

# SmartPlant Instrumentation Macro Expansion

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- A “**Macro**” is a collection of one or more typical items in SPI (Instruments and/or Loops).

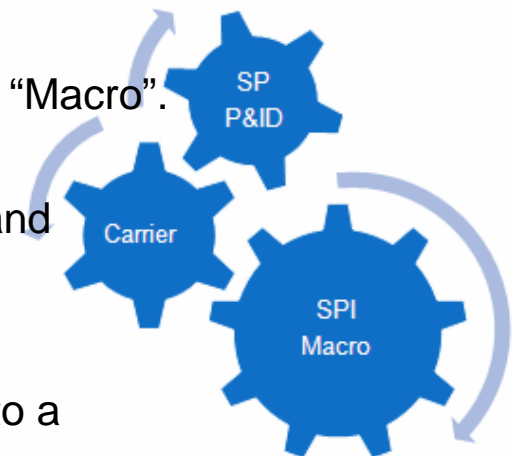


- A “**Carrier**” is a published P&ID object, that during its execution in SPI initiates a “Macro” execution.

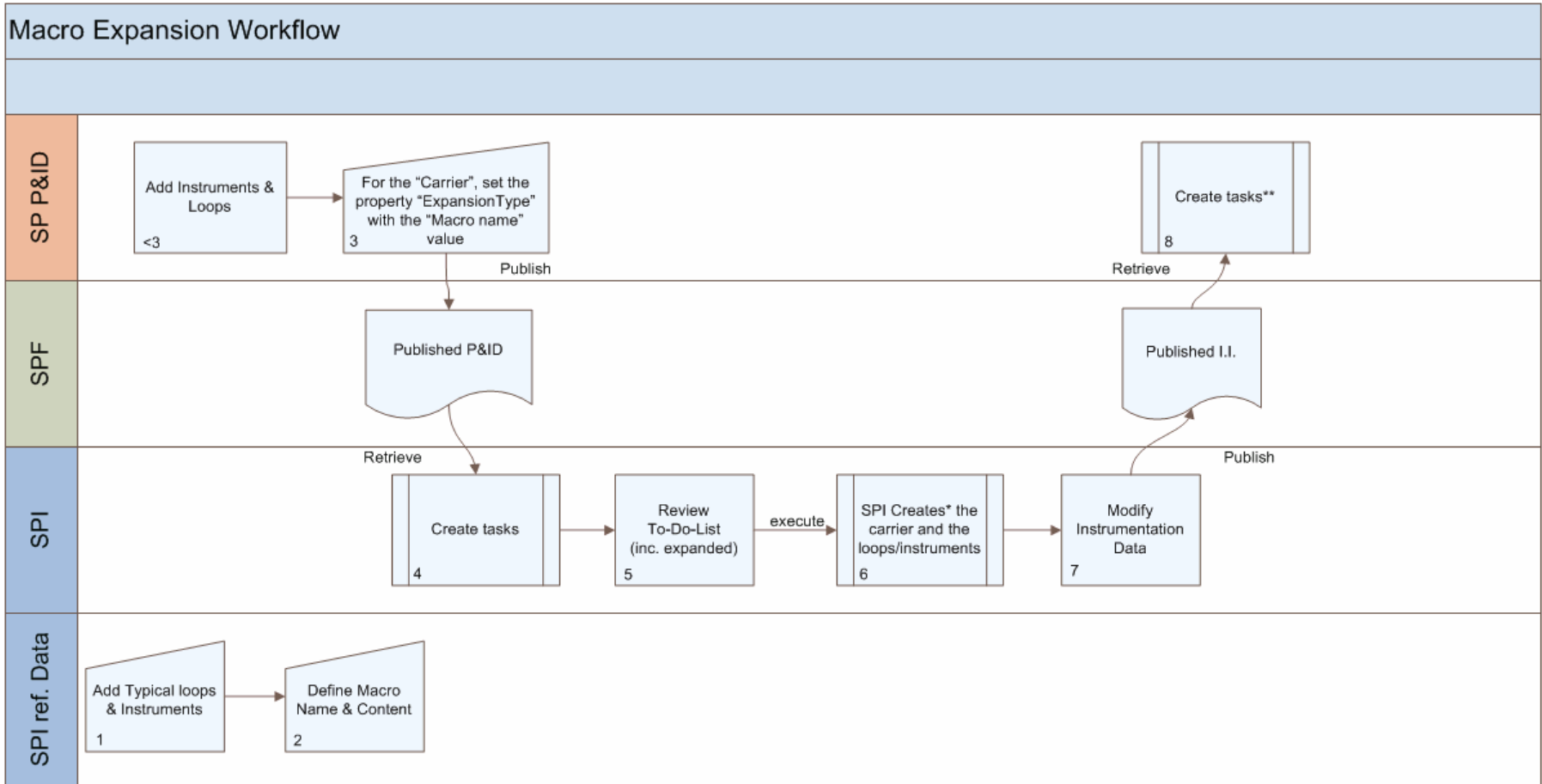
- “**Macro execution**” - the process in which a “Carrier” creates SPI Instruments and/or loops as defined by the “Macro”.

- **Expanded object** – SPI item that belongs to a carrier and Macro (created or updated by macro expansion).

- **Non-Expanded object** – SPI item that doesn't belong to a carrier and/or macro.



# Integration



\* Carrier can be set not to be created as an object. Objects which already exists in SPI will be updated or skipped.

\*\* Expanded SPI objects can be ignored depending on SPI flag (macro)

# Example

- SPI Macro structure:

Macro: FlowType1			
Name	Inst. Type	Class	type
FC - nnnn	FC	Soft Tag	<i>Carrier</i>
F-nnnn		Flow loop	Sub-items
FE-nnnn	FE	Instrument	Sub-items
FT-nnnn	FT	Instrument	Sub-items
FI-nnnn	FI	Instrument	Sub-items
FY-nnnn	FY	Instrument	Sub-items
FV-nnnn	FV	Instrument	Sub-items

- SPI data before retrieving from SP P&ID

Tag Number	Loop Name	Instrument Type	Service	IO Type Name
101-FE -2214	101-F -2214	FE	Feed to B-101 Pass C	*
101-FT -2214	101-F -2214	FT	Feed to B-101 Pass C	AI
101-FV -2214	*	FV	Feed to B-101 Pass C	*

# P&ID (still under development !!!)

The screenshot displays the SmartPlant P&ID software interface. The main window shows a process flow diagram with a central horizontal pipe. Above the pipe is a flow controller (FC) labeled '2214'. Below the pipe, from left to right, are a flow transmitter (FT) labeled '2214', a feed-effluent stream (FE) labeled '2214', and a flow valve (FV) labeled '2214'. The diagram is rendered in green lines on a white background.

