PROCESS CONTROL LAB MANUAL

TRAINING 1: Implement Valmet Template to generate I/Os system and logic (Analogue Output) 1. To open a template, change the workspace setting from repository to templates and browse to TRESLIB. Browse AMS for analogue output templates.

🞯 DNA Explorer - [[EAS1] - Process Ar	a Hierarchy - Workspace <templates> - Application Engineer]</templates>	– 🗆 X
Object <u>E</u> dit <u>V</u> iew Design Upload	Download Logs <u>W</u> indow <u>H</u> elp	
DNA Explorer	💷 🖻 🕗 🚱 🔍 😭	templates R Repository
JB2_U2_PROCESS_MODEL	Identifier 🗠 Name	Cate Default Workspace
DB3_U3_PROCESS_MODEL	A00 AM Basic without IO	Functemplates
10 JB4_U4_PROCESS_MODEL	🗉 🖅 A00_00 Adjustable AM	Function Block Diagrar
Not Categorized	■ I A00_STA Running time counter with start and stop count	Function Block Diagrar
🛨 🦳 System Modules	🗉 🖅 A01 AM only one AOU	Function Block Diagrar
TRAINING1	🗉 🖅 A10 AM Basic model	Function Block Diagrar
	🔁 🖅 A10_HART HART Measurements	Function Block Diagrar
	🗉 🖅 A10AF Air flow flange	Function Block Diagrar
	A10CF Condensate flow, flange	Function Block Diagrar
	A10D Limits with delay and hyst	Function Block Diagrar
	A10D_00 Limits with delay and hyst	Function Block Diagrar
	Image: A10FI FI Cycle Time Measurement	Function Block Diagrar
	🗉 🖅 A10FI_SSI 🛛 FI SSI Measurement	Function Block Diagrar
	A10Q Cons. with laboratycorrection	Function Block Diagrar
	🗉 🖅 A10SF Steam flow, flange	Function Block Diagrar 🗸
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2. Select the analogue output (AO) templates with desired parameters. In this example, choose A01 template. Double click to open.

纉 DNA Explorer - [[EAS1] - P	roces	ess Area Hierarchy - Works	space <templates> - Application Engineer] — 🛛</templates>	×
Object <u>E</u> dit <u>V</u> iew Design	Upl	pload/Download Logs	Window Help	
DNA Explo	orer	r 🎹	🔊 🖸 🔄 🖄 😭 🔍 🚆	templ
Interlockings	^	Identifier	/ Name	^
🕀 🛅 JB1_U1_PROCESS_MC	DI	⊞ ‡ 7] A00	AM Basic without IO	
🕀 🛅 JB2_U2_PROCESS_MC	DI	🗉 ‡ 7] A00_00	Adjustable AM	
🗄 🛅 JB3_U3_PROCESS_MC		🗉 🖅 A00_STA	Running time counter with start and stop o	ount
🗄 🛅 JB4_U4_PROCESS_MC	DI	🗉 🖅 A01	AM only one AOU	
Not Categorized		■ 17 A10	AM Basic model	
🗄 🛄 System Modules		D 410_HART	HART Measurements	
TRAINING1		🗉 🖅 A10AF	Air flow flange	
TRAINING2		⊞	Condensate flow, flange	
		🖽 📅 A10D	Limits with delay and hyst	
		🖽 📅 A10D_00	Limits with delay and hyst	
BINS	~		FI Cycle Time Measurement	~
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3. Create new AO application file. Template will be an application as soon as the template name changed. To change the parameter values, click Edit, then choose Design Members.



Parameters window will pop up. Default parameters are preferred except some that need to be changed according to the system requirement such as tag, I/O address and etc. For now, change the selected values to rename the template. Make sure that the changed values identify the respective I/O address.

