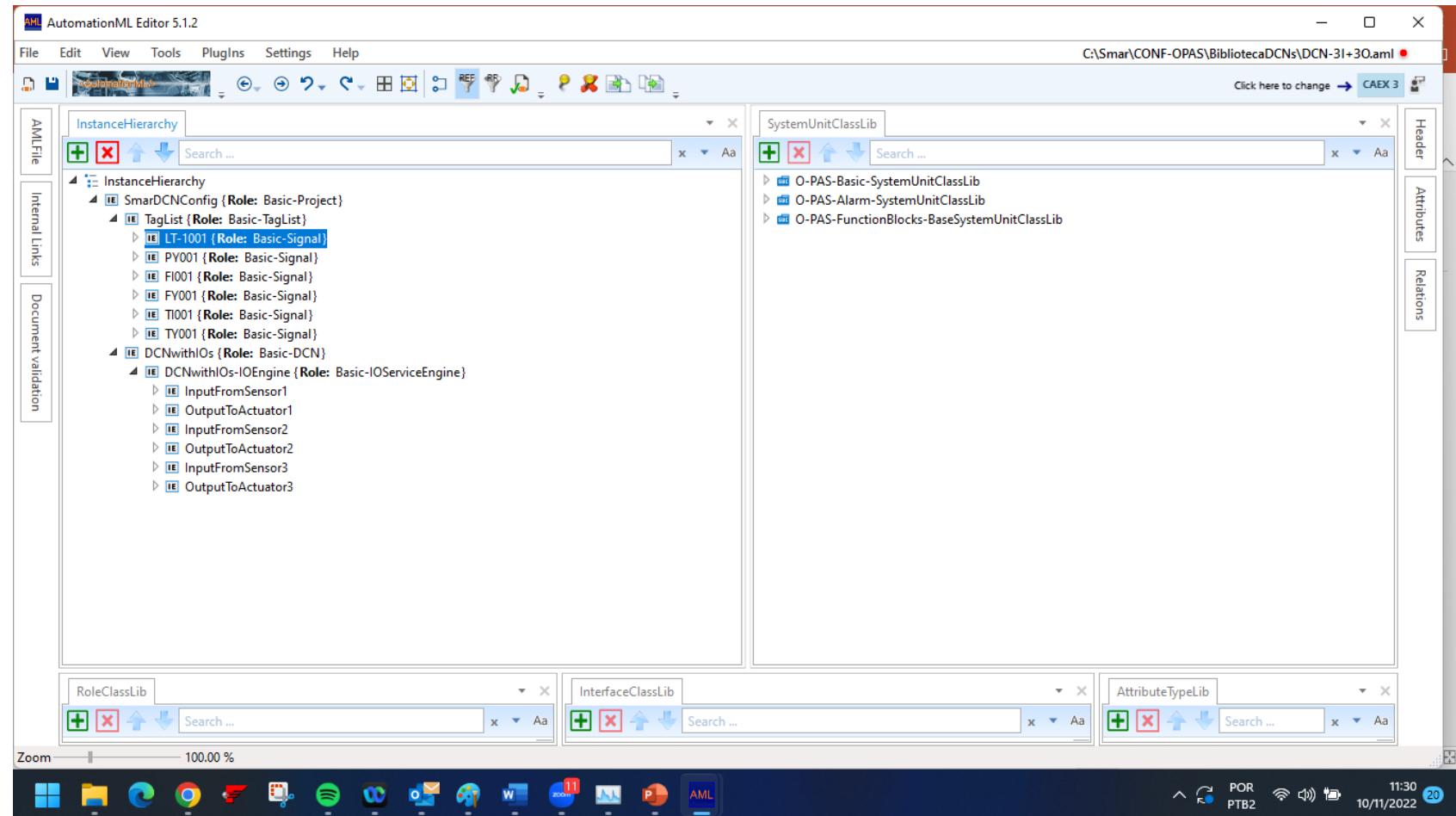


Logic View

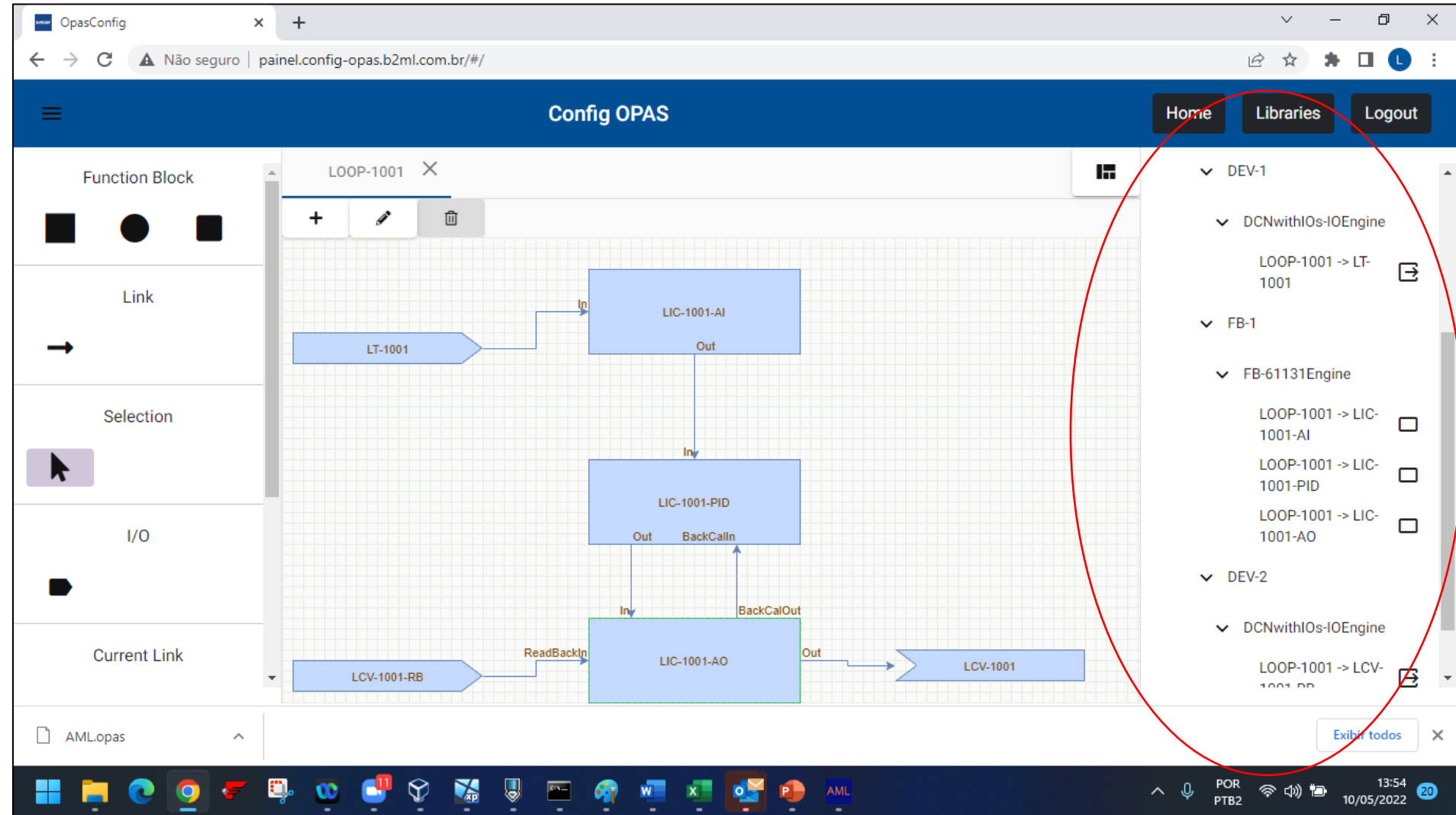
## FB DCN



I/O DCN

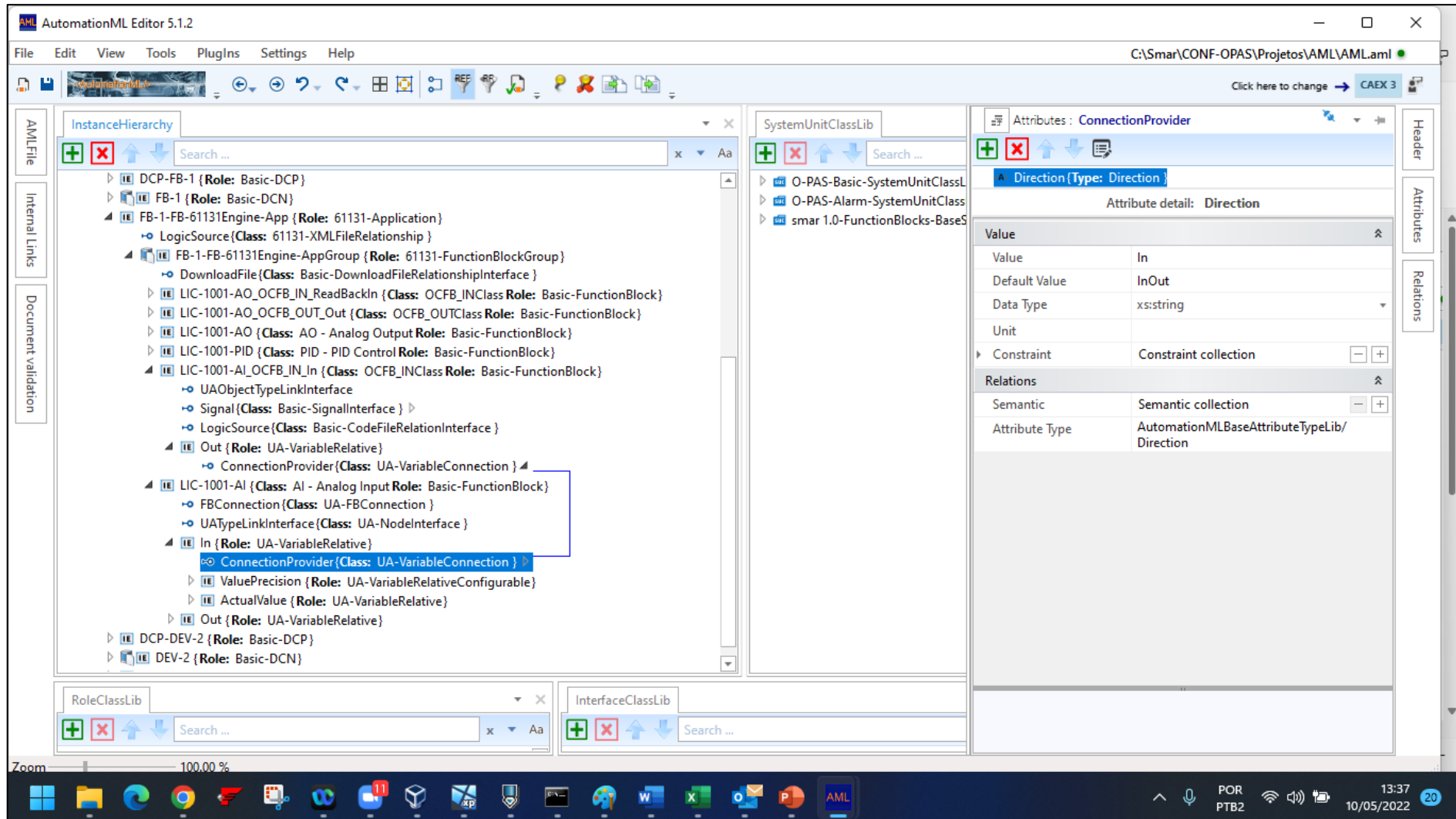






Physical View

# Conexão entre OCFB\_In e entrada do bloco funcional: LIC-1001-AI\_OCFB\_IN\_In e LIC-1001-AI.In



# Conexão entre os blocos: LIC-1001-PID.Out e LIC-1001-AO.In

The screenshot shows the AutomationML Editor 5.1.2 interface. The main window displays the InstanceHierarchy tree on the left, where the 'Out' property of the 'LIC-1001-PID' block and the 'ConnectionProvider' property of the 'LIC-1001-AO' block are highlighted. A blue box highlights the 'ConnectionProvider' property in the tree. The right panel shows the 'Attributes' for the selected 'ConnectionProvider' block, with the 'Direction' attribute highlighted. The 'Direction' attribute is of type 'Direction' and has a value of 'Out'. The 'Default Value' is 'InOut' and the 'Data Type' is 'xs:string'. The 'Relations' section shows a 'Semantic' collection and an 'Attribute Type' of 'AutomationMLBaseAttributeTypeLib/Direction'.

## Geração dos dados para configuração dos containers

The screenshot shows the DCN Tool application window with the following configuration sections:

- O-PAS Control Application:** A large empty text area.
- Selected DCN:** A section containing two text input fields:
  - O-PAS package file name:
  - O-PAS control application file name:
- Endpoint URLs:** A section containing a checkbox labeled "The system has a Global Discovery Server (GDS)" and a text input field labeled "Endpoint URL for the GDS:".
- Endpoint URLs for the alias tags:** A table with two columns: "Alias Tag" and "Endpoint URL". The table body is currently empty.

