SI Merge Demo

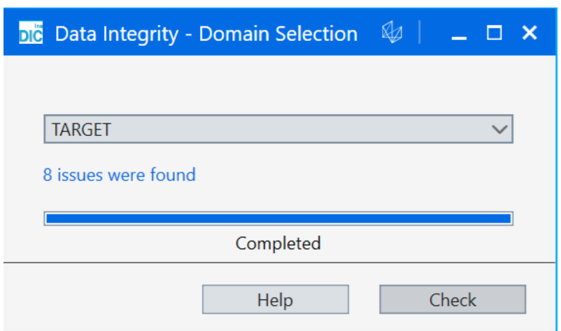
2 SI 13.1 Domains used for Merging

- **OOTB DEMO (TARGET) SI DB – 1 new Unit was added under New Refinery Plant – Crude Area ➔ Crude Unit 3 – No Data in it**
- **EMPTY OOTB DEMO2 SI DB (SOURCE) - 1 new Unit was added under New Refinery Plant – Crude Area ➔ Crude Unit 3 - with 2 Full Loops data**

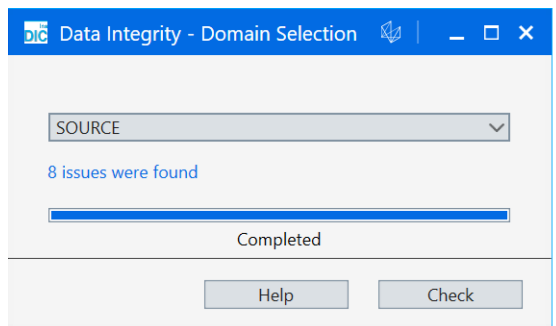
Highly recommended to run first:

- **Data Integrity Checker Utility on both Source & Target SI Domains**

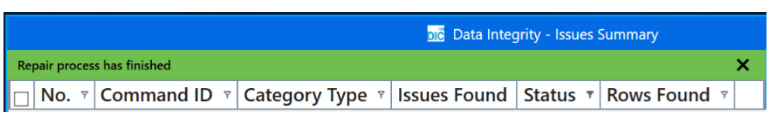
Target Domain Check – 8 issues found



Source Domain Check – 8 issues found



Use: Ready to Repair Filter - click Repair



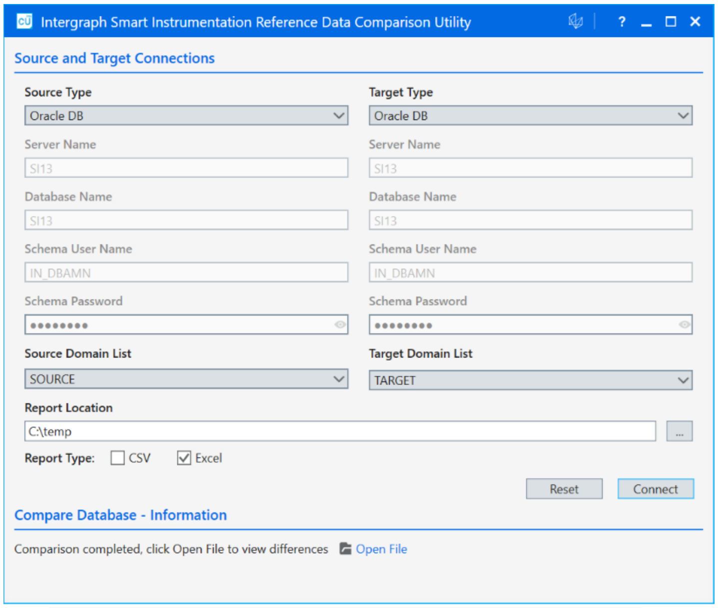
Use: Manual Repair Filter - click Export File

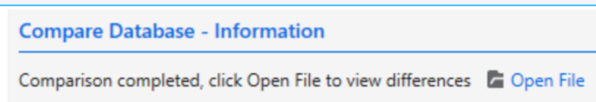
Send the Excel file(s) to HxGN SI Support via a Case and get SQLs solutions to run

No.	Command ID	Category	Issues Found	Status	Rows Found	Command Description
60	600	Wiring	Check to see if there are rows in the CABLE_CONFIG_SET_TYPE_WIRE table with a NULL value in the WIRE_POLARITY	Manual repair	10	There are rows in the CABLE_CONF
227	2280	Wiring	Check to see if there are rows in the CONNECTOR_PIN table with a NULL value in the PIN_POLARITY column	Manual repair	1	There are rows in the CONNECTOR
228	2290	Wiring	Check to see if there are rows in the CONNECTOR_TYPE_PIN table with a NULL value in the PIN_POLARITY column	Manual repair	1	There are rows in the CONNECTOR
370	3970	Wiring	Check to see if there are rows in the PANEL_STRIP_TERM table with a NULL value in the POLARITY_LEFT column	Manual repair	74	There are rows in the PANEL_STRIP_
371	3980	Wiring	Check to see if there are rows in the PANEL_STRIP_TERM table with a NULL value in the POLARITY_RIGHT column	Manual repair	74	There are rows in the PANEL_STRIP_
436	4620	Wiring	Check to see if there are rows in the STRIP_CONFIG_TERM table with a NULL value in the POLARITY_LEFT column	Manual repair	4	There are rows in the STRIP_CONFI
437	4630	Wiring	Check to see if there are rows in the STRIP_CONFIG_TERM table with a NULL value in the POLARITY_RIGHT column	Manual repair	4	There are rows in the STRIP_CONFI
480	5060	Wiring	Check to see if there are rows in the WIRE table with a NULL value in the POLARITY column	Manual repair	20	There are rows in the WIRE table wit

- **Reference Data Comparison Utility between Source & Target SI Domains**

Connect & Compare & View the Excel file





Intergraph Smart Instrumentation Reference Data Comparison Utility

Report Date: 8/3/2025

	Source	Target
Connection Type	ORACLE	ORACLE
Server Name/File	ORCL	ORCL
Database	ORCL	ORCL
Domain	DEMO2	DEMO
Comparison Utility Version		

Comparison Results

Just showing no. of issues per SI Item Type

No	Item	Category	No of Discrepancies
1	Cable Color	Supporting Tables Data	1
2	Cable Manufacturer	Supporting Tables Data	0
3	Cable Model	Supporting Tables Data	0
4	Cable Type	Supporting Tables Data	2
5	Criticality	Supporting Tables Data	0
6	Equipment Type	Supporting Tables Data	8
7	Instrument Category	Supporting Tables Data	3
8	Instrument Location	Supporting Tables Data	7
9	Instrument Manufacturer	Supporting Tables Data	23
10	Instrument Model	Supporting Tables Data	13
11	Line Type	Supporting Tables Data	2
12	Loop Function	Supporting Tables Data	3
13	Loop Type	Supporting Tables Data	4
14	Measured Variable	Supporting Tables Data	1
15	Panel Location	Supporting Tables Data	13
16	Panel Manufacturer	Supporting Tables Data	14
17	Panel Model	Supporting Tables Data	1
42	Ins. Type Profile-General	Instrument Type Data	105

Reference Tables | Cable Color | Cable Type | Equipment Type | Instrument Categoı

e.g

A	B	C	D	E
Home		Loop Function		
No	Discrepancy Type	Loop Function	Loop Function Descriptio	LOOP_FUN
		LOOP_FUNC_NAME	LOOP_FUNC_DESC	LOOP_FUN
1	Mismatch Source	IC	Control Indicating	2
1	Mismatch Target	IC	Indication and Control	2
2	Mismatch Source	IRC	Control Indicating / Recor	3
2	Mismatch Target	IRC	Indication Control & Reco	3
3	Only in Target	IA	Indication and Alarm	4229

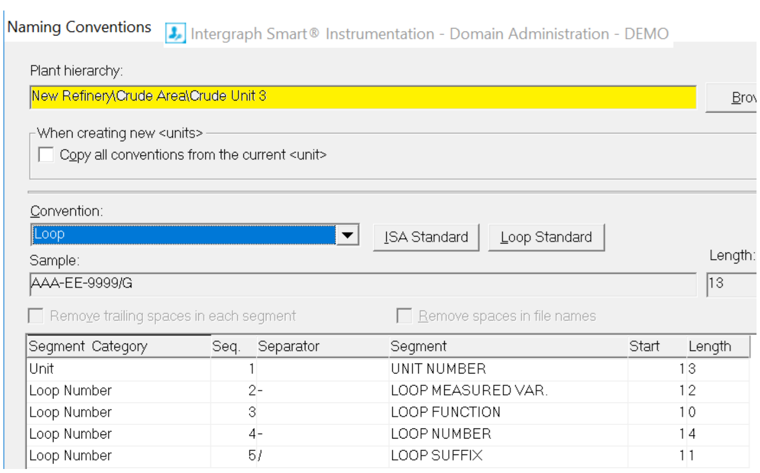
Need to check carefully the Comparison Results in the Excel, Tab by Tab (42 Tabs in this example) and fix All issues before starting the Merge itself.

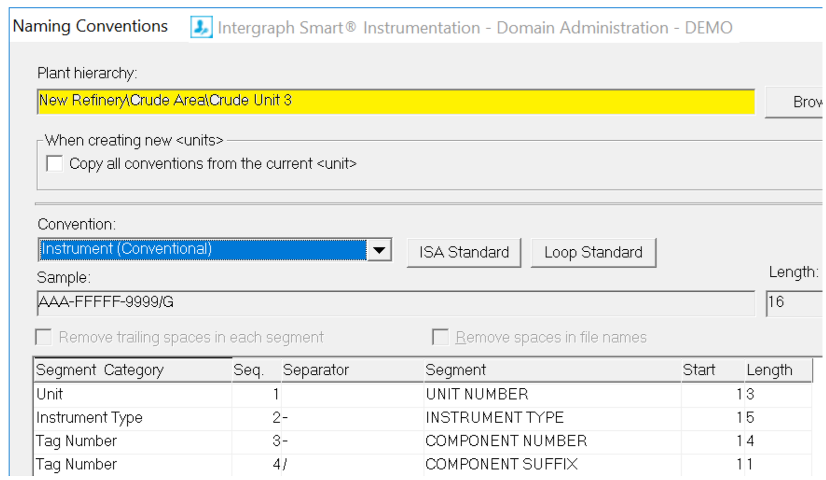
NC of Source & Target Domains should be the same or have the option to Match

If not the same & no match:

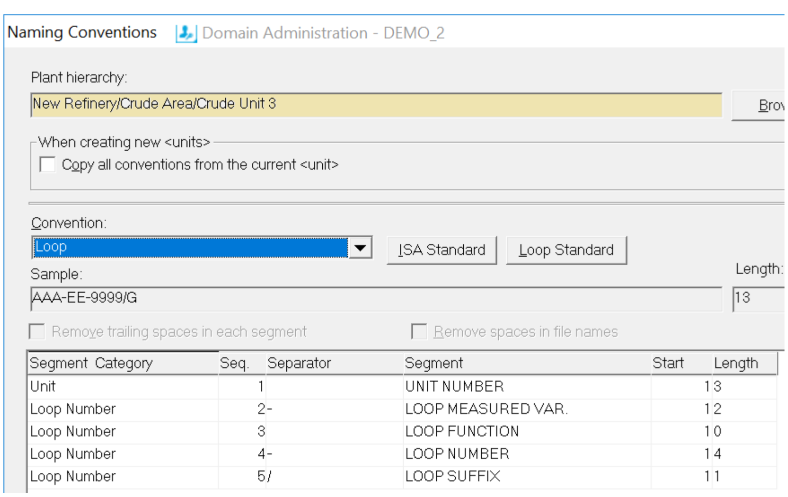
- **Target Unit(s) is Blank – Update the NC on the Target Unit(s) to match the Source Unit(s) NC**
- **Target Unit(s) is NOT Blank – Update the NC on the Source Unit(s) to match the Source Unit(s) NC**

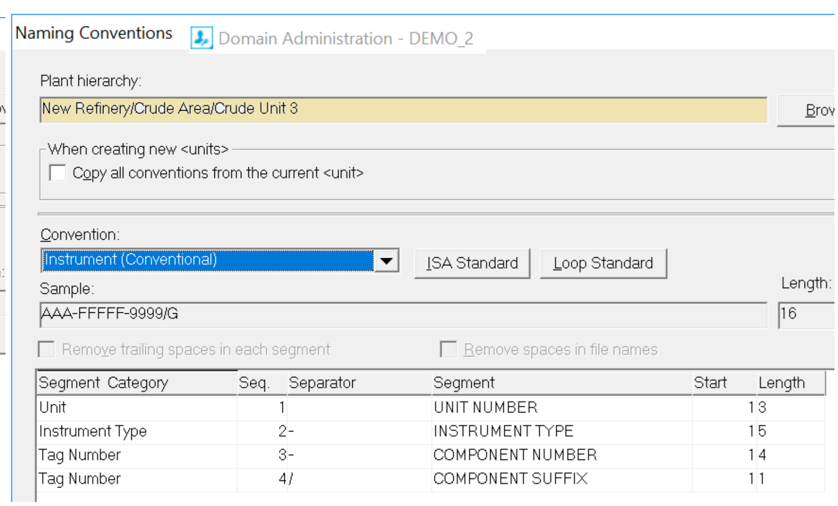
Target SI DEMO Domain – PBS: New Refinery / Crude Area – Crude Unit 3 - NC



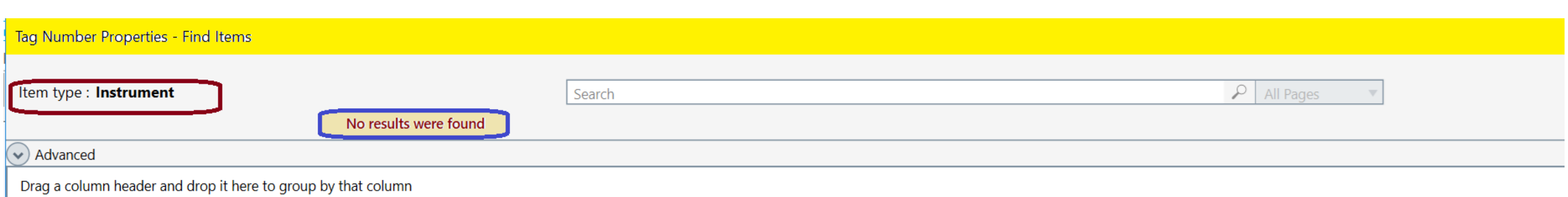


Source SI DEMO-2 Domain – PBS: New Refinery / Crude Area – Crude Unit 3 - NC



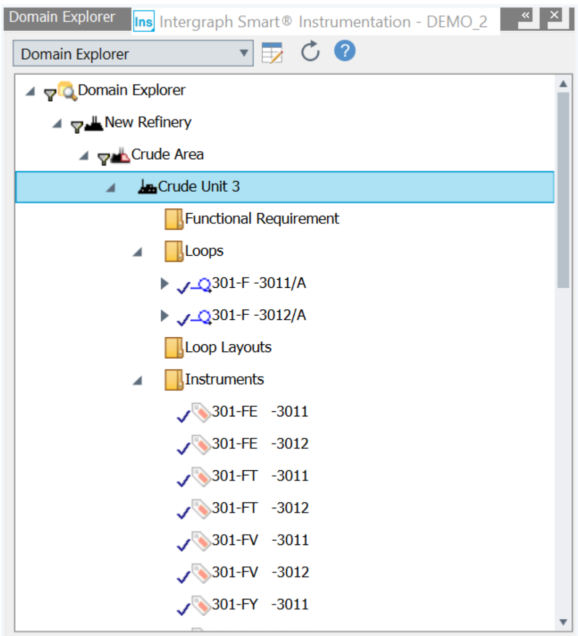


Target SI DEMO Domain – PBS: New Refinery / Crude Area – Crude Unit 3 – No Data

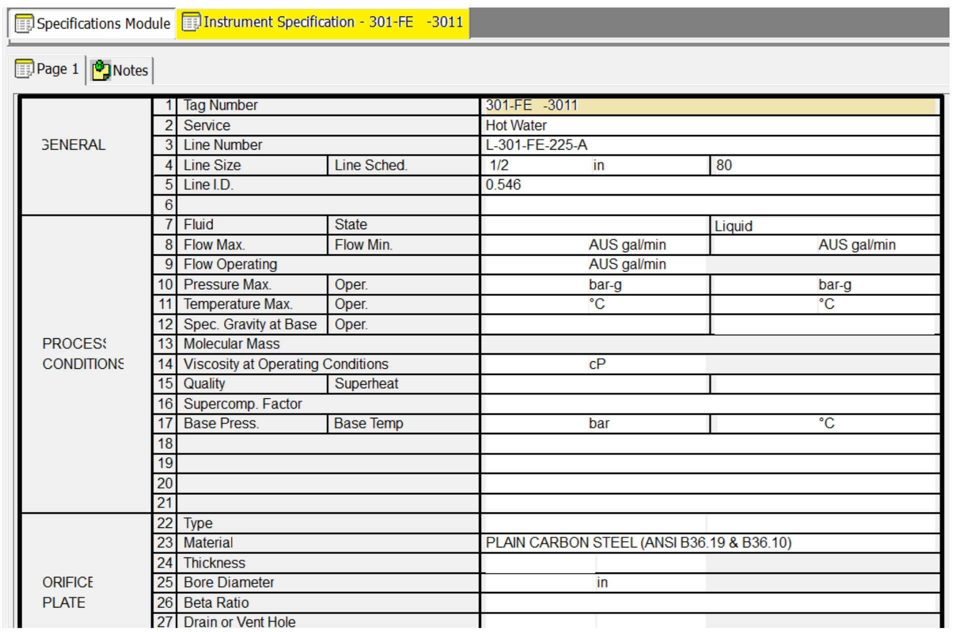


Source SI DEMO-2 Domain – PBS: New Refinery / Crude Area – Crude Unit 3 – 2 Loops & Tags + Wiring

Loops & Tags

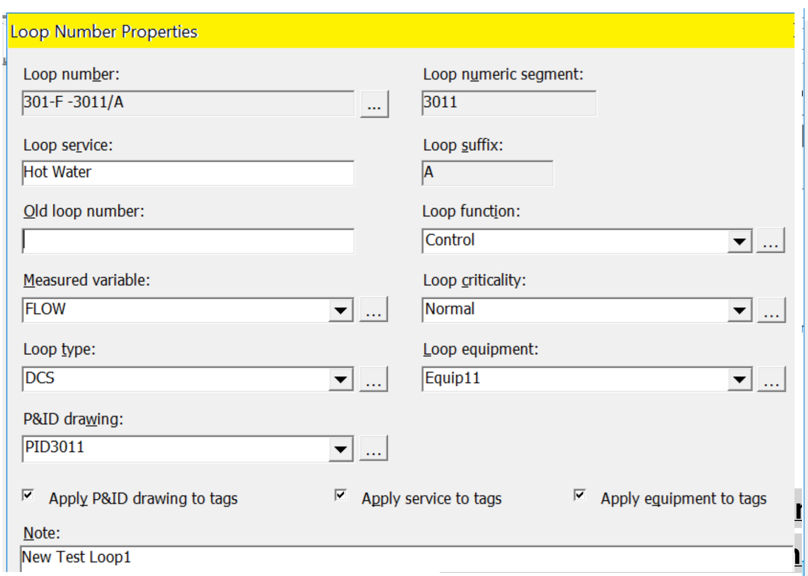


Specification Sheet

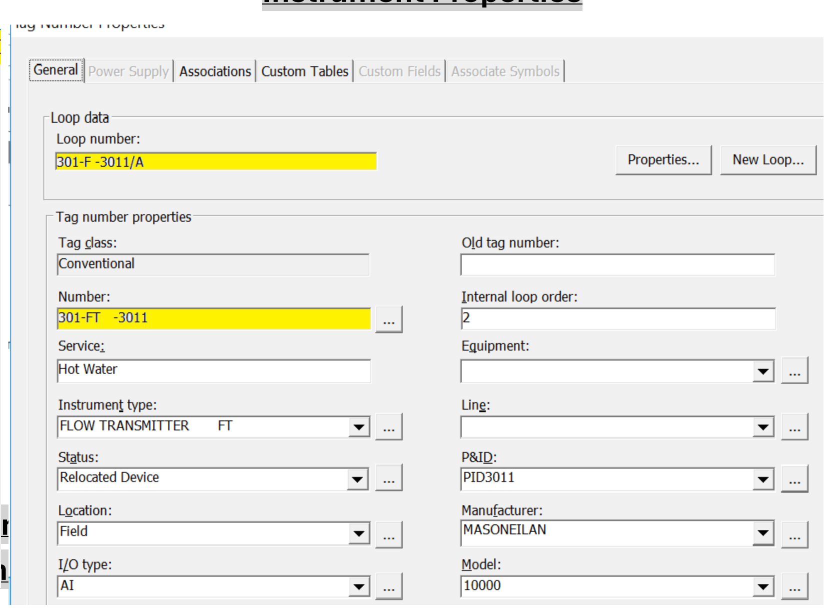


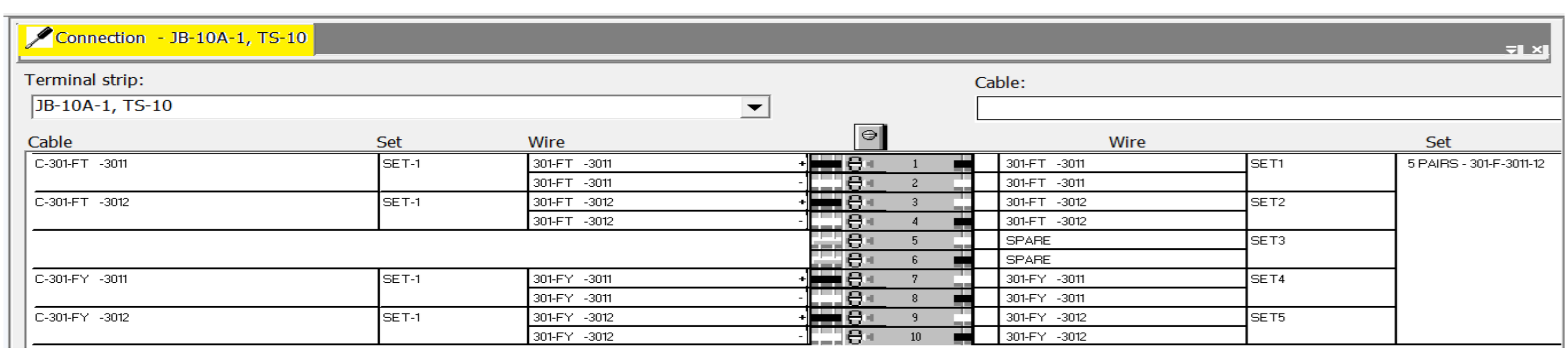
GENERAL	1	Tag Number		301-FE -3011	
	2	Service		Hot Water	
	3	Line Number		L-301-FE-225-A	
	4	Line Size	Line Sched.	1/2 in	80
	5	Line I.D.		0.546	
	6				
PROCESS CONDITIONS	7	Fluid	State		Liquid
	8	Flow Max.	Flow Min.	AUS gal/min	AUS gal/min
	9	Flow Operating		AUS gal/min	
	10	Pressure Max.	Oper.	bar-g	bar-g
	11	Temperature Max.	Oper.	°C	°C
	12	Spec. Gravity at Base	Oper.		
	13	Molecular Mass			
	14	Viscosity at Operating Conditions		cP	
	15	Quality	Superheat		
	16	Supercomp. Factor			
	17	Base Press.	Base Temp	bar	°C
	18				
	19				
	20				
	21				
ORIFICE PLATE	22	Type			
	23	Material		PLAIN CARBON STEEL (ANSI B36.19 & B36.10)	
	24	Thickness			
	25	Bore Diameter		in	
	26	Beta Ratio			
	27	Drain or Vent Hole			

Loop Properties



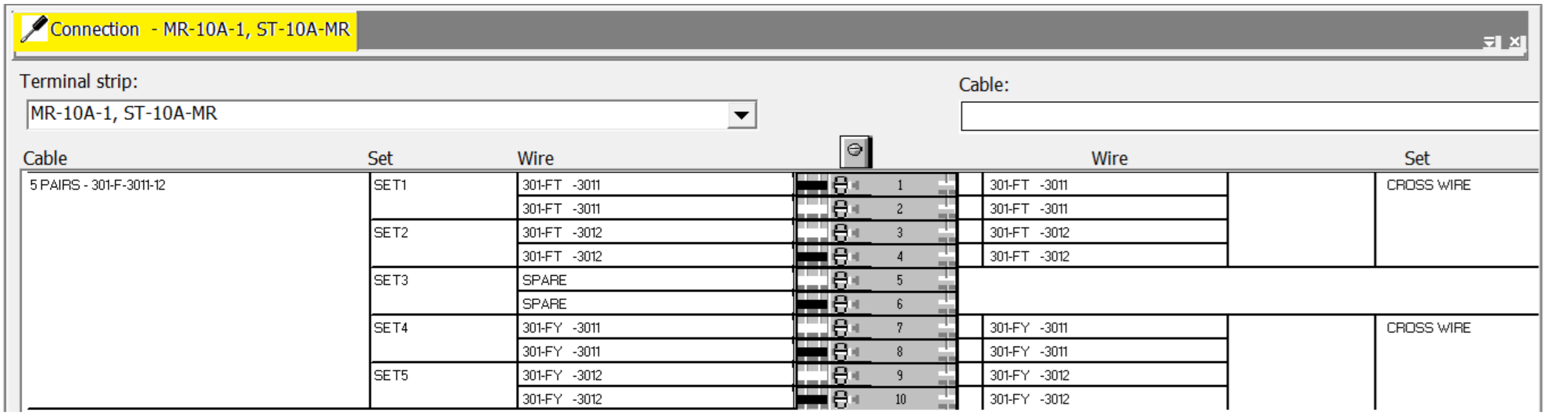
Instrument Properties



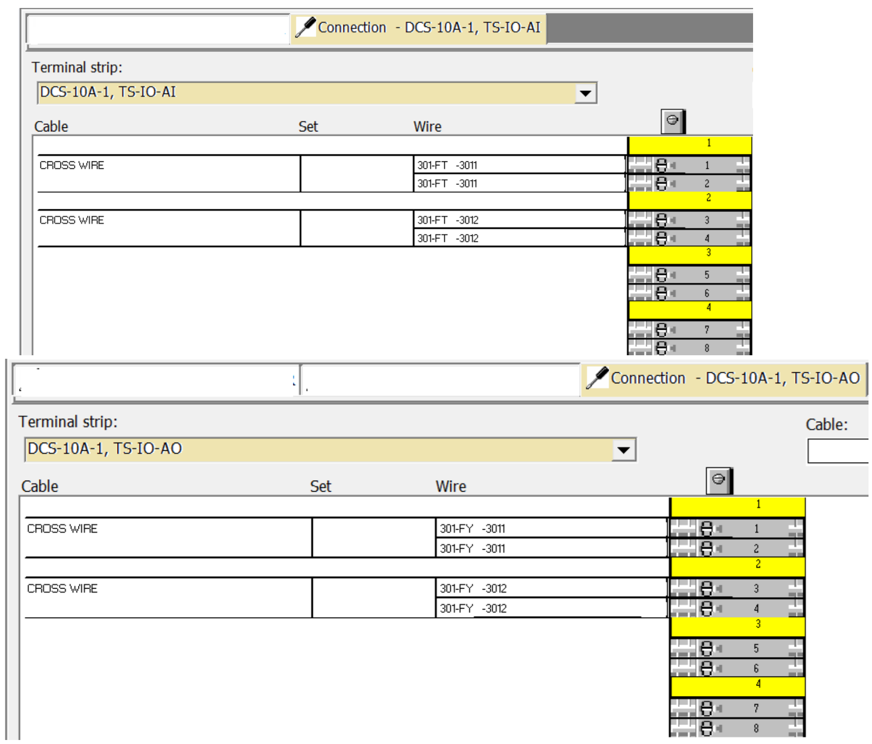


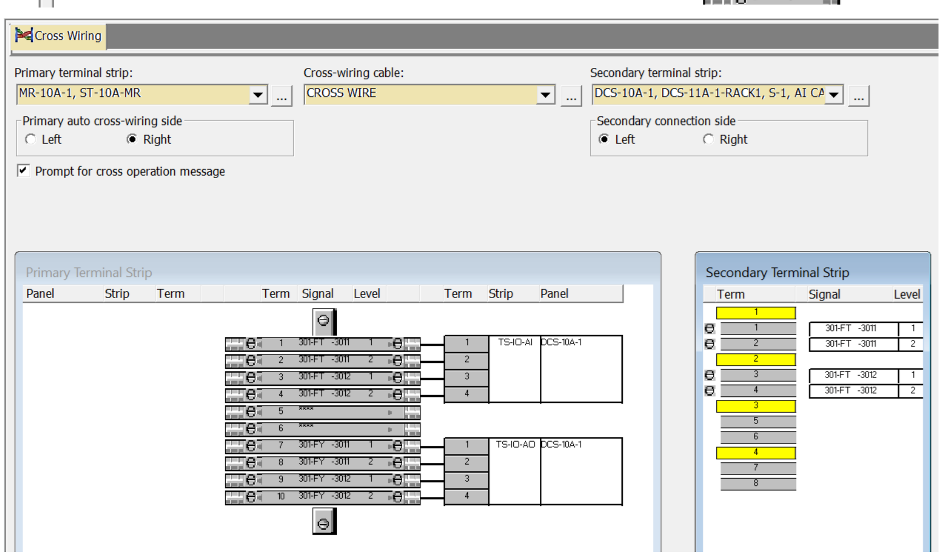
Cable	Set	Wire	Terminal	Wire	Set	Cable
C-301-FT -3011	SET-1	301-FT -3011 +	1	301-FT -3011	SET1	5 PAIRS - 301-F-3011-12
		301-FT -3011 -	2	301-FT -3011		
C-301-FT -3012	SET-1	301-FT -3012 +	3	301-FT -3012	SET2	
		301-FT -3012 -	4	301-FT -3012		
			5	SPARE	SET3	
			6	SPARE		
C-301-FY -3011	SET-1	301-FY -3011 +	7	301-FY -3011	SET4	
		301-FY -3011 -	8	301-FY -3011		
C-301-FY -3012	SET-1	301-FY -3012 +	9	301-FY -3012	SET5	
		301-FY -3012 -	10	301-FY -3012		

Multi-Cable from the Junction Box to the MR and C.W from the MR to the DCS

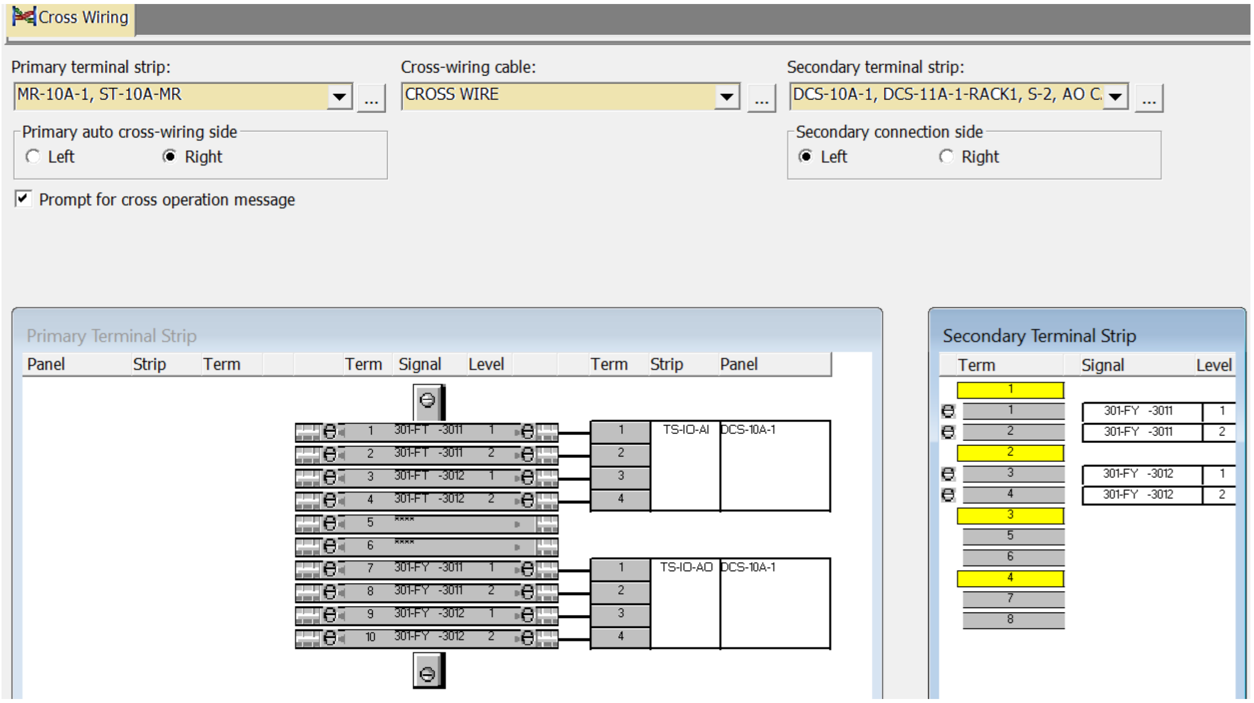


C.W to the DCS from the MR and view the C.W Window

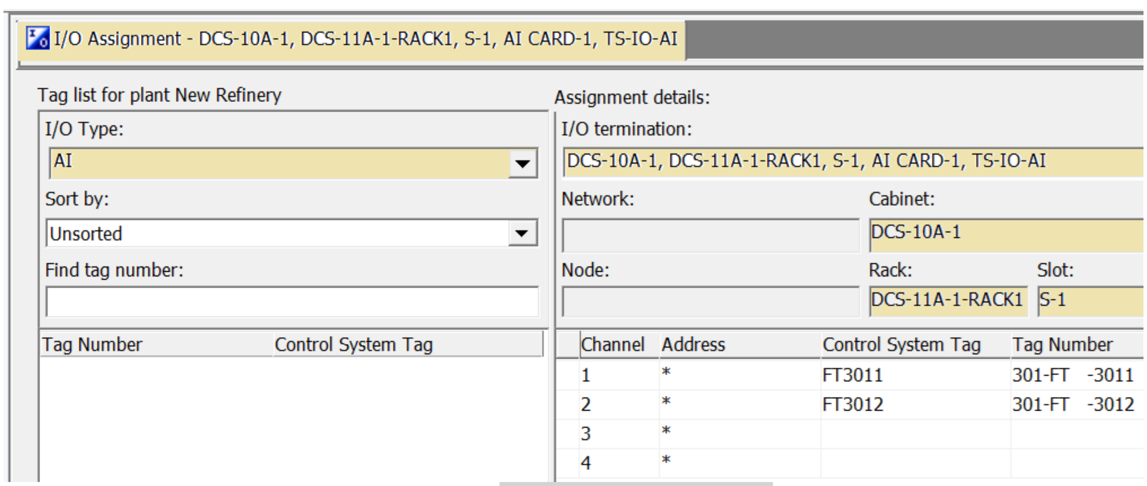




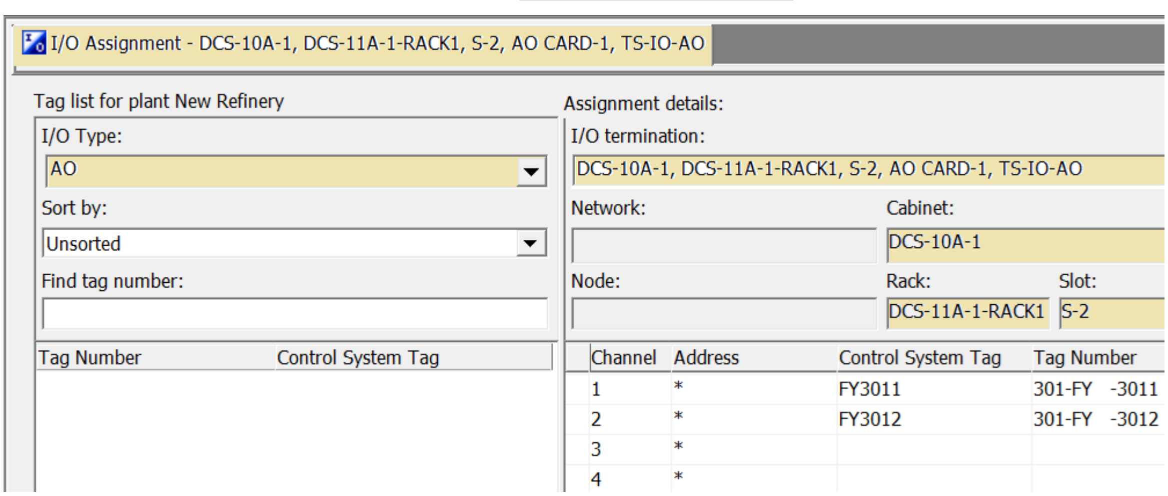
AO C.W



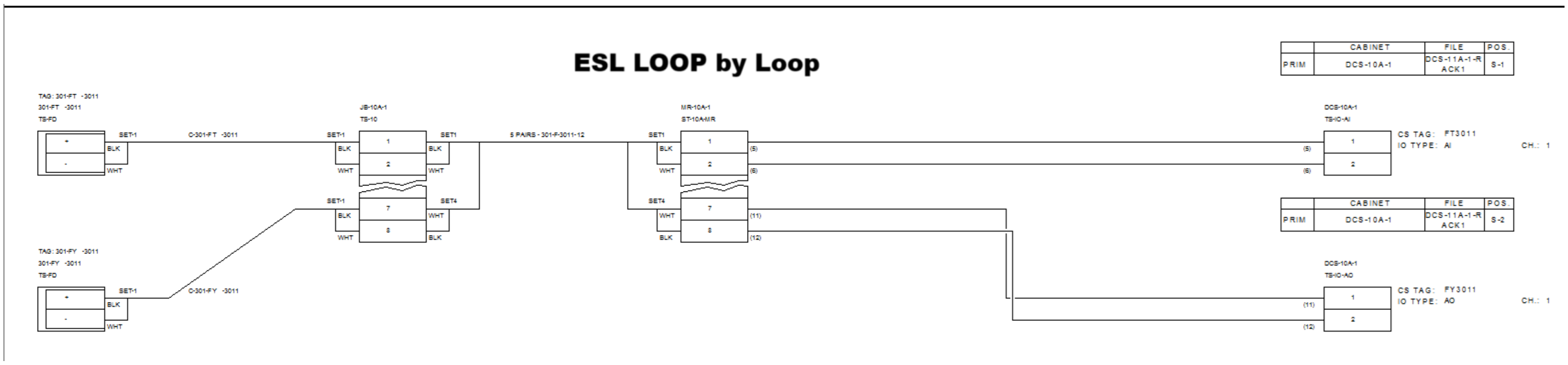
AI I/O Assignment

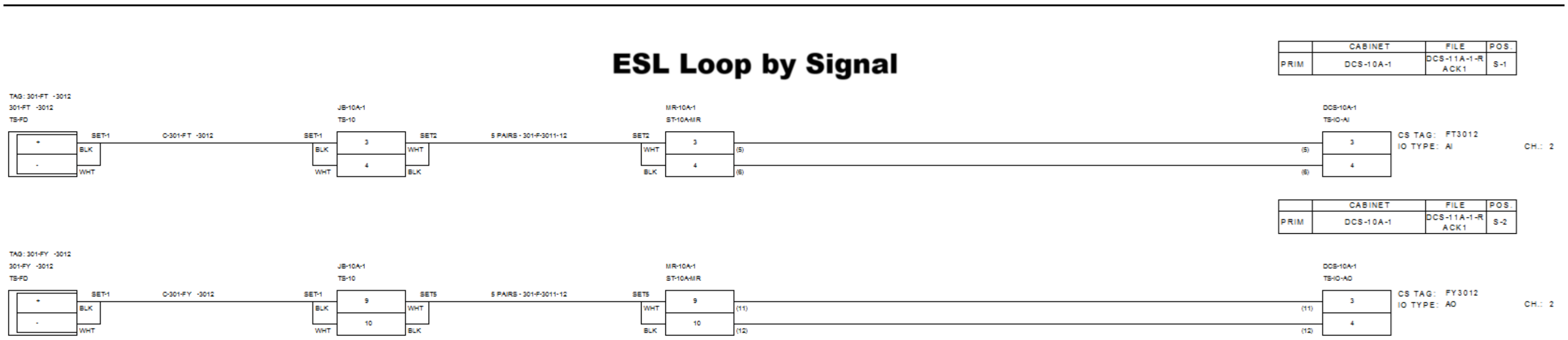


AO I/O Assignment



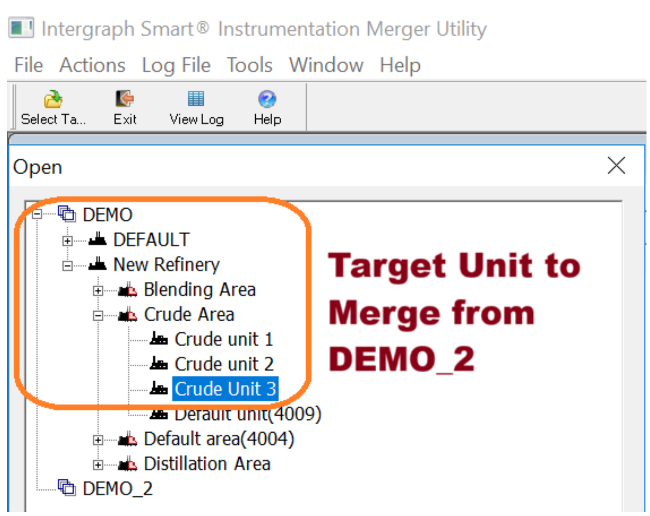
ESL Loop by Loop & by Signal



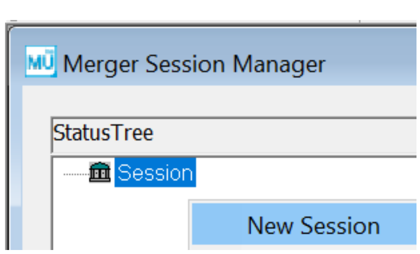


Merge Process (step-by-step)

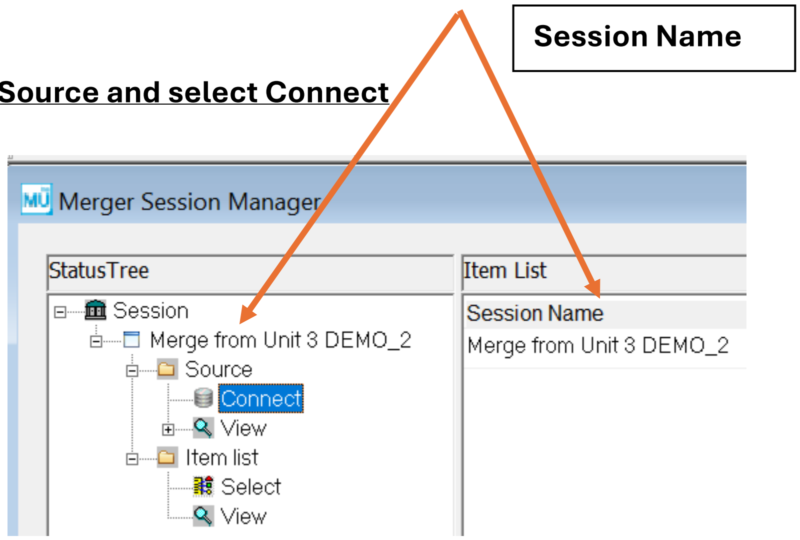
1) Login in the SI Merger Utility to the Target SI DEMO Domain – Crude Unit 3



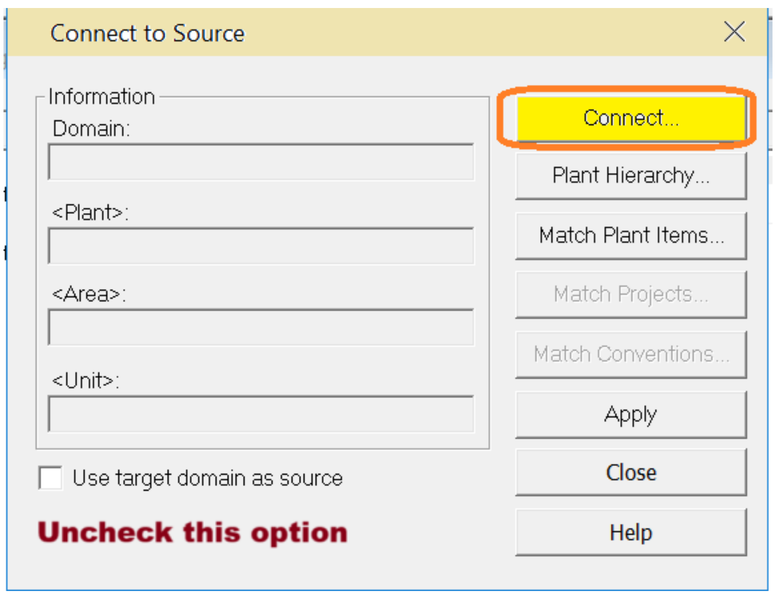
2) Create a new Session and give it a Name for the Merge



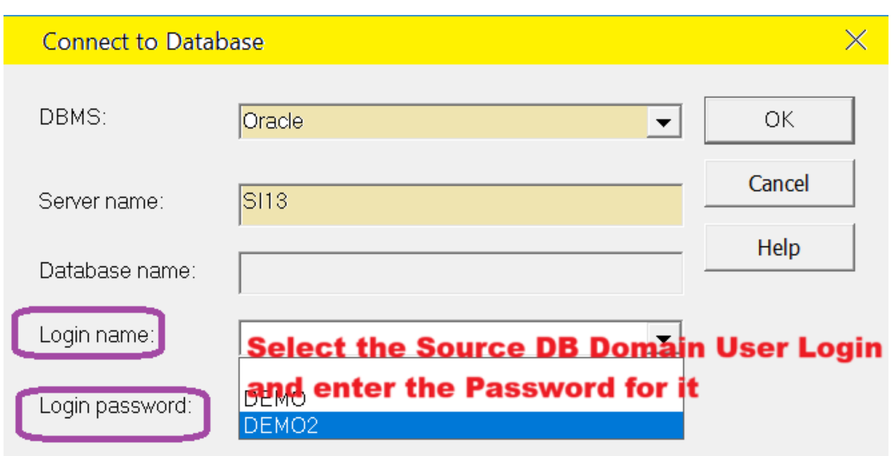
3) **<u>Expand Source and select Connect</u>**

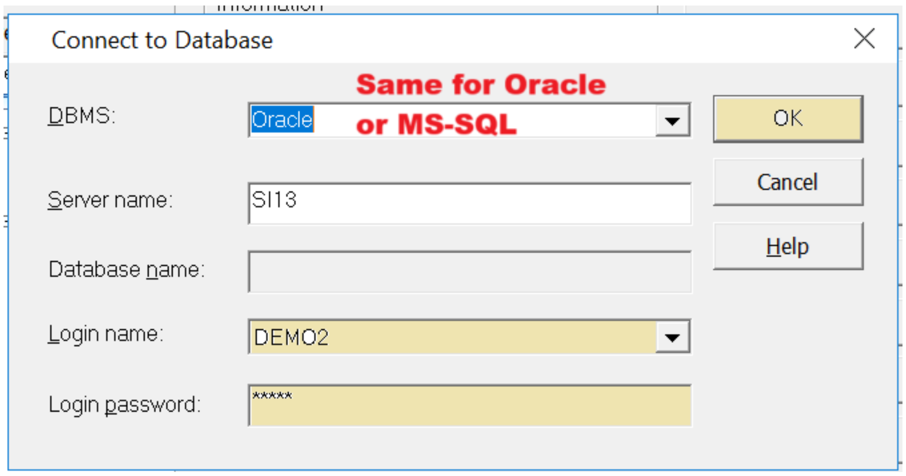


4) **<u>Uncheck [] Use Target Domain as Source and click Connect</u>**

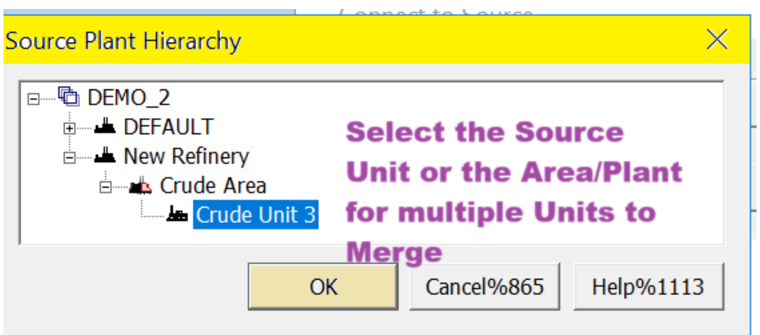


5) **<u>Select DBMS, Fill Server name / Login name / Login Password, whatever not comes out automatically</u>**

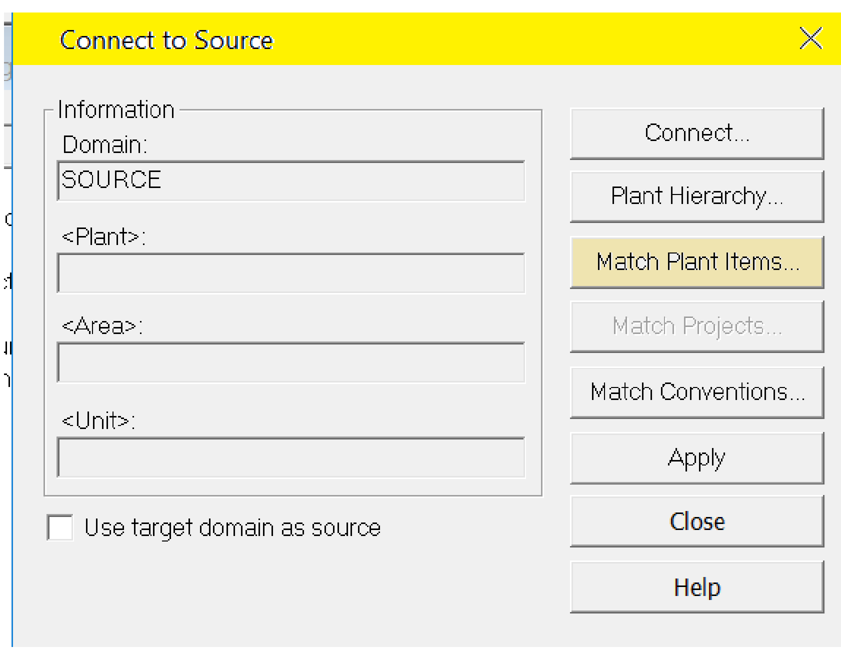


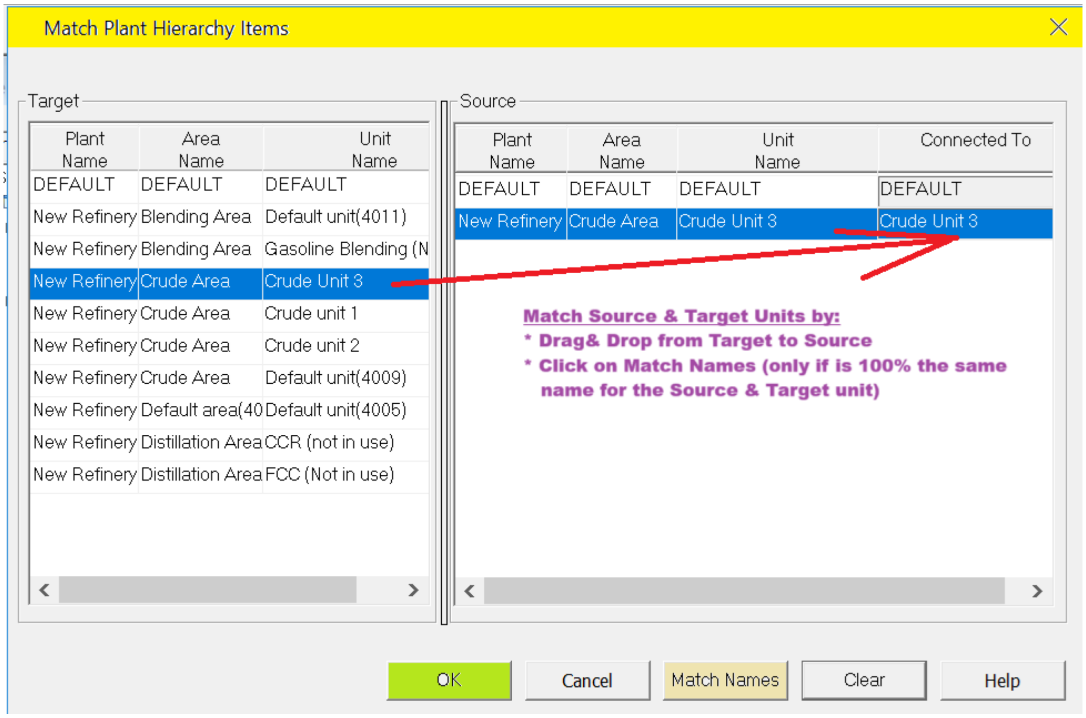


6) **Select the source Unit or the Source Plant/Area for Multiple Units to be Merged and hit OK**

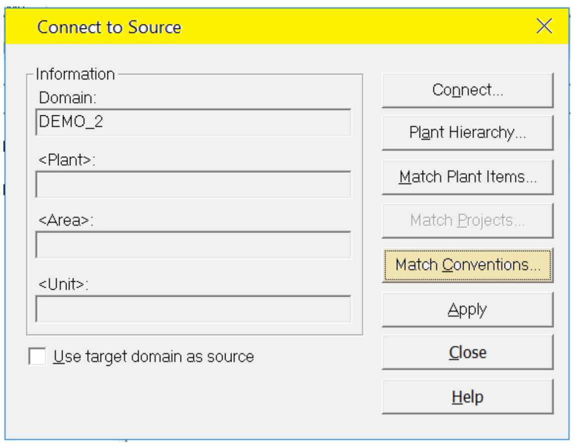


7) **Select Match Plant items - Select the Target Unit to Merge into it and the Source Unit to Merge from it**
Can be done multiple Units match selection by Drag&Drop / Match Names option and hit OK

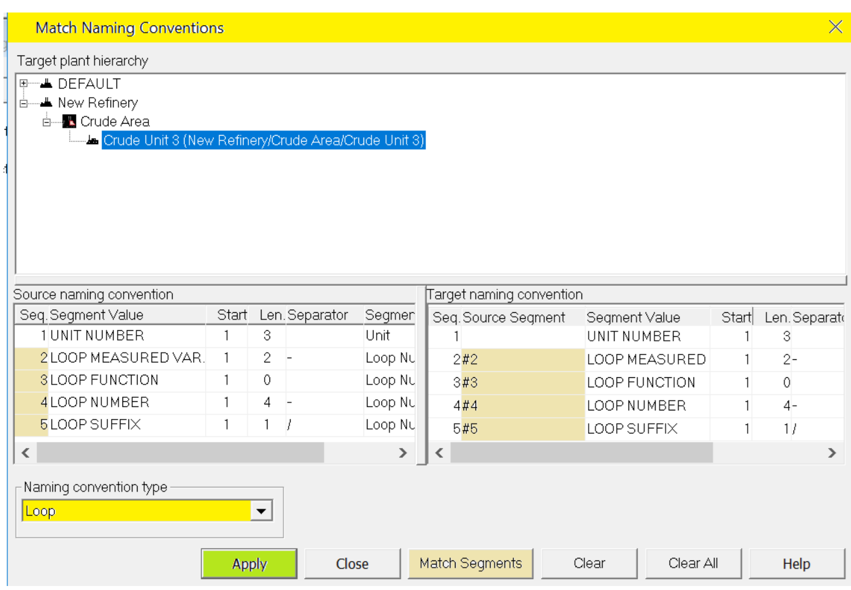


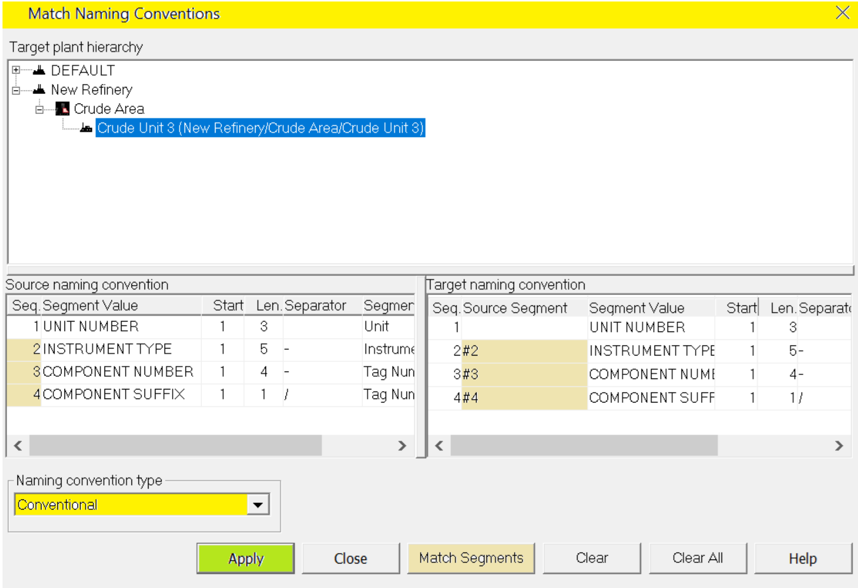


8) **Select Match Conventions to Map the Source & Target Loops & Instrument Naming Conventions as min + other Items if have Naming Convention and hit OK**

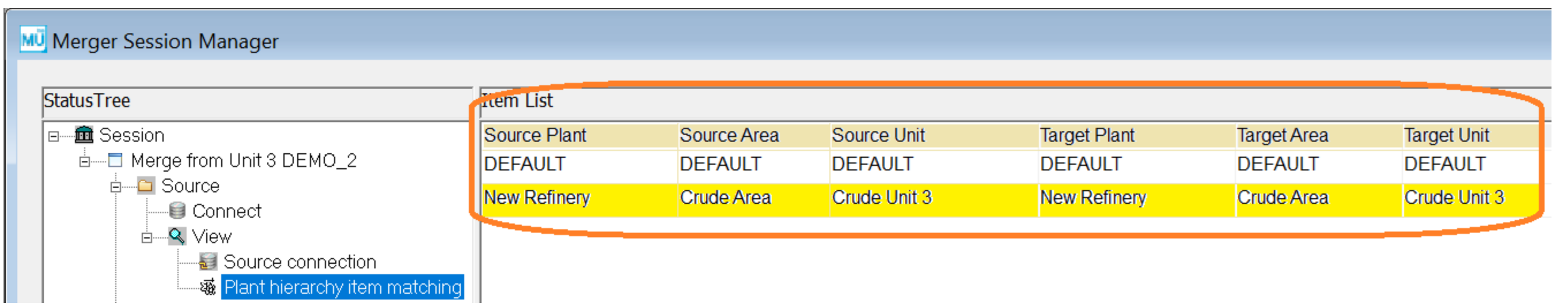


9) **Match NC for the Loop & Instrument (Match Segments option or Drag&Drop) & hit Apply & Close when done & hit Apply again to close the current Window to return to the main Merger Window**

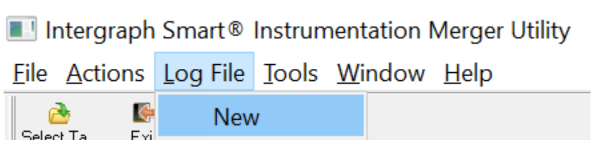




10) Select View → Plant Hierarchy item matching to see & Verify the Units match

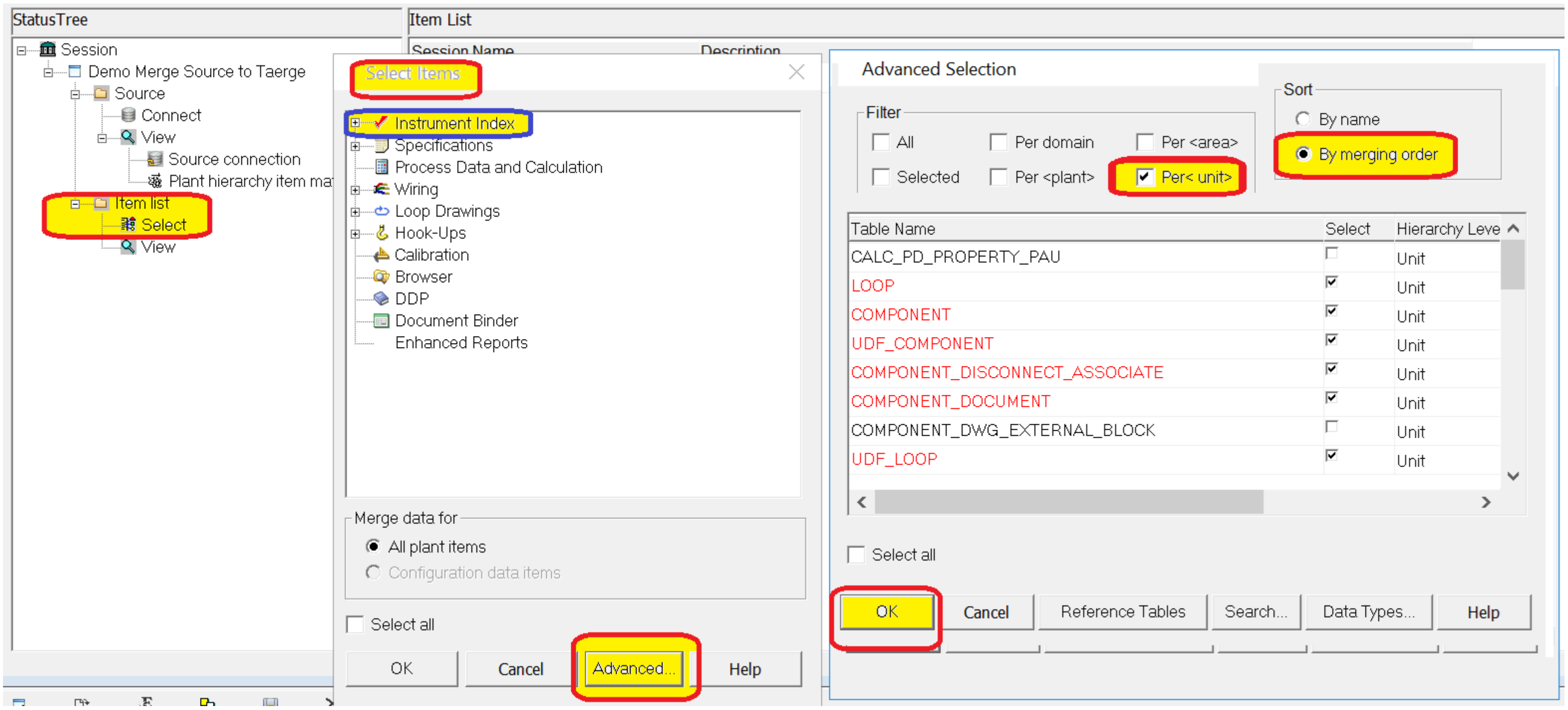


11) For the following Merge options (depending of the Data needed to Merge), a LOG file should be defined (Log File Menu → New → Need to give it a name& Folder Location (Recommended one (1) LOG per every Merge)

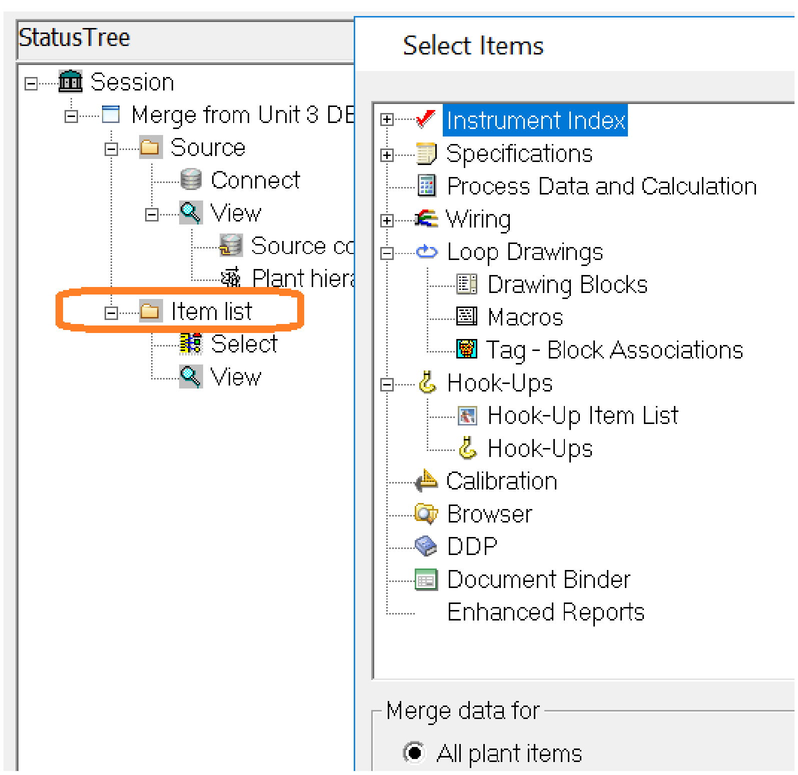


12) LOG file must be viewed once a Merge is complete → Must look for Rejected Rows → Need to fix what is broken and run the Merge again

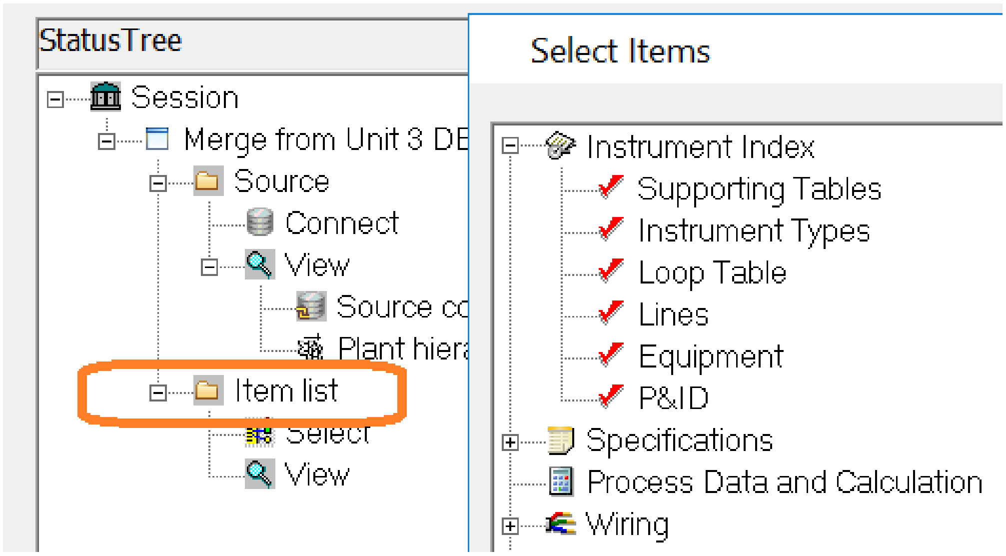
13) **[could be on the specific Item(s), there is an option to run by selected SI Tables but this is only if the one who runs the Merge is 100% familiar with the SI Tables& Relations]**