identifier	Prompt	Value	- 1
S(DUMMY1)	LOOP		
\$(TAG)	TAG	A01	
S(TEMPLATE)	TEMPLATE	Aŭi	
\$(NAME20)	NAME TEXT 3(20char)	AM BASIC	
\$(PACKAGE)	PACKAGE	AP01	
\$(EXE)	EXE	900	
S(ORDER)	EXECUTION ORDER	65	
\$(CTRLROOM)	Control room identifier	A1	
\$(ALGROUP)	Alarm area (1-64)	11	
\$(ALPRI)	ALARM PRIORITY	700	
\$(GDID_1)	HIERARCHY CODE OF DISPL		
S(NAME14)	NAME TEXT 1(14char)		
\$(NAME40_1)	NAME40_1	AM only one AOU	
\$(NAME40_2)	NAME40_2		
\$(FDESCR)	INFO DISP HIERARCHY CODE		
\$(DECS)	NUMBER OF DECIMALS(0-5)	0	
\$(EXT_1)	Tag for output	#	
S(EXTTEXT_1)	Comment		
\$(DUMMY2)	DEVICE		
S(CARDTYPE1)	Outputcards type (AO4, AO4H, AOI4, AOI4H, AOU4, AOH4, AOU1)	A04	
(DEVICETAG1)	DEVICETAG1	A01c	
(DEVICETAGT:MIN)	MEASUREMENT MIN	U	
S(DEVICETAG1:MAX)	MEASUREMENT MAX	999	
		0/	

For example: analogue output at JB 2 using Channel 4. Software address = 2334. Then click OK.

Editing attributes ofDESIG	SNMEMBERS		×
Identifier	Prompt	Value	
S(DUMMY1)	I OOP		
\$(TAG)	TAG	JB2_A0_2334	7
S(TEMPLATE)	TEMPLATE	A01	
\$(NAME20)	NAME TEXT 3(20char)	JB2 AO CH4	
\$(PACKAGE)	PACKAGE	AP01	
\$(EXE)	EXE	900	
\$(ORDER)	EXECUTION ORDER	65	
\$(CTRLROOM)	Control room identifier	A1	
\$(ALGROUP)	Alarm area (1-64)	11	
\$(ALPRI)	ALARM PRIORITY	700	
\$(GDID_1)	HIERARCHY CODE OF DISPL		
\$(NAME14)	NAME TEXT 1(14char)		
\$(NAME40_1)	NAME40_1	JB2 AO CH4	
\$(NAME40_2)	NAME40_2		
\$(FDESCR)	INFO DISP HIERARCHY CODE		
\$(DECS)	NUMBER OF DECIMALS(0-5)	0	
\$(EXT_1)	Tag for output	#	
\$(EXTTEXT_1)	Comment		
\$(DUMMY2)	DEVICE		
S(CARDTYPE1)	Outputcards type (AO4, AO4H, AOI4, AOI4H, AOU4, AOH4, AOU1)	A04	
\$(DEVICETAG1)	DEVICETAG1	JB2_A0_2334	
\$(DEVICETAG1:MIN)	MEASUREMENT MIN	0	
\$(DEVICETAG1:MAX)	MEASUREMENT MAX	200	
\$(DEVICETAG1:UNIT)	UNIT OF MEAS VAL.(8char)	%	×
Show Formulas Function for	mula:	ehelp	
+ -	OK Cancel		//

4. Change the new application file I/O address. To change the address, click Edit and choose Values.

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Then, click the I/O address box.



A parameter selection window will pop up. Default values are in preferred in the window. Only change values in the red box according to the respective I/O address. Then, click OK.

······	Value								
utput module name	pr:JB2_A0_2334.0								
ard type	A04								
rcabinet									
BC slot (2-15)	-1								
C number (0-15)	-1								
ard place (0-15)	-1								
hannel number (0-3)	0								
inimum	ămi								
aximum	&ma								
ail safe change rate	0								
ail safe time	0								
ail safe value	0								
ail safe mode	0								
larm delay	25								
utput data range	0								
utput change rate	0								
dditional parameter									
utput fault control	0								
ne fault control	2								
cale and unit	0-200 %								
omment text									
Simulation parameters									
mulation Group	SIM1								
ashle simulation	1								

Prompt	Value	
Output module name	pr:JB2_A0_2334.0	
Card type	A04	
O cabinet		
FBC slot (2-15)	2 FBC	
BC number (0-15)	³ IBC 2 (Rack 2)	
Card place (0-15)	³ Card AO	
Channel number (0-3)	4 Channel 4	
Minimum	&mi	
Maximum	&ma	
Fail safe change rate	0	
Fail safe time	0	
Fail safe value	0	
Fail safe mode	0	
Alarm delay	25	
Output data range	0	
Output change rate	0	
Additional parameter	-	
Output fault control	0	
Line fault control	2	
Scale and unit	0-200 %	
Comment text		
Simulation parameters		
Simulation Group	SIM1	
Enable simulation	1	

5. Change the new application file process area. To change the process area, click Edit and choose Values.

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Then, click the department box.