## Geração dos dados para configuração dos containers

The screenshot shows the DCN Tool application window. The title bar reads "DCN Tool" and includes standard window controls (minimize, maximize, close). The application has a menu bar with "File" and "Tools". The "Tools" menu is open, showing two options: "Open OPAS Control Application" (highlighted) and "Close OPAS Control Application".

The main interface is divided into two panes. The right pane contains the following configuration fields:

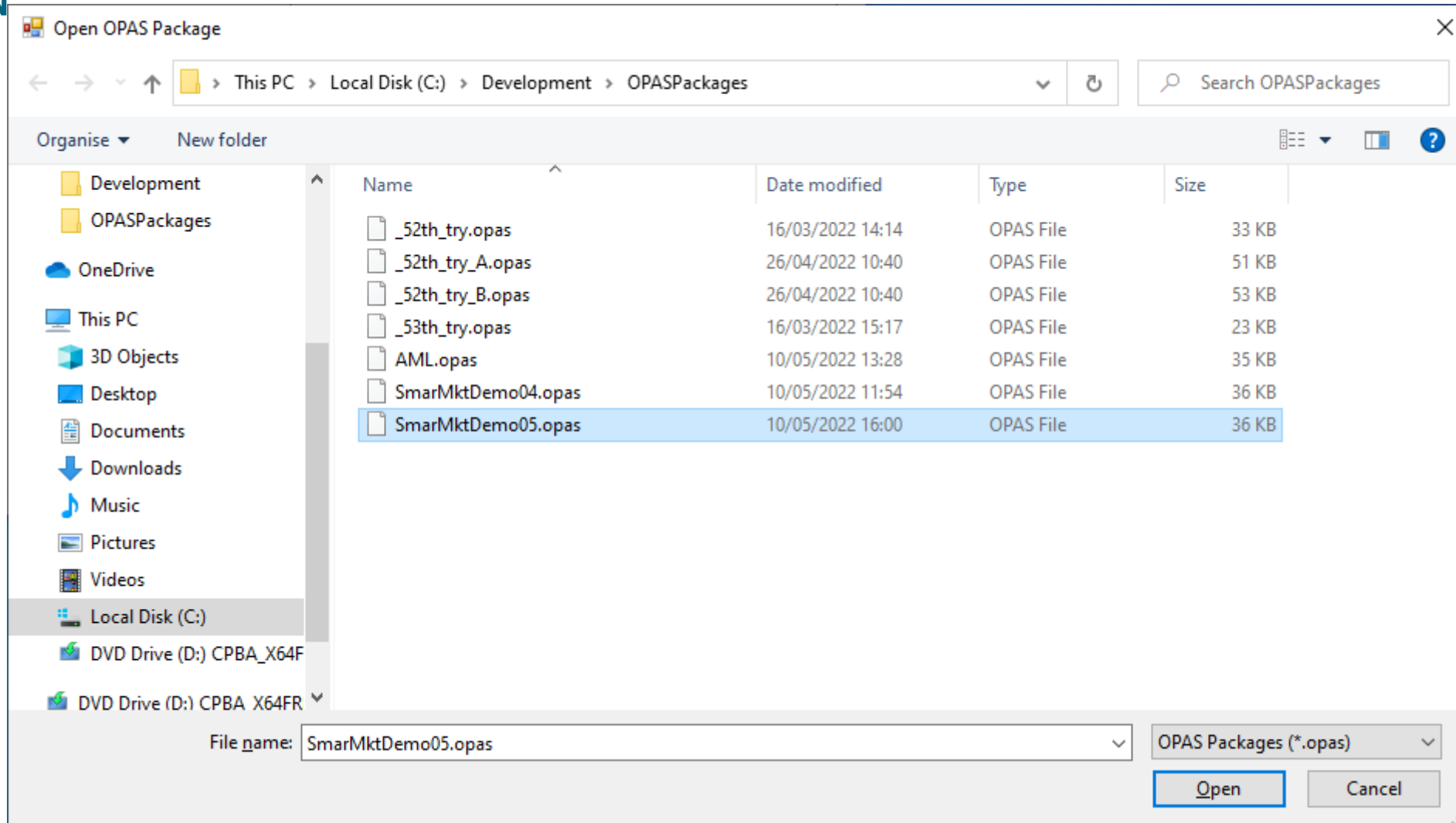
- Selected DCN:** (Label)
- O-PAS package file name:** (Text input field)
- O-PAS control application file name:** (Text input field)
- Endpoint URLs:** (Section header)
- The system has a Global Discovery Server (GDS)
- Endpoint URL for the GDS:** (Text input field)
- Endpoint URLs for the alias tags:** (Section header)