Below the diagram is the 'Engineering Data Editor' panel, which contains a table with the following data:

Loop Number	Loop Function	Tag Seq No	Tag Suffix	Plant Group Name
F-2214	F	2214		Unit1

To the right of the diagram are two panels: 'Properties' and 'Catalog Explorer'. The 'Properties' panel is titled 'Instrument Loop - F-2214' and lists various attributes:

- Identification**
  - Catalog Name
  - Description
  - ERP Asset No
  - Expansion Type
  - Inventory Tag
  - Is Shared: False
  - Is Typical: False
  - Item Tag: F-2214
  - Loop Function: F
  - Loop Type: Flow
  - Name
  - Part Number
  - Plant Group Name: Unit1
  - Plant Group Type: Unit
  - Plant Item Group 1: Instrument Loop
  - Plant Item Group: Instrument Loop
  - Plant Item Type: Plant Item Group
  - Requisition No
  - SP ID: 0F768A88CE6B4FC391D8A8C6
  - Tag Seq No: 2214
  - Tag Suffix
- Physical**
  - Fabrication Categ
- Responsibility**
  - Construction By
  - Design By
  - Requisition By
  - Supply By
- Status**
  - Construction Stati: New

The 'Catalog Explorer' panel shows a tree structure with 'My Catalog' and 'Symbols'.

# P&ID (still under development !!!)

The screenshot displays the SmartPlant P&ID software interface. The main window shows a P&ID diagram with a yellow highlight around a section containing a flow control loop. The loop consists of a flow control valve (FC 2214) at the top, connected to a flow transmitter (FT 2214) on the left and a flow valve (FV 2214) on the right. Below the loop, there is a flow element (FE 2214) and another flow valve (FV 2214). The Properties panel on the right shows the 'Instrument Loop - F-2214' with various identification and physical properties. A blue callout bubble points to the Properties panel with the text: 'Create Loop F – 2214 Instrumentation Items that do not appear here: FI, FY & loop.'

**Properties**  
Instrument Loop - F-2214

Identification	
Catalog Name	
Description	
ERP Asset No	
Expansion Type	
Inventory Tag	
Is Shared	
Is Typical	
Item Tag	
Loop Function	
Loop Number	
Plant Group Name	Unit
Plant Group Type	Unit
Plant Item Group 1	Instrument Loop
Plant Item Group 2	Instrument Loop
Plant Item Type	Plant Item Group
Requisition No	
SP ID	0F768A88CE6B4FC391D8A8C6
Tag Seq No	2214
Tag Suffix	

Physical	
Fabrication Categ	

Responsibility	
Construction By	
Design By	
Requisition By	
Supply By	

Status	
Construction Stat	New

**Engineering Data Editor**  
Instrument Loop

Loop Number	Loop Function	Tag Seq No	Tag Suffix	Plant Group Name
F-2214	F	2214		Unit1

# P&ID (still under development !!!)

The screenshot displays the SmartPlant P&ID software interface. The main window shows a P&ID diagram with a central instrument labeled 'FC 2214' (Flow Controller) connected to a flow element 'FE 2214' and a flow valve 'FV 2214'. The 'Properties' panel on the right is open for 'Instrument - FC-2214'. The 'Expansion Type' dropdown menu is highlighted in yellow, showing options: 'FlowType1', 'FlowType2', and 'FlowType3'. A blue speech bubble points to this menu with the text: 'For the FC set the "Expansion Type" property'. The 'Engineering Data Editor' at the bottom left shows a table of instrument data.

Item Tag	Instr Type	Parent Item Name	Plant Group Name
F-2214	Diaphragm		Unit1
FC-2214	DCS function		Unit1
FE-2214	Orif plate & flanges		Unit1
FT-2214	Discrete FT		Unit1
FV-2214	Ball control valve		Unit1
	Discrete PSH		Unit1
	DCS function		Unit1

# SPI To-Do-List

SmartPlant Instrumentation - MEX3DEMO

File Modules Actions SmartPlant Tools Window Help

To Do List

	Task Type	Item Type	Item Name	Macro
[-]	✓ Create	Instrument	101-FC -2214	FlowType1
			101-F -2214 - [Item to carrier association]	
			101-FE -2214 - [Item to carrier association]	
			101-FT -2214 - [Item to carrier association]	
			101-FI -2214 - [Create]	
			101-FY -2214 - [Create]	
			101-FV -2214 - [Item to carrier association]	
[-]	✓ Create	Instrument	101 ABV -1263/A	Macro #3
			101-FE -1263/A - [Create]	
			101-TE -1263/A - [Create]	
			101-FY -1263/A - [Create]	
			101-TW -1263/A - [Create]	
[+]	Create	SoftTag	101-PIC -1262	Macro #4
[+]	Create	Instrument	101-ZSC -1282	Macro #5
[+]	Create	Instrument	101-PT -1287	Macro #1
[+]	Create	Loop	101-P -1244	Macro #2
	Update	Instrument	101-CV -1261	



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**To Do List**

Task Type	Item Type	Item Name	Macro
<ul style="list-style-type: none"> <li> <input checked="" type="checkbox"/> Create                             <ul style="list-style-type: none"> <li> 101-F -2214 - [Item to carrier association]</li> <li> 101-FE -2214 - [Item to carrier association]</li> <li> 101-FT -2214 - [Item to carrier association]</li> <li> 101-FI -2214 - [Create]</li> <li> 101-FY -2214 - [Create]</li> <li> 101-FV -2214 - [Item to carrier association]</li> </ul> </li> </ul>	Instrument	101-FC -2214	FlowType1
<ul style="list-style-type: none"> <li> <input checked="" type="checkbox"/> Create                             <ul style="list-style-type: none"> <li> 101-FE -1263/A - [Create]</li> <li> 101-TE -1263/A - [Create]</li> <li> 101-FY -1263/A - [Create]</li> <li> 101-TW -1263/A - [Create]</li> </ul> </li> <li><input type="checkbox"/> Create</li> <li><input type="checkbox"/> Create</li> <li><input type="checkbox"/> Create</li> <li><input type="checkbox"/> Update</li> </ul>	Instrument	101 ABV -1263	Macro #3
<input type="checkbox"/> Create	SoftTag		
<input type="checkbox"/> Create	Instrument		
<input type="checkbox"/> Create	Instrument		
<input type="checkbox"/> Create	Loop		
<input type="checkbox"/> Update	Instrument		

Loop F-2214 will be associated with the macro  
 The FC, FI & FY instruments will be created.  
 The FE, FT & FV will be associated with the macro  
 The FV 2214 will be associated with the loop.