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Parameters window will pop up. Change the process area from TRESLIB-BINS to TRAINING1. Then click OK.

Prompt	Value
.OOP TAG	JB2_A0_2334
.OOP NAME (FIELD 1)	JB2 AO CH4
.OOP NAME (FIELD 2)	
.00P STATUS	complete
IAME OF PLANNER	A01
ATE OF PLANNING	11-05-01 12:00
IAME OF MODIFIER	treslib
ATE OF MODIFICATION	12-02-10 14:03
ROCESS AREA 1	TRESLIB
ROCESS AREA 2	AMS
PROCESS AREA 3	
PROCESS AREA 4	
Show Formulas Euloction formula:	Typehelp

Prompt	Value
OOP TAG	JB2_A0_2334
OOP NAME (FIELD 1)	JB2 AO CH4
OOP NAME (FIELD 2)	
OOP STATUS	complete
IAME OF PLANNER	A01
ATE OF PLANNING	11-05-01 12:00
IAME OF MODIFIER	treslib
ATE OF MODIFICATION	12-02-10 14:03
ROCESS AREA 1	TRAINING1
PROCESS AREA 2	
PROCESS AREA 3	
PROCESS AREA 4	
Show Formulas Function formula:	Typehelp

6. To save the new application, click File and choose Check. Created application must be check in repository before downloaded to avoid any error.

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A message will appear as there is an error. The error occurs because Channel 4 to 7 are unavailable in the AO system. Refer to the schematic diagram.



Start again using another example: Analogue output at JB 2 using channel 3. Software address = 2333. Then click OK.

Identifier	Prompt	Value	٦.					
S(DUMMY1)	LOOP	LOOP						
\$(TAG)	TAG	JB2_AO_2333						
S(TEMPLATE)	TEMPLATE	A01						
\$(NAME20)	NAME TEXT 3(20char)	JB2 AO CH3						
S(PACKAGE)	PACKAGE	4P01						
\$(EXE)	EXE	900						
\$(ORDER)	EXECUTION ORDER	65						
\$(CTRLROOM)	Control room identifier	A1						
\$(ALGROUP)	Alarm area (1-64)	11						
\$(ALPRI)	ALARM PRIORITY	700						
\$(GDID_1)	HIERARCHY CODE OF DISPL							
\$(NAME14)	NAME TEXT 1(14char)							
\$(NAME40_1)	NAME40_1	JB2 AO CH3						
\$(NAME40_2)	NAME40_2							
\$(FDESCR)	INFO DISP HIERARCHY CODE							
\$(DECS)	NUMBER OF DECIMALS(0-5)	0						
\$(EXT_1)	Tag for output	#						
\$(EXTTEXT_1)	Comment							
\$(DUMMY2)	DEVICE	DEVICE						
\$(CARDTYPE1)	Outputcards type (A04, A04H, A0I4, A0I4, A0H4, A0U1) A04							
S(DEVICETAG1)	DEVICETAG1	JB2 AO 2333						
\$(DEVICETAG1:MIN)	MEASUREMENT MIN 0							
\$(DEVICETAG1:MAX)	MEASUREMENT MAX	200						
\$(DEVICETAG1:UNIT)	UNIT OF MEAS VAL.(8char)	%	~					
Show Formulas Functio	on formula:	lypehelp						

Change I/O address. Then, click OK.

Prompt	Value	<u>^</u>
Output module name	pr:JB2_A0_2333.0	
Card type	A04	
IO cabinet		
FBC slot (2-15)	2	
IBC number (0-15)	3	
Card place (0-15)	3	
Channel number (0-3)	3	
Minimum	&mi	
Maximum	&ma	
Fail safe change rate	0	
Fail safe time	0	
Fail safe value	0	
Fail safe mode	0	
Alarm delay	25	
Output data range	0	
Output change rate	0	
Additional parameter		
Output fault control	0	
Line fault control	2	
Scale and unit	0-200 %	
Comment text		
Simulation parameters		
Simulation Group	SIM1	
Enable simulation	1	V
Show Formulas Function formula: \$(CARDTYPE1)==A04	Typehelp	04

7. To save the new application with new address, click File and choose Check. Created application must be check every time there is a change to avoid any error.

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8. If there is no error occurs, message to save the engineering object will pop up. Click Yes.

Another window will pop up. Change the storage location from templates to repository. Then, click OK. Wait until the colon symbol to reappear.