The "Endpoint URLs for the alias tags" section contains a table with two columns: "Alias Tag" and "Endpoint URL". The table body is currently empty.

| Alias Tag | Endpoint URL |
|-----------|--------------|
|-----------|--------------|



## Geração dos dados para configuração dos containers



## Geração dos dados para configuração dos containers

The screenshot shows the DCN Tool application window. On the left, a tree view under 'O-PAS Control Application:' shows 'Function Block Applications' selected, containing 'smar\_DCN\_01-Smar-61131Engine-App' and 'smar\_DCN\_02-Smar-61131Engine-App'. Below it are 'Distributed Control Nodes' including 'DCN\_IO\_01', 'DCN\_IO\_02', 'smar\_DCN\_01', and 'smar\_DCN\_02'. On the right, configuration fields are visible: 'Selected DCN:' (empty), 'O-PAS package file name:' (C:\Development\OPASPackages\SmarMktDemo05.opas), 'O-PAS control application file name:' (SmarMktDemo05.aml), 'Endpoint URLs:' with a checkbox for 'The system has a Global Discovery Server (GDS)' (unchecked) and an empty text box for 'Endpoint URL for the GDS:'. At the bottom, a table for 'Endpoint URLs for the alias tags:' has two columns: 'Alias Tag' and 'Endpoint URL', with a greyed-out body.

| Alias Tag | Endpoint URL |
|-----------|--------------|
|           |              |

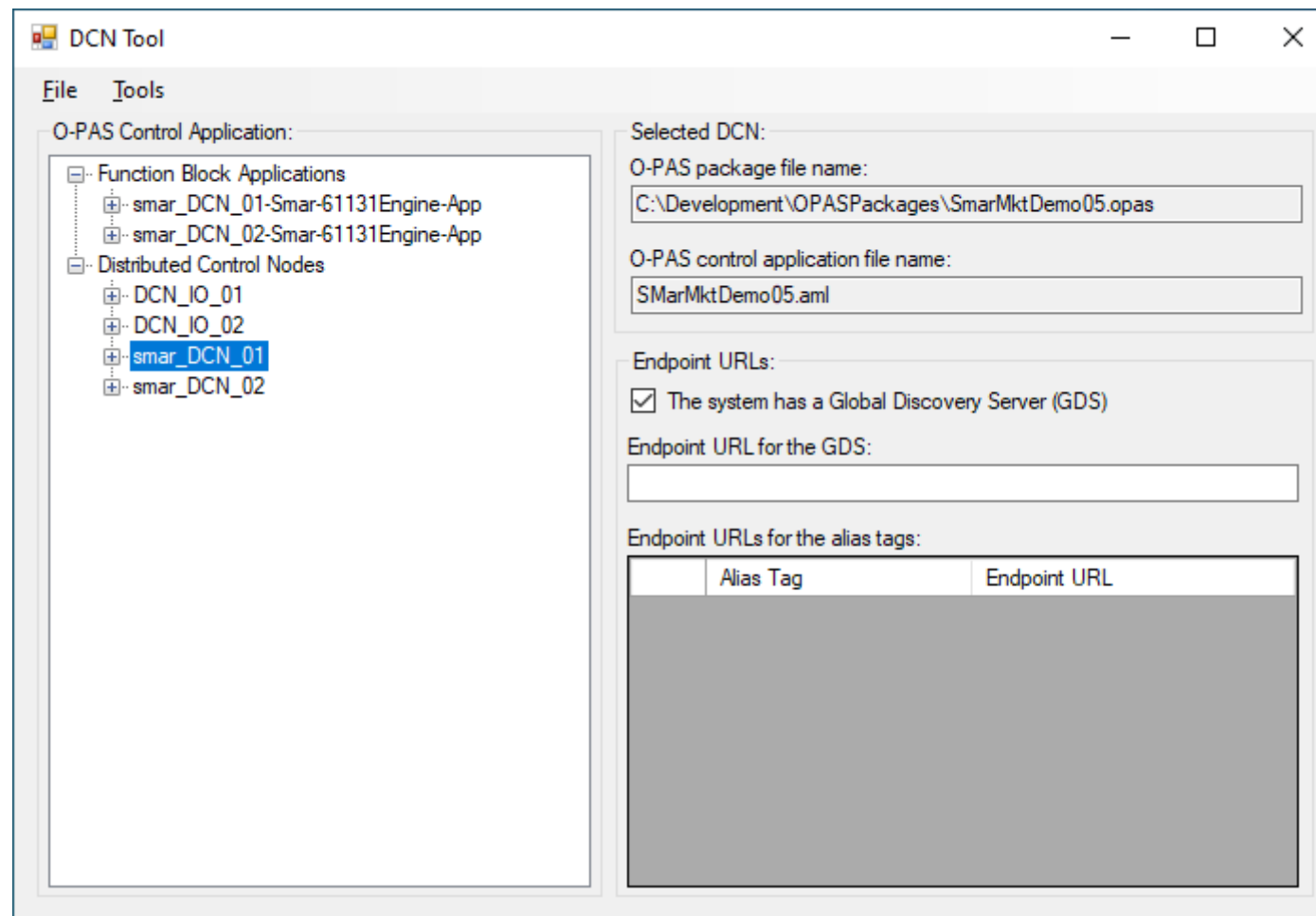
## Geração dos dados para configuração dos containers