# Example

- SPI Macro structure:

Macro: FlowType1			
Name	Inst. Type	Class	type
FC - nnnn	FC	Soft Tag	<i>Carrier</i>
F-nnnn		Flow loop	Sub-items
FE-nnnn	FE	Instrument	Sub-items
FT-nnnn	FT	Instrument	Sub-items
FI-nnnn	FI	Instrument	Sub-items
FY-nnnn	FY	Instrument	Sub-items
FV-nnnn	FV	Instrument	Sub-items

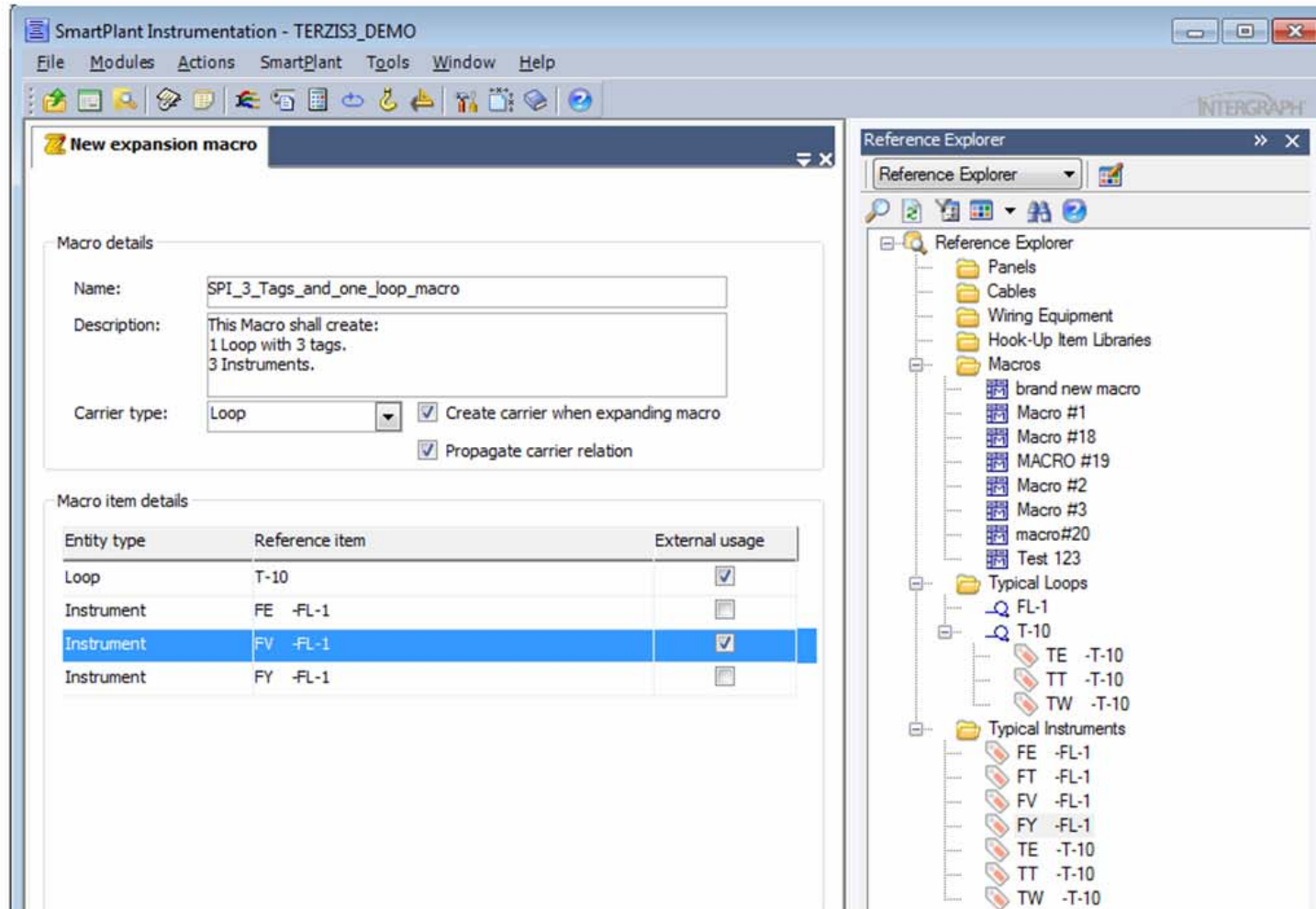
- SPI data before retrieving from SP P&ID

Tag Number	Loop Name	Instrument Type	Service	IO Type Name
101-FE -2214	101-F -2214	FE	Feed to B-101 Pass C	*
101-FT -2214	101-F -2214	FT	Feed to B-101 Pass C	AI
101-FV -2214	*	FV	Feed to B-101 Pass C	*

- SPI data after running To-do-list

Tag Number	Loop Name	Instrument Type	Service	IO Type Name
101-FC -2214	101-F -2214	FC	Feed to B-101 Pass C	*
101-FE -2214	101-F -2214	FE	Feed to B-101 Pass C	*
101-FI -2214	101-F -2214	FI	Feed to B-101 Pass C	*
101-FT -2214	101-F -2214	FT	Feed to B-101 Pass C	AI
101-FV -2214	101-F -2214	FV	Feed to B-101 Pass C	*
101-FY -2214	101-F -2214	FY	Feed to B-101 Pass C	AI

# SPI macro Definition (from Reference Explorer)



The screenshot displays the 'SmartPlant Instrumentation - TERZIS3\_DEMO' application. The main window is titled 'New expansion macro' and contains the following fields and options:

**Macro details**

- Name: SPI\_3\_Tags\_and\_one\_loop\_macro
- Description: This Macro shall create:  
1 Loop with 3 tags.  
3 Instruments.
- Carrier type: Loop (dropdown menu)
- Create carrier when expanding macro
- Propagate carrier relation

**Macro item details**

Entity type	Reference item	External usage
Loop	T-10	<input checked="" type="checkbox"/>
Instrument	FE -FL-1	<input type="checkbox"/>
Instrument	FV -FL-1	<input checked="" type="checkbox"/>
Instrument	FY -FL-1	<input type="checkbox"/>

The 'Reference Explorer' window on the right shows a hierarchical tree structure:

- Reference Explorer
  - Panels
  - Cables
  - Wiring Equipment
  - Hook-Up Item Libraries
  - Macros
    - brand new macro
    - Macro #1
    - Macro #18
    - MACRO #19
    - Macro #2
    - Macro #3
    - macro#20
    - Test 123
  - Typical Loops
    - FL-1
    - T-10
      - TE -T-10
      - TT -T-10
      - TW -T-10
  - Typical Instruments
    - FE -FL-1
    - FT -FL-1
    - FV -FL-1
    - FY -FL-1
    - TE -T-10
    - TT -T-10
    - TW -T-10

# SPI macro Definition (from Reference Explorer)

The screenshot displays the 'New expansion macro' dialog box in the SmartPlant Instrumentation software. The dialog is titled 'New expansion macro' and is highlighted with a yellow border. It contains the following fields and options:

- Macro details:**
  - Name: SPI\_3\_Tags\_and\_one\_loop\_macro
  - Description: This Macro shall create:  
1 Loop with 3 tags.  
3 Instruments.
  - Carrier type: Loop (dropdown menu)
  - Create carrier when expanding macro
  - Propagate carrier relation
- Macro item details:**

Entity type	Reference item	External usage
Loop	T-10	<input checked="" type="checkbox"/>
Instrument	FE -FL-1	<input type="checkbox"/>
Instrument	FV -FL-1	<input checked="" type="checkbox"/>
Instrument	FY -FL-1	<input type="checkbox"/>

To the right of the dialog box is the Reference Explorer tree, which is highlighted with a blue speech bubble labeled 'Macro Definition Window'. The tree shows a hierarchy of items:

- Wiring equipment
- Hook-Up Item Libraries
- Macros
  - brand new macro
  - Macro #1
  - Macro #18
  - MACRO #19
  - Macro #2
  - Macro #3
  - macro#20
  - Test 123
- Typical Loops
  - FL-1
  - T-10
    - TE -T-10
    - TT -T-10
    - TW -T-10
- Typical Instruments
  - FE -FL-1
  - FT -FL-1
  - FV -FL-1
  - FY -FL-1
  - TE -T-10
  - TT -T-10
  - TW -T-10

# SPI macro Definition (from Reference Explorer)

The screenshot shows the 'New expansion macro' dialog box in the SmartPlant Instrumentation software. The 'Name' field is highlighted in yellow and contains the text 'SPI\_3\_Tags\_and\_one\_loop\_macro'. A blue callout bubble points to this field with the text 'Macro Name'. The 'Description' field contains the text: 'This Macro shall create:  
1 Loop with 3 tags.  
3 Instruments.' The 'Carrier type' is set to 'Loop'. There are two checked options: 'Create carrier when expanding macro' and 'Propagate carrier relation'.

The 'Reference Explorer' window on the right shows a tree view of the project structure. The 'Typical Instruments' folder is expanded, showing a list of instrument types: FE -FL-1, FT -FL-1, FV -FL-1, FY -FL-1, TE -T-10, TT -T-10, and TW -T-10. The 'FV -FL-1' instrument is highlighted in blue.

Entity type	Reference item	External usage
Loop	T-10	<input checked="" type="checkbox"/>
Instrument	FE -FL-1	<input type="checkbox"/>
Instrument	FV -FL-1	<input checked="" type="checkbox"/>
Instrument	FY -FL-1	<input type="checkbox"/>

# SPI macro Definition (from Reference Explorer)



The screenshot shows the SmartPlant Instrumentation interface. The main window is titled "New expansion macro" and contains the following details:

**Macro details**

- Name: SPI\_3\_Tags\_and\_one\_loop\_macro
- Description: This Macro shall create:  
1 Loop with 3 tags.  
3 Instruments.
- Carrier type: Loop (highlighted in yellow)

**Macro item details**

Entity type	Reference item	External usage
Loop	T-10	<input checked="" type="checkbox"/>
Instrument	FE -FL-1	<input type="checkbox"/>
Instrument	FV -FL-1	<input checked="" type="checkbox"/>
Instrument	FY -FL-1	<input type="checkbox"/>

A callout box points to the "Carrier type" dropdown with the text: "Identify Carrier type".

The **Reference Explorer** on the right shows a tree structure:

- Reference Explorer
  - Panels
  - Cables
  - Wiring Equipment
  - Hook-Up Item Libraries
  - Macros
    - brand new macro
    - Macro #1
    - Macro #18
    - MACRO #19
    - Macro #2
    - Macro #3
    - macro#20
    - Test 123
  - Typical Loops
    - FL-1
    - T-10
      - TE -T-10
      - TT -T-10
      - TW -T-10
  - Typical Instruments
    - FE -FL-1
    - FT -FL-1
    - FV -FL-1
    - FY -FL-1
    - TE -T-10
    - TT -T-10
    - TW -T-10

# SPI macro Definition (from Reference Explorer)



SmartPlant Instrumentation - TERZIS3\_DEMO

File Modules Actions SmartPlant Tools Window Help

**New expansion macro**

Macro details

Name: SPI\_3\_Tags\_and\_one\_loop\_macro

Description: This Macro shall create:  
1 Loop with 3 tags.  
3 Instruments.