Ъ	JB2_A	.O_2333 - Fur	nction B	lock CAD - [Draw	ng2] —	
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9. The colon symbol reappears to indicate that the saving process is completed. Then download the file.

A download window will pop up. Click OK.

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λ	<u>F</u> ile	<u>E</u> dit <u>V</u> iew	<u>D</u> rav	v <u>C</u> ommon Fb	locks <u>1</u> Fblocl	ks <u>2</u> Fblocks <u>3</u> J/O <u>M</u> o	dules Interlockings Fl	bC <u>A</u> DHelp			-	e x
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INS	 Image: A second s			 Update 		Preprocess						
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0	7		$ \in$	JB2 AO 2333	JB2 AO CH3	pr:JB2_AO_2333.F	JB2 AO CH3	AP01				
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∎tg.	5			JB2_AO_2333	JB2 AO CH3	od:A1:JB2_AO_2333		A10				
BLA BLS	C ⁴			JB2_AO_2333	JB2 AO CH3	al:A1:JB2_AO_2333.F		A1A1				
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Download is processing. The colon symbol at the bottom will reappears when the process is completed.

An error occurred because there is no AI file that linked to this AO file. So, create another AI that links with JB2_AO_2333 which is JB2_AI_2327. Please refer to the schematic drawing.

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UM 1 UM 5	lain									22.0	8.2019 08:38:10
UM 2		□ 2	2:17:48:479		JB2_AO_23	33	JB2	АО СНЗ		Ic	o-fault
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JB2_AO_2333 - Function Block CAD - [Drawing	2]									_	
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Function Test (AB01) Running - JB2_AO_2333											
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861.94869686, 573.25468117, 0.00000000 MONOTXT STANDARD 2D Drafting SNAP GRID ORTHO POLAR ESNAP STRACK LWT TILE DUCS DYN QUAD RNone

JB2_ AI 2327 application file is created.

🏈 DNA Explorer - [[EAS1] - Process A	rea Hierarchy - Repository - Applicatio	n Engineer]		D X
Object <u>E</u> dit <u>V</u> iew Design Upload	d/Download Logs <u>W</u> indow <u>H</u> elp			
DNA Explorer	💷 🖻 🖉 🤤	🔰 💁 🚰 🛛 👰 📇 Reposit	tory 💌 Real	Y
🚞 Process Area Hierarchy	Identifier /	Name	Category	Description ^
E A_UM_PROCESS_MODEL	🗉 🏘 JB1_AI_2227	JB1 AI CH7	Function Block Diagram	JB1 AI CH7
Design Accessories	🗉 🏘 JB1_AO_2230	JB1 AO1	Function Block Diagram	
Diagnostic modules A1	🗉 🏘 JB1_AO_2233	AM only one AOU	Function Block Diagram	
HKatSite CtrlRoom A1	🗉 🏘 JB1_DI_2200	JB1 TOGGLE SW1	Function Block Diagram	
	🗉 🏘 JB1_DI_2201	D1 JB1 CH1	Function Block Diagram	
Interlockings	🗉 🏘 JB1_DI_2204	D1 JB1 CH4	Function Block Diagram	
	🗉 🏘 JB1_DO_2210	Binary port with BO, with pulse	Function Block Diagram	
	🗉 🏘 JB1_DO_2212	LED1 JB1	Function Block Diagram	
	🗉 🏘 JB2_AI_2323	JB2 AI CH3	Function Block Diagram	JB2 AI CH3
	🗉 鑇 JB2 AI 2324	AI JB2 CH5	Function Block Diagram	
	🗉 🏘 JB2_AI_2327	JB2 AI CH 7	Function Block Diagram	
	🗉 🏘 JB2_AO_2330	AM only one AOU	Function Block Diagram	
TRAINING2	⊞ 🏘 JB2_AO_2333	JB2 AO CH3	Function Block Diagram	
	🗉 🏘 JB2_D0_2314	JB2 DO CH4	Function Block Diagram	
	🗉 🏘 JB2_DI_2301	JB2 DI CH1	Function Block Diagram	
	🗉 🏘 JB2_DI_2304	DI_JB2_CHANNEL1	Function Block Diagram	
	🗉 🏘 JB2_DO_2312	JB2 DO CH2	Function Block Diagram	~
	<			>
Ready		10 : 5 % UITag : 38 %	Items at Process Area <#T	RAINING1>

10. Test AO application.





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