The screenshot shows the DCN Tool interface with the following components:

- File Tools** menu bar.
- O-PAS Control Application:**
  - Function Block Applications
    - smar\_DCN\_01-Smar-61131Engine-App
      - smar\_DCN\_01-Smar-61131Engine-AppGroup
        - LIC1001\_AI\_OCFB\_OUT\_Out
        - LIC1001\_AI\_OCFB\_IN\_In
        - LIC1001\_AI
      - smar\_DCN\_02-Smar-61131Engine-App
        - smar\_DCN\_02-Smar-61131Engine-AppGroup
          - LIC1001\_AO\_OCFB\_IN\_ReadBackIn
          - LIC1001\_AO\_OCFB\_OUT\_Out
          - LIC1001\_AO
            - In
              - Link from: LIC1001\_PID.Out
            - Out
              - ReadBackIn
              - BackCalOut
            - LIC1001\_PID\_OCFB\_IN\_In
            - LIC1001\_PID
    - Distributed Control Nodes
      - DCN\_IO\_01
        - DCNwithIOs-IOEngine
          - I-0001
      - DCN\_IO\_02
        - DCNwithIOs-IOEngine
          - I-0001
          - O-0001
      - smar\_DCN\_01
        - Smar-61131Engine
          - smar\_DCN\_01-Smar-61131Engine-AppGroup
            - LIC1001\_AI\_OCFB\_OUT\_Out
            - LIC1001\_AI\_OCFB\_IN\_In
            - LIC1001\_AI
      - smar\_DCN\_02
        - Smar-61131Engine
          - smar\_DCN\_02-Smar-61131Engine-AppGroup
            - LIC1001\_AO\_OCFB\_IN\_ReadBackIn
            - LIC1001\_AO\_OCFB\_OUT\_Out
            - LIC1001\_AO
              - LIC1001\_PID\_OCFB\_IN\_In
              - LIC1001\_PID
- Selected DCN:**
  - O-PAS package file name: C:\Development\OPASPackages\SmarMktDemo05.opas
  - O-PAS control application file name: SMarMktDemo05.aml
- Endpoint URLs:**
  - The system has a Global Discovery Server (GDS)
  - Endpoint URL for the GDS: [Empty field]
  - Endpoint URLs for the alias tags:
 

| Alias Tag          | Endpoint URL |
|--------------------|--------------|
| [Empty table body] |              |