Carrier type: Loop

Create carrier when expanding macro

Propagate carrier relation

Macro item details

Entity type	Reference item	External usage
Loop	T-10	<input checked="" type="checkbox"/>
Instrument	FE -FL-1	<input type="checkbox"/>
Instrument	FV -FL-1	<input checked="" type="checkbox"/>
Instrument	FY -FL-1	<input type="checkbox"/>

Reference Explorer

- Reference Explorer
  - Panels
  - Cables
  - Wiring Equipment
  - Hook-Up Item Libraries
  - Typical Loops
    - FL-1
    - T-10
      - TE -T-10
      - TT -T-10
      - TW -T-10
  - Typical Instruments
    - FE -FL-1
    - FT -FL-1
    - FV -FL-1
    - FY -FL-1
    - TE -T-10
    - TT -T-10
    - TW -T-10

# SPI macro Definition (from Reference Explorer)

SmartPlant Instrumentation - TERZIS3\_DEMO

File Modules Actions SmartPlant Tools Window Help

### New expansion macro

Macro details

Name: SPI\_3\_Tags\_and\_one\_loop\_macro

Description: This Macro shall create:  
1 Loop with 3 tags.  
3 Instruments.

Carrier type: Loop  Create carrier when expanding macro  
 Propagate carrier relation

Macro item details

Entity type	Reference item	External usage
Loop	T-10	<input checked="" type="checkbox"/>
Instrument	FE -FL-1	<input type="checkbox"/>
Instrument	FV -FL-1	<input checked="" type="checkbox"/>
Instrument	FY -FL-1	<input type="checkbox"/>

Reference Explorer

- Reference Explorer
  - Panels
  - Cables
  - Wiring Equipment
  - Hook-Up Item Libraries

Typical Instruments

- TE -T-10
- TT -T-10
- TW -T-10
- FE -FL-1
- FT -FL-1
- FV -FL-1
- FY -FL-1
- TE -T-10
- TT -T-10
- TW -T-10

Propagate carrier related data (P&ID, line, equipment etc.) to expanded objects



# SPI macro Definition (from Reference Explorer)

The screenshot displays the SmartPlant Instrumentation interface. The main window is titled "New expansion macro" and contains the following details:

**Macro details**

- Name: SPI\_3\_Tags\_and\_one\_loop\_macro
- Description: This Macro shall create:  
1 Loop with 3 tags.  
3 Instruments.
- Carrier type: Loop
- Create carrier when expanding macro
- Propagate carrier relation

**Macro item details**

Entity type	Reference item	External usage
Loop	T-10	<input checked="" type="checkbox"/>
Instrument	FE -FL-1	<input type="checkbox"/>
<b>Instrument</b>	<b>FV -FL-1</b>	<input checked="" type="checkbox"/>
Instrument	FY -FL-1	<input type="checkbox"/>

The Reference Explorer window on the right shows a tree structure with the following items:

- Reference Explorer
- Panels
- Cables
- Wiring Equipment
- Hook-Up Item Libraries
- Macros
  - brand new macro
  - Macro #1
  - Macro #18
  - MACRO #19
  - Macro #2
  - Macro #3
  - macro#20
  - Taget 122
- Typical Loops
  - FL-1
  - T-10
    - TE -T-10
    - TT -T-10
    - TW -T-10
- Typical Instruments
  - FE -FL-1
  - FT -FL-1
  - FV -FL-1
  - FY -FL-1
  - TE -T-10
  - TT -T-10
  - TW -T-10

A yellow box highlights the "Typical Loops" and "Typical Instruments" sections in the Reference Explorer. A blue callout bubble points to this area with the text: "Typical instruments & typical loops".

# SPI macro Definition (from Reference Explorer)

The screenshot displays the 'SmartPlant Instrumentation - TERZIS3\_DEMO' application. The main window is titled 'New expansion macro'. The 'Macro details' section includes:

- Name: SPI\_3\_Tags\_and\_one\_loop\_macro
- Description: This Macro shall create:  
1 Loop with 3 tags.  
3 Instruments.
- Carrier type: Loop
- Options:  Create carrier when expanding macro,  Propagate carrier relation

The 'Macro item details' section contains a table with the following data:

Entity type	Reference item	External usage
Loop	T-10	<input checked="" type="checkbox"/>
Instrument	FE -FL-1	<input type="checkbox"/>
Instrument	FV -FL-1	<input checked="" type="checkbox"/>
Instrument	FY -FL-1	<input type="checkbox"/>

The 'Reference Explorer' on the right shows a tree view with categories: Panels, Cables, Wiring Equipment, Hook-Up Item Libraries, and Macros. Under 'Macros', there are items like 'brand new macro', 'Macro #1', 'Macro #18', 'MACRO #19', 'Macro #2', 'Macro #3', 'macro#20', and 'Test 123'. Under 'Typical Loops', there are 'FL-1', 'T-10', 'TE -T-10', 'TT -T-10', and 'TW -T-10'. Under 'Typical Instruments', there are 'FE -FL-1', 'FT -FL-1', 'FV -FL-1', 'FY -FL-1', 'TE -T-10', 'TT -T-10', and 'TW -T-10'.

Macro Details...

# SPI macro Definition (from Reference Explorer)

The screenshot shows the 'New expansion macro' dialog box in the SmartPlant Instrumentation software. The dialog is titled 'New expansion macro' and has a menu bar with 'File', 'Modules', 'Actions', 'SmartPlant', 'Tools', 'Window', and 'Help'. The 'Macro details' section contains the following information:

- Name: SPI\_3\_Tags\_and\_one\_loop\_macro
- Description: This Macro shall create:  
1 Loop with 3 tags.  
3 Instruments.
- Carrier type: Loop (selected in a dropdown menu)
- Create carrier when expanding macro
- Propagate carrier relation

The 'Macro item details' section contains a table with the following data:

Entity type	Reference item	External usage
Loop	T-10	<input checked="" type="checkbox"/>
Instrument	FE -FL-1	<input type="checkbox"/>
Instrument	FV -FL-1	<input checked="" type="checkbox"/>
Instrument	FY -FL-1	<input type="checkbox"/>

The 'Reference Explorer' window on the right shows a tree view of the software's reference data. The tree is organized into folders: Panels, Cables, Wiring Equipment, Hook-Up Item Libraries, and Macros. The 'Macros' folder is expanded, showing a list of macros: brand new macro, Macro #1, Macro #18, MACRO #19, Macro #2, Macro #3, macro#20, and Test 123. Below the 'Macros' folder are 'Typical Loops' (FL-1, T-10) and 'Typical Instruments' (TE -T-10, TT -T-10, TW -T-10, FE -FL-1, FT -FL-1, FV -FL-1, FY -FL-1, and T-10). A blue arrow points from the 'Typical Instruments' folder in the Reference Explorer to the 'Macro item details' table in the 'New expansion macro' dialog.