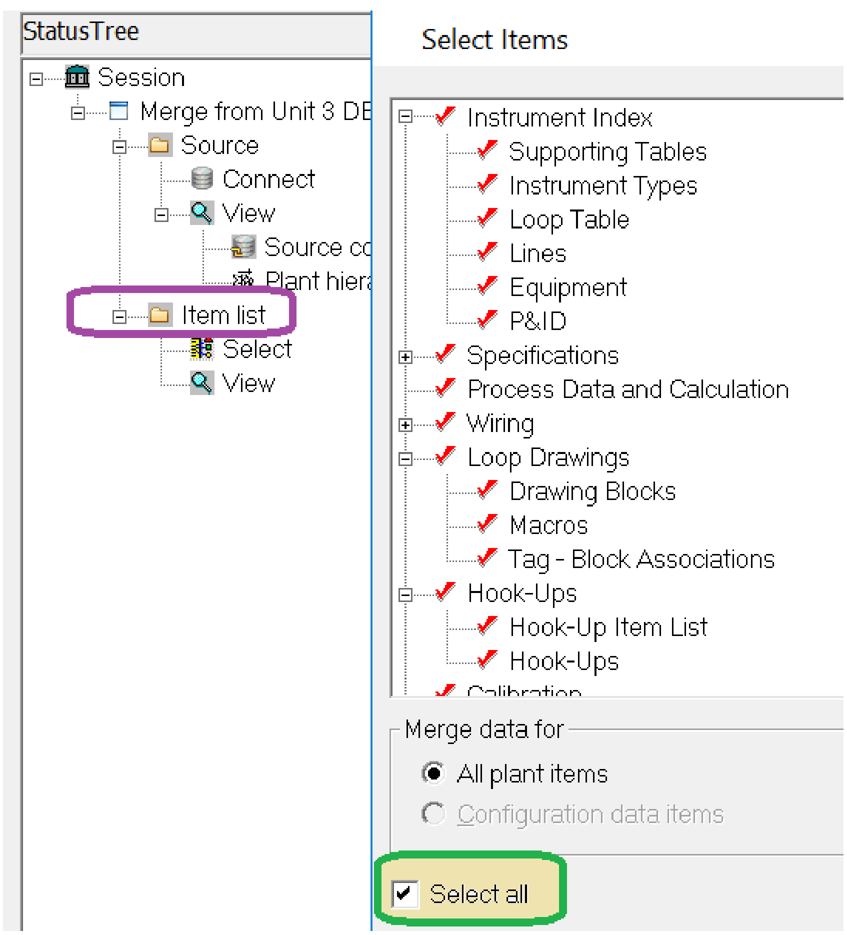
14) **1st option to Merge – Click on Items List and select a SI Module(s) by click on it → OK → Merge**



2nd option to Merge – Click on Items List and select SI Module(s) items by click on them → OK → Merge

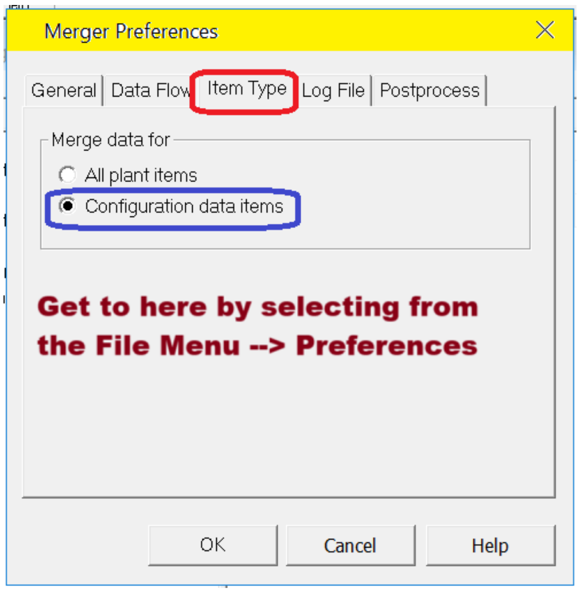


3RD option to Merge – Click on Items List and select All Items → OK → Merge

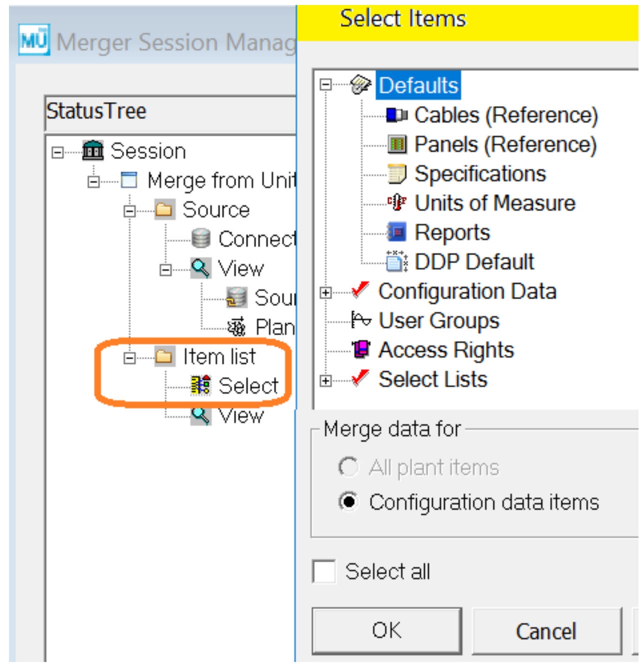


4th option to Merge – Merge Configuration Data only (Supporting Tables / Reference Data etc…) → select Items from the Item List → OK → Merge

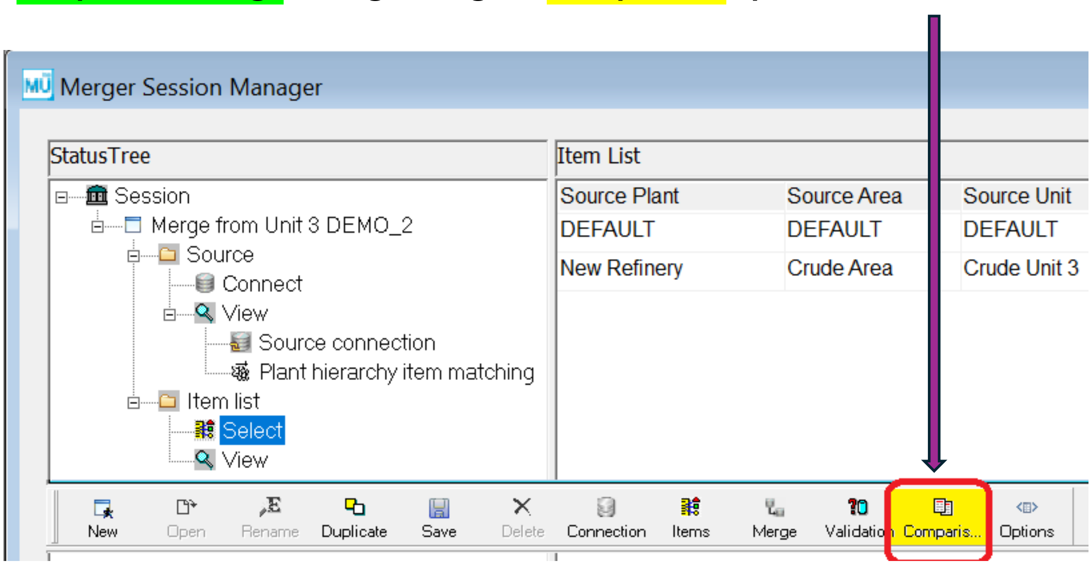
Select the Item Type from the Preferences in the Merge Menu → Select (*) Configuration Data Items



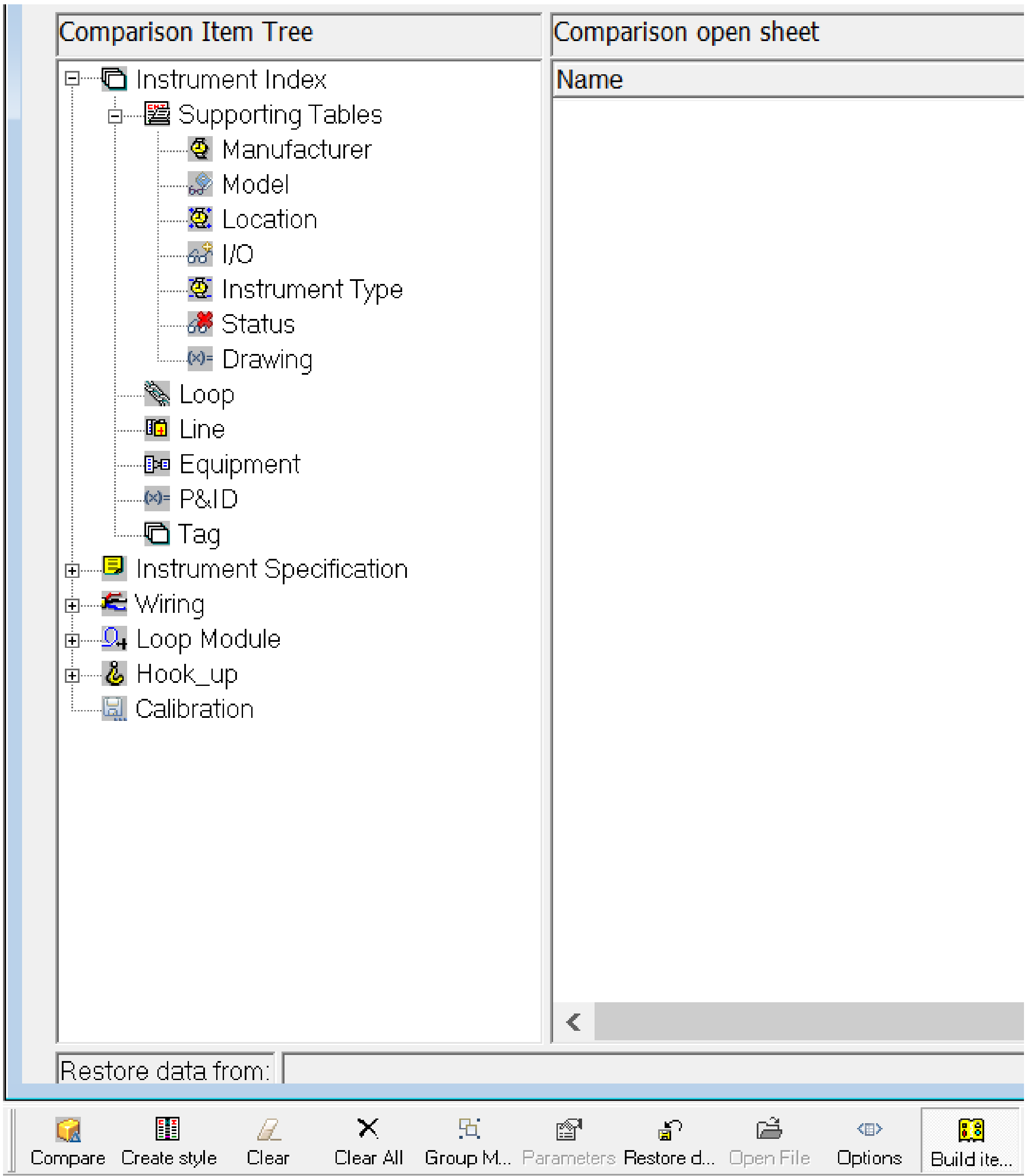
Select the required Items → OK → Merge



5th option to Merge – Merge using the Comparison option → Click on it

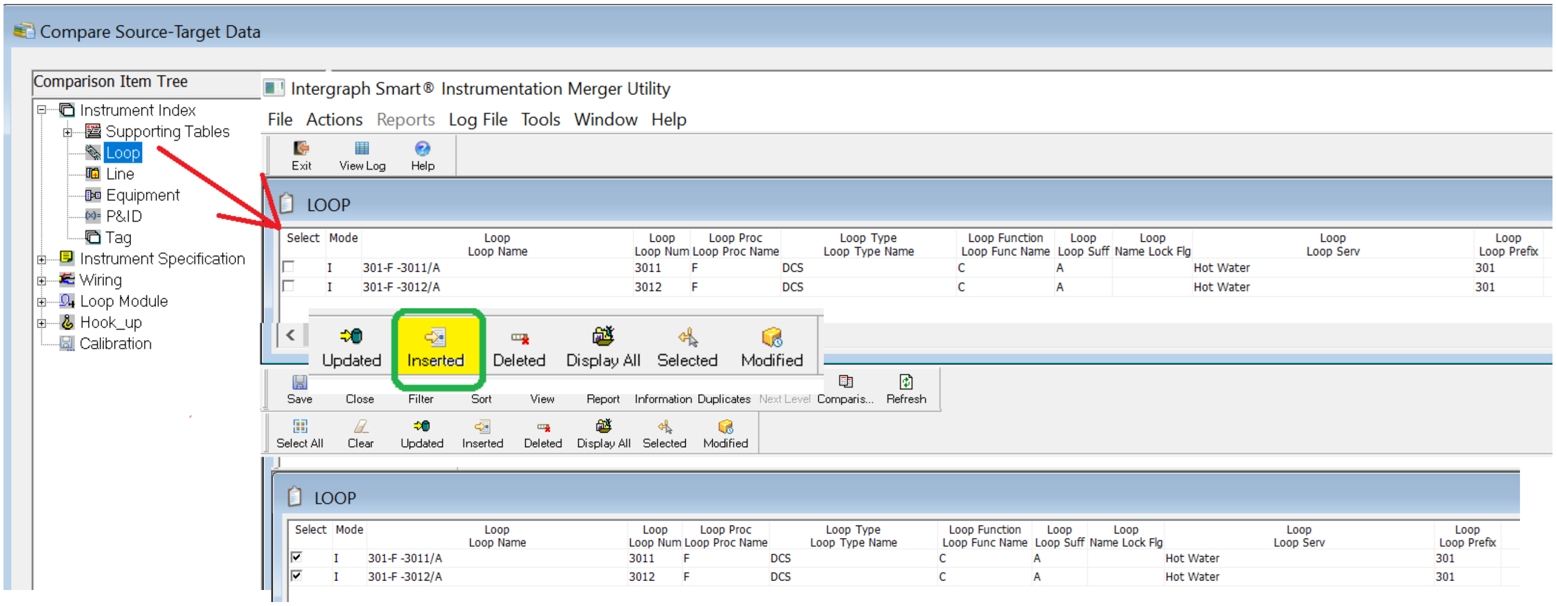


- **Comparison Tree with All SI Items (Module & Module items) will be shown**

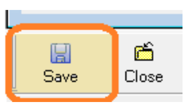


- **Comparison examples** Merge for SI **Loop + Instrument + Panels + Cables**

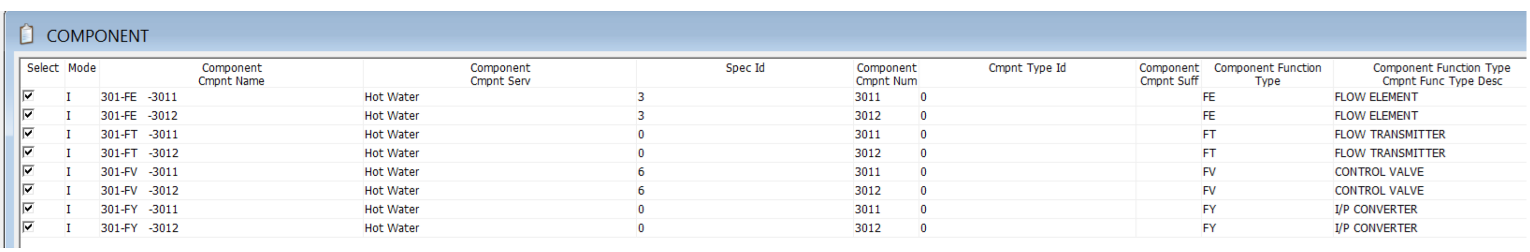
Loops – click on the Loop item in the Comparison Tree