## Geração dos dados para configuração dos containers



## Geração dos dados para configuração dos containers

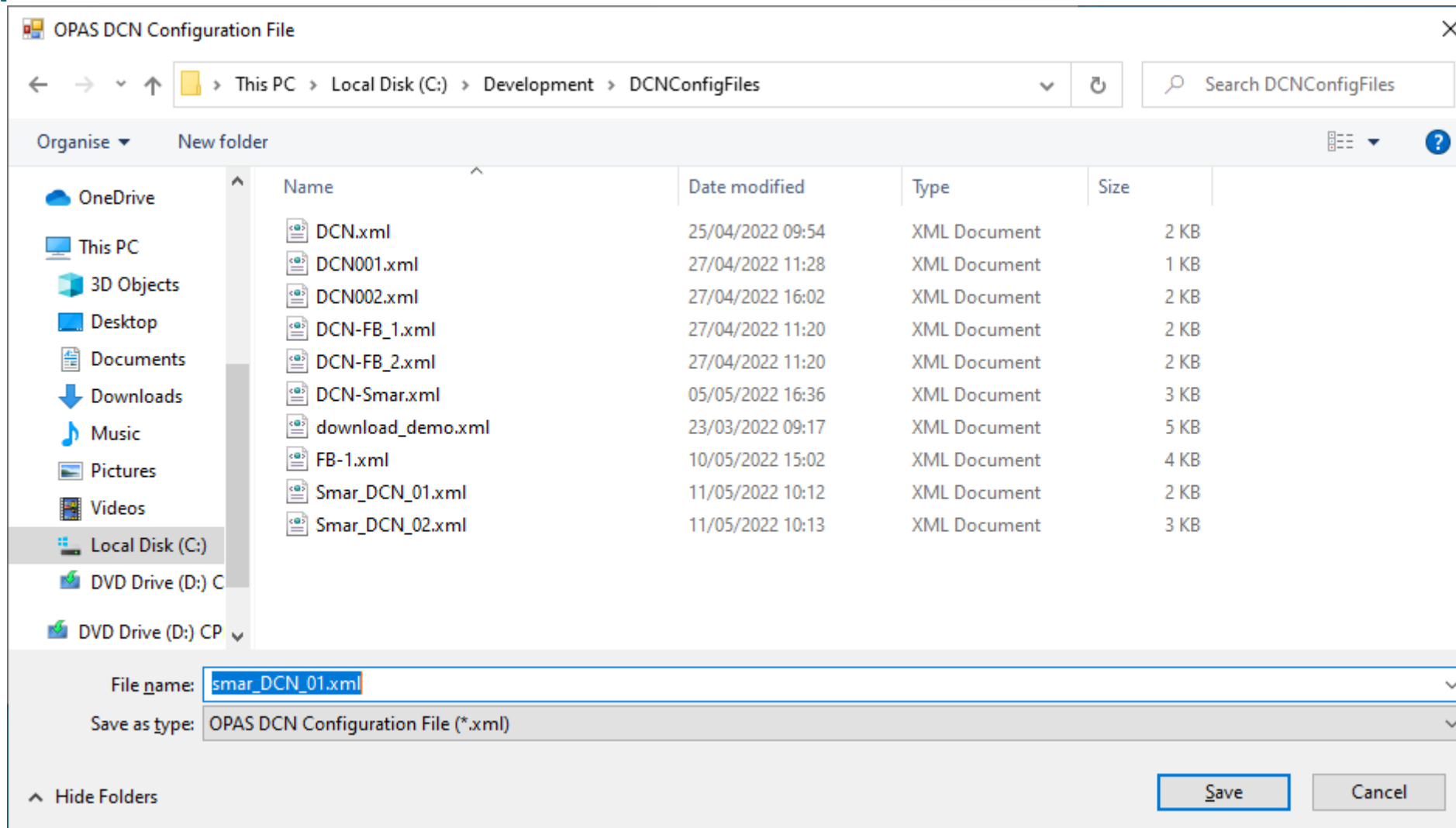
The screenshot shows the DCN Tool interface. On the left, a tree view under 'Distributed Control Nodes' has 'smar\_DCN\_01' selected. A 'Tools' menu is open, highlighting 'Download DCN Configuration'. On the right, the configuration panel includes:

- Selected DCN:** O-PAS package file name: C:\Development\OPASPackages\SmarMktDemo05.opas
- O-PAS control application file name:** SmarMktDemo05.aml
- Endpoint URLs:**  The system has a Global Discovery Server (GDS). Endpoint URL for the GDS: [empty text box]
- Endpoint URLs for the alias tags:** A table with columns 'Alias Tag' and 'Endpoint URL'.

| Alias Tag | Endpoint URL |
|-----------|--------------|
|-----------|--------------|



## Geração dos dados para configuração dos containers



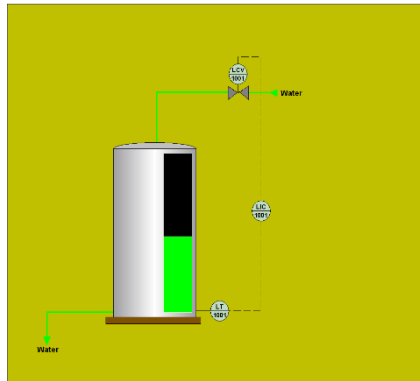
## Geração dos dados para configuração dos containers

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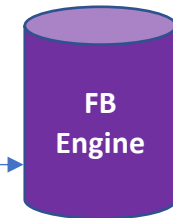
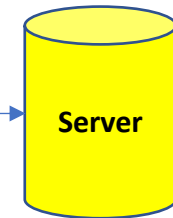
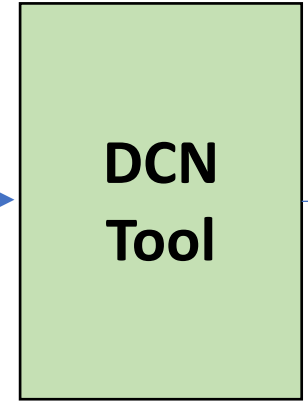
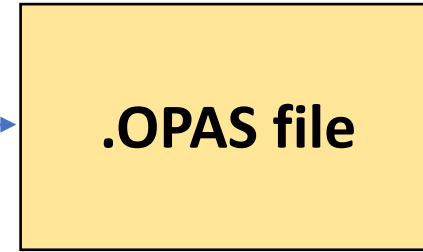
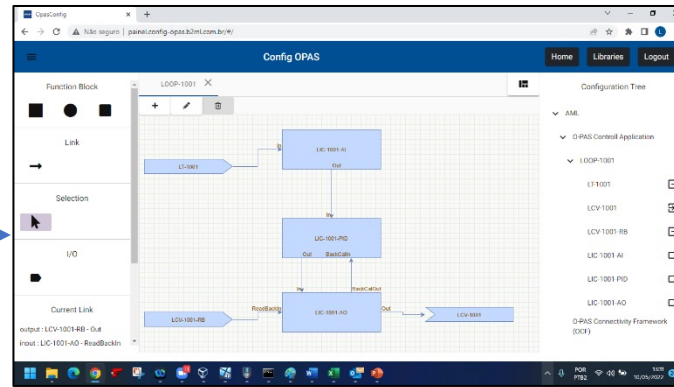
C:\Development\DCNConfigFiles\Smar_DCN_01.xml
C:\Development\DCNConfigFiles\Smar_DCN_01.xml

<?xml version="1.0" encoding="UTF-8"?>
- <DCNConfiguration DCNTag="smar_DCN_01">
  - <UANodeset>
    - <NamespaceUris>
      - <Uri>https://www.opengroup.org/open-process-automation/O-PAS/Base</Uri>
      - <Uri>https://www.opengroup.org/open-process-automation/O-PAS/%20FunctionBlocks</Uri>
    </NamespaceUris>
  </UANodeset>
  - <UAGlobalDiscoveryServer>
    <SystemHasGDS>No</SystemHasGDS>
  </UAGlobalDiscoveryServer>
  - <FBExecutionEngine Tag="Smar-61131Engine">
    - <FunctionBlocks>
      - <FunctionBlock Tag="LIC1001_AI">
        <FunctionBlockType UANodeId="ns=2;i=1003">AI - Analog Input</FunctionBlockType>
      </FunctionBlock>
    </FunctionBlocks>
    <FunctionBlockLinks/>
  </FBExecutionEngine>
  - <OCFBs>
    - <OCFB Tag="LIC1001_AI_OCFB_OUT_Out">
      <FunctionBlockType UANodeId="ns=1;i=1011">OCFB_OUTClass</FunctionBlockType>
      <AliasTag>LIC1001_AI.Out</AliasTag>
    </OCFB>
    - <OCFB Tag="LIC1001_AI_OCFB_IN_In">
      <FunctionBlockType UANodeId="ns=1;i=1012">OCFB_INClass</FunctionBlockType>
      <AliasTag>LT1001</AliasTag>
      <EndpointURL>http://poe-qualquer-coisa.com/depois-a-gente-muda:4840</EndpointURL>
    </OCFB>
  </OCFBs>
  - <OCFBLinks>
    - <OCFBLink>
      <From ParameterName="Out" BlockTag="LIC1001_AI_OCFB_IN_In"/>
      <To ParameterName="In" BlockTag="LIC1001_AI"/>
    </OCFBLink>
    - <OCFBLink>
      <From ParameterName="Out" BlockTag="LIC1001_AI"/>
      <To ParameterName="In" BlockTag="LIC1001_AI_OCFB_OUT_Out"/>
    </OCFBLink>
  </OCFBLinks>
</FBExecutionEngine>
</DCNConfiguration>
  
```

# CONF\_OPAS



**P&ID**



# DEMONSTRAÇÃO INTEGRAÇÃO COM SISTEMAS INSTALADOS