Drag & drop  
typical  
instruments &  
loops

# SPI macro Definition (from Reference Explorer)

The screenshot displays the SmartPlant Instrumentation interface. The main window is titled "New expansion macro" and contains the following details:

**Macro details**

- Name: SPI\_3\_Tags\_and\_one\_loop\_macro
- Description: This Macro shall create:  
1 Loop with 3 tags.  
3 Instruments.
- Carrier type: Loop
- Create carrier when expanding macro
- Propagate carrier relation

**Macro item details**

Entity type	Reference item	External usage
Loop	T-10	<input checked="" type="checkbox"/>
Instrument	FE -FL-1	<input type="checkbox"/>
Instrument	FV -FL-1	<input checked="" type="checkbox"/>
Instrument	FY -FL-1	<input type="checkbox"/>

The "External usage" column is highlighted with a yellow box. A callout bubble points to the checked checkbox for the "FV -FL-1" instrument, containing the text: "Selecting this flag prevents P&ID from retrieving expanded items".

The Reference Explorer on the right shows a tree view with folders for Panels, Cables, Wiring Equipment, Hook-Up Item Libraries, and Macros. Under Macros, there are several macro entries including "brand new macro", "Macro #1", "Macro #18", "MACRO #19", "Macro #2", "Macro #3", "macro#20", and "Test 123". Under Typical Loops, there are entries for "FL-1", "T-10", "TE -T-10", "TT -T-10", and "TW -T-10".

# SPI To-do-List Enhancements

SmartPlant Instrumentation - MEX3DEMO

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**To Do List**

	Task Type	Item Type	Item Name	Macro
<input checked="" type="checkbox"/>	Create	Instrument	101-CV -1261	
<input type="checkbox"/>		101-FE -1261	- [Exists]	
<input type="checkbox"/>		101-FT -1261	- [Exists]	
<input type="checkbox"/>		101-TE -1261	- [Exists]	
<input type="checkbox"/>		101-TT -1261	- [Exists]	
<input type="checkbox"/>		101-FY -1261	- [Exists]	
<input type="checkbox"/>		101-FV -1261	- [Exists]	
<input checked="" type="checkbox"/>	Create	Instrument	101-ABV -1263/A	Macro #3
<input type="checkbox"/>		101-FE -1263/A	- [Create]	
<input type="checkbox"/>		101-TE -1263/A	- [Create]	
<input type="checkbox"/>		101-FY -1263/A	- [Create]	
<input type="checkbox"/>		101-TW -1263/A	- [Create]	
<input type="checkbox"/>	Create	SoftTag	101-PIC -1262	Macro #4
<input type="checkbox"/>	Create	Instrument	101-ZSC -1282	Macro #5
<input type="checkbox"/>	Create	Instrument	101-PT -1287	Macro #1
<input type="checkbox"/>	Create	Loop	101-P -1244	Macro #2
	Update	Instrument	101-CV -1261	
	Update	Instrument	101-CV -1261	
	Update	Instrument	101-CV -1261/A	
	Update	Instrument	101-ABV -1263	
	Update	Instrument	101-ABV -1263	
	Update	Instrument	101-ABV -1263/A	
	Update	Instrument	101-EV -1263	

To Do List

# SPI To-do-List Enhancements

SmartPlant Instrumentation - MEX3DEMO

File Modules Actions SmartPlant Tools Window Help

To Do List

Task Type	Item Type	Item Name	Macro	
✓ Create	Instrument	101-CV -1261	Macro #1	
101-FE -1261	- [Exists]			
101-FT -1261	- [Exists]			
101-TE -1261	- [Exists]			
101-TT -1261	- [Exists]			
101-FY -1261	- [Exists]			
101-FV -1261	- [Exists]			
Create	Instrument	101-ABV -1263/A	Macro #3	
101-FE -1263/A	- [Create]			
101-TE -1263/A	- [Create]			
101-FY -1263/A	- [Create]			
101-TW -1263/A	- [Create]			
+	Create	SoftTag	101-PIC -1262	Macro #4
+	Create	Instrument	101-ZSC -1282	Macro #5
+	Create	Instrument	101-PT -1287	Macro #1
+	Create	Loop		Macro #2
Update	Instrument			
Update	Instrument			
Update	Instrument			
Update	Instrument			
Update	Instrument			
Update	Instrument			
Update	Instrument			
Update	Instrument			
Update	Instrument			

Carriers are identified with the macro name.

# SPI To-do-List Enhancements

The screenshot shows the 'SmartPlant Instrumentation - MEX3DEMO' application window. The 'To-do List' window is open, displaying a table of tasks. A yellow box highlights the left side of the table, and a blue callout bubble points to the plus/minus icons in the first column.

Task Type	Item Type	Item Name	Macro
[-] Create	Instrument	101-CV -1261	Macro #1
	101-FE -1261 - [Exists]		
	101-FT -1261 - [Exists]		
	101-TE -1261 - [Exists]		
	101-TT -1261 - [Exists]		
	101-FY -1261 - [Exists]		
	101-FV -1261 - [Exists]		
[+] Create	Instrument	101-ABV -1263/A	Macro #3
	101-FE -1263/A - [Create]		
	101-TE -1263/A - [Create]		
	101-FY -1263/A - [Create]		
	101-TW -1263/A - [Create]		
[+] Create	SoftTag	101-PIC -1262	Macro #4
[+] Create	Instrument	101-ZSC -1282	Macro #5
[+] Create		101-PT -1287	Macro #1
[+] Create			Macro #2
	Update		
	Update		
	Update		
	Update		
	Update		
	Update		
	Update		
	Update		
	Update		

Use the plus/minus to reveal/hide sub- items according to macro definitions.