Click: Save



Instruments – click on the Tag item in the Comparison Tree



COMPONENT

Select	Mode	Component Cmpnt Name	Component Cmpnt Serv	Spec Id	Component Cmpnt Num	Cmpnt Type Id	Component Cmpnt Suff	Component Function Type	Component Function Type Cmpnt Func Type Desc
☑	I	301-FE -3011	Hot Water	3	3011	0		FE	FLOW ELEMENT
☑	I	301-FE -3012	Hot Water	3	3012	0		FE	FLOW ELEMENT
☑	I	301-FT -3011	Hot Water	0	3011	0		FT	FLOW TRANSMITTER
☑	I	301-FT -3012	Hot Water	0	3012	0		FT	FLOW TRANSMITTER
☑	I	301-FV -3011	Hot Water	6	3011	0		FV	CONTROL VALVE
☑	I	301-FV -3012	Hot Water	6	3012	0		FV	CONTROL VALVE
☑	I	301-FY -3011	Hot Water	0	3011	0		FY	I/P CONVERTER
☑	I	301-FY -3012	Hot Water	0	3012	0		FY	I/P CONVERTER

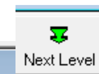
Click inserted – Selected – Save

Panels – click on the item

PANEL (Project)

Select	Mode	Panel Panel Name
☑	I	301-FT -3011
☑	I	301-FT -3012
☑	I	301-FY -3011
☑	I	301-FY -3012
☑	I	DCS-10A-1
☑	I	JB-10A-1
☑	I	MR-10A-1

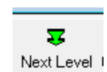
Click inserted – Selected – Next Level (will go to the Strips)



PANEL STRIP (Project)

Select	Mode	Panel Panel Name	Strip Mfr Strip Mfr Name	Strip Mfr Mod Strip Mod Name	Strip Type Strip Type Name	Panel Strip Strip Name
☑	I	301-FT -3011				TS-FD
☑	I	301-FT -3012				TS-FD
☑	I	301-FY -3011				TS-FD
☑	I	301-FY -3012				TS-FD
☑	I	DCS-10A-1				TS-IO-AI
☑	I	DCS-10A-1				TS-IO-AO
☑	I	JB-10A-1				TS-10
☑	I	MR-10A-1				ST-10A-MR

Click inserted – Selected – Next Level (will go to the Terminals)



PANEL STRIP TERM (Project)

Select	Mode	Panel Panel Name	Panel Strip Strip Name	Term Seq	Panel Strip Term Term Num
☑	I	301-FT -3011	TS-FD	1	+
☑	I	301-FT -3011	TS-FD	2	-
☑	I	301-FT -3012	TS-FD	1	+
☑	I	301-FT -3012	TS-FD	2	-
☑	I	301-FY -3011	TS-FD	1	+
☑	I	301-FY -3011	TS-FD	2	-
☑	I	301-FY -3012	TS-FD	1	+
☑	I	301-FY -3012	TS-FD	2	-
☑	I	DCS-10A-1	TS-IO-AI	1	1
☑	I	DCS-10A-1	TS-IO-AI	2	2
☑	I	DCS-10A-1	TS-IO-AI	3	3
☑	I	DCS-10A-1	TS-IO-AI	4	4
☑	I	DCS-10A-1	TS-IO-AI	5	5
☑	I	DCS-10A-1	TS-IO-AI	6	6
☑	I	DCS-10A-1	TS-IO-AI	7	7
☑	I	DCS-10A-1	TS-IO-AI	8	8
☑	I	DCS-10A-1	TS-IO-AO	1	1
☑	I	DCS-10A-1	TS-IO-AO	2	2
☑	I	DCS-10A-1	TS-IO-AO	3	3
☑	I	DCS-10A-1	TS-IO-AO	4	4
☑	I	DCS-10A-1	TS-IO-AO	5	5
☑	I	DCS-10A-1	TS-IO-AO	6	6
☑	I	DCS-10A-1	TS-IO-AO	7	7
☑	I	DCS-10A-1	TS-IO-AO	8	8
☑	I	JB-10A-1	TS-10	1	1
☑	I	JB-10A-1	TS-10	2	2
☑	I	JB-10A-1	TS-10	3	3
☑	I	JB-10A-1	TS-10	4	4
☑	I	JB-10A-1	TS-10	5	5

Click inserted – Selected – Save (Terminals) → Save again (Strips) → Save again (Panels)

Cables – click on the item

CABLE (Project)

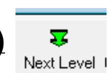
Select	Mode	Cable Cable Num	Cable Mfr Cable Mfr Name	Cable Mfr Mod Cable Mod Name	Cable Length	Cable Cable Desc	Cable Type Cable Type Name
☑	I	5 PAIRS - 301-F-3011-12			0	For Loops 301-F-3011-12	
☑	I	C-301-FT -3011			0		Type A
☑	I	C-301-FT -3012			0		Type A
☑	I	C-301-FY -3011			0		Type A
☑	I	C-301-FY -3012			0		Type A

Click inserted – Selected – Next Level (will go to the Sets)

CABLE SET (Project)

Select	Mode	Cable Cable Num	Cable Set Seq	Cable Set Cable Set Name	Cable Set Landing Side	Landing Seq	Landing Type Landing Type Name	Cable Set Def Flg
☑	I	5 PAIRS - 301-F-3011-12	1	SET1	L	0	2 In a row	N
☑	I	5 PAIRS - 301-F-3011-12	2	SET2	L	0	2 In a row	N
☑	I	5 PAIRS - 301-F-3011-12	3	SET3	L	0	2 In a row	N
☑	I	5 PAIRS - 301-F-3011-12	4	SET4	L	0	2 In a row	N
☑	I	5 PAIRS - 301-F-3011-12	5	SET5	L	0	2 In a row	N
☑	I	C-301-FT -3011	1	SET-1	L	0	2 In a row	N
☑	I	C-301-FT -3012	1	SET-1	L	0	2 In a row	N
☑	I	C-301-FY -3011	1	SET-1	L	0	2 In a row	N
☑	I	C-301-FY -3012	1	SET-1	L	0	2 In a row	N

Click inserted – Selected – Next Level (will go to the Wires)



WIRE (Project)

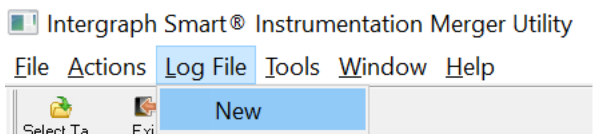
Select	Mode	Cable Cable Num	Cable Set Seq	Wire Type Wire Type Name	Wire Color Wire Color Name	Wire Wire Tag	
☑	I	5 PAIRS - 301-F-3011-12	1		BLK	301-FT -3011	1
☑	I	5 PAIRS - 301-F-3011-12	1		WHT	301-FT -3011	2
☑	I	5 PAIRS - 301-F-3011-12	2		WHT	301-FT -3012	1
☑	I	5 PAIRS - 301-F-3011-12	2		BLK	301-FT -3012	2
☑	I	5 PAIRS - 301-F-3011-12	3		WHT	SPARE	1
☑	I	5 PAIRS - 301-F-3011-12	3		BLK	SPARE	2
☑	I	5 PAIRS - 301-F-3011-12	4		WHT	301-FY -3011	1
☑	I	5 PAIRS - 301-F-3011-12	4		BLK	301-FY -3011	2
☑	I	5 PAIRS - 301-F-3011-12	5		WHT	301-FY -3012	1
☑	I	5 PAIRS - 301-F-3011-12	5		BLK	301-FY -3012	2
☑	I	C-301-FT -3011	1		BLK	301-FT -3011	1
☑	I	C-301-FT -3011	1		WHT	301-FT -3011	2
☑	I	C-301-FT -3012	1		BLK	301-FT -3012	1
☑	I	C-301-FT -3012	1		WHT	301-FT -3012	2
☑	I	C-301-FY -3011	1		BLK	301-FY -3011	1
☑	I	C-301-FY -3011	1		WHT	301-FY -3011	2
☑	I	C-301-FY -3012	1		BLK	301-FY -3012	1
☑	I	C-301-FY -3012	1		WHT	301-FY -3012	2

Click inserted – Selected – Save (Wires) → Save again (Sets) → Save again (Cables)

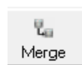
- **Repeat the same steps in the Comparison option for All required Items to be Merged**

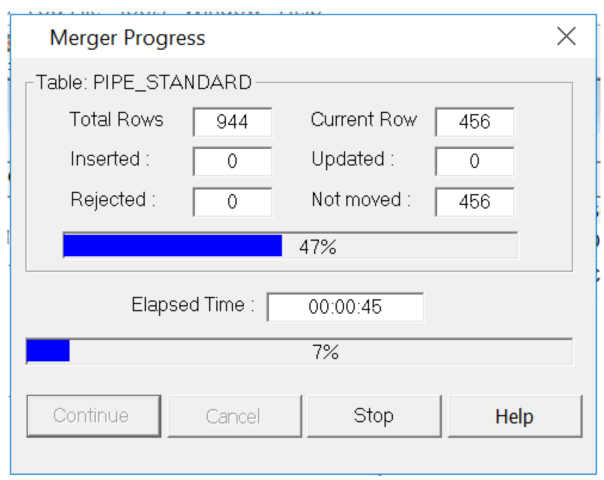
- **When done, click the Save icon in the Comparison screen To return to the main Merge screen**

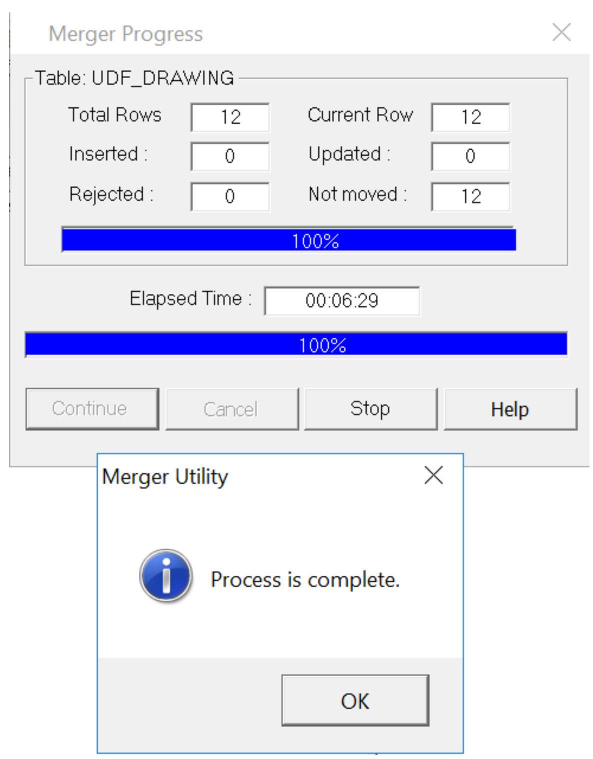
- **Define a new LOG file for the Merge process**



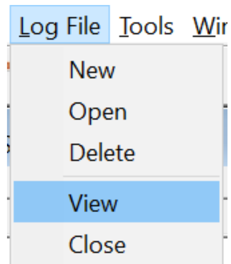
- **Click on the Merge Icon & hold the Bible in one hand & Pray**





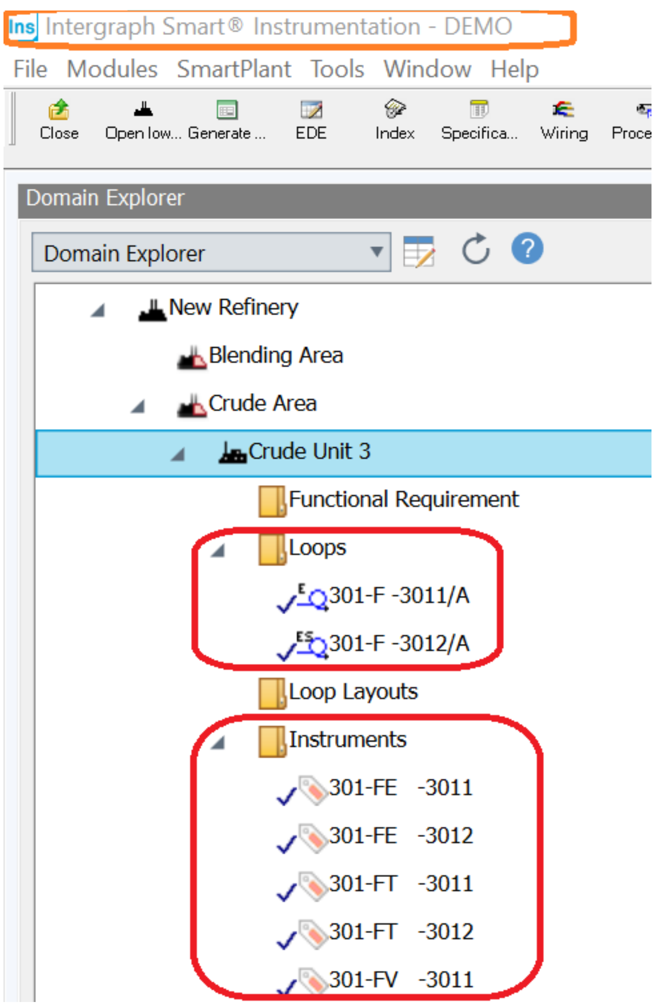


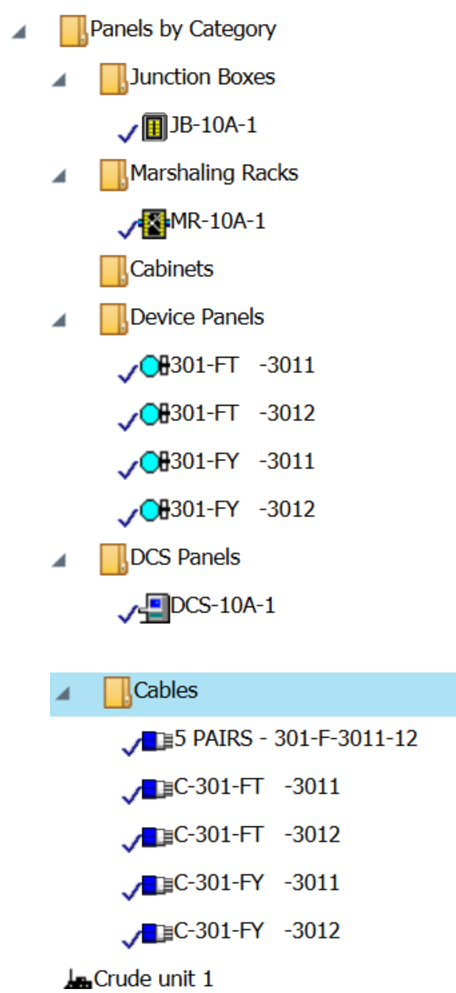
- **View the LOG file for issues (Rejected items)**

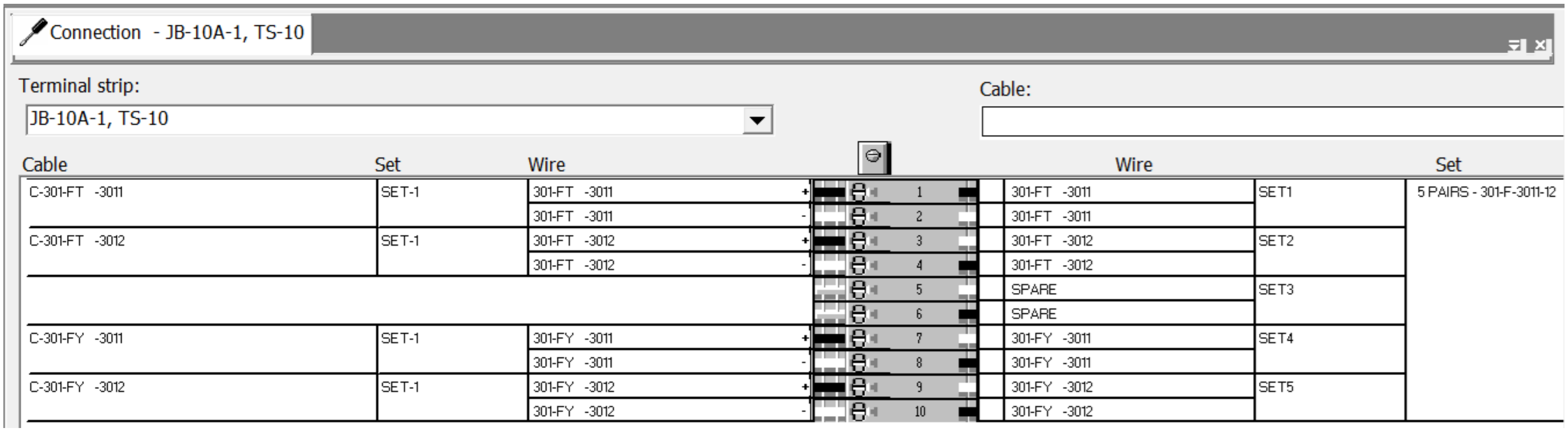


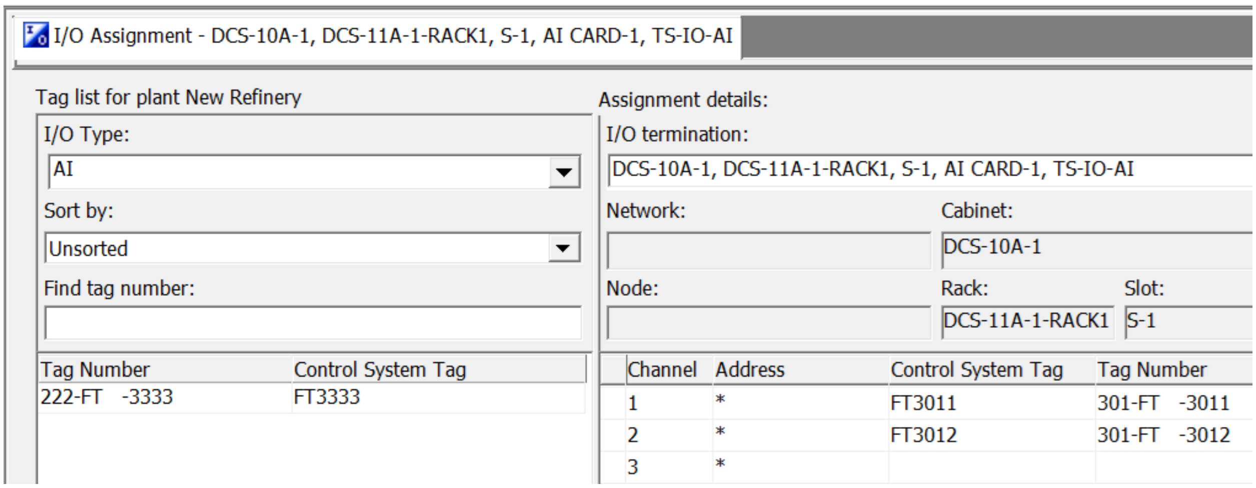
Rejected Rows: 0 (Optimal: No Rejected items were found)

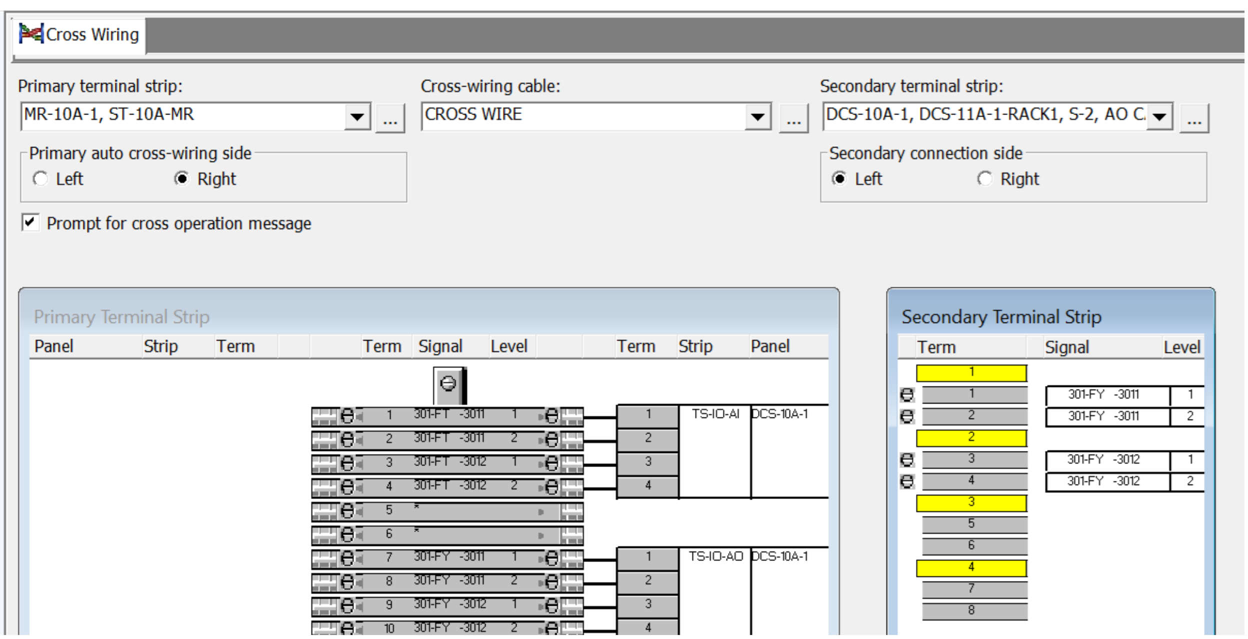
- **View the SI DEMO Target Domain – Crude Unit 3 for the Merge results**

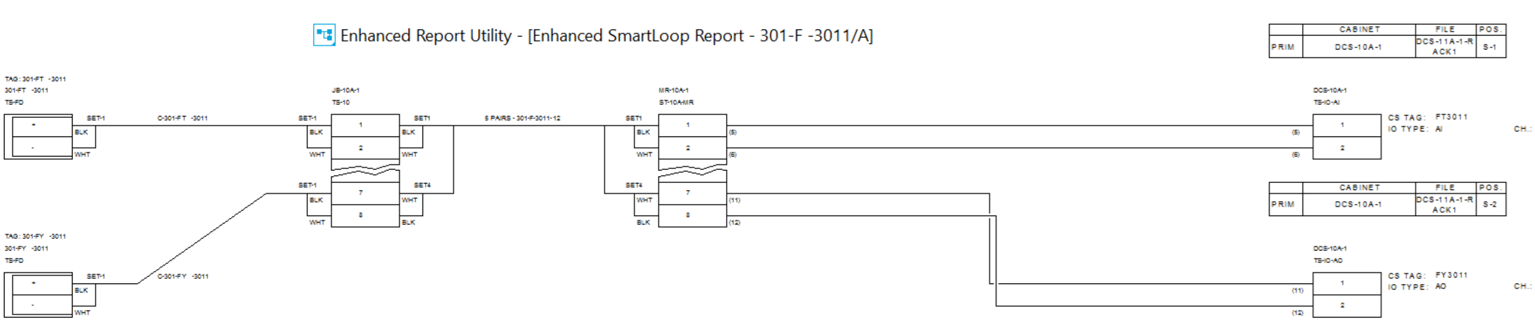





Connection - JB-10A-1, TS-10
Terminal strip:
JB-10A-1, TS-10
Cable:
Cable
Set
Wire
Wire
Set
C-301-FT -3011
SET-1
301-FT -3011
C-301-FT -3012
C-301-FY -3011
C-301-FY -3012
SPARE
SET1
SET2
SET3
SET4
SET5
5 PAIRS - 301-F-3011-12


I/O Assignment - DCS-10A-1, DCS-11A-1-RACK1, S-1, AI CARD-1, TS-IO-AI
Tag list for plant New Refinery
I/O Type:
AI
Sort by:
Unsorted
Find tag number:
Tag Number
Control System Tag
222-FT -3333
FT3333
Assignment details:
I/O termination:
DCS-10A-1, DCS-11A-1-RACK1, S-1, AI CARD-1, TS-IO-AI
Network:
Cabinet:
DCS-10A-1
Node:
Rack:
DCS-11A-1-RACK1
Slot:
S-1
Channel
Address
Control System Tag
Tag Number
FT3011
301-FT -3011
FT3012
301-FT -3012


Cross Wiring
Primary terminal strip:
MR-10A-1, ST-10A-MR
Cross-wiring cable:
CROSS WIRE
Secondary terminal strip:
DCS-10A-1, DCS-11A-1-RACK1, S-2, AO C.
Primary auto cross-wiring side
Left
Right
Secondary connection side
Left
Right
Prompt for cross operation message
Primary Terminal Strip
Panel
Strip
Term
Term
Signal
Level
Term
Strip
Panel
301-FT -3011
301-FT -3012
301-FY -3011
301-FY -3012
TS-IO-AI
DCS-10A-1
TS-IO-AO
Secondary Terminal Strip
Term
Signal
Level


Enhanced Report Utility - [Enhanced SmartLoop Report - 301-F -3011/A]
CABINET
FILE
POS.
PRIM
DCS-10A-1
DCS-11A-1-RACK1
S-1
S-2
C-301-FT -3011
C-301-FY -3011
5 PAIRS - 301-F-3011-12
CS TAG: FT3011
IO TYPE: AI
CS TAG: FY3011
IO TYPE: AO

It seems

a good

Merge