# SPI To-do-List Enhancements

The screenshot shows the 'To Do List' window in the SmartPlant Instrumentation - MEX3DEMO application. The window has a menu bar (File, Modules, Actions, SmartPlant, Tools, Window, Help) and a toolbar. The main area displays a table with columns: Task Type, Item Type, Item Name, and Macro. A yellow box highlights a group of items under the 'Create' task type, all with 'Instrument' as the item type and '-1261' as the item name. These items are: 101-FE -1261 - [Exists], 101-FT -1261 - [Exists], 101-TE -1261 - [Exists], 101-TT -1261 - [Exists], 101-FY -1261 - [Exists], and 101-FV -1261 - [Exists]. A blue callout box points to this group and contains the following text:

Indication of Sub-item status :

- Create
- Exists (macro already executed)
- Item to carrier association
- Item to carrier dissociation

Below the highlighted group, there is another section for 'Create' tasks with 'Instrument' item type and '101-...' item names, including 101-FE -1263/A - [Create], 101-TE -1263/A - [Create], 101-FY -1263/A - [Create], and 101-TW -1263/A - [Create]. The bottom part of the table shows various other tasks like 'SoftTag', 'Loop', and 'Update' for different item types and names.



# SPI To-do-List Enhancements

The screenshot displays the SmartPlant Instrumentation interface. On the left, the 'To Do List' pane shows a hierarchy of tasks. The 'Create' task type is expanded, showing several instrument tasks. The 'EXP\_MACRO\_NAME' property is highlighted in a yellow box in the 'Create Instrument 101-FE -1261 Task Properties' dialog box.

**SmartPlant Instrumentation - MEX3DEMO**

File Modules Actions SmartPlant Tools Window

**To Do List**

Task Type	Item Type	Item	
✓ Create	Instrument	10	
101-FE	-1261 - [Exists]		
101-FT	-1261 - [Exists]		
101-TE	-1261 - [Exists]		
101-TT	-1261 - [Exists]		
101-FY	-1261 - [Exists]		
101-FV	-1261 - [Exists]		
+	Create	Instrument	10
101-FE	-1263/A - [Create]		
101-TE	-1263/A - [Create]		
101-FY	-1263/A - [Create]		
101-TW	-1263/A - [Create]		
+	Create	SoftTag	10
+	Create	Instrument	10
+	Create	Instrument	10
+	Create	Loop	10
Update	Instrument	10	
Update	Instrument	10	
Update	Instrument	10	
Update	Instrument	101-ABV -1263	
Update	Instrument	101-ABV -1263	
Update	Instrument	101-ABV -1263/A	
Update	Instrument	101-EV -1263	

**Create Instrument 101-FE -1261 Task Properties**

General Details History Notes

Item type:  
Instrument

Item properties:

Active	Ignored	Property	New Value
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Tag Number	101-FE -1261
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Process Function Type	Flow
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Location	Field
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Instrument Type Desc	Orifice Plate, FE
<input checked="" type="checkbox"/>	<input type="checkbox"/>	P&ID	D1Regression
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Status	NEW
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Pipe Spec	1C0031
<input checked="" type="checkbox"/>	<input type="checkbox"/>	EXP_MACRO_NAME	Macro #1

OK Cancel Previous

Macro name property displayed on the task properties

# Macro Execution

SmartPlant Instrumentation - MEX3DEMO

File Modules Actions SmartPlant Tools Window Help

**To Do List**

Task Type	Item Type	Item Name	Macro	Created Date	
✓ Create	Instrument	101-CV -1261	Macro #1	2/14/2011 14:22:53	
✓ Create	Instrument	101-ABV -1263/A	Macro #3	2/14/2011 14:22:54	
✓ Create	SoftTag	101-PIC -1262	Macro #4	2/14/2011 14:23:02	
	101-TW -1262 - [Create]				
	101-TE -1262 - [Create]				
	101-TT -1262 - [Create]				
+	Create	Instrument	101-ZSC -1282	Macro #5	2/14/2011 14:23:11
+	Create	Instrument	101-PT -1287	Macro #1	2/14/2011 14:23:12
+	Create	Loop	101-P -1244	Macro #2	2/14/2011 14:23:28
	Update	Instrument	101-CV -1261		2/14/2011 14:22:53
	Update	Instrument	101-CV -1261		2/14/2011 14:22:53
	Update	Instrument	101-CV -1261/A		2/14/2011 14:22:53
	Update	Instrument	101-ABV -1263		2/14/2011 14:22:54
	Update	Instrument	101-ABV -1263		2/14/2011 14:22:54
	Update	Instrument	101-ABV -1263/A		2/14/2011 14:22:54
	Update	Instrument	101-EV -1263		2/14/2011 14:22:55
	Update	Instrument	101-ZSC -1263		2/14/2011 14:22:55
	Update	Instrument	101-CV -1262		2/14/2011 14:22:56
	Update	Instrument	101-FE -1262		2/14/2011 14:22:56
	Update	Instrument	101-FE -1262		2/14/2011 14:22:56
	Update	Instrument	101-FT -1262		2/14/2011 14:22:56
	Update	Instrument	101-CV -1262		2/14/2011 14:22:57
	Update	Instrument	101-CV -1262/A		2/14/2011 14:22:57
	Update	Instrument	101-CV -1261		2/14/2011 14:22:58
	Update	Instrument	101-CV -1261		2/14/2011 14:22:58
	Update	Instrument	101-CV -1261/A		2/14/2011 14:22:58
	Update	Instrument	101-CV -1261		2/14/2011 14:22:59

**Run**

Progress:

Activity:

# Macro Expansion Cases\*



Case #	Task input	SPI items before running task & macro	SPI items after running task & macro	Object registry	SPI Hierarchy																														
1	<ul style="list-style-type: none"> <li>Task: Create Loop 101-F-100</li> <li>Macro M1:                             <ul style="list-style-type: none"> <li>➤ Create Carrier Flag – yes</li> <li>➤ Create Tag of type FY, Update Relations - Yes</li> <li>➤ Create Tag of type FE, Update Relations - Yes</li> <li>➤ Create Tag of type FT, Update Relations - Yes</li> </ul> </li> </ul>	Loops and tags not defined in SPI.	Loop 101-F-100 – will be created Tag 101-FY-100 – will be created Tag 101-FE-100 – will be created Tag 101-FT-100 – will be created	<table border="1"> <thead> <tr> <th></th> <th></th> <th>Object ID</th> <th>Publishable flag</th> <th>macro</th> <th>Carrier Object ID</th> </tr> </thead> <tbody> <tr> <td>101-F-100</td> <td>N</td> <td>xxx</td> <td>Y</td> <td>M1</td> <td></td> </tr> <tr> <td>101-FY-100</td> <td>n</td> <td>123</td> <td>N</td> <td>M1</td> <td>xxx</td> </tr> <tr> <td>101-FE-100</td> <td>New entry</td> <td>345</td> <td>N</td> <td>M1</td> <td>xxx</td> </tr> <tr> <td>101-FT-100</td> <td>New entry</td> <td>678</td> <td>N</td> <td>M1</td> <td>xxx</td> </tr> </tbody> </table>			Object ID	Publishable flag	macro	Carrier Object ID	101-F-100	N	xxx	Y	M1		101-FY-100	n	123	N	M1	xxx	101-FE-100	New entry	345	N	M1	xxx	101-FT-100	New entry	678	N	M1	xxx	Loop 101-F-100 ↳ Tag 101-FY-100 ↳ Tag 101-FE-100 ↳ Tag 101-FT-100
		Object ID	Publishable flag	macro	Carrier Object ID																														
101-F-100	N	xxx	Y	M1																															
101-FY-100	n	123	N	M1	xxx																														
101-FE-100	New entry	345	N	M1	xxx																														
101-FT-100	New entry	678	N	M1	xxx																														
2	<ul style="list-style-type: none"> <li>Task: Create Loop 101-F-100</li> <li>Macro M1:                             <ul style="list-style-type: none"> <li>➤ Create Carrier Flag – yes</li> <li>➤ Create Tag of type FY, Update Relations - Yes</li> <li>➤ Create Tag of type FE, Update Relations - Yes</li> <li>➤ Create Tag of type FT, Update Relations - Yes</li> </ul> </li> </ul>	Tag 101-FE-100 already exists, not related to any carrier.	Loop 101-F-100 – will be created Tag 101-FY-100 – will be created Tag 101-FE-100 – will not be created but will be associated to the carrier Tag 101-FT-100 – will be created	<table border="1"> <thead> <tr> <th></th> <th></th> <th>Object ID</th> <th>Publishable flag</th> <th>macro</th> <th>Carrier Object ID</th> </tr> </thead> <tbody> <tr> <td>101-F-100</td> <td>New entry</td> <td>xxx</td> <td>Y</td> <td>M1</td> <td></td> </tr> <tr> <td>101-FY-100</td> <td>New entry</td> <td>123</td> <td>N</td> <td>M1</td> <td>xxx</td> </tr> <tr> <td>101-FE-100</td> <td>Update</td> <td>345</td> <td>N</td> <td>M1</td> <td>xxx</td> </tr> <tr> <td>101-FT-100</td> <td>New entry</td> <td>678</td> <td>N</td> <td>M1</td> <td>xxx</td> </tr> </tbody> </table>			Object ID	Publishable flag	macro	Carrier Object ID	101-F-100	New entry	xxx	Y	M1		101-FY-100	New entry	123	N	M1	xxx	101-FE-100	Update	345	N	M1	xxx	101-FT-100	New entry	678	N	M1	xxx	Loop 101-F-100 ↳ Tag 101-FY-100 ↳ Tag 101-FE-100 ↳ Tag 101-FT-100
		Object ID	Publishable flag	macro	Carrier Object ID																														
101-F-100	New entry	xxx	Y	M1																															
101-FY-100	New entry	123	N	M1	xxx																														
101-FE-100	Update	345	N	M1	xxx																														
101-FT-100	New entry	678	N	M1	xxx																														
3	<ul style="list-style-type: none"> <li>Task: Update Loop 101-F-100</li> <li>Macro M2:                             <ul style="list-style-type: none"> <li>➤ Create Carrier Flag – No</li> <li>➤ Create Tag of type FY, Update Relations - Yes</li> <li>➤ Create Tag of type FT, Update Relations - Yes</li> </ul> </li> </ul>	Loop 101-F-100 already exists. Tags 101-FE-100 already exists, related to this loop.	Loop 101-F-100 – will not be created Tag 101-FY-100 – will be created Tag 101-FE-100 – will not be created and it will be dissociated from the carrier expansion package. Tag 101-FT-100 – will be created	<table border="1"> <thead> <tr> <th></th> <th></th> <th>Object ID</th> <th>Publishable flag</th> <th>macro</th> <th>Carrier Object ID</th> </tr> </thead> <tbody> <tr> <td>101-F-100</td> <td>Update</td> <td>xxx</td> <td>Y</td> <td>M2</td> <td></td> </tr> <tr> <td>101-FY-100</td> <td>New entry</td> <td>123</td> <td>N</td> <td>M2</td> <td>xxx</td> </tr> <tr> <td>101-FE-100</td> <td>update</td> <td>345</td> <td>Y</td> <td></td> <td></td> </tr> <tr> <td>101-FT-100</td> <td>New entry</td> <td>678</td> <td>N</td> <td>M2</td> <td>xxx</td> </tr> </tbody> </table>			Object ID	Publishable flag	macro	Carrier Object ID	101-F-100	Update	xxx	Y	M2		101-FY-100	New entry	123	N	M2	xxx	101-FE-100	update	345	Y			101-FT-100	New entry	678	N	M2	xxx	Leave physical relation as is. Loop 101-F-100 ↳ Tag 101-FY-100 ↳ Tag 101-FE-100 ↳ Tag 101-FT-100
		Object ID	Publishable flag	macro	Carrier Object ID																														
101-F-100	Update	xxx	Y	M2																															
101-FY-100	New entry	123	N	M2	xxx																														
101-FE-100	update	345	Y																																
101-FT-100	New entry	678	N	M2	xxx																														

\* Partial list..

# Things you should know

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- Once a macro has been executed by integration, it cannot be modified in SPI.
- Renaming a carrier in SP P&ID will create update tasks in SPI\*
- Changing the macro name in SP P&ID will apply the new macro structure on SPI. Irrelevant items will be dissociated from the carrier and the “package”\*
- Deletion of the carrier in SP P&ID will result with deletion of the objects in SPI as it is today\*
- There is no user interface that reflects macro relationship with a carrier or sub items.
- In case conflicts are encountered during execution of the To-do-list tasks, the macro execution will fail followed by an appropriate notification.
- Macro execution log files are created in the system’s temp directory.

\* Not implemented